Test Report:	2W06641
Applicant:	Digital Security Controls Ltd. 3301 Langstaff Road Vaughan, Ontario L4K 4L2
Equipment Under Test: **(EUT)**	WLS925L-433NA 433MHz Transmitter
FCC ID:	F5302WLS925LNB
In Accordance With:	**FCC Part 15, Subpart C, 15.231** Class II Permissive Change
Tested By:	Nemko Canada Inc. 303 River Road, R.R. 5 Ottawa, Ontario K1V 1H2
Authorized By:	 Kevin Carr, EMC Specialist
Date:	19 November 2002
Total Number of Pages:	18

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Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. All tests were conducted using measurement procedure ANSI C63.4-1992. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.
See " Summary of Test Data".

TESTED BY: _____ DATE: 19 November 2002
Glen Westwell, Wireless Technologist

Summary Of Test Data

Name of Test	Para. Number	Results
Transmission Requirements	15.231(a)	Complies
Radiated Emissions	15.231(b)	Complies
Occupied Bandwidth	15.231(c)	Complies
Frequency Tolerance	15.231(d)	N/A
Periodic Alternate Field Strength Requirements	15.231(e)	N/A
Powerline Conducted Emissions	15.207	N/A

Note:

-This Device is powered by a 3Vdc cell only.
-All tests were performed with fresh batteries.

Justification for Class II Modification:

-R8 changed from 1k to 3.3kohms, reduced the voltage drive to the crystal to improve yields in production.
-C14 from 3.3pF to 1pF, reduced the transmit current to improve battery life
-C5, changed from 12pF to NU, to improve the on/off ration in normal mode
-This sample has a reduced output level from the RF1 chip to provide a better margin for compliance.
-R7 of this device has been changed from 1K ohms to 4.7K ohms.

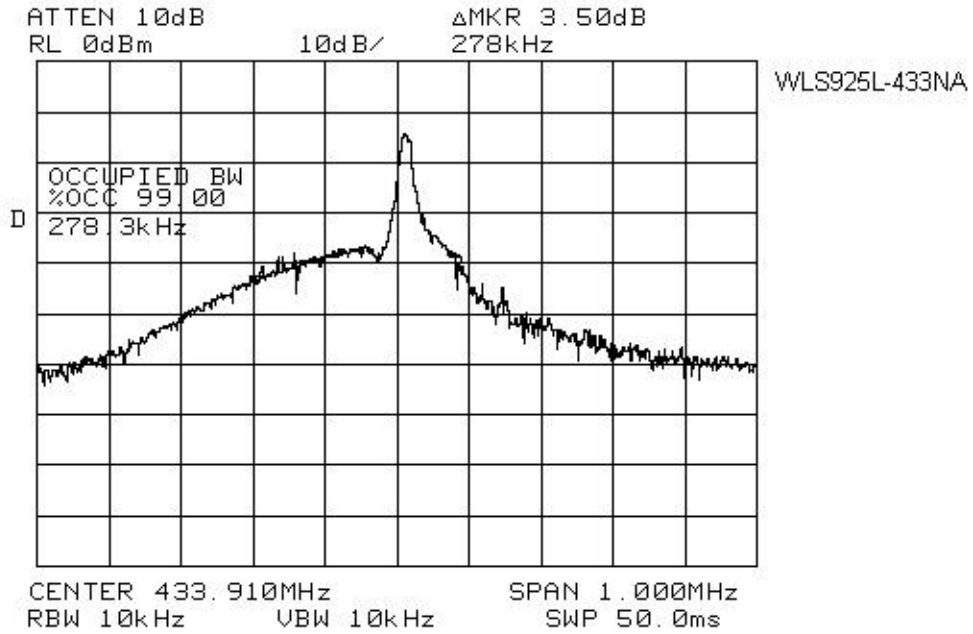
Test Conditions:

Indoor	Temperature:	20°C
	Humidity:	42%
Outdoor	Temperature:	25°C
	Humidity:	46%

Section 2. Equipment Under Test

General Equipment Information

Manufacturer:	Digital Security Controls Ltd.
Model No.:	WLS925L-433NA
Serial No.:	Constant Carrier 1
Date Received In Laboratory:	June 14 & Oct 31, 2002
Nemko Identification No.:	#4 & #1
Transmit Frequency (Fixed):	433MHz
Emission Designator:	278KL1D


ATTEN 10dB
RL 0dBm
10dB/
ΔMKR 3.50dB
278kHz
WLS925L-433NA
OCCUPIED BW
%OCC 99.00
278.3kHz
D
CENTER 433.910MHz
SPAN 1.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms

Section 3. Transmission Requirements

Para. No.: 15.231(a)

Test Performed By: Glen Westwell	**Date of Test: 25 June 2002**

Minimum Standard:

15.231(a) Continuous transmissions such as voice, video or data transmissions are not permitted.

