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## FCC PART 15.247

### TEST REPORT

APPLICANT	CLEVELAND MEDICAL DEVICE, INC.
	4415 EUCLID AVE 4TH FLOOR
	CLEVELAND OHIO 44103 USA
TEL	216.619.5931
FCC ID	N9Y0103
MODEL NUMBER	0103
PRODUCT DESCRIPTION	QUANTITATIVE MOTOR ASSESSMENT SYSTEM
DATE SAMPLE RECEIVED	MARCH 6, 2006
DATE TESTED	MARCH 7, 2006
TESTED BY	<i>Mario R. de Aranzeta</i> Mario R. de Aranzeta
APPROVED BY	<i>Frank Denuzzo</i> Frank Denuzzo
TIMCO REPORT NO.	450AUT6TestReport
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.

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### EXHIBIT INCLUDING:

REQUEST FOR CONFIDENTIALITY LETTER  
BLOCK DIAGRAM  
SCHEMATIC  
LABEL SAMPLE  
LABEL LOCATION  
USERS MANUAL  
EXTERNAL PHOTOGRAPHS  
INTERNAL PHOTOGRAPHS  
OPERATIONAL DESCRIPTION  
TEST SET UP PHOTOGRAPHS  
ANTENNA INFORMATION

**LETTER OF EXPLANATION**

March 27, 2006

Federal Communications Commission  
Authorization and Evaluation Division  
7435 Oakland Mills Road  
Columbia, MD 21046

SUBJECT: CLEVELAND MEDICAL DEVICES, INC

FCC ID: N9Y0103

To Whom It May Concern:

The attached application is for a portable device that employs a blue tooth device.

The unit employs internal antenna. The Bluetooth antenna has a gain of +1.2 dBi.

Should you have any questions or require any further information with regards to this, please feel free to contact me.

Sincerely,



Mario R. de Aranzeta C.E.T.  
Engineer

MRD/sh  
Encl.

## EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/27/04	3/26/07
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Biconnical Antenna	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Biconnical Antenna	Eaton	94455-1	1096	CAL 8/17/04	8/17/06
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/29/05	4/29/07
Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/13/05	4/13/07
Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 9/5/05	9/5/07
Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/13/05	4/13/07
LISN	Electro-Metrics	ANS-25/2	2604	CAL 8/27/04	8/27/06
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/05	4/28/07
Log-Periodic Antenna	Eaton	96005	1243	CAL 12/14/05	12/14/07

**Statement of Traceability:** All calibrations have been performed per the NVLAP requirements traceable to the NIST.

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## **TEST PROCEDURE**

**GENERAL:** This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

**POWER LINE CONDUCTED INTERFERENCE:** The procedure used was ANSI STANDARD C63.4-2003 using a 50uH LISN. Both lines were observed with the UUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed. The ambient temperature of the UUT was 76°F with a humidity of 55%.

**BANDWIDTH 20 dB:** The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

**POWER OUTPUT:** The RF power output was measured at the antenna feed point using a peak power meter.

**ANTENNA CONDUCTED EMISSIONS:** The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10<sup>th</sup> Harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

**RADIATION INTERFERENCE:** The test procedure used was ANSI STANDARD C63.4-2003 using an Agilent spectrum receiver with pre-selector. The bandwidth (RBW) of the spectrum receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The ambient temperature of the UUT was 76°F with a humidity of 55%.

## POWER LINE CONDUCTED INTERFERENCE

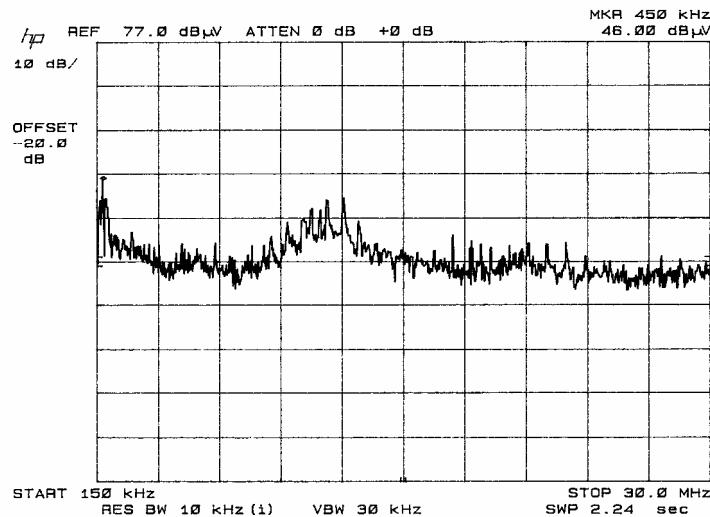
RULES PART NO.: 15.107(a)

