

TEST REPORT



Certification # 1367-01

Laboratory ID

PRODUCT SAFETY ENGINEERING, INC.
12955 Bellamy Brothers Boulevard
Dade City, Florida 33525 USA
PH (352) 588-2209 FX (352) 588-2544

Submitter ID

Kidder Industrial Limited
1455 Monterey Pass Road
Suite 102
Monterey Park, CA 91754

Report Issue Date: 10 MAY 02

Sample S/N: None

Sample Receipt Date: March 15, 2002

Sample Test Date: see data sheets

Test Report Number: 02F171T

Model Designation: 9003T

Product Description: Remote Transmitter

Marketing Approval

Description of non-standard test method or test practice: *None*

Estimated Measurement Uncertainty: *Not Applicable*

Special limitations of use: *None*

Traceability: *reference standards of measurement have been calibrated by a competent body using standards traceable to the NIST.*

According to testing performed at Product Safety Engineering, Inc., the above-mentioned unit is in compliance with the electromagnetic compatibility requirements defined in regulations indicated on page (3) of the test report. The test results contained herein relate only to the model(s) identified above. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Project Engineer, I hereby declare that the equipment tested as specified above conforms to the requirements indicated on page (3) of the test report.

Signature *David Foerstner* Name David Foerstner

Title Engineering Group Leader Date 10 MAY 02

Reviewed by: *Steve E. Huh*
Approved Signatory *Steve E. Huh* Date 10 MAY 02

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Test Report Number 02F171T

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DIRECTORY - EMISSIONS

		Page(s)
A)	Documentation	
	Test report	1 - 10
	Directory	2
	Test Regulations	3
	General Remarks	10
	Test-setups (Photos)	11 - 12
B)	Test data	
	Conducted emissions	10/150 kHz - 30 MHz
	Radiated emissions	10 kHz - 30 MHz
	Radiated emissions	30 MHz - 1000 MHz
	Interference power	30 MHz - 300 MHz
	Equivalent Radiated emissions	1 GHz - 18 GHz
	Antenna Disturbance Voltage	30 MHz - 1,000 MHz
C)	Appendix A	
	Test Equipment Calibration Information	A2
	Test Data Sheets	A3 - A5
D)	Appendix B	
	System Under Test Description	B2 - B4
E)	Appendix C	
	Measurement Protocol	C1 - C2

Test Report Number 02F171T

EMISSIONS TEST REGULATIONS :

The emissions tests were performed according to following regulations:

☐ - EN 50081-1 : 1992

☐ - EN 50081-2 : 1995

☐ - EN 55011 : 1998 / A1:1999

☐ - Group 1

☐ - Group 2

☐ - Class A

☐ - Class B

☐ - EN 55013 : 1990 / A12:1994 / A13:1996

☐ - EN 55014 : 1993 / A1:1997

☐ - Household appliances and similar

☐ - Portable tools

☐ - Semiconductor devices

☐ - EN 55022 : 1998

☐ - Class A

☐ - Class B

☐ - AS/NZS 3548:1995

☐ - Class A

☐ - Class B

☐ - ICES-003

☐ - Class A

☐ - Class B

☐ - CNS 13438

☐ - Class A

☐ - Class B

☐ - VCCI : 1999

☐ - Class A

☐ - Class B

☒ - FCC Part 15

☐ - Class A

☐ - Class B

☒ - Certification

☐ - Verification

☐ - Declaration of Conformity

☐ - FCC Part 18

Test Report Number 02F171T

Environmental conditions during testing:

LAB

OATS

Temperature: *

_____ : _____

Relative Humidity: **

_____ : _____

* The ambient temperature during the testing was within the range of (50° - 104° F) unless indicted above.

