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Test Report:	105678-1TRFWL
Applicant:	Tyco Safety Products / Kantech 9995-L Catania Avenue Brossard, Quebec J4Z 3V7
Apparatus:	IoProx (Long Range)
FCC ID:	V85P600
In Accordance With:	FCC Part 15 Subpart C, 15.207 and 15.209 Intentional Radiators
Tested By:	Nemko Canada Inc. 303 River Road Ottawa, Ontario K1V 1H2
Authorized By:	 Heng Lin, EMC/Wireless Specialist
Date:	April 25, 2008
Total Number of Pages:	20

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:	IoProx (Long Range)
Specification:	FCC Part 15 Subpart C, 15.207 and 15.209
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None
Report Release History:	Original Release

Author: Jason Nixon Wireless/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:

IoProx (Long range) Model number: P600

1.2 Samples Submitted for Assessment

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

Sample No.	Description	Serial No.
1	P600	2
4	ATC-Frost Transformer (P/N: FPS4016)	9812110
5	KT-100 Controller	None
6	USB-485 serial converter	None
7	Dell Laptop (M/N: PP01L)	DS/N CN-04E641-48155-225-2456
8	PC-4204 Power supply card	None

The first samples were received on: April 17, 2008

1.3 Theory of Operation

The EUT is a long range RFID reader. It is used to read RFID tags.

1.4 Technical Specifications of the EUT

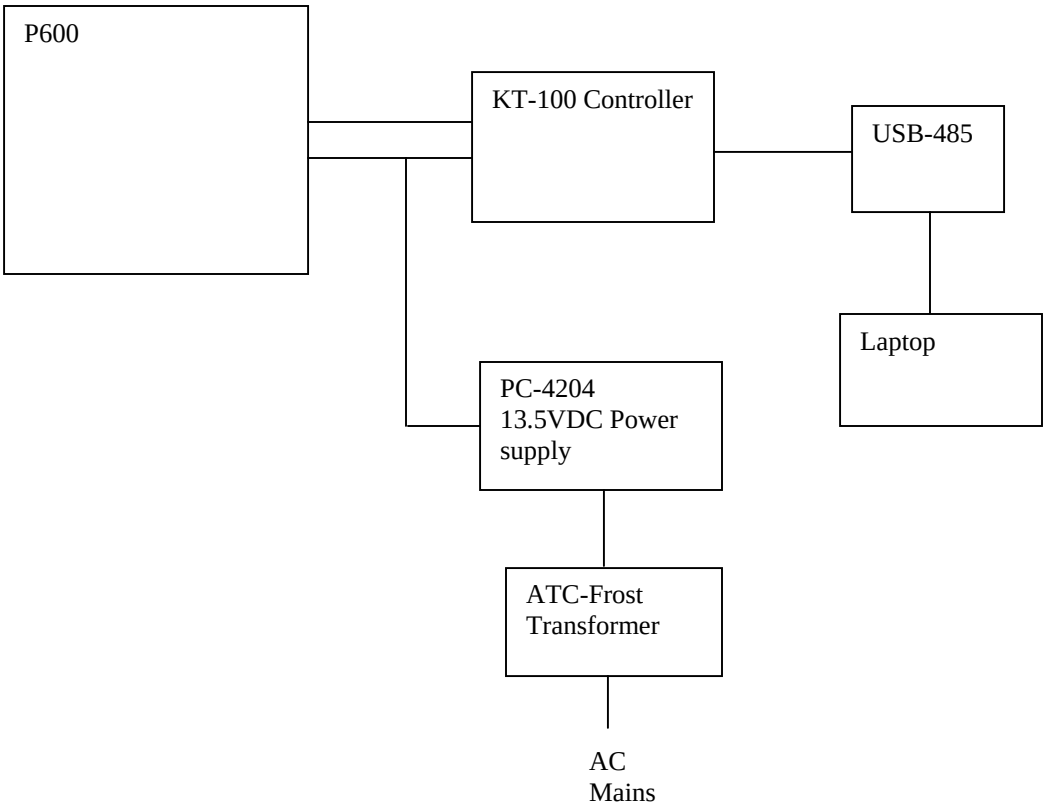
Transmitter Frequency: 125kHz

Modulation: Pulse modulated

Antenna Data: Integral loop antenna

Power Source: 13.5VDC provided by a PC-4204 Power supply card

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, 15.207 and 15.209
Intentional Radiators

