

Nemko Test Report: 126985-3TRFWL

Applicant: Paradox Security Systems Ltd.
780 boul. Industriel
St-Eustache (Montréal), QC
Canada J7R 5V3

Apparatus: SR150 - Wireless Siren

FCC ID: KDYSR150

In Accordance With: FCC Part 15 Subpart C, 15.231
Periodic operation in the band 40.66–40.70 MHz
and above 70 MHz.

Authorized By: 
Andrey Adelberg, EMC/Wireless Specialist

Date: July 28, 2009

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Section 1 : 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.

The assessment summary is as follows:

Apparatus Assessed:	SR150 - Wireless Siren
Specification:	FCC Part 15 Subpart C, 15.231
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release
Test Location:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Registration Number:	176392 (3 m Semi-Anechoic Chamber)
Tests Performed By:	Jason Nixon, Wireless/Telecom Specialist
Test Dates:	May 29, 2009

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. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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Section 2 : Equipment Under Test

2.1 Identification of Equipment Under Test (EUT)

The following information identifies the EUT under test:

Type of Equipment:	Wireless Siren
Brand Name:	PARDOX
Model Name or Number:	SR150
Serial Number:	C6P
Nemko Sample Number:	4
FCC ID:	KDYSR150
Date of Receipt:	May 20, 2009

2.2 Accessories

No additional accessories were used to exercise the EUT during testing:

2.3 EUT Description

The SR150 operates at 433 MHz using 3 “D” size alkaline batteries. Battery life can be extended by many years if an optional AC or DC connection is used.

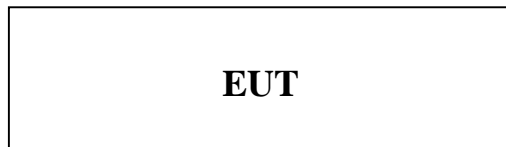
The SR150 uses 2-way wireless communication, which provides continuous supervision between the panel and siren with fast response to alarm signals of up to 4 seconds.

The SR150 is compatible with the MG series V4.0, and with the SP series using the RTX3 V1.5. Each control panel supports up to 4 wireless sirens.

2.4 Technical Specifications of the EUT

Operating Frequency:	433.92 MHz
Modulation:	On/Off Keying
Occupied Bandwidth:	44 kHz
Emission Designator:	44K0L1D
Antenna Data:	Wire antenna
Power Supply Requirements:	3 “D” type batteries of 1.5 V each or 8–16 Vac / 9–20 Vdc power supply.

2.5 EUT Setup diagram



2.6 Operation of the EUT during testing

The EUT was modified to transmit constantly when energized.

2.7 Modifications incorporated in the EUT

There were no modifications performed to the EUT during this assessment.

Section 3 : Test Conditions

3.1 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.

3.2 Deviations From Laboratory Test Procedures

No deviations were made from laboratory test procedures.

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15–30 °C
Humidity range	:	20–75 %
Pressure range	:	86–106 kPa
Power supply range	:	±5 % of rated voltages

3.4 Measurement Uncertainty

Nemko Canada measurement uncertainty has been calculated using guidance of UKAS LAB 34:2003 and TIA-603-B Nov 7, 2002. All calculations have been performed to provide a confidence level of 95 % and can be found in Nemko Canada document MU-003.

3.5 Test Equipment

Equipment	Manufacturer	Model No.	Asset/Serial No.	Cal. Date	Next Cal.
3 m EMI Test Chamber	TDK	SAC-3	FA002047	May 06/9	May 06/10
Bilog	Sunol	JB3	FA002108	Jan. 27/9	Jan. 27/10
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR	NCR
Controller	Sunol	SC104V	FA002060	NCR	NCR
Mast	Sunol	TLT2	FA002061	NCR	NCR
International Power Supply	California Inst.	3001i	FA001021	Jan. 13/9	Jan. 13/10
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 26	FA002043	Dec. 16/08	Dec. 16/09
Horn Antenna #2	EMCO	3115	FA000825	Jan. 21/9	Jan. 21/10
1 – 18 GHz Amplifier	JCA	JCA118-503	FA002091	Oct 2/08	Oct 2/09
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU 40	FA002071	Nov. 25/08	Nov. 25/09