**REQUIREMENTS:**

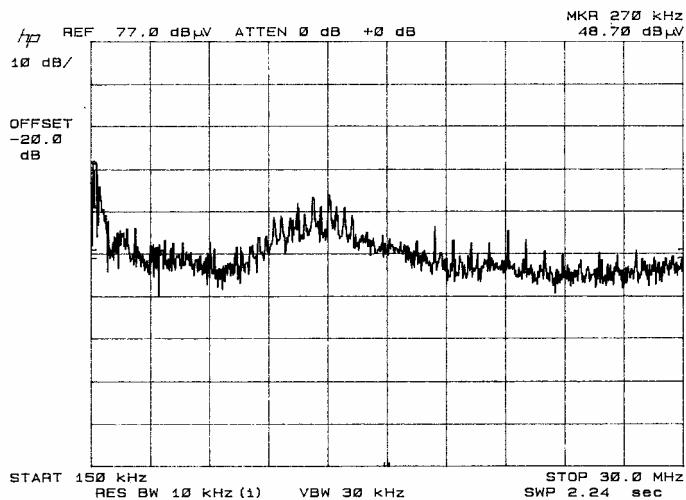
	<b>QUASI-PEAK</b>	<b>AVERAGE</b>
.15 - 0.5 MHz	66-56 dB <sub>µ</sub> V	56-46 dB <sub>µ</sub> V
0.5 - 5.0	56	46
5.0 - 30.	60	50

**TEST PROCEDURE:** ANSI C63.4-2003. The spectrum was scanned from .15 to 30 MHz.

**TEST DATA - LINE 1**



**LINE 2**



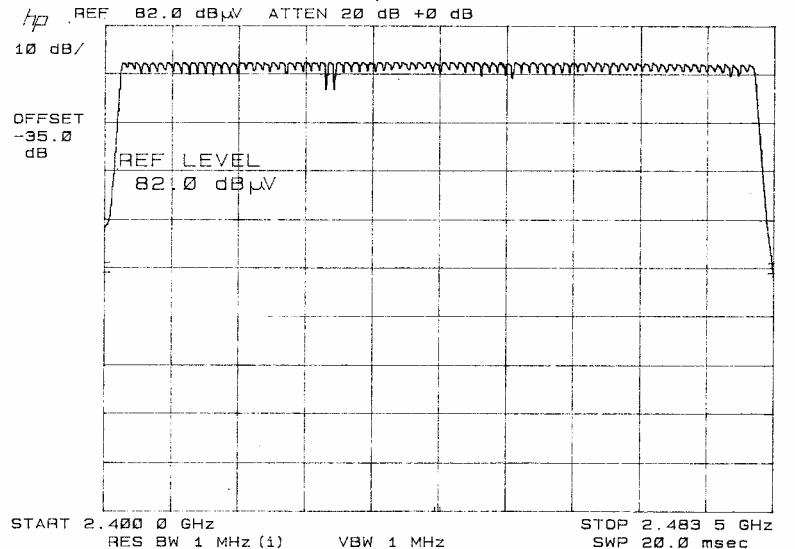
**TEST RESULTS:** Both lines were observed. The measurements indicate that the unit DOES meet the FCC requirements for this class of equipment.

## NUMBER OF HOPPING CHANNELS

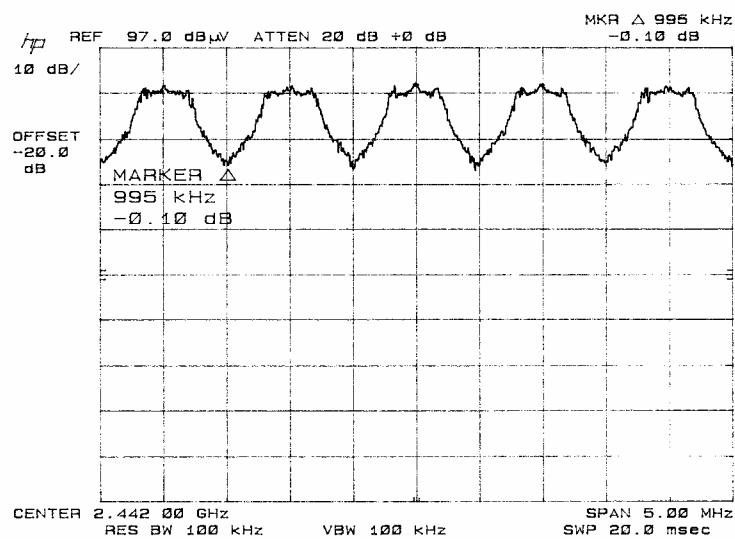
RULES PART NO.: 15.247(a)(1)