** The humidity levels during the testing was within the range of (10% - 90%) relative humidity unless indicated above.

Power supply system

: 12 Volts DC Hz INTERNAL BATTERY

Sign Explanations:

- ☐ - not applicable
- ☒ - applicable

Test Report Number 02F171T

Emissions Test Conditions: CONDUCTED EMISSIONS (Interference Voltage)

The *CONDUCTED EMISSIONS (INTERFERENCE VOLTAGE)* measurements were performed at the following test location:

■ - Test not applicable

- ☐ - Darby Test Site (Open Area Test Site)
- ☐ - Darby Laboratory

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
☐ - 8028-50	Solar	50 Ω LISN	829012, 829022
☐ - 3825/2	Solar	50 Ω LISN	924840
☐ - EMC-30	Electro-Metrics	EMI Receiver	191
☐ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
☐ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
☐ - 85662A	Hewlett Packard	Analyzer Display	2403A07352
☐ - 8028-50	Solar	50 Ω LISN	903725, 903726
☐ - FCC-TLISN-T4	Fisher Custom Com.	Telecom ISN	20072

Emissions Test Conditions: RADIATED EMISSIONS (Magnetic Field)

The *RADIATED EMISSIONS (MAGNETIC FIELD)* measurements were performed at the following test location:

- ☐ - Darby Test Site (Open Area Test Site)
- ☐ -
- ☐ -

at a test distance of :

- ☐ - 3 meters
- ☐ - 30 meters

■ - Test not applicable

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
☐ - 96005	Eaton	Log Periodic Antenna	1099
☐ - BIA-25	Electro-Metrics	Biconical Antenna	4283
☐ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
☐ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
☐ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
☐ - ALR-30M	Electro-Metrics	Loop Antenna	824
☐ - 8447D	Hewlett Packard	Preamplifier	2944A06832
☐ - EMC-30	Electro-Metrics	EMI Receiver	191

Test Report Number 02F171T

Emissions Test Conditions: RADIATED EMISSIONS (Electric Field)

The *RADIATED EMISSIONS (ELECTRIC FIELD)* measurements, in the frequency range of 30 MHz-1000 MHz, were tested in a horizontal and vertical polarization at the following test location :

☐ - Test not applicable

- ☒ - Darby Site (Open Area Test Site)
- ☐ - Darby Lab
- ☐ -

at a test distance of :

- ☒ - 3 meters
- ☐ - 10 meters
- ☐ - 30 meters

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
☒ - 96005	Eaton	Log Periodic Antenna	1099
☒ - BIA-25	Electro-Metrics	Biconical Antenna	4283
☒ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
☒ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
☒ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
☒ - 8447D	Hewlett-Packard	Preamplifier (26dB)	2944A06832
☐ - EMC-30	Electro-Metrics	EMI Receiver	191
☐ - 8568B	Hewlett Packard	Spectrum Analyzer	2407A03213
☐ - 85650A	Hewlett Packard	Quasi-Peak Adapter	2043A00358
☐ - 85662A	Hewlett Packard	Analyzer Display	2340A05806
☐ - LPA30	Electro-Metrics	Log Periodic	2280
☐ - BIA 30	Electro-Metrics	Biconical Antenna	3852

Emissions Test Conditions): INTERFERENCE POWER

The *INTERFERENCE POWER* measurements were performed by using the absorbing clamp on the mains and interface cables in the frequency range 30 MHz - 300 MHz at the following test location :

☒ - Test not applicable

- ☐ - Darby Lab
- ☐ -

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
☐ - MDS-21	Rhode&Schwarz	Absorbing Clamp	8608447020
☐ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
☐ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
☐ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
☐ - 8447D	Hewlett-Packard	Amplifier (26 dB)	2944A06832
☐ - EMC-30	Electro-Metrics	EMI Receiver	191

Test Report Number 02F171T

The EQUIVALENT RADIATED EMISSIONS measurements in the frequency range 1 GHz - 5 GHz were performed in a horizontal and vertical polarization at the following test location :

☒ - Darby Test Site (Open Area Test Site)

- ☐ -
☐ -
☐ -

at a test distance of:

- ☐ - 1 meters
☒ - 3 meters
☐ - 10 meters

☐ - Test not applicable

Test equipment used :

Model Number	Manufacturer	Description	Serial Number
☒ - 8566B	Hewlett-Packard	Spectrum Analyzer	2421A00526
☒ - 85662A	Hewlett-Packard	Analyzer Display	2403A07352
☒ - 85650A	Hewlett-Packard	Quasi-Peak Adapter	2043A00209
☒ - 8449B	Hewlett-Packard	Preamplifier	3008A00320
☒ - 3115	Electro-Mechanics	Double Ridge Guide Horn	3810

The ANTENNA TERMINAL DISTURBANCE VOLTAGE in the frequency range 30 MHz - 1,000 MHz were performed.