NCR – No Calibration Required

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 Report Summary)

4.1 FCC Part 15 Subpart C : Test Results

Part 15	Test Description	Required	Result
15.31(e)	Variation of Power source	Y	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	N	
15.231(a)(2)	Automatically activated transmitter	Y	PASS
15.231(a)(3)	Periodic transmissions at regular predetermined intervals	N	
15.231(a)(4)	Radiators used in cases of emergency	N	
15.231(a)(5)	Set-up information for security systems	N	
15.231(b)	Radiated Emissions	Y	PASS
15.231(c)	20 dB 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	

Appendix A : Test Results

Clause 15.207(a) Powerline Conducted Emissions

Frequency of Conducted limit (dB μ V)		
Emission (MHz)	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.		

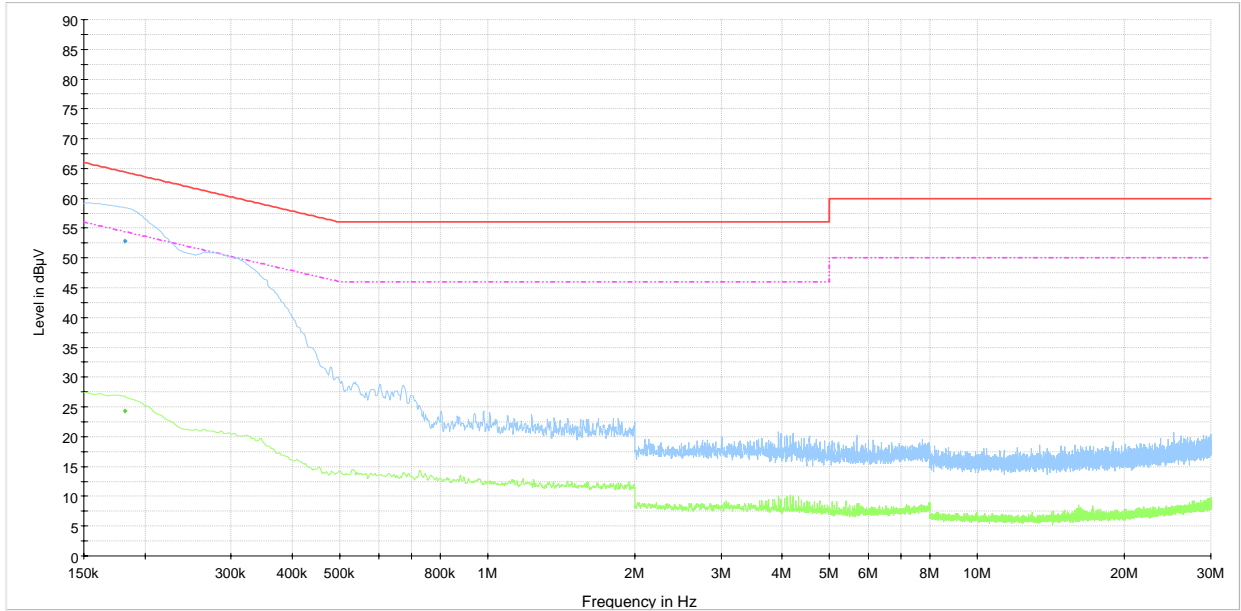
Test Results: Pass

Additional Observations:

All plots were obtained using a sweeping receiver with an IF of 9 kHz using a Peak and Average detector. The plots have been corrected with the cable loss and LISN loss to show compliance.