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.
3m EMI Test Chamber	TDK	SAC-3	FA002047	May 19/08
Bilog	Sunol	JB3	FA002108	Jan. 21/09
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 26	FA002043	Dec. 07/08
50 Coax cable	HUBER + SUHNER	None	FA002022	Sept. 19/08
50 Coax cable	HUBER + SUHNER	None	FA002015	Sept. 19/08
50 Coax cable	HUBER + SUHNER	None	FA002074	July 03/08
International Power Supply	California Inst.	3001i	FA001021	Jan. 16/09
Active Loop Antenna	EMCO	6502	FA001686	July 27/08
Spectrum Analyzer	Rohde & Schwarz	FSP40	FA001920	April 14/09

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

No modifications were performed during assessment.

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
15.207(a)	Conducted Emissions	Y	PASS
15.209(a)	Radiated Emissions, general requirements	Y	PASS
15.215(c)	20dB Bandwidth	Y	PASS

Notes:

Appendix A : Test Results

Clause 15.207(a) Conducted Emissions

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 mH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of	Conducted limit (dBµV)	
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 Conditions:

Sample Number:	1	**Temperature:**	21°C
Date:	April 18, 2008	**Humidity:**	20%
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	3m Chamber

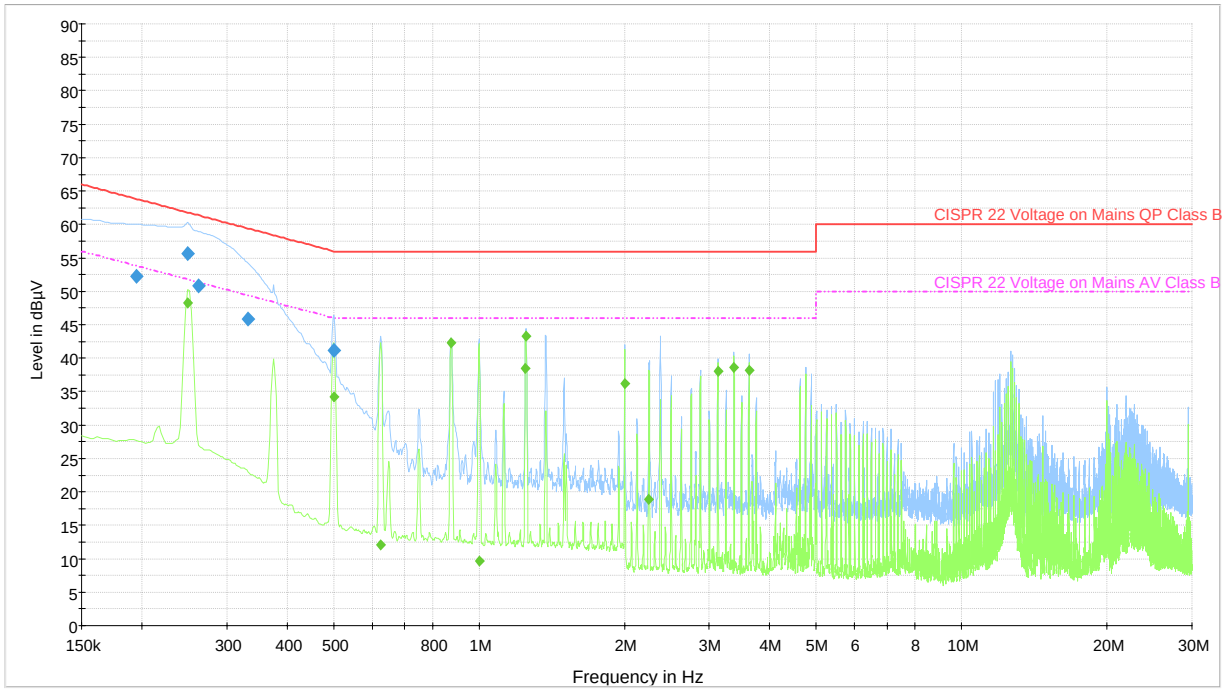
Test Results: See Attached Plots and tables.

Additional Observations:

All plots were obtained by using a receiver set to scan the spectrum with a 9kHz IF and include the cable and LISN losses to show compliance.

Final measurement values in the tables include the correction value in the measured Quasi-peak of Average values.