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

15.231(a)(2) A transmitter activated automatically shall cease transmission within 5 seconds of activation.

15.231(a)(3) Periodic transmissions at regular pre-determined intervals are not permitted. However polling or supervisory transmissions to determine system integrity of transmitters used in security or safety applications are allowed if the periodic rate of transmission does not exceed one transmission of not more than one second duration per hour for each transmitter.

15.231(a)(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.

Test Results: Complies.

Test Data: See Attached Data.

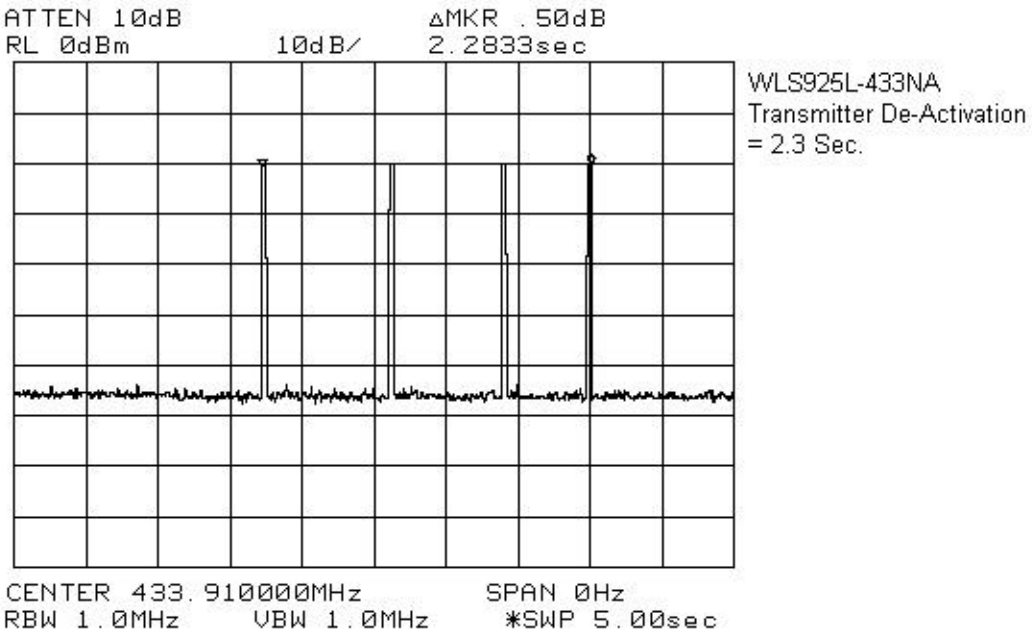
Rationale for Compliance with Transmission Requirements

15.231(a)(1) : N/A

15.231(a)(2) : Transmission ceases within 2.3 seconds of activation.

15.231(a)(3) : This transmitter has no regular pre-determined periodic transmissions.

15.231(a)(4) : N/A


ATTEN 10dB
RL 0dBm
10dB/
ΔMKR .50dB
2.2833sec
WLS925L-433NA
Transmitter De-Activation
= 2.3 Sec.
CENTER 433.910000MHz
SPAN 0Hz
RBW 1.0MHz
VBW 1.0MHz
*SWP 5.00sec

Section 4. Radiated Emissions

Para. No.: 15.231(b)

Test Performed By: Glen Westwell	**Date of Test: 5 Nov, 2002**

Minimum Standard:

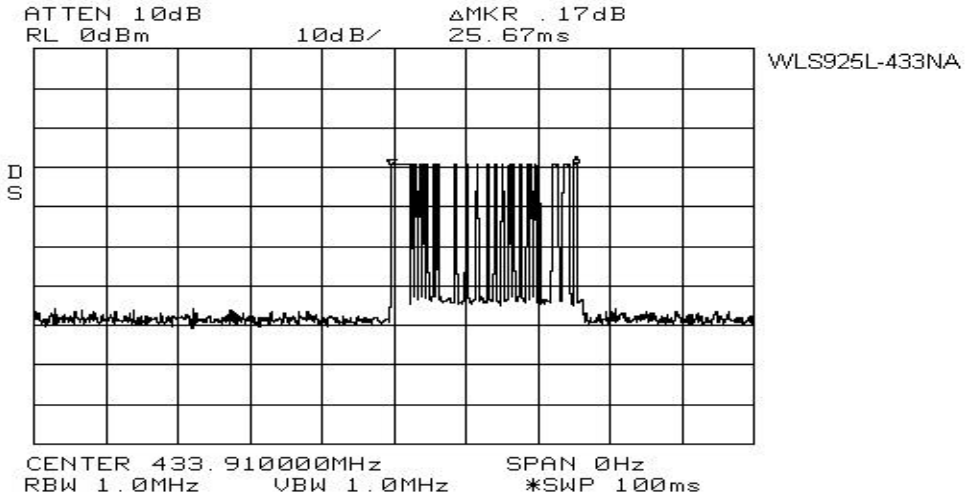
Fundamental Frequency (MHz)	Field Strength of Fundamental (µV/m @ 3m)	Field Strength of Spurious Emissions (µV/m @ 3m)
40.66 - 40.70	2,250	225
70-130	1, 250	125
130-174	1,250 to 3,750*	125 to 375
174-260 (note 1)	3,750	375
260-470 (note 1)	3,750 to 12,500*	375 to 1,250
Above 470	12,500	1,250

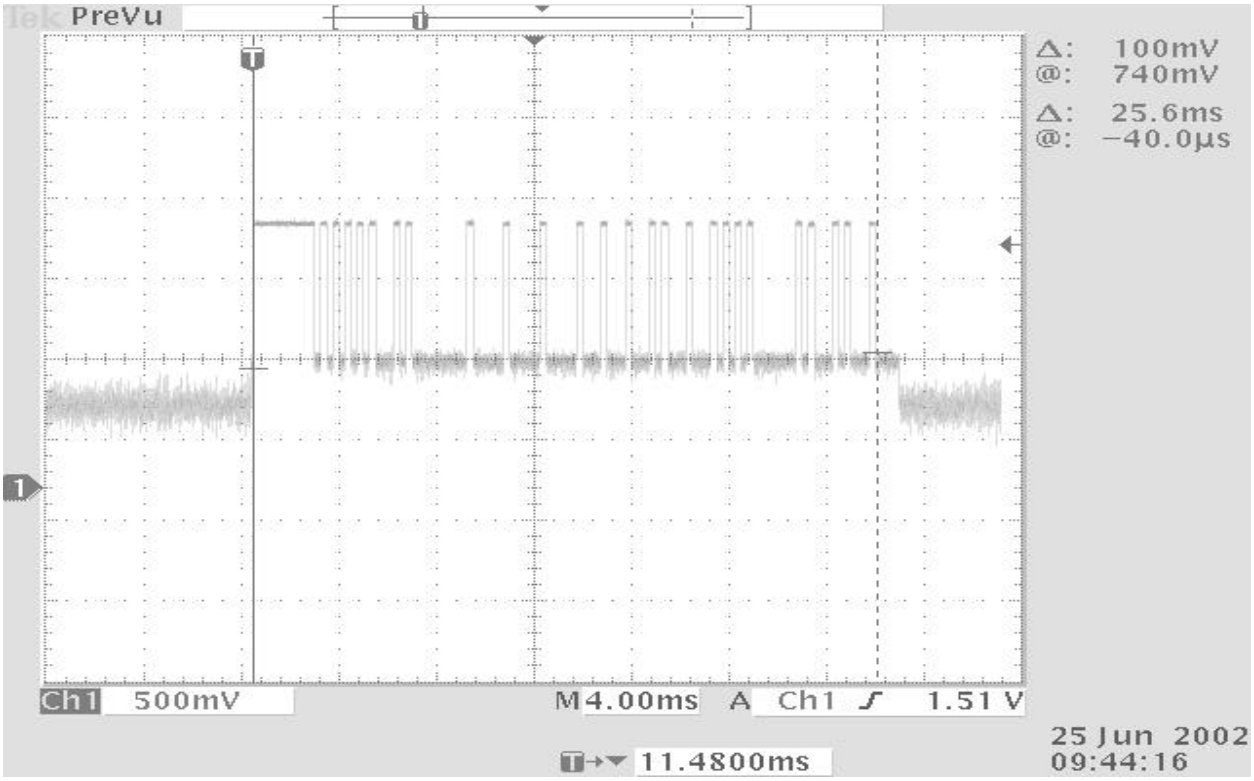
Restricted Band Limits		
Frequency (MHz)	**Field Strength (µV/m @ 3m)**	**Field Strength (dBµV/m @ 3m)**
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