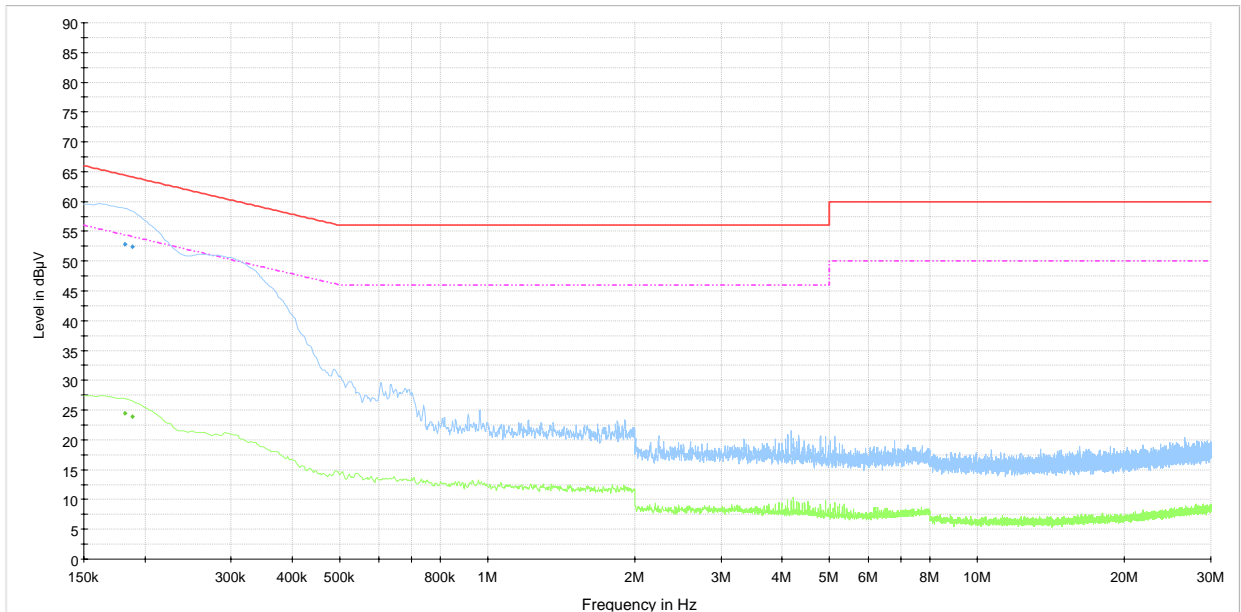
Frequency MHz	Quasi Peak dB μ V	Meas. Time ms	Bandwidth kHz	Filter	Line	Corr. dB	Margin dB	Limit dB μ V
0.182	52.801	100	9	On	L1	10.217	11.600	64.417
0.182	24.301	100	9	On	L1	10.217	30.100	54.417
0.182	52.765	100	9	On	N	10.197	11.600	64.417
0.188	52.370	100	9	On	N	10.197	11.700	64.113
0.182	24.427	100	9	On	N	10.197	30.000	54.417
0.188	23.843	100	9	On	N	10.197	30.300	54.113

Phase



— CISPR 22 Mains QP Class B.LimitLine
 - - - CISPR 22 Mains AV Class B.LimitLine
 — Preview Result 1
 — Preview Result 2
 • Final Result 1
 • Final Result 2

Neutral



— CISPR 22 Mains QP Class B.LimitLine
 - - - CISPR 22 Mains AV Class B.LimitLine
 — Preview Result 1
 — Preview Result 2
 • Final Result 1
 • Final Result 2



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 Results: Pass

Additional Observations:

The Spectrum was searched from 30 MHz to the 10th Harmonic.

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 100 kHz RBW/VBW below 1 GHz and a 1 MHz RBW/VBW above 1 GHz at a distance of 3 meters.

No emissions within 20 dB below limit were found.

