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Test Report:	91017-7TRFWL
Applicant:	Paradox Security Systems 780 Industrial Blvd. Ste-Eustache, Quebec J7R 5V3
Apparatus:	MG-RTX3 433MHz Wireless Expansion Module
FCC ID:	KDYMGRTX3
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:	Roman Kuleba, Wireless Specialist
Date:	November 7, 2007
Total Number of Pages:	22

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: MG-RTX3 433MHz Wireless Expansion Module

Specification: FCC Part 15 Subpart C, 15.231

Compliance Status: Complies

Exclusions: None

Non-compliances: None

Report Release History: Original Release

Author: Heng Lin, EMC/Wireless 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.

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Section 1 : Equipment Under Test

1.1 Product Identification

The Equipment Under Test was identified as follows:

MG-RTX3 433MHz Wireless Expansion Module

1.2 Samples Submitted for Assessment

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

Sample No.	Description	Serial No.
2	MG-RTX3 Wireless Expansion Module	3B00354C
4	MG-RTX3 Wireless Expansion Module	3B003572
	ATC-Frost 120VAC to 16VAC Transformer PN# FTC3716	None

The first samples were received on: August 31, 2007

1.3 Theory of Operation

The EUT is a 2-Way Wireless Expansion Module for use with the Digiplex EVO, Digiplex 848, and Esprit series control panels.

1.4 Technical Specifications of the EUT

Operating Frequency: 433.92MHz fixed

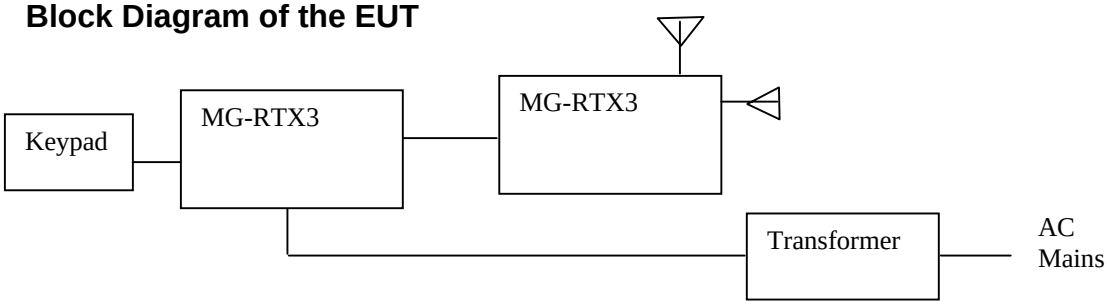
Emission Designator: L1D

Modulation: Pulse modulated

Antenna Connector: Integral

Power Source: 12VDC

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.
Spectrum Analyzer	Rohde & Schwarz	FSP40	FA001920	Mar 19/08
Spectrum Analyzer	Rohde & Schwarz	FSU	FA001877	Jan 16/08
Horn Antenna #2	EMCO	3115	FA000825	Jan. 30/08
Log Periodic Antenna #4	EMCO	3146	FA001455	April 26/08
Biconical (1) Antenna	EMCO	3109	FA000805	May 05/08
1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	Aug. 21/08
2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	Aug. 21/08
4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	Aug. 21/08
Electro-Magnetic Interference Test Chamber	TDK	SAC-3	FA002047	May 19/08
Flush Mount Turntable	Sunol	FM2022	FA002082	NCR
Controller	Sunol	SC104V	FA002060	NCR
Mast	Sunol	TLT2	FA002061	NCR
LISN	Rohde & Schwarz	ENV216	FA002023	Sept. 04/08
Receiver/Spectrum Analyzer	Rohde & Schwarz	ESU	FA002043	Oct. 24/07

COU – Calibrate on Use
NCR – No Calibration Required

2.5 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.

Section 3 : Observations

3.1 Modifications Performed During Assessment

The following modifications was performed during this assessment:

As originally submitted the EUT was found to be non-compliant with the requirements of A1.1.2. R804 was added with a value of 120kohms. Following this modification the EUT was found to be compliant with the requirements of A1.1.2.