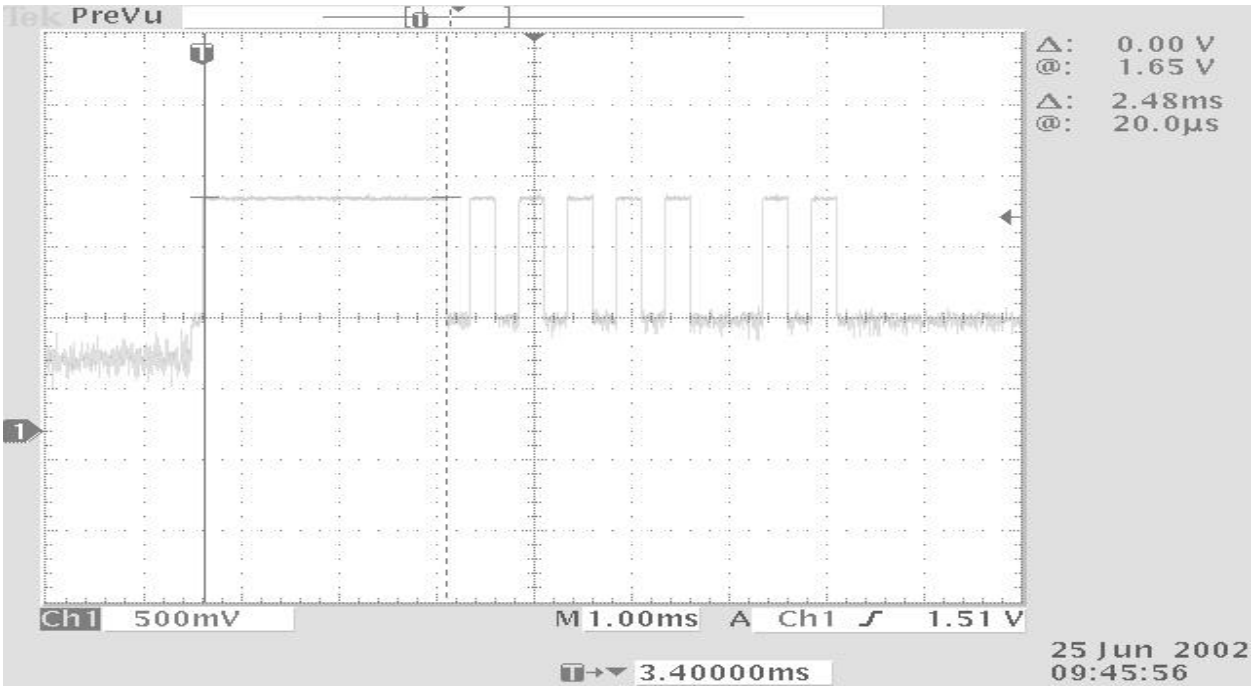
Test Results: Complies.