Phase Conductor



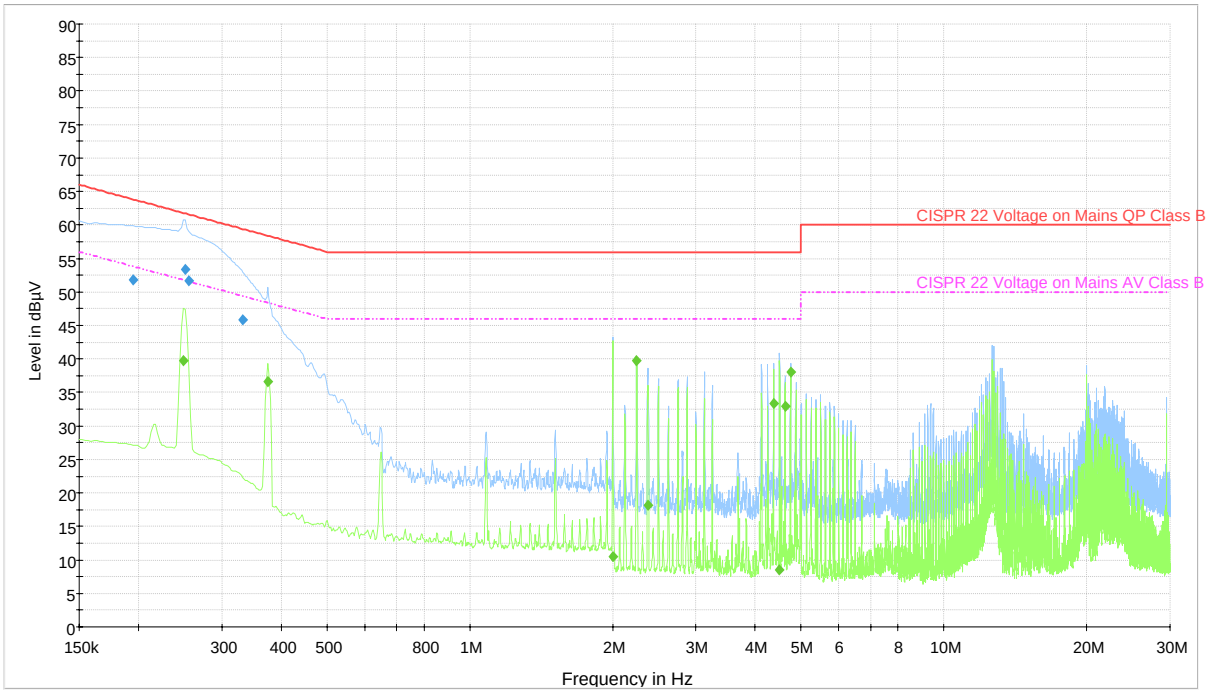
AC Powerline Conducted - Phase

CISPR 22 Voltage on Mains QP Class B.LimitLine
CISPR 22 Voltage on Mains AV Class B.LimitLine
Preview Peak Detector
Preview Average Detector
Final Result Quasi-Peak Detector
Final Result Average Detector

Frequency MHz	QuasiPeak dBµV	Line	Corr. dB	Margin dB	Limit dBµV
0.20	52.25	L1	10.09	11.50	63.82
0.25	55.58	L1	10.01	6.20	61.79
0.26	50.86	L1	10.01	10.50	61.35
0.33	45.92	L1	10.02	13.50	59.39
0.50	41.20	L1	10.08	14.80	56.00

Frequency MHz	Average dBµV	Line	Corr. dB	Margin dB	Limit dBµV
0.25	48.22	L1	10.01	3.60	51.79
0.50	34.25	L1	10.08	11.80	46.00
0.62	12.06	L1	10.10	33.90	46.00
0.87	42.29	L1	10.13	3.70	46.00
1.00	9.70	L1	10.00	36.30	46.00
1.25	38.54	L1	10.02	7.50	46.00
1.25	43.23	L1	10.02	2.80	46.00
2.00	36.25	L1	10.04	9.70	46.00
2.25	18.91	L1	10.04	27.10	46.00
3.12	38.02	L1	10.05	8.00	46.00
3.37	38.62	L1	10.07	7.40	46.00
3.63	38.14	L1	10.09	7.90	46.00

Neutral Conductor



AC Powerline Conducted - Neutral

CISPR 22 Voltage on Mains QP Class B.LimitLine
CISPR 22 Voltage on Mains AV Class B.LimitLine
Preview Peak Detector
Preview Average Detector
Final Result Quasi-Peak Detector
Final Result Average Detector