**REQUIREMENTS:** The number of hops is 79 hops at a separation of 1 MHz, the requirement in the 2400 - 2483.5 MHz band is a minimum of 75 hops.

### NUMBER OF HOPPING CHANNELS



### CHANNEL/CARRIER SPACING

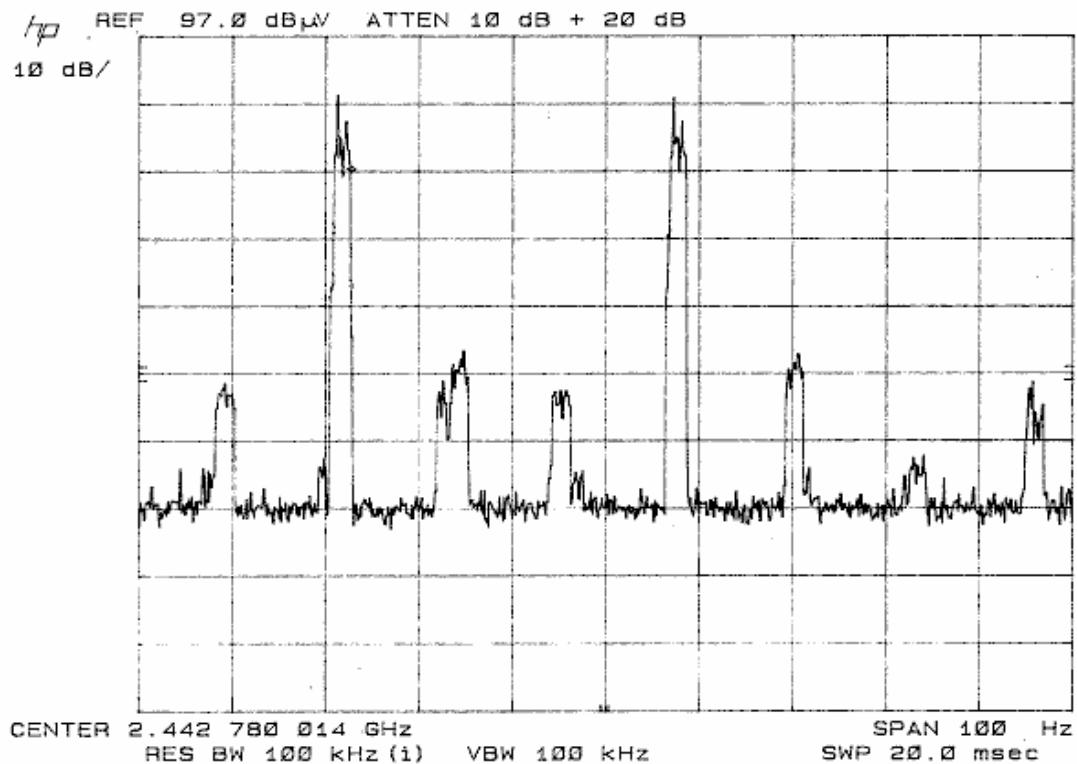


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### **DWELL TIME OF A HOPPING CHANNEL**