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	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)	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:

Appendix A : Test Results

Clause 15.207(a) Powerline Conducted Emissions

Frequency of Emission (MHz)	Conducted limit (dBµV) 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:

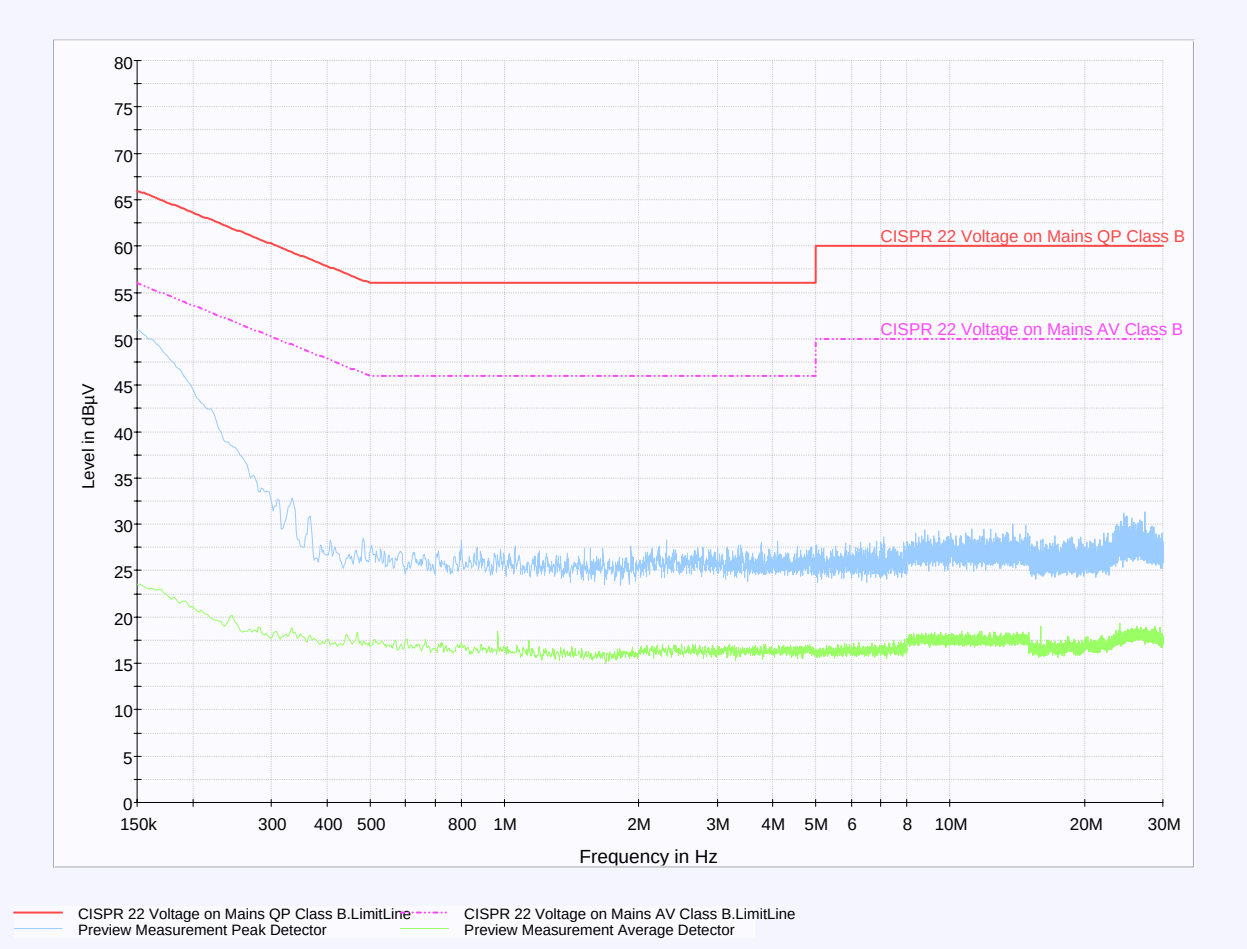
Sample Number:	4	**Temperature (°C):**	21.5
Date:	September 24, 2007	**Humidity (%):**	48.6
Modification State:	0	**Tester:**	Heng Lin
		Laboratory:	3m Chamber

Test Results: See Attached Plots.