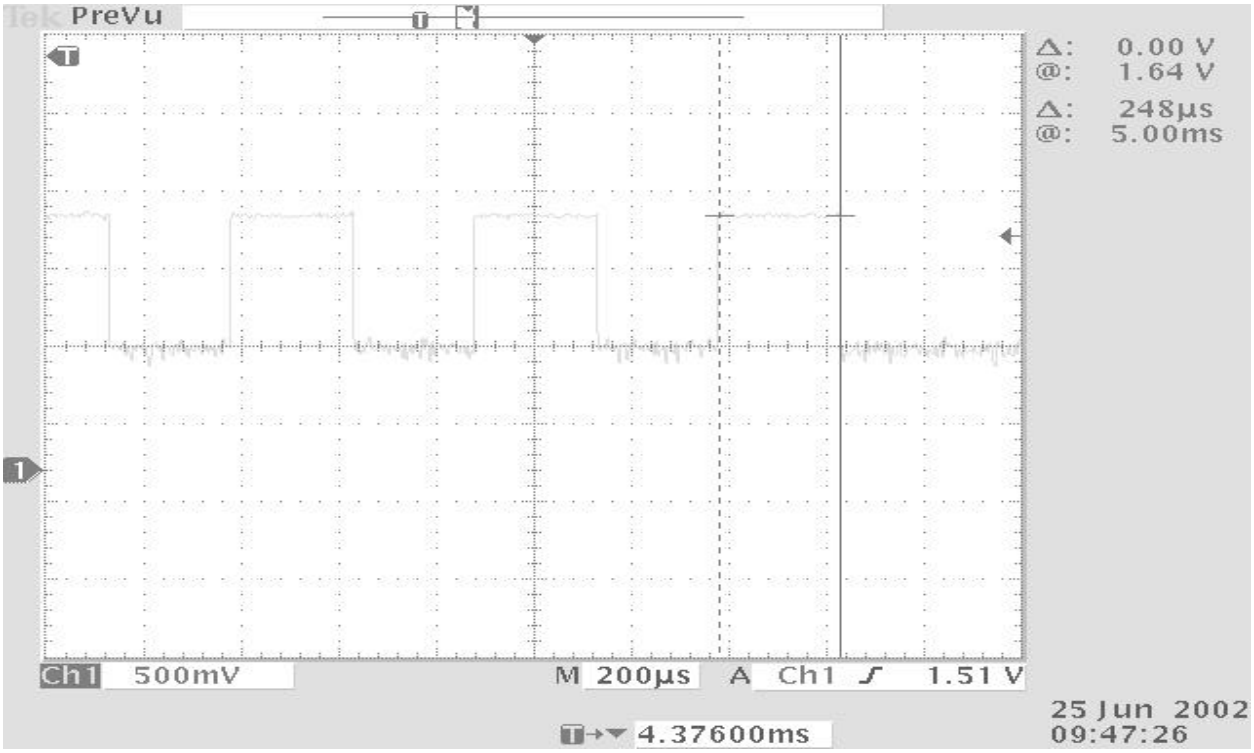
Test Data: As per attached tabulated data.
- This device was searched on 3 orthogonal axis.
- Emissions were searched with an 18 inch wire attached.
- This device was tested using a fresh battery.

Duty Cycle: 20Log (2.48mS + 6.2mS / 100mS) = -21.2dB


ATTEN 10dB
RL 0dBm
10dB/
ΔMKR .17dB
25.67ms
WLS925L-433NA
D
S
CENTER 433.910000MHz
SPAN 0Hz
RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms


PreVu
Δ: 100mV
@: 740mV
Δ: 25.6ms
@: −40.0µs
Ch1 500mV
M4.00ms A Ch1 1.51 V
11.4800ms
25 Jun 2002
09:44:16


PreVu
Δ: 0.00 V
@: 1.65 V
Δ: 2.48ms
@: 20.0µs
Ch1 500mV
M 1.00ms A Ch1 1.51 V
3.40000ms
25 Jun 2002
09:45:56


PreVu
Δ: 0.00 V
@: 1.64 V
Δ: 248µs
@: 5.00ms
Ch1 500mV
M 200µs A Ch1 1.51 V
4.37600ms
25 Jun 2002
09:47:26