Frequency MHz	QuasiPeak dBµV	Line	Corr. dB	Margin dB	Limit dBµV
0.20	51.80	N	10.07	12.00	63.82
0.25	53.33	N	9.99	8.40	61.72
0.26	51.67	N	9.99	9.90	61.57
0.33	45.86	N	10.00	13.50	59.39

Frequency MHz	Average dBµV	Line	Corr. dB	Margin dB	Limit dBµV
0.25	39.81	N	9.99	12.00	51.79
0.38	36.67	N	10.01	11.70	48.39
2.00	10.52	N	10.02	35.50	46.00
2.25	39.76	N	10.02	6.20	46.00
2.38	18.22	N	10.02	27.80	46.00
4.38	33.41	N	10.13	12.60	46.00
4.50	8.51	N	10.14	37.50	46.00
4.63	32.89	N	10.16	13.10	46.00
4.75	38.03	N	10.16	8.00	46.00

Clause 15.209(a) Radiated Emissions, General Limits

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:	1	**Temperature:**	21°C
Date:	April 18, 2008	**Humidity:**	25%
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	OATS

Test Results:

See Attached Table for Results

Additional Observations:

The Spectrum was searched from 9kHz to 1GHz.

All Measurements below 30MHz were performed at 5 meters with a 10kHz RBW/VBW Peak detector and at 3m above 30MHz with a 120kHz Quasi-Peak detector.

Emissions 9kHz to 30MHz

Freq. (kHz)	RCVD Signal (dBµV)	Ant. Factor (dB)	Cable Loss (dB)	Distance Corr (dB)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
125	108.27	20.5	0.1	106.02[1]	22.85	25.67	2.82
250	65.96	15.1	0.1	71.13[2]	10.03	19.65	9.62
375	56.55	13.8	0.1	71.13[2]	-0.68	16.12	16.80
500	52.55	12.8	0.1	35.18[3]	30.27	33.62	3.35
625	48.56	12.6	0.1	31.13[2]	30.13	31.69	1.56
875	43.26	12.1	0.1	31.13[2]	24.33	28.76	4.43

[1]The emission was also measured at 10m, with a value of 90.32dBuV/m, to calculate the extrapolation factor as follows:

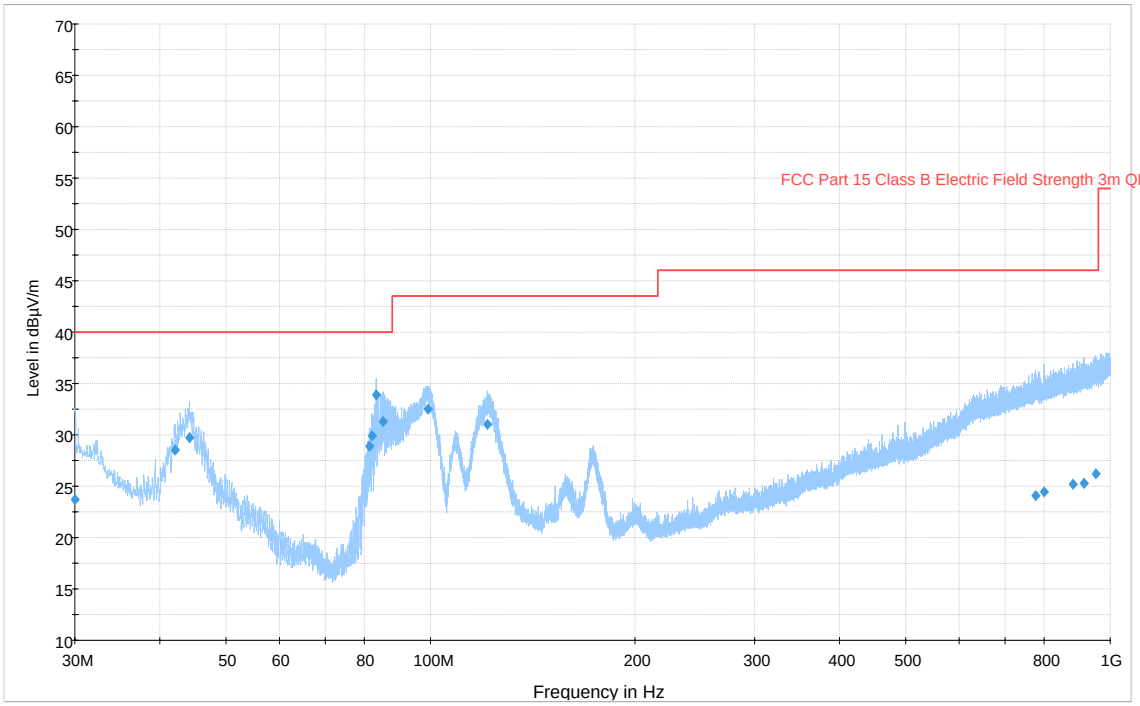
number of decades in measurements = log(10/5) = 0.301
change in reading = 108.27-90.32 = 17.95dB
change per decade = 17.95/0.301 = 59.63dB
number of decades from measured distance to limit distance = log(300/5) = 1.778
distance correction = 59.63 * 1.778 = 106.02dB