**RULES PART NO.:** 15.247(a)(1)(i)

**REQUIREMENTS:** The dwell time is 620 microseconds.



## ANTENNA GAIN

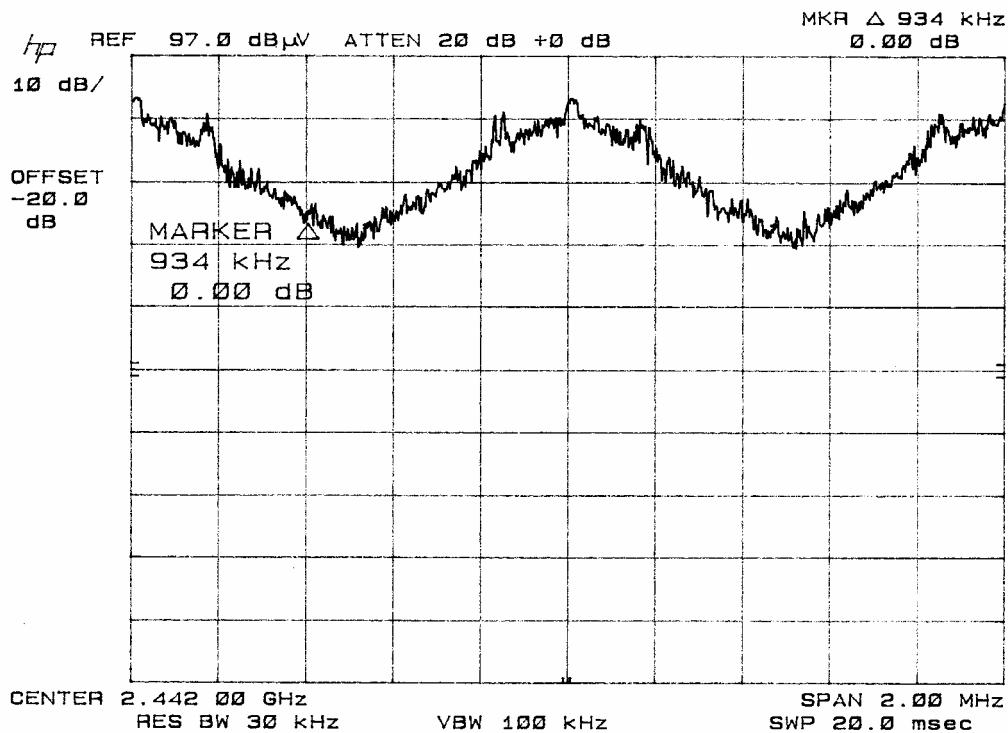
**RULE PART NO.:** 15.247(b)(3)

**REQUIREMENTS:** The antenna's gain is a negative number. This is described in the circuit description.

## 20DB BANDWIDTH

**RULE PART NO.:** 15.247(a)(1)(iii)

**REQUIREMENTS:** The 20 dB bandwidth measured was 934 kHz.



Three places in the band were measured and the worst case presented above.

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**POWER OUTPUT**

**RULE PART NO.:** 15.247(b)(1)

**REQUIREMENTS:** 1.0 Watt or +30 dBm

**MEASUREMENT:**

2402 MHz	5 mW or 0.005 Watts EIRP
2440 MHz	2 mW or 0.002 Watts EIRP
2480 MHz	2 mW or 0.002 Watts EIRP

**Method:** 15.247(c)

The device under test has an integral antenna and the power was measured on a radiated basis.

## **FIELD STRENGTH OF SPURIOUS EMISSIONS**

**RULES PART NO.:** 15.247(c), 15.205 &15.209(b)

### **REQUIREMENTS:**

FIELD STRENGTH of Fundamental:	FIELD STRENGTH of Harmonics	S15.209 30 - 88 MHz 40 dBuV/m @3M
902-928MHz		88 -216 MHz 43.5
2.4-2.4835GHz	127.37dBuV/m	216 -960 MHz 46
127.38dBuV/m @3m	54 dBuV/m @3m	ABOVE 960 MHz 54dBuV/m

EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 20 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209, WHICHEVER IS THE LESSER ATTENUATION.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dB.

**TEST DATA:** Above 1 GHz and to the tenth harmonic

Tuned Frequency (MHz)	Emission Frequency (MHz)	Meter Reading (dBuV)	Ant. Polarity (V/H)	Coax Loss (dB)	Correction Factor (dB)	Field Strength (dBuV/m)	Margin (dB)
2,402.0	2,402.00	66.7	V	3.18	32.33	102.21	25.17
2,402.0	4,804.00 R	5.0	H	4.90	34.34	44.24	9.76
2,402.0	4,804.00 R	7.8	V	4.90	34.34	47.04	6.96
2,402.0	9,608.00	-2.2	V	6.78	37.53	42.11	40.10
2,440.0	2,440.00	60.0	V	3.21	32.43	95.64	31.74
2440.0	4880.00 R	7.8	V	4.95	34.40	47.15	6.85
2,480.0	2,480.00	59.5	V	3.24	32.54	95.28	32.1
2,480.0	4,960.00 R	7.4	V	4.98	34.47	46.85	7.15

Emissions attenuated more than 20 dB below the permissible value are not reported.

