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FCC PART 15.249 TEST REPORT

UNLICENSED INTENTIONAL RADIATOR

Applicant	Cleveland Medical Devices, Inc
Address	4415 Euclid Ave 4th Floor Cleveland Ohio 44103 USA
FCC ID	N9Y0091
Model Number	0091
Product Description	ISM Device
Date Sample Received	December 12, 2007
Date Tested	January 12, 2008
Tested By	Nam Nguyen
Approved By	Mario de Aranzeta
Report Number	2324EU7TestReport.pdf
Test Results	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Certificate # 0955-01

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ATTESTATIONS



Test certificate # 0955-01

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report. No modifications were made to the equipment during testing in order to demonstrate compliance with these standards.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made, under my supervision, at one or more of the test sites of:

Timco Engineering Inc.
849 NW State Road 45
Newberry, Fl 32669



Authorized Signatory Name:

Mario de Aranzeta C.E.T.
Compliance Engineer/ Lab. Supervisor



REPORT SUMMARY

Purpose of Test:	To demonstrate compliance with FCC Part 15.249 requirements.
Applicable Standards:	Pt15.249, ANSI C63.4: 2003
Related Reports:	2324CUT7TestReport.pdf

TEST ENVIRONMENT AND TEST SETUP

Test Facilities:	All measurements were made at one or more of the test sites of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.
Laboratory Test Conditions:	Temperature: 26°C , Humidity: 55%
Test Exercise:	The DUT was set in continuous transmit mode of operation.
Deviation to the Standards:	There was no deviation from the standard.
Modification to the DUT:	No modification was made.
Supporting Accessories:	Laptop: Dell Inspirion 1100

DUT DESCRIPTION

DUT Description	ISM DEVICE
FCC ID	N9Y0091
Model Number	0091
Serial Number	N/A
Operating Frequency	TX: 2402- 2481.3 MHz RX: same as TX
Modulation	650K0F1D (GFSK)
DUT Power Source	<input type="checkbox"/> 110-120Vac/50- 60Hz <input checked="" type="checkbox"/> DC Power 3Vdc (USB powered) <input type="checkbox"/> Battery Operated Exclusively
Test Item	<input checked="" type="checkbox"/> Prototype <input type="checkbox"/> Pre-Production <input type="checkbox"/> Production
Type of Equipment	<input type="checkbox"/> Fixed <input type="checkbox"/> Mobile <input checked="" type="checkbox"/> Portable
Antenna	Vertical dipole
Antenna Connector	Reverse SMA

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Antenna: Biconnical	Eaton	94455-1	1057	CAL 1/15/08	1/15/10
Antenna: Biconnical	Eaton	94455-1	1096	CAL 10/11/06	10/11/08
Antenna: Biconnical	Electro-Metrics	BIA-25	1171	CAL 7/18/07	7/18/09
Analyzer Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 5/17/07	5/17/09
Analyzer Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 5/17/07	5/17/09
Analyzer Blue Tower Spectrum Analyzer	HP	8566B	2928A04729 2848A18049	CAL 5/17/07	5/17/09
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/5/06	10/5/08
LISN	Electro-Metrics	EM-7820	2682	CAL 7/23/07	7/23/09
Antenna: Log-Periodic	Eaton	96005	1243	CAL 12/13/07	12/13/09

TEST PROCEDURE

Radiation Interference: ANSI C63.4-2003 using an Agilent model 8566B spectrum analyzer, an Agilent model 85685A preselector, a Agilent model 85650A Quasi-Peak adapter, and an appropriate antenna. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100 kHz with an appropriate sweep speed and the video bandwidth was 300 kHz up to 1 GHz and 1 MHz with a video BW of 3 MHz above 1 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The spectrum was searched to at least the tenth (10) harmonic of the fundamental.

Formula Of Conversion Factors: The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	Meter Reading	+ ACF	+ CL	= FS
33	20 dBuV	+ 10.36 dB	+ 0.5	= 30.86 dBuV/m @ 3m

Power Line Conducted Interference: The procedure used was ANSI C63.4-2003 using a 50uH LISN. Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed. The spectrum was scanned from 0.15 to 30 MHz.