[2]The theoretical extrapolation factor of 40log(limit distance/measurement distance) was used.

[3]The emission was also measured at 7m, with a value of 45.95dBuV/m, to calculate the extrapolation factor as follows:

number of decades in measurements = log(7/5) = 0.146
change in reading = 52.55-45.95 = 6.6dB
change per decade = 6.6/0.146 = 45.21dB
number of decades from measured distance to limit distance = log(30/5) = 0.778
distance correction = 45.21 * 0.778 = 35.18dB

Radiated results 30MHz to 1GHz



Frequency MHz	QuasiPeak dBµV/m	Antenna height cm	Polarity	Turntable position deg	Corr. dB	Margin dB	Limit dBµV/m
30.03	23.73	103.95	V	63.00	21.10	16.30	40.00
42.12	28.48	103.91	V	52.00	12.28	11.50	40.00
44.25	29.72	99.95	V	62.00	10.84	10.30	40.00
81.27	28.91	107.00	V	69.00	9.00	11.10	40.00
82.02	29.89	100.04	V	90.00	9.04	10.10	40.00
83.25	33.91	124.95	V	84.00	9.11	6.10	40.00
85.14	31.29	110.91	V	42.00	9.20	8.70	40.00
99.27	32.47	108.00	V	85.00	11.38	11.00	43.50
121.14	31.06	108.00	V	336.00	15.02	12.40	43.50
775.77	24.04	150.00	V	248.00	23.58	22.00	46.00
800.16	24.48	230.95	H	300.00	24.32	21.50	46.00
880.95	25.20	125.04	H	150.00	24.99	20.80	46.00
915.90	25.28	395.00	V	70.00	25.05	20.70	46.00
952.32	26.23	250.00	H	76.00	26.10	19.80	46.00

Final Quasi-Peak measurements include the Correction value, which includes Antenna factor and cable loss.

Clause 15.215(c) 20dB Bandwidth

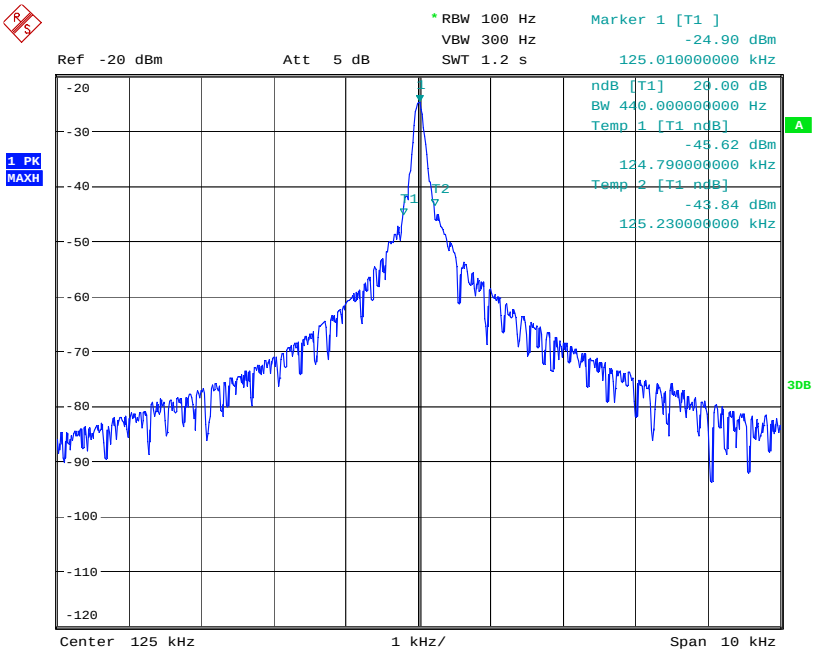
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Conditions:

Sample Number:	1	**Temperature:**	23°C
Date:	April 17, 2008	**Humidity:**	14%
Modification State:	0	**Tester:**	Jason Nixon
		Laboratory:	Wireless

Test Results: See Attached Plots.