☐ - Darby Test Site (Open Area Test Site)

- ☐ - Laboratory
☐ -
☐ -

☒ - Test not applicable

Model Number	Manufacturer	Description	Serial Number
☐ - 2F9-3C4-3C5	Wavecom	UHF PAL TV Modulator	185879
☐ - 2F1-3C4-3C5	Wavecom	VHF PAL TV Modulator	157728
☐ - A-8000	IFR	Spectrum Analyzer	1306
☐ - 8648B	Hewlett-Packard	Signal Generator	3623A01433
☐ - 8648B	Hewlett-Packard	Signal Generator	3623A01477
☐ - LMV-182A	Leader	RMS Milli-Voltmeter	8010091
☐ - 3202	Krhon-Hite	Active filter	5899
☐ - FMT115	Leaming	FM Modulator	NONE
☐ - 371	UDT	Optical power meter	06657
☐ - TSG95	Tektronix	PAL video / Audio generator	B028883
☐ -			

Test Report Number 02F171T

Equipment Under Test (EUT) Test Operation Mode - Emission tests :

The device under test was operated under the following conditions during emissions testing:

- ☐ - Standby
- ☐ - Test program (H - Pattern)
- ☐ - Test program (color bar)
- ☐ - Test program (customer specific)
- ☒ - Practice operation
- ☐ - Normal Operating Mode
- ☐ -

Configuration of the device under test:

- ☒ - See System Under Test Information in Appendix B

Rationale for EUT setup / configuration:

Test Report Number 02F171T

Emission Test Results:

Conducted emissions 450 kHz - 30 MHz

The requirements are

☐ - MET

☐ - NOT MET

Minimum limit margin

dB

at

MHz

Remarks:

Radiated emissions (magnetic field) 10 kHz - 30 MHz

The requirements are

☐ - MET

☐ - NOT MET

Minimum limit margin

dB

at

MHz

Remarks:

Radiated emissions (electric field) 30 MHz - 1000 MHz

The requirements are

☒ - MET

☐ - NOT MET

Minimum limit margin

4.3 dB

at

887.8 MHz

Remarks:

Interference Power at the mains and interface cables 30 MHz - 300 MHz

The requirements are

☐ - MET

☐ - NOT MET

Minimum limit margin

dB

at

MHz

Remarks:

Radiated emissions 1 GHz - 2.5 GHz

The requirements are

☒ - MET

☐ - NOT MET

Minimum limit margin

0.2 dB

at

1.773 GHz

Remarks:

Antenna Terminal Disturbance Voltage 30 MHz - 1,000 MHz

The requirements are

☐ - MET

☐ - NOT MET

Minimum limit margin

dB

at

MHz

Remarks:

Test Report Number 02F171T

GENERAL REMARKS:

The EUT was tested per ANSI C63.4-1992 paragraph 13.1.4.1 in (3) orthogonal planes. Radiated emissions were investigated from (30) MHz through (5) Ghz. We elected to demonstrate compliance while utilizing a quasi-peak detector rather than calculate the average level because this device can be used in conjunction with various infrared remote controls and therefore no repeatable pulse train, for the purpose of calculation, could be established. All testing was performed with a fresh battery.

The EUT meets the requirements of 15.231 as follows:

- 1) It manually transmits a control signal and deactivates within (5) seconds of release.
- 2) The bandwidth of emission is less than (0.25%) of the center frequency as shown in the bandwidth plot on page A5. The maximum allowed bandwidth was calculated to be $(0.0025 \times 444,000,000 \text{ Hz} = 1,110,000 \text{ Hz})$. The measured bandwidth was (627,000 Hz).

The EUT meets the requirements of 15.205.

SUMMARY:

The requirements according to the technical regulations are

■ - met

□ - not met.

The device under test does

■ - fulfill the general approval requirements mentioned on page 3.

□ - not fulfill the general approval requirements mentioned on page 3.