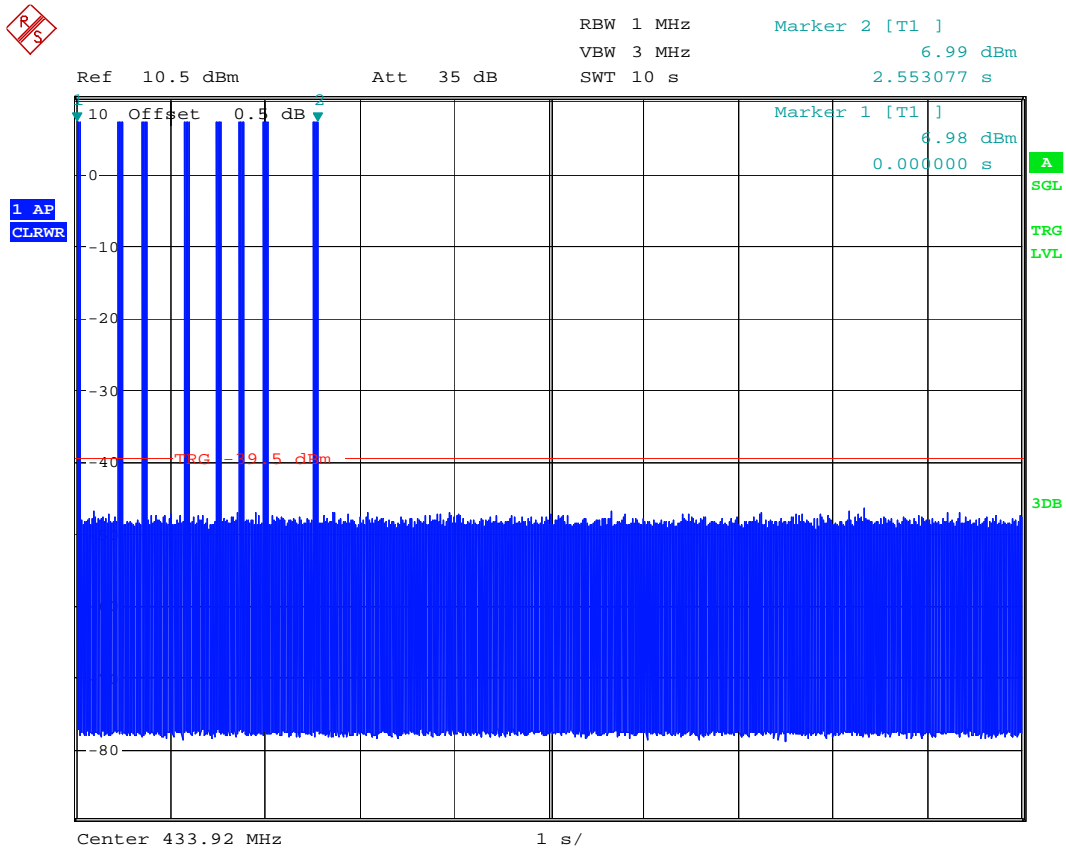
Clause 15.231(a) Conditions for intentional radiators to comply with periodic operation

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 Results: Pass

- (1) The EUT is not manually triggered.
- (2) See attached plot for the timing of an automatically trigger event.
- (3) The EUT is not a periodic transmitter.
- (4) The EUT operates as in 15.231(a)(2) during an alarm state.
- (5) The EUT does not transmit set-up information.



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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 Results: Pass

Additional Observations:

The Spectrum was searched from 30 MHz to the 10th Harmonic.

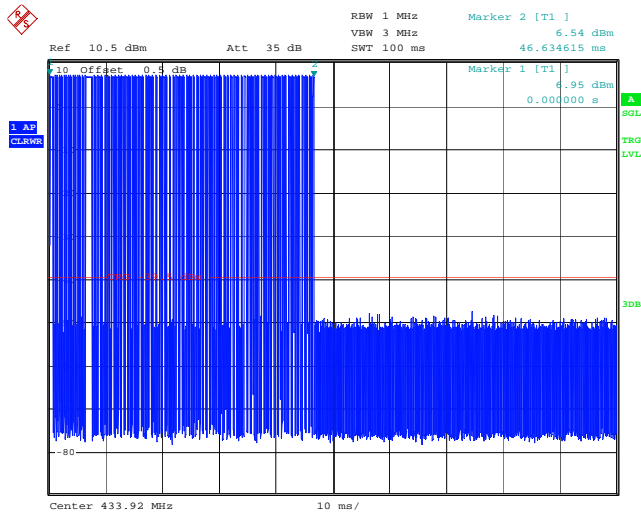
The fundamental field strength was also measured at ±15 % of the supply voltage and found that there was no change.