## FIELD STRENGTH OF SPURIOUS EMISSIONS (CONTINUED)

**RULE PART NO.** 15.247(c), 15.205 &15.209(b)

**REQUIREMENTS:**

FIELD STRENGTH of Fundamental:	FIELD STRENGTH of Harmonics	S15.209 30 - 88 MHz 40 dBuV/m @3M
902-928MHz		88 -216 MHz 43.5
2.4-2.4835GHz	127.37dBuV/m	216 -960 MHz 46
127.38dBuV/m @3m	54 dBuV/m @3m	ABOVE 960 MHz 54dBuV/m

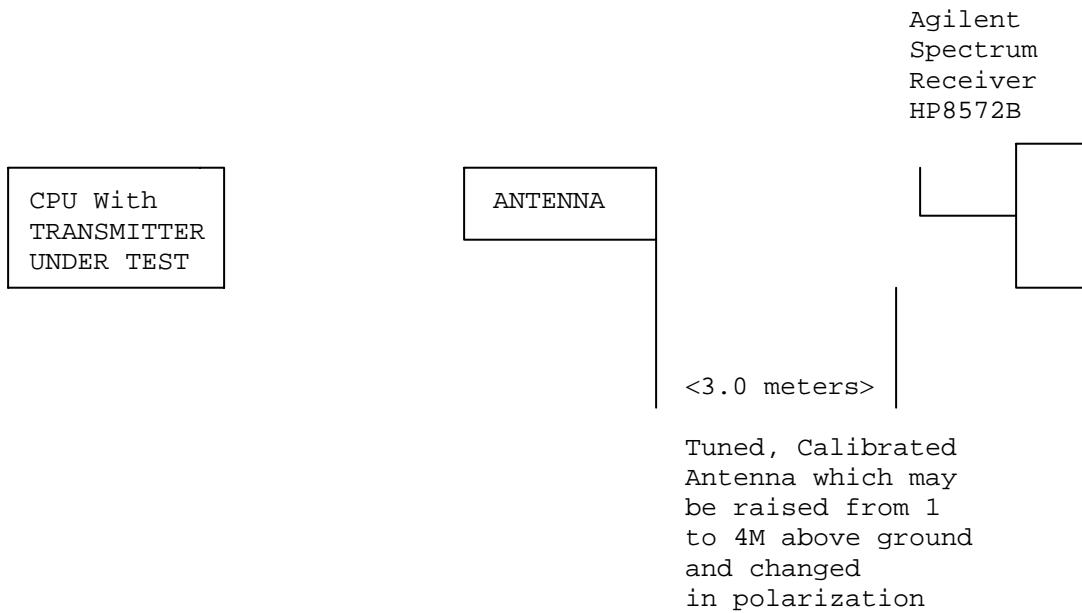
EMISSIONS RADIATED OUTSIDE OF THE SPECIFIED FREQUENCY BANDS, EXCEPT FOR HARMONICS, SHALL BE ATTENUATED BY AT LEAST 20 dB BELOW THE LEVEL OF THE FUNDAMENTAL OR TO THE GENERAL RADIATED EMISSION LIMITS IN 15.209, WHICHEVER IS THE LESSER ATTENUATION.

Emissions that fall in the restricted bands (15.205) must be less than 54dBuV/m otherwise the spurious and harmonics must be attenuated by at least 20dBc.