Test Data - Radiated Emissions

Test Distance (meters) : 3		Range: A		Receiver: HP8564E			RBW(kHz): 100		Detector: Peak	
No.	Freq. (MHz)	Ant.	Pol (V/H)	RCVD Signal (dBµV)	Ant. Factor (dB)**	Amp. Gain (dB)***	Duty Cycle Corr. (dB)	Field Strength (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1	433.9	LP1	V	77.2	19.1		-20.0	76.3	81.0	4.7
2	433.9	LP1	H	77.0	19.7		-20.0	76.7	81.0	4.3
3	867.8	LP1	V	44.5	27.2		-20.0	51.7	61.0	9.3
4	867.8	LP1	H	39.7	27.2		-20.0	46.9	61.0	14.1
5	1301.7	Hrn2	V	78.2	28.8	-48.2	-20.0	38.8	54.0	15.2
6	1301.7	Hrn2	H	69.2	28.8	-48.2	-20.0	29.8	54.0	24.2
7	1735.68	Hrn2	V	94.7	31.4	-47.9	-20.0	58.4	61.0	2.8
8	1735.68	Hrn2	H	86.2	31.4	-47.9	-20.0	49.7	61.0	11.3
9	2169.58	Hrn2	V	89.8	34.0	-58.6	-20.0	45.2	61.0	15.8
10	2169.58	Hrn2	H	84.0	34.0	-58.6	-20.0	39.4	61.0	21.6
11	2603.46	Hrn2	V	89.0	35.2	60.2	-20	44.0	61.0	17.0
12	2603.46	Hrn2	H	90.5	35.2	60.2	-20	45.5	61.0	15.5
13	3037.36	Hrn2	V	87.2	36.8	59.8	-20	44.2	61.0	16.8
14	3037.36	Hrn2	H	87.2	36.8	59.8	-20	44.2	61.0	16.8
15	3471.51	Hrn2	V	84.2	38.5	59.1	-20	43.6	61.0	17.4
16	3471.51	Hrn2	H	85.7	38.5	59.1	-20	45.1	61.0	15.9

Notes:

B/C = Biconical, BL = Bilog, L/P = Log-Periodic, H = Horn, D/P = Dipole, E/D = EMCO Dipole

* Re-measured using dipole antenna.

** Includes cable loss when amplifier is not used.

*** Includes cable loss.

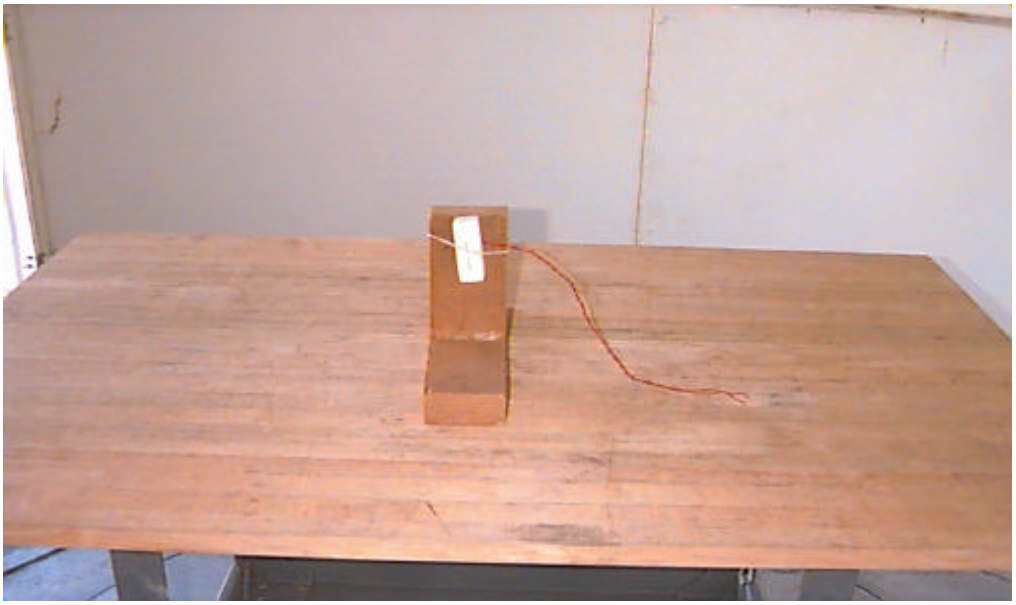
( ) Denotes failing emission level.