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

Freq. (MHz)	Pol. V/H	Peak Field Strength (dBμV/m)	Correction (dB)	Peak Limit (dBμV/m)	Peak Margin (dB)	Duty Cycle Corr. (dB)	Avg Field Strength (dBμV/m)	Avg Limit (dBμV/m)	Avg Margin (dB)
433.92	V	86.97	18.43	100.80	13.83	-6.63	80.34	80.80	0.46
433.92	H	76.65	18.43	100.80	24.15	-6.63	70.02	80.80	10.78
867.84	V	33.06	24.48	80.80	47.74	-6.63	26.43	60.80	34.37
867.84	H	33.74	24.48	80.80	47.06	-6.63	27.11	60.80	33.69
1301.76	V	35.68	-18.19	80.80	45.12	-6.63	29.05	60.80	31.75
1301.76	H	29.24	-18.19	80.80	51.56	-6.63	22.61	60.80	38.19
1735.68	V	59.95	-16.23	80.80	20.85	-6.63	53.32	60.80	7.48
1735.68	H	60.68	-16.23	80.80	20.12	-6.63	54.05	60.80	6.75
2169.60	V	61.74	-14.10	80.80	19.06	-6.63	55.11	60.80	5.69
2169.60	H	57.95	-14.10	80.80	22.85	-6.63	51.32	60.80	9.48
2603.52	V	57.23	-12.35	80.80	23.57	-6.63	50.60	60.80	10.20
3037.44	V	57.40	-10.51	80.80	23.40	-6.63	50.77	60.80	10.03

Note: Correction factor includes antenna, cable loss, amplifier, and attenuators.

Duty Cycle:



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Duty cycle correction: $20 \times \log(46.6 \text{ ms}/100 \text{ ms}) = -6.63 \text{ dB}$



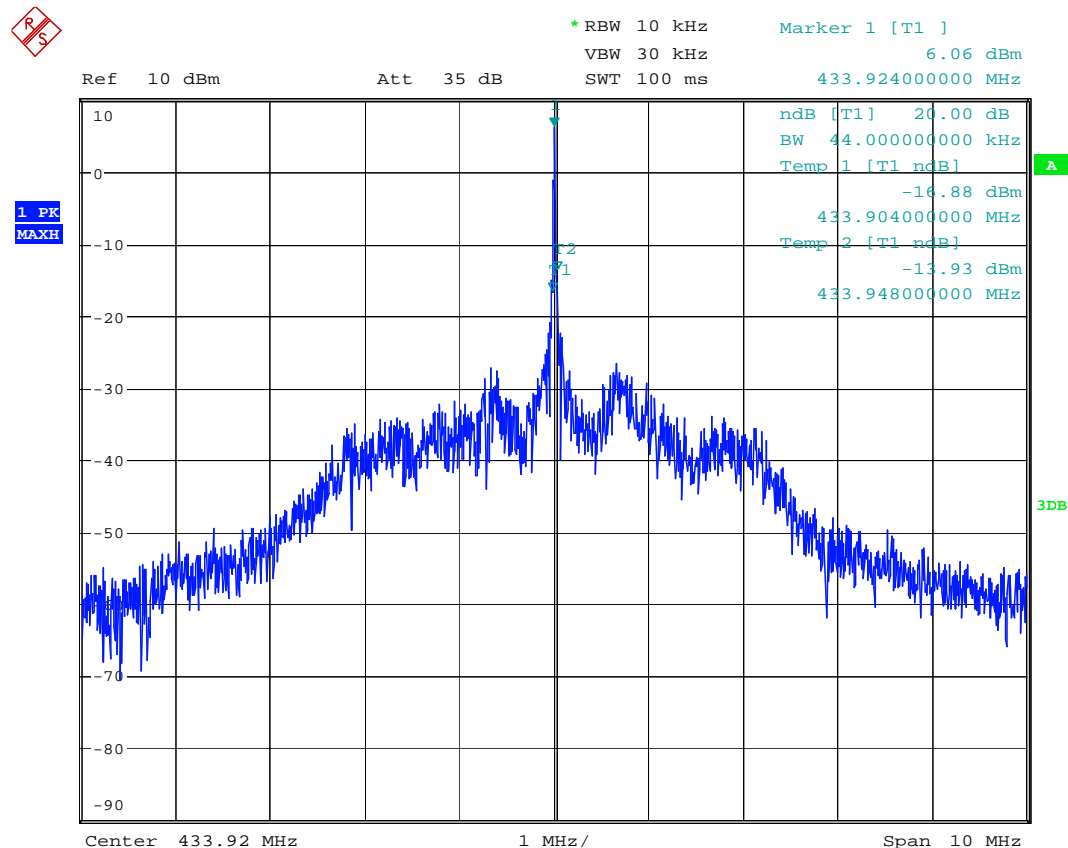
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Clause 15.231(c) 20 dB Bandwidth