Testing Start Date

April 02, 2002

Testing End Date:

April 02, 2002

Test Report Number 02F171T

Test-setup photo(s):

Conducted emission 450/150 kHz - 30 MHz

N/A

Test Report Number 02F171T

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APPENDIX

A

Test Equipment Calibration Information

&

Test Data Sheets

TEST EQUIPMENT CALIBRATION INFORMATION

Manufacturer	Model	Description	Serial Number	Cal Due
Hewlett Packard	8566B	Spectrum Analyzer	2421A00526	09/04/02
Hewlett Packard	85662A	Display	2403A07352	09/04/02
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00209	09/04/02
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06832	10/17/02
Hewlett Packard	8568B	Spectrum Analyzer	2407A03213	08/20/02
Hewlett Packard	85662A	Display	2340A05806	08/20/02
Hewlett Packard	85650A	Quasi-Peak Adapter	2043A00358	08/20/02
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	2944A06901	07/25/02
Hewlett Packard	8447D	Preamp 0.1 - 1,000 MHz	1937A03247	07/04/02
Hewlett Packard	8449B	Preamp 1 - 26.5 GHz	3008A00320	11/30/02
Hewlett Packard	8648B	Signal Generator	3443U00312	05/13/02
Hewlett Packard	8672A	Signal Generator	2211A02426	12/06/02
Eaton	96005	Log Periodic Antenna	1099	11/29/02
Electro-Metrics	LPA 30	Log Periodic Antenna	2280	11/06/02
Electro-Metrics	BIA 30	Biconical Antenna	3852	10/30/02
Electro-Metrics	BIA 25	Biconical Antenna	4283	12/15/02
Electro-Mechanics	3115	Double Ridge Guide Ant.	3810	11/07/03
Electro-Metrics	ALR30M	Magnetic Loop Antenna	824	11/29/02
Solar	8012	LISN	924840	01/04/03
Solar	8028	LISN	829012/809022	12/12/02
Solar	8028	LISN	903725/903726	11/20/02
Schwartzbeck	MDS-21	Absorbing Clamp	02581	11/28/01
Leader	LFG1310	Function Generator	8060233	03/09/02
Holaday Ind.	HI 4422	Isotropic Probe	90310	04/26/02
IFR Systems	A-8000	Spectrum Analyzer	1306	06/08/02
Fischer Custom	F-33-1	RF Current Probe	360	09/08/01
Electro-Metrics	EMC-30	EMI Receiver	191	03/29/02
Boonton	4220A	RF Power Meter	204103AA	11/13/02
Boonton	51011	RF Power Meter	28823	11/13/02

PRODUCT EMISSIONS

PRODUCT SAFETY ENGINEERING

Data File: RE200 TRANSMITTER FCC-B 04-02-02

No	EMISSION FREQUENCY MHz	SPEC LIMIT dBuV/m	MEASUREMENTS			MODE	POL	SITE		CORR FACTOR dB	COMMENTS
			ABS	dLIM	dB			HGT	AZM		
								cm	deg		
1	443.456	81.1	56.2	-24.9	PK	V		350	180	-7.3	
2	887.770	61.1	56.9	-4.3	QP	V		150	180	2.1	

Kidder RE 200 Transmitter

Measured @ 3 Meters

Frequency (GHz)	Spec Limit (dB μ V/M)	Measurement (dB μ V/M)	Δ Limit	Polarity	Height (cm)
1.330	61.1	53.4	-7.7	Vertical	100
1.773	61.1	60.9	-0.2	Vertical	100
2.221	61.1	51.6	-9.5	Vertical	100