Occupied Bandwidth: A small sample of the transmitter output was fed into the spectrum analyzer and the attached plot was printed. The vertical scale is set to -10 dBm per division.

ANSI Standard C63.4-2003 Measurement Procedures: The DUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The DUT was placed in the center of the table (1.5m side). The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

RADIATED INTERFERENCE

Rules Part No.: 15.249, 15.209

Requirements:

Frequency	Limits
Part 15.209	
9 to 490 kHz	2400/F (kHz) μ V/m @ 300 meters
490 to 1705 kHz	24000/F (kHz) μ V/m @ 30 meters
1705 kHz to 30 MHz	29.54 dB μ V/m @ 30 meters
30 – 88	40.0 dB μ V/m @ 3 meters
80 – 216	43.5 dB μ V/m @ 3 meters
216 – 960	46.0 dB μ V/m @ 3 meters
Above 960	54.0 dB μ V/m @ 3 meters
Part 15.249	
Fundamental 902 – 928 MHz	94.0 dB μ V/m @ 3 meters
Fundamental 2.4 – 2.4835 MHz	94.0 dB μ V/m @ 3 meters
Harmonics	54.0 dB μ V/m @ 3 meters

Test Data:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,402.0	2,402.00	41.8	H	3.18	32.24	77.22	16.78
2,402.0	2,402.00	53.1	V	3.18	32.24	88.52	5.48
2,402.0	4,803.70	8.6	H	4.90	34.10	47.60	6.4
2,402.0	4,803.70	10.8	V	4.90	34.10	49.80	4.2
2,440.1	2,440.10	44.4	H	3.21	32.34	79.95	14.05
2,440.1	2,440.10	56.1	V	3.21	32.34	91.65	2.35
2,440.1	4,880.20	8.5	H	4.94	34.10	47.54	6.46
2,440.1	4,880.20	10.5	V	4.94	34.10	49.54	4.46
2,481.3	2,481.30	41.3	H	3.24	32.45	76.99	17.01
2,481.3	2,481.30	52.3	V	3.24	32.45	87.99	6.01
2,481.3	4,962.50	7.4	H	4.98	34.10	46.48	7.52
2,481.3	4,962.50	8.8	V	4.98	34.10	47.88	6.12

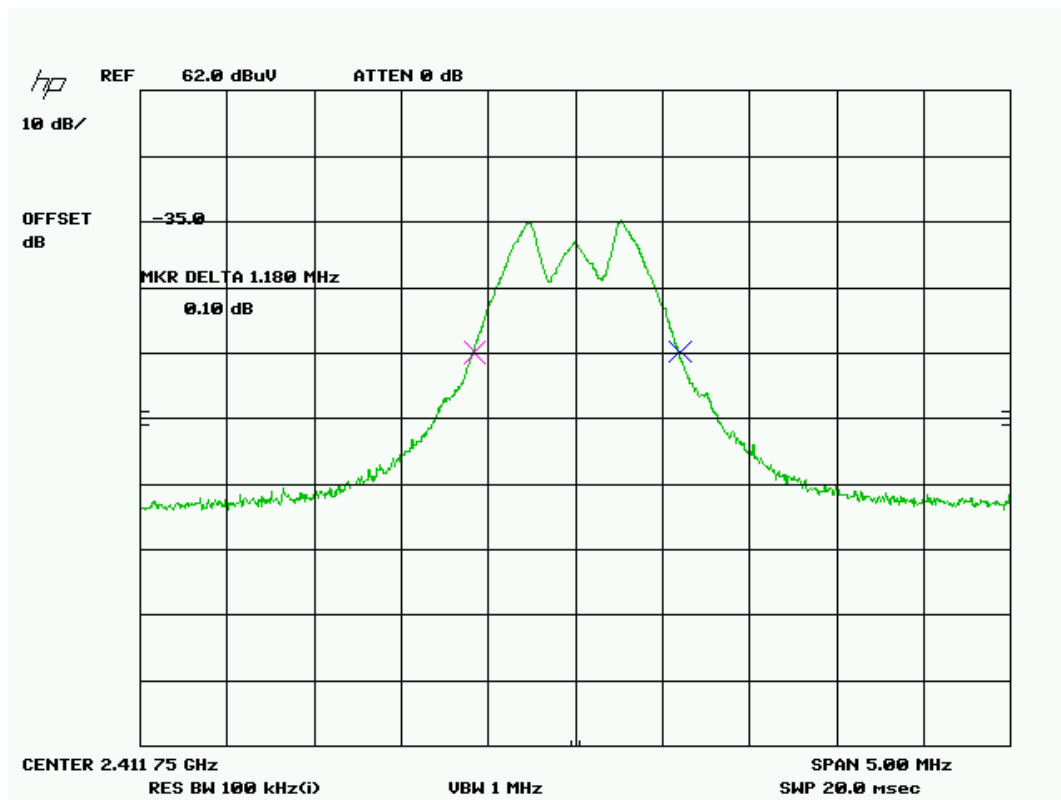
Harmonics were check through the 10th.