**TEST DATA:** from 30 MHz to 1 GHz

Emission Frequency (MHz)	Meter Reading (dBuV)	Ant. Polarity (V/H)	Coax Loss (dB)	Correction Factor (dB)	Field Strength (dBuV/m)
47.90	22.2	V	0.49	10.68	33.37
51.60	18.0	H	0.51	11.20	29.71
63.00	15.9	H	0.54	10.56	27.00
80.80	22.9	V	0.60	6.88	30.38
89.90	22.9	H	0.62	8.18	31.70
133.20 R	18.4	H	0.68	13.10	32.18
147.50	11.5	V	0.70	13.65	25.85
160.00	15.0	V	0.74	14.90	30.64
160.30	16.3	H	0.74	14.03	31.07
165.70 R	15.4	V	0.76	15.88	32.04
166.40 R	22.5	H	0.77	14.67	37.94
240.00 R	18.1	V	0.98	11.90	30.98
300.00	11.0	H	1.10	14.40	26.50
312.00	15.8	H	1.11	15.16	32.07
319.40	14.1	V	1.12	14.72	29.94
433.00	14.7	V	1.23	16.16	32.09
490.00	18.7	V	1.29	17.70	37.69
499.00	27.4	H	1.30	17.86	46.56
499.00	30.2	V	1.30	17.88	49.38
560.00	14.0	H	1.48	18.80	34.28
560.00	20.0	V	1.48	18.10	39.58
596.50	21.0	V	1.59	18.60	41.19
663.20	17.0	V	1.66	20.30	38.96
665.00	16.0	H	1.67	20.50	38.17
832.00	25.8	V	1.92	21.44	49.16
832.00	26.8	H	1.92	22.18	50.90

## Method of Measuring Radiated Spurious Emissions



Equipment placed 80cm above ground on a rotatable platform.

**METHOD OF MEASUREMENT:** The procedure used was ANSI STANDARD C63.4-2003 & the FCC/OET Guidance on Measurements for Direct Sequence Spread Spectrum Systems - Public Notice 54797 Dated July 12, 1995. Measurements were made at the open area test site of TIMCO ENGINEERING INC. located at 849 N.W. State Road 45, Newberry, FL 32669.

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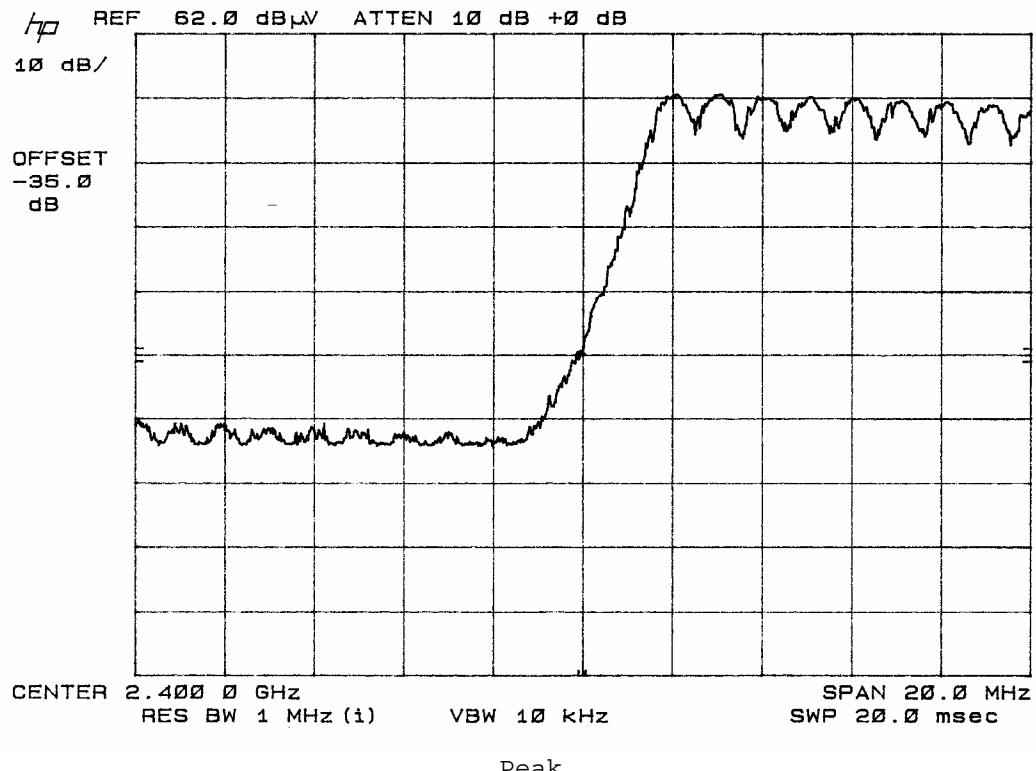
## **RADIATED SPURIOUS EMISSIONS INTO ADJACENT RESTRICTED BAND**