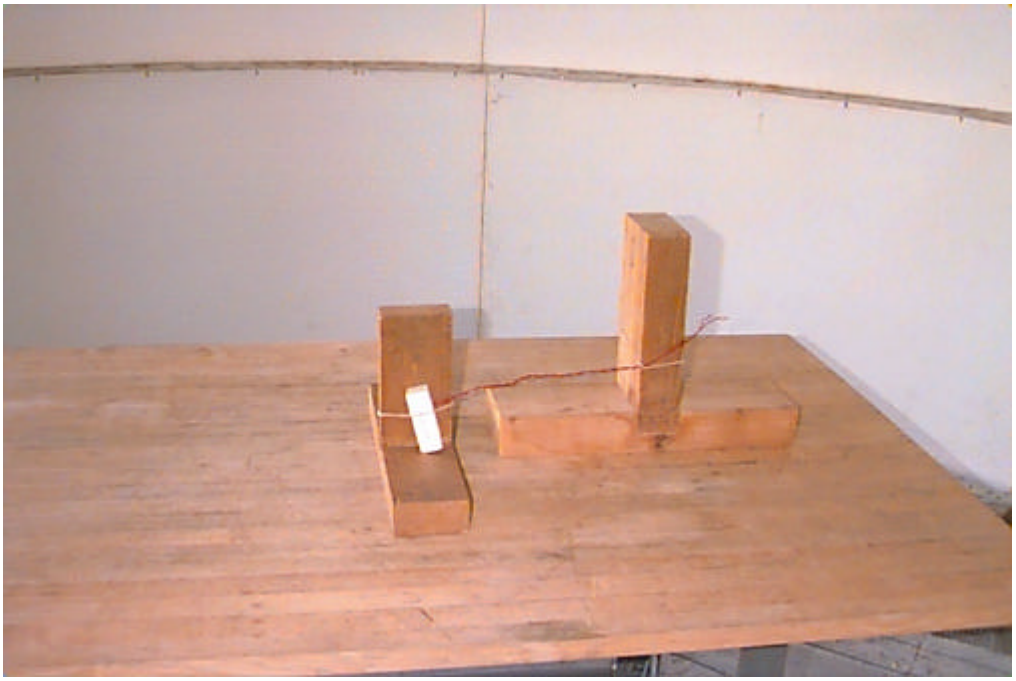
N.D. = Not Detected

All spurious & harmonic emissions were searched up to the 10th harmonic. Only those within 20dB of the limit were reported.

The EUT was searched for maximum emission levels on 3 orthogonal axis.

Radiated Emissions Photos.





Section 5. Occupied Bandwidth

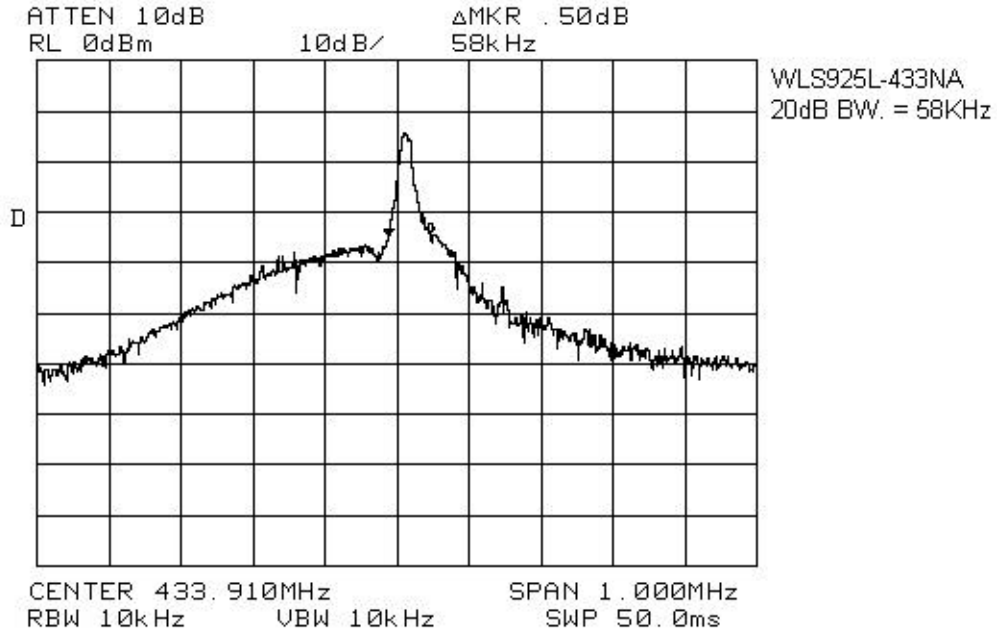
Para. No.: 15.231(c)

Test Performed By: Glen Westwell	**Date of Test: 25 June 2002**

Minimum Standard: 15.231(c) 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.