OCCUPIED BANDWIDTH

Rules Part No.: 15.249 (d)

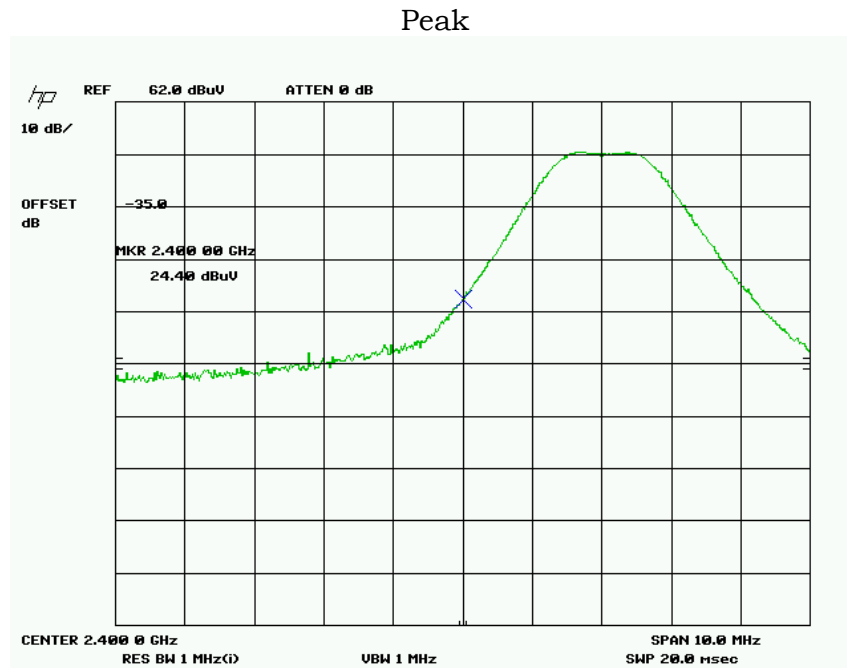
Requirements: The field strength of any emissions appearing outside the band edges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.249.

Test Data: Three places in the band were measured and the worst case presented.