**RULE PART NO.:** 15.205

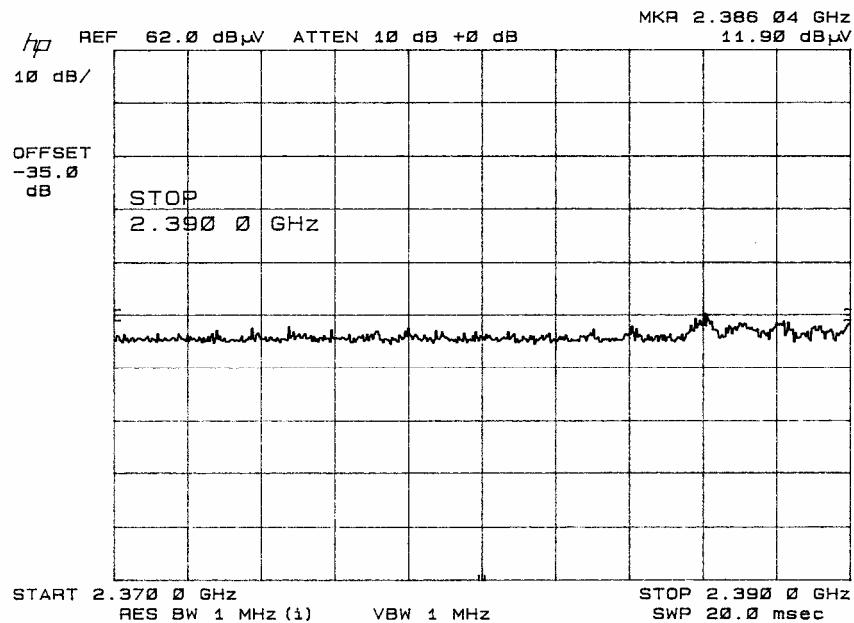
**REQUIREMENTS:** Emissions that fall in the restricted bands (15.205). These emissions must be less than or equal to 500  $\mu$ V/m (54 dBuV/m).

**TEST PROCEDURE:** An in band field strength measurement of the fundamental Emission using the RBW and detector function required by C63.4-2003 and FCC Rules. The procedure was repeated with an average detector and a plot made. The calculated field strength in the adjacent restricted band is presented below.