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 Results: Pass

20 dB Bandwidth:



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Limit: 0.25 % of 433.92 MHz = 1084.8 kHz

20 dB BW result: 44 kHz

Appendix B : Setup Photographs

Conducted Emissions Setup:

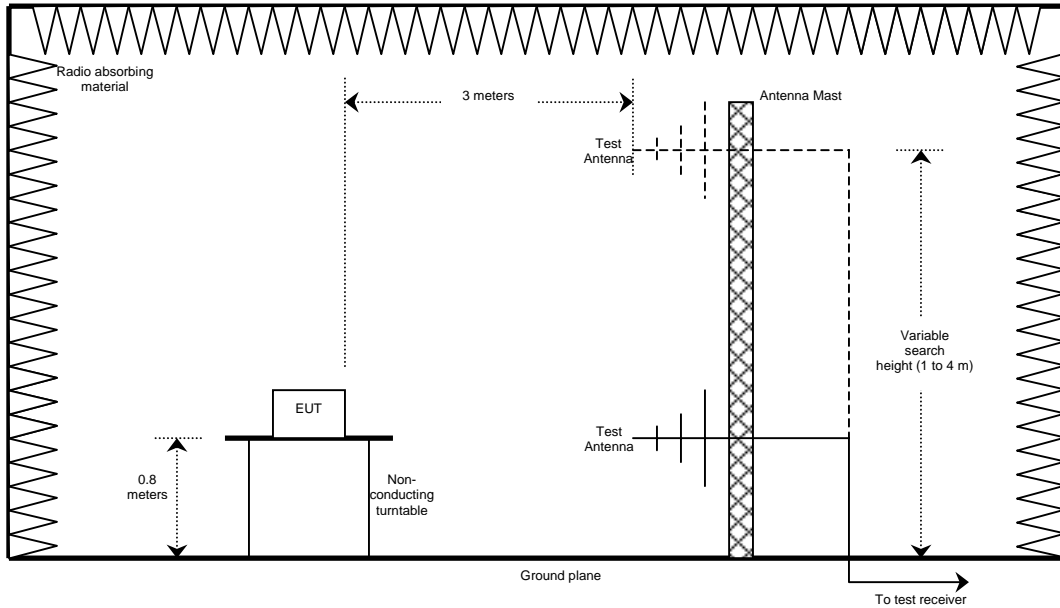


Spurious Emissions Setup:



Appendix C : Block Diagram of Test Setups

Radiated Emissions above 30 MHz Test Site



Conducted Emissions Test Site