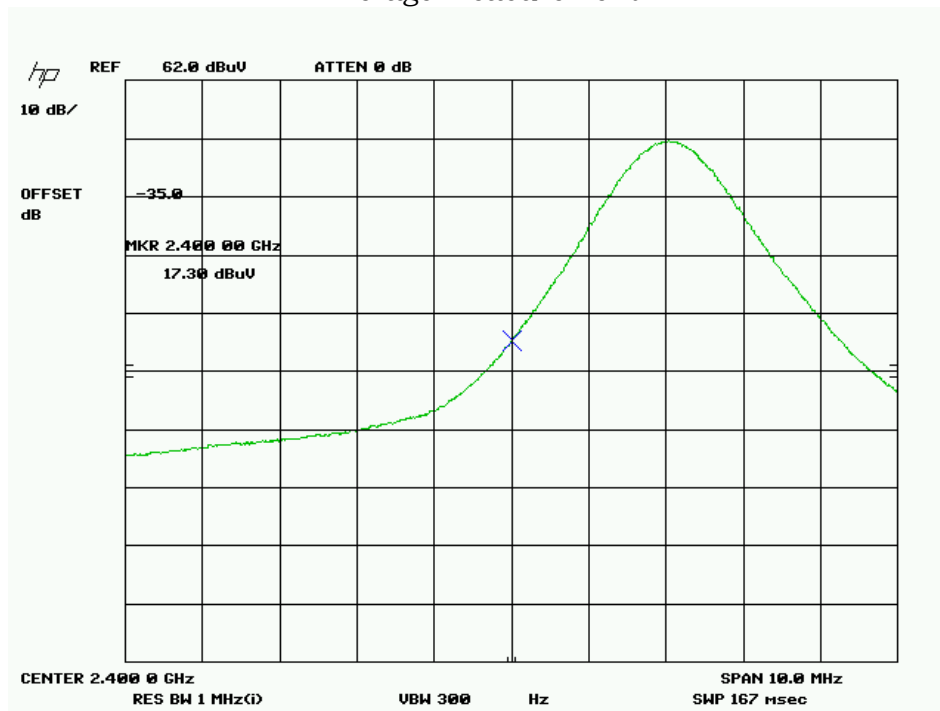


BANDEDGE COMPLIANCE

Requirements: The field strength of any emissions appearing outside the bandedges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.209.



Average measurement

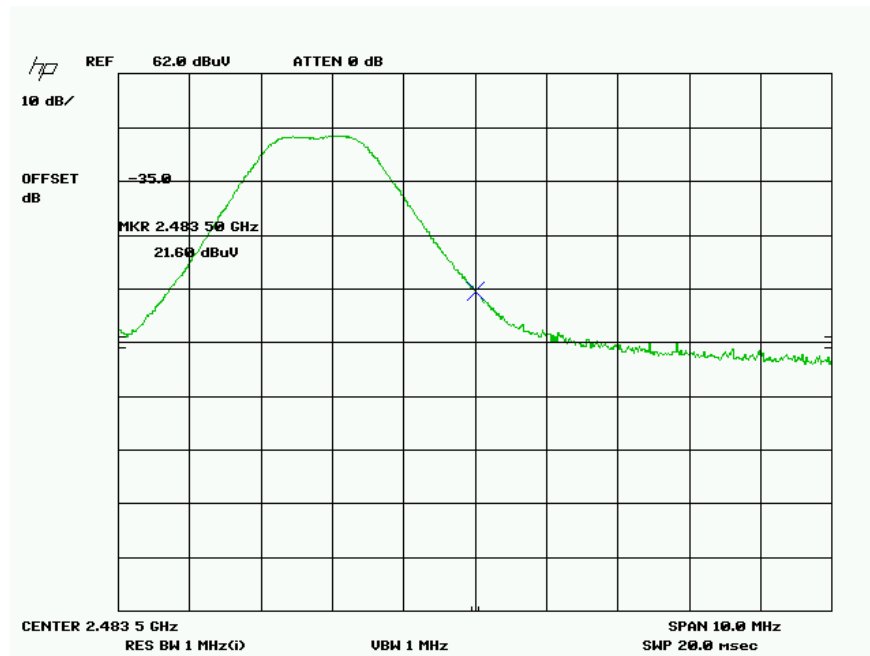


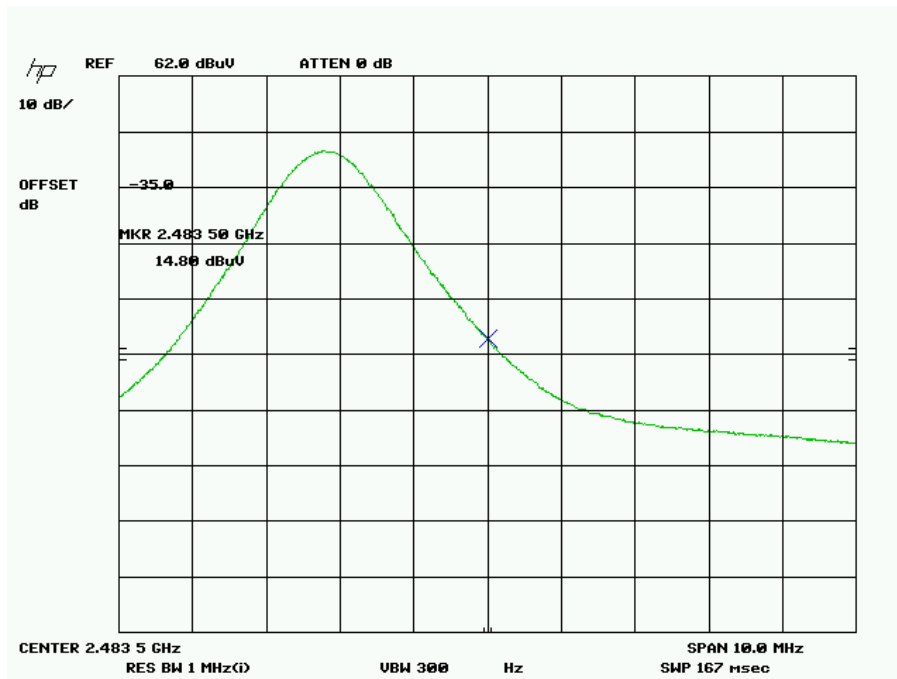
Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2402.0	2400.00	24.4Pk	V	3.18	32.24	59.82	14.18
2,402.0	2,400.00	17.3Av	V	3.18	32.24	52.72	1.28