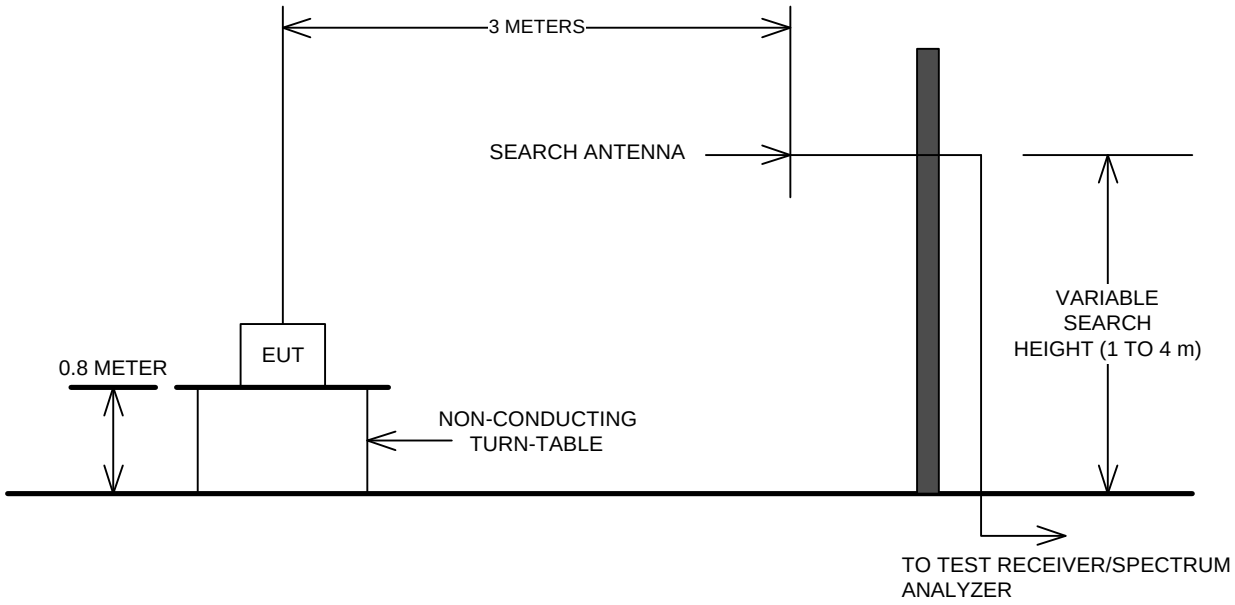
Test Results: Complies.

Test Data: See attached graph.


ATTEN 10dB
RL 0dBm
10dB/
ΔMKR .50dB
58kHz
WLS925L-433NA
20dB BW. = 58KHz
D
CENTER 433.910MHz
SPAN 1.000MHz
RBW 10kHz
VBW 10kHz
SWP 50.0ms

Section 6. Block Diagrams

Outdoor Test Site For Radiated Emissions



The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.

Section 7. Test Equipment List

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett-Packard	8564E	FA001367	Mar. 06/02	Mar. 06/03
1 Year	Dipole Antenna Set	EMCO #1	3121C	FA000814	May. 06/02	May. 06/03
1 Year	Horn Antenna #2	EMCO	3115	FA000825	Dec. 01/01	Dec. 01/02
1 Year	Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug 23/02	Aug. 23/03
1 Year	RF Amplifier	JCA	1.0 – 2.0 GHz	FA001498	June. 04/02	June. 04/03
1 Year	RF Amplifier	JCA	2.0 – 4.0 GHz	FA001496	June. 04/02	June. 04/03
1 Year	RF Amplifier	JCA	4.0 – 8.0 GHz	FA001497	June. 04/02	June. 04/03

Note: N/A = Not Applicable
NCR = No Cal Required
COU = CAL On Use
OUT = Out For CAL/Repair