20dB Bandwidth:



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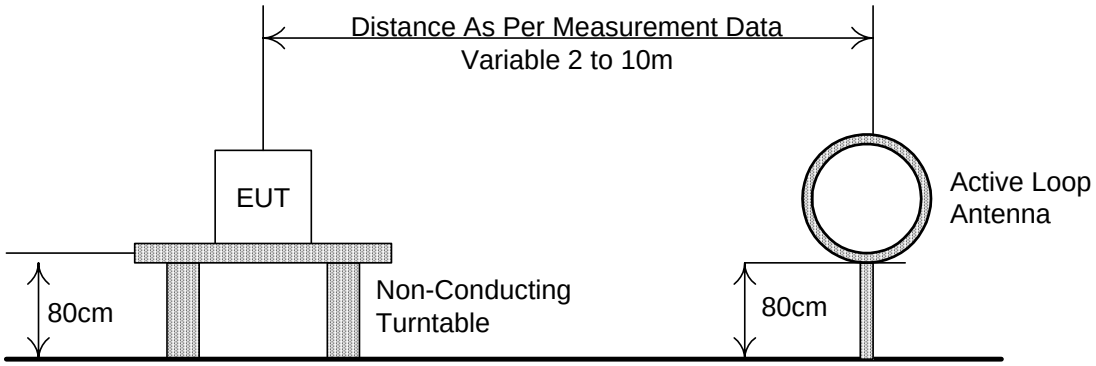
Appendix B : Setup Photographs

Conducted Emissions Setup:

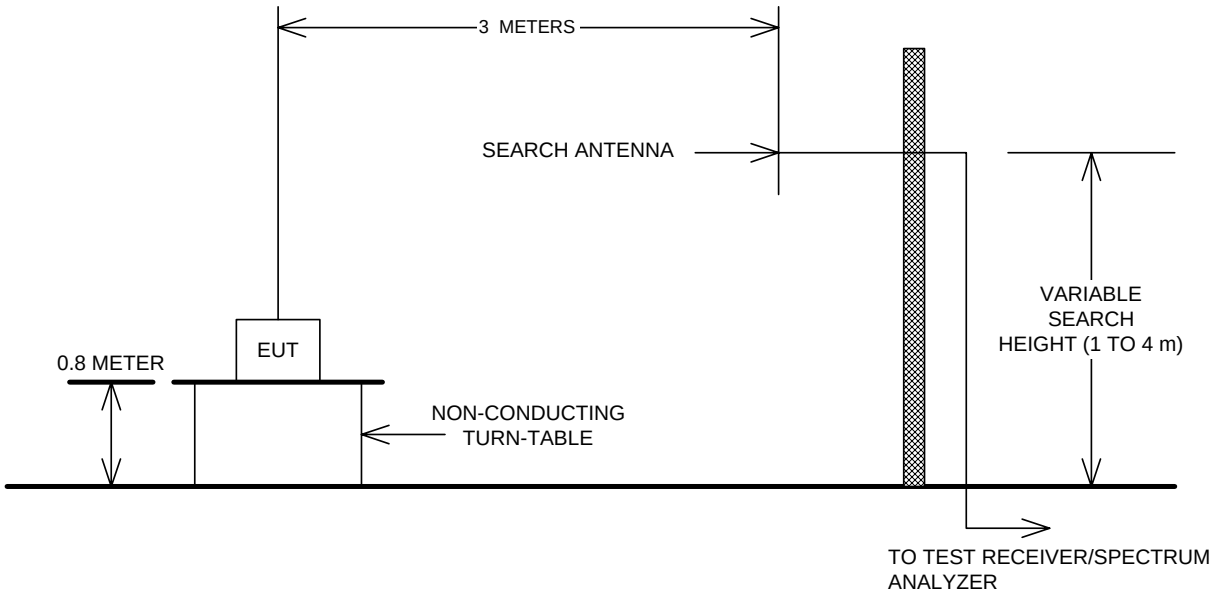
Spurious Emissions Setup:

Appendix C : Block Diagram of Test Setups

Test Site For Radiated Emissions Below 30MHz



Test Site For Radiated Emissions Above 30MHz



Conducted Emissions