BANDEDGE (CONT'D)

Requirements: The field strength of any emissions appearing outside the bandedges and up to 10 kHz above and below the band edges shall be attenuated at least 50 dB below the level of the carrier or to the general limits of 15.209.

Peak





Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2481.30	2483.50	21.60Pk	V	3.24	32.46	59.82	14.18
2,481.30	2,483.50	14.80Av	V	3.24	32.46	52.72	1.28

POWER LINE CONDUCTED INTERFERENCE

Rules Part No.: 15.207

Requirements:

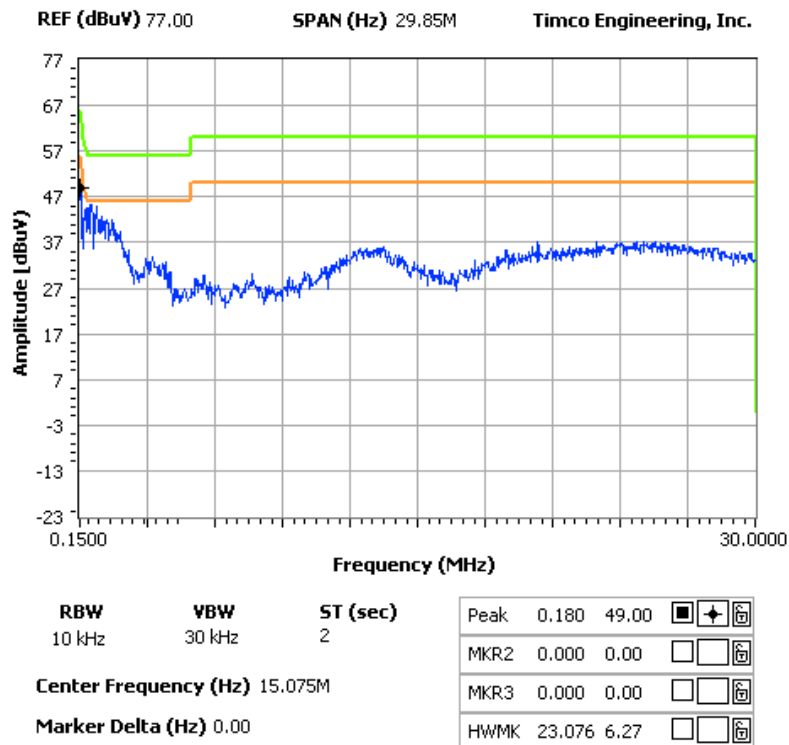
Frequency (MHz)	Quasi Peak Limits (dBuV)	Average Limits (dBuV)
0.15 – 0.5	66 – 56	56 – 46
0.5 – 5.0	56	46
5.0 – 30	60	50

Test Data: The attached plots represent the emissions for power line conducted. Both lines were observed.

NOTES:

CLEVELAND MEDICAL DEVICES, INC - ISM DEVICE
POWER LINE CONDUCTED - LINE 1

FCC 15.107 Mask Class B



NOTES:

CLEVELAND MEDICAL DEVICES, INC - ISM DEVICE
POWER LINE CONDUCTED - LINE 2

FCC 15.107 Mask Class B