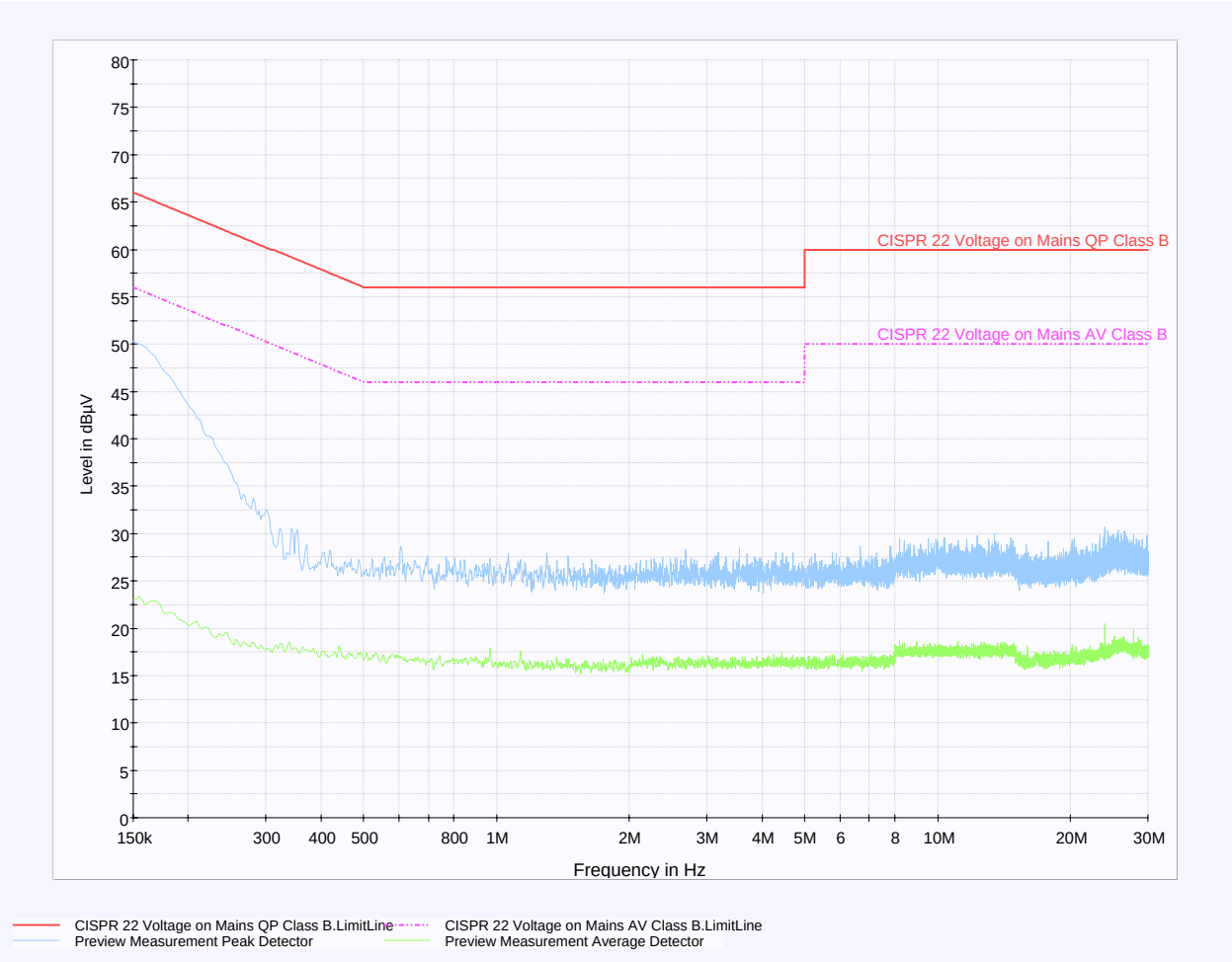
Additional Observations:

All plots were taken using a Receiver in scan mode with a 10kHz IF bandwidth Peak and Average detectors. The plots have been corrected with the LISN and cable losses to show compliance with the limits.

Phase Conductor _ 120VAC, 60Hz



Neutral Conductor - 120VAC, 60Hz



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:	2	**Temperature (°C):**	23
Date:	September 28, 2007	**Humidity (%):**	47
Modification State:	0	**Tester:**	Heng Lin
		Laboratory:	OATS

Test Results:

See Attached Table for Results

Additional Observations:

The Spectrum was searched from 30MHz 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 100kHz RBW/VBW below 1GHz and a 1MHz RBW/VBW above 1GHz at a distance of 3 meters.