Lower Bandedge



Lower Restricted Band

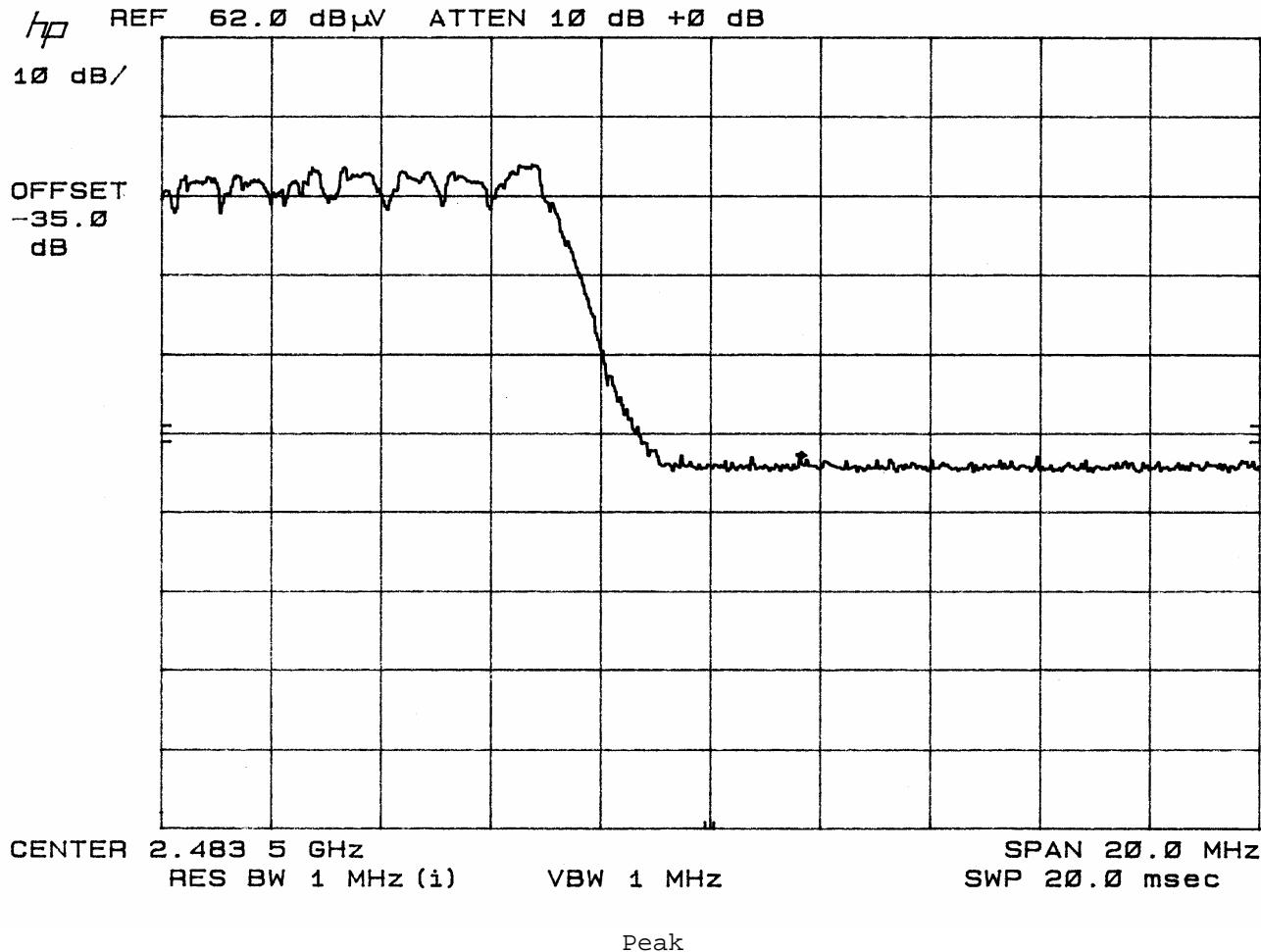


Lower restricted band

From Plot 11.9  
 ACF 32.28  
Coax loss 3.17  
Total 47.35 dB $\mu$ V/m

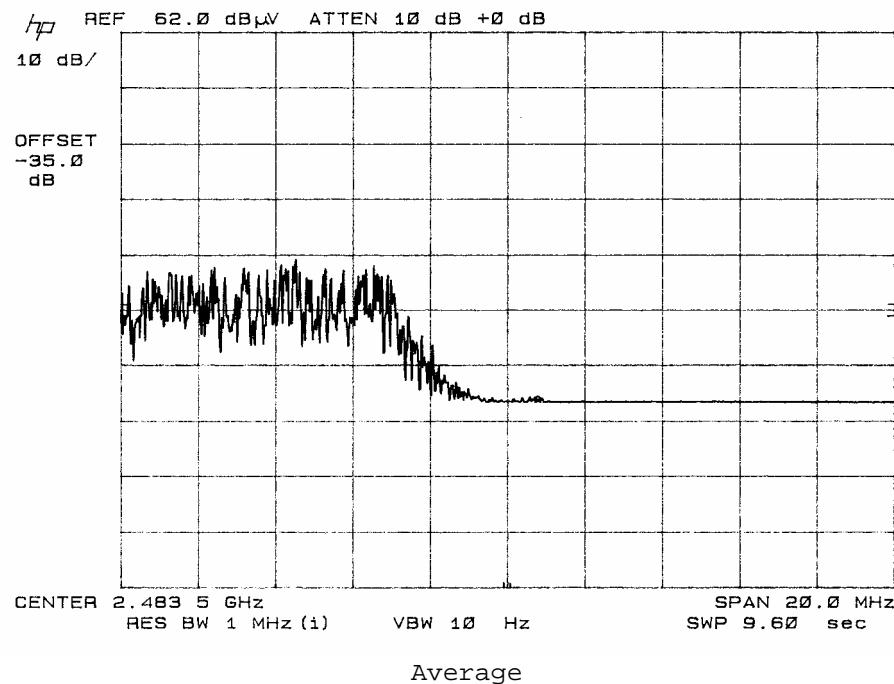
Peak meets the Average Value.

Upper bandedge and restricted band (peak value)



From Plot 22.0 dB $\mu$ V  
 Attenuator 10.0  
 ACF 32.32  
 Coax Loss 3.18  
 Total 67.5 dB $\mu$ V/m Peak

Upper bandedge and restricted band (Average value)



From Plot 6.0 dB $\mu$ V  
 Attenuator 10.0  
 ACF 32.55  
 Coax Loss 3.24  
 Total 51.79 dB $\mu$ V/m Peak