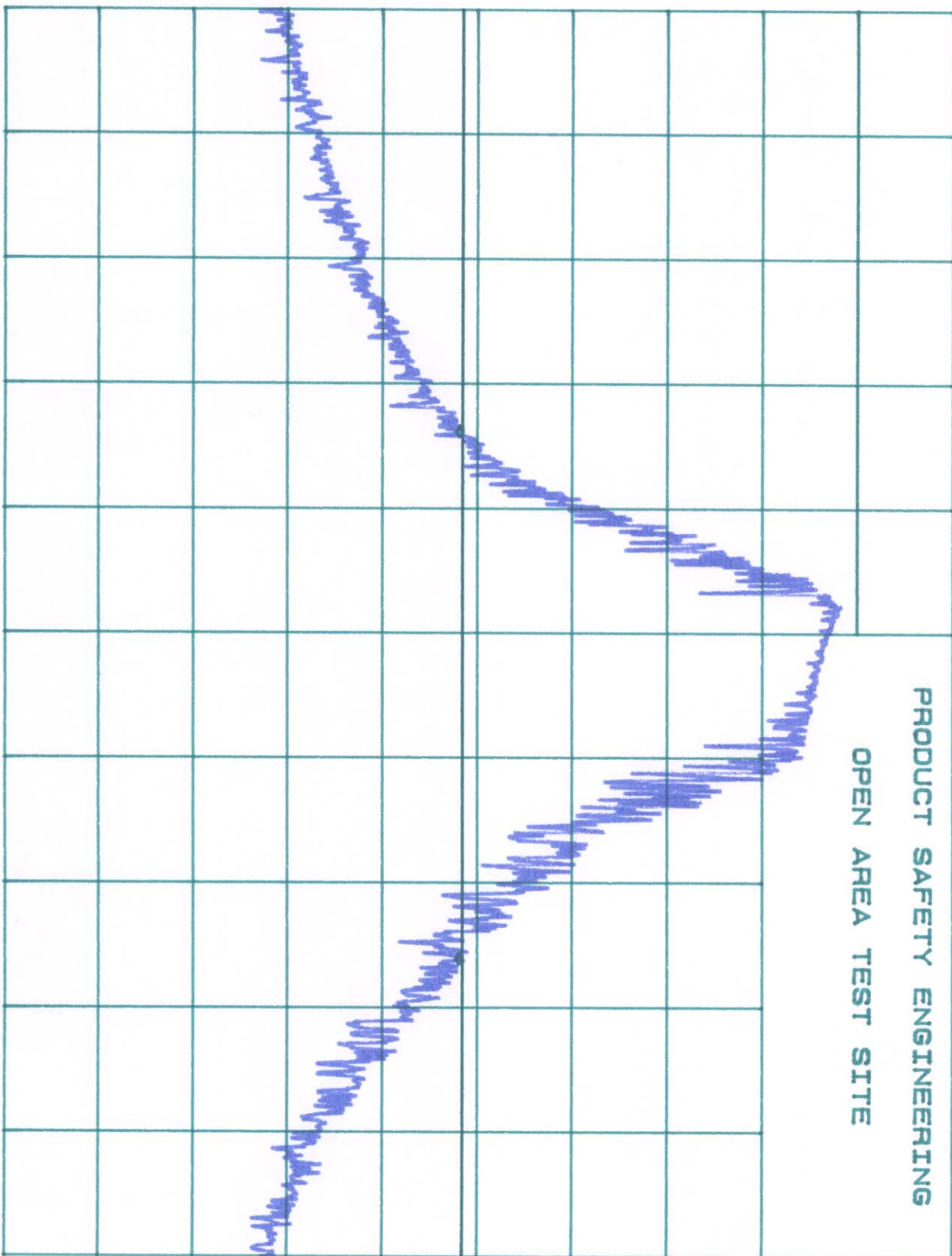
h/p

PRODUCT SAFETY ENGINEERING
REF 97.0 DBμV ATTEN 0 DB
MKR Δ 627 KHZ
-0.05 DB

5 DB/

POS PK

DL
71.2
DBμV



A5

APPENDIX

B

System Under Test Description

SYSTEM COMPONENTS

DEVICE TYPE: EUT, KIDDER RE200 REMOTE TRANSMITTER

DEVICE TYPE: JVC IR REMOTE CONTROL RM-C457

INTERFACE CABLES

DEVICE TYPE: **NONE**

SHIELD:

LENGTH:

CONNECTOR TYPE:

PORT:

AC LINE CORDS

DEVICE TYPE: N/A

SHIELD:

LENGTH:

CONNECTOR TYPE:

APPENDIX

C

Measurement Protocol

The test methodology followed during the collection of the data included within this technical report was ANSI C63.4:1992.

The EUT was powered from internal battery during the collection of data included within.

The data is compared to the FCC Part 15 Class B limits.

The "EMI" instrumentation is capable of calculating the final emission level based on the following formula:

Level at the receiver (dB μ V) + Antenna Correction Factor (dB/M) + Cable Loss (dB) - Preamp Gain (dB) = Actual Level in dB μ V/M.

The sample calculation below is based on the actual test data collected:

Observed Level	61.8	dB μ V	
ACF	+	17.7	dB/M
Cable Loss	+	2.7	dB
Preamp Gain	-	<u>26.0</u>	dB
Actual Level		56.2	dB μ V/M @ 443.5 MHz

Please have a company official review this report and sign.