Freq. (MHz)	Ant	Pol.	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Cable Loss (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1301.7600	Horn2	V	66.5	25.2	47.3	N/A	3.9	48.3	54.0	5.7	Peak
1301.7600	Horn2	H	68.8	25.2	47.3	N/A	3.9	50.6	54.0	3.4	Peak

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

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:	4	**Temperature (°C):**	22.7
Date:	October 2, 2007	**Humidity (%):**	46.7
Modification State:	0	**Tester:**	Heng Lin
		Laboratory:	Wireless

Test Results:

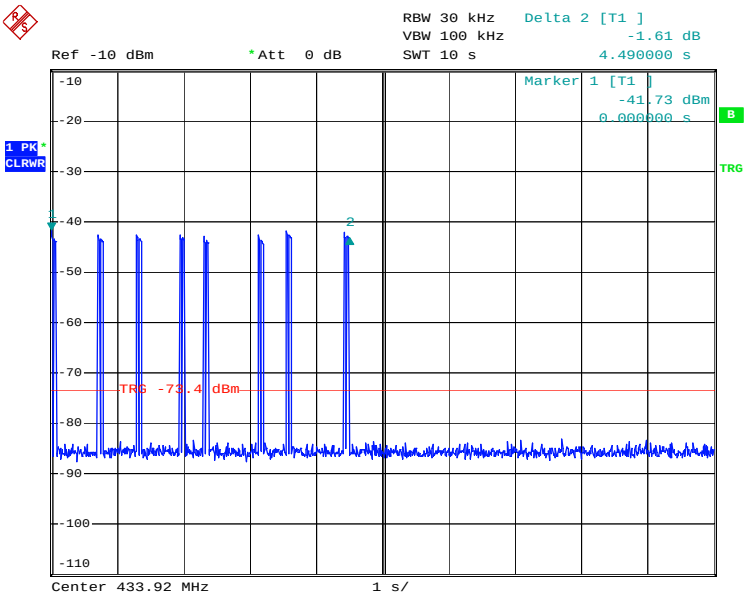
1) The EUT is not manually triggered.

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 Conditions:

Sample Number:	2	**Temperature (°C):**	22.7
Date:	October 2, 2007	**Humidity (%):**	46.7
Modification State:	1	**Tester:**	Heng Lin
		Laboratory:	OATS

Test Results:

See Attached Table for Results

Additional Observations:

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

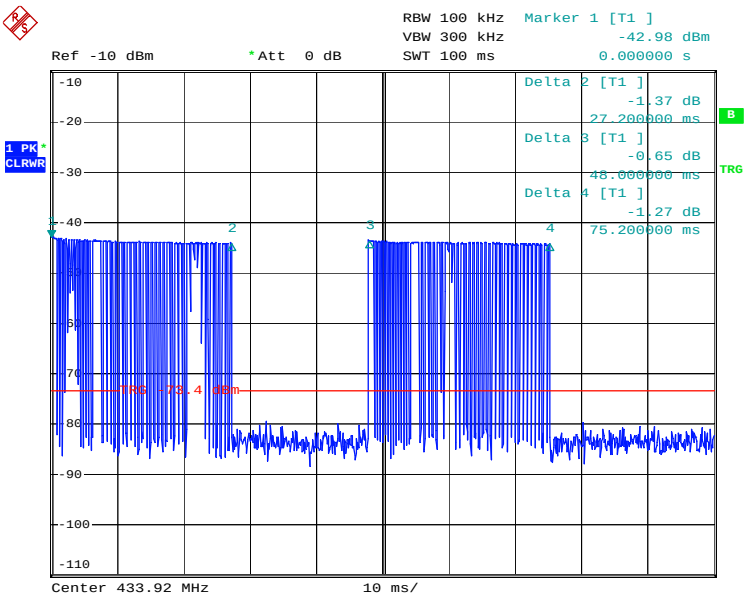
The Spectrum was searched from 30MHz to the 10th Harmonic.

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.

Freq. (MHz)	Ant	Pol.	RCVD Signal (dBµV)	Ant. Factor (dB)	Amp. Gain (dB)	Duty Cycle Corr. (dB)	Cable Loss (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
433.9200	LP1	V	60.8	16.3	N/A	N/A	2.1	79.2	100.8	21.6	Peak
433.9200	LP1	H	63.7	16.9	N/A	N/A	2.1	82.7	100.8	18.1	Peak
433.9200	LP1	V	60.8	16.3	N/A	-5.3	2.1	73.9	80.8	6.9	Average
433.9200	LP1	H	63.7	16.9	N/A	-5.3	2.1	77.4	80.8	3.4	Average
867.8400	LP1	V	26.0	22.7	N/A	N/A	3.0	51.7	60.8	9.1	Peak
867.8400	LP1	H	27.1	23.3	N/A	N/A	3.0	53.4	60.8	7.4	Peak

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

Duty Cycle:



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Duty cycle correction = 20log(54.4msec/100msec) = -5.3dB

Clause 15.231(c) 20dB Bandwidth

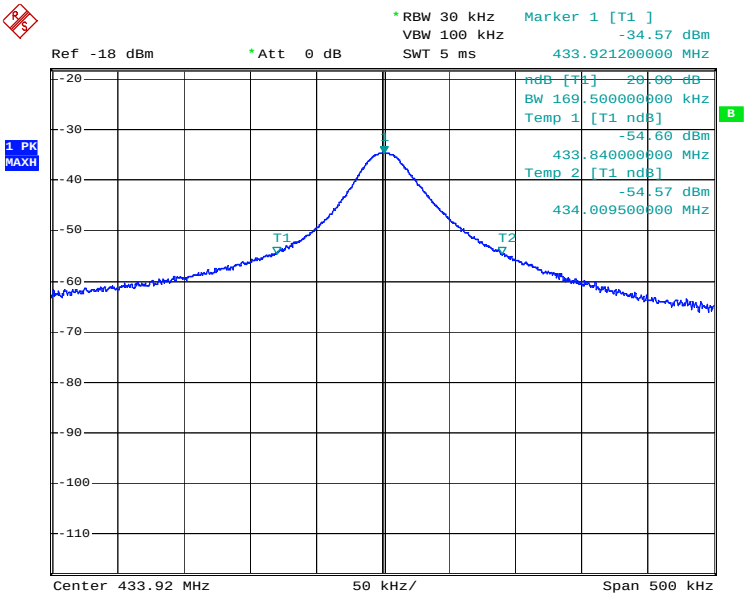
The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated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

Test Conditions:

Sample Number:	2	**Temperature (°C):**	22.7
Date:	October 2, 2007	**Humidity (%):**	46.7
Modification State:	0	**Tester:**	Heng Lin
		Laboratory:	Wireless

Test Results:

20dB Bandwidth:



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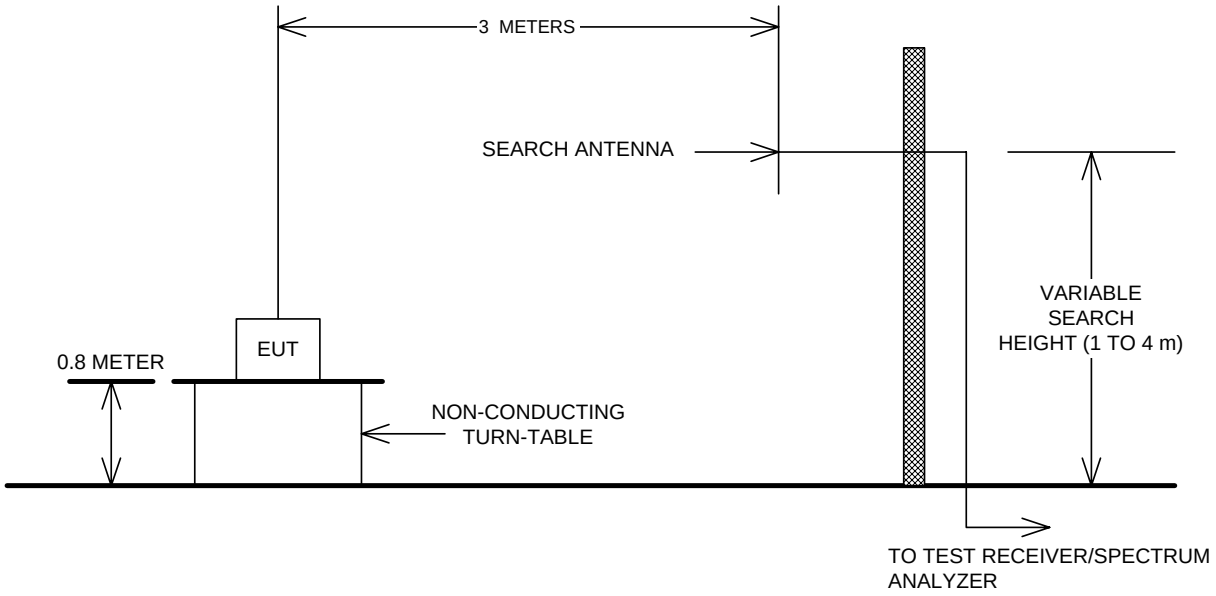
Appendix B : Setup Photographs

Conducted Emissions Setup:

Spurious Emissions Setup:

Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions



Conducted Emissions