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## TEST REPORT

PER FCC PART 15.249 & IC RSS-210  
UNLICENSED INTENTIONAL RADIATOR

Applicant	T AND D US, LLC
Address	PO BOX 321 Saratoga Springs, New York 12866 USA
FCC ID	SRDRTR6X
IC Label	IC: 5558A-RTR6X
Model Number	RTR-61
Product Description	Wireless Core Temperatrue Data Logger
Date Sample Received	10/17/2007
Date Tested	10/31/2007
Tested By	Richard Block
Approved By	Mario de Aranzeta
Report Number	3376AUT7TestReport.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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**ATTESTATION**

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

**Summary**

The device under test does:

- fulfill the general approval requirements as identified in this test report
- not fulfill the general approval requirements as identified in this test report

**Attestations**

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

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



Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

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

**Authorized Signatory Name:** *Mario de Aranzeta*

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

**Date:** November 7, 2007

## REPORT SUMMARY

Disclaimer	The test results relate only to the items tested.
Purpose of Test	To show the DUT in compliance with FCC CFR 47, Part 15.249 and Industry Canada RSS-210 Issue 7 requirements for 900 MHz low power radio.
Test Standards	FCC CFR 47 Part 15.249 IC RSS-210 ANSI C63.4: 2003
Related Approval(s)/Report(s)	3376CUT7TestReport.pdf

## TEST ENVIRONMENT AND TEST SETUP

Test Facility	RF output power and radiated emission were conducted by Timco Engineering Inc. located at 849 NW State Road 45, Newberry, FL 32669 USA
Laboratory Test Condition	Temperature: 26°C Relative humidity: 50%.
Deviation from the standards	No deviation
Modification to the DUT	No modification.
Test Exercise (e.g. software description, test signal, etc.)	The DUT was placed in continuous transmitting mode of operation.
System Setup	Stand alone device.

**DUT SPECIFICATION**

DUT Description	WIRELESS CORE TEMPERATRUE DATA LOGGER		
FCC ID	SRDRTR6X		
Model Number	RTR-61		
Operating Frequency	TX: 902.3 – 927.1 MHz	RX: Same	
No. of Channels	21		
Modulations	FM		
DUT Power Source	<input type="checkbox"/> 110–120Vac/50– 60Hz		
	<input type="checkbox"/> DC Power		
	<input checked="" type="checkbox"/> Battery Operated Exclusively		
Test Item	<input type="checkbox"/> Prototype	<input checked="" 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 Connector	FCC Rules require that the antenna connector be unique.		

### 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 12/12/05	12/12/07
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	8568B	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 12/14/05	12/14/07



**TEST PROCEDURES**

**Radiation Interference:** ANSI C63.4-2003 using a spectrum analyzer, a preselector, a 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 10kHz 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 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.



**RADIATION INTERFERENCE**

**Rules Part No.:** 15.249, 15.209, RSS-210

**Requirements:**

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

**Test Data:**

TX

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	Note
902.3	902.28	55.0	H	4.82	23.35	83.17	10.83	
902.3	902.28	62.4	V	4.82	22.92	90.14	3.86	
902.3	1,804.90	18.9	H	1.60	30.34	50.84	3.16	
902.3	1,804.90	21.4	V	1.60	30.34	53.34	0.66	
902.3	2,706.80	16.4	H	1.98	32.68	51.06	2.94	
902.3	2,706.80	17.2	V	1.98	32.68	51.86	2.14	
902.3	3,609.10	14.0	V	2.28	33.19	49.47	4.53	
902.3	3,609.10	15.5	H	2.28	33.19	50.97	3.03	
902.3	4,511.40	12.8	V	2.55	33.90	49.25	4.75	
902.3	4,511.40	13.6	H	2.55	33.90	50.05	3.95	
902.3	5,413.60	10.4	V	2.87	34.50	47.77	6.23	
902.3	5,413.60	12.2	H	2.87	34.50	49.57	4.43	
902.3	6,315.90	9.8	H	3.16	35.55	48.51	5.49	
902.3	6,315.90	10.0	V	3.16	35.55	48.71	5.29	

[Continued]





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	Note
902.3	7,218.20	9.8	V	3.37	35.56	48.73	5.27	
902.3	7,218.20	11.2	H	3.37	35.56	50.13	3.87	
902.3	8,120.50	10.1	V	3.62	35.72	49.44	4.56	
902.3	8,120.50	10.9	H	3.62	35.72	50.24	3.76	
902.3	9,022.80	10.7	H	3.80	36.02	50.52	3.48	
902.3	9,022.80	11.1	V	3.80	36.02	50.92	3.08	
915.3	915.26	53.6	H	4.34	23.66	81.60	12.40	
915.3	915.26	60.2	V	4.34	23.21	87.75	6.25	
915.3	1,830.50	17.5	V	1.62	30.54	49.69	4.31	AV
915.3	1,830.50	21.0	H	1.62	30.54	53.16	0.84	
915.3	1,830.50	23.6	V	1.62	30.54	55.76	-1.76	PK
915.3	2,745.70	18.4	V	2.00	32.70	53.10	0.90	
915.3	2,745.70	19.3	H	2.00	32.70	54.00	0.00	
915.3	3,661.00	13.7	V	2.30	33.23	49.23	4.77	
915.3	3,661.00	15.5	H	2.30	33.23	51.03	2.97	
915.3	4,576.20	12.5	V	2.57	33.92	48.99	5.01	
915.3	4,576.20	13.6	H	2.57	33.92	50.09	3.91	
915.3	5,491.50	10.2	H	2.90	34.59	47.69	6.31	
915.3	5,491.50	10.8	V	2.90	34.59	48.29	5.71	
915.3	6,406.70	9.7	V	3.18	35.63	48.51	5.49	
915.3	6,406.70	10.7	H	3.18	35.63	49.51	4.49	
915.3	7,322.00	10.2	V	3.40	35.54	49.14	4.86	
915.3	7,322.00	10.4	H	3.40	35.54	49.34	4.66	
915.3	8,237.30	11.2	H	3.65	35.75	50.60	3.40	
915.3	8,237.30	11.4	V	3.65	35.75	50.80	3.20	
915.3	9,152.50	11.2	V	3.82	36.15	51.17	2.83	
915.3	9,152.50	11.3	H	3.82	36.15	51.27	2.73	
927.1	927.05	54.4	H	3.90	24.43	82.73	11.27	
927.1	927.05	60.6	V	3.90	24.32	88.82	5.18	
927.1	1,854.10	19.7	V	1.63	30.73	52.02	1.98	AV
927.1	1,854.10	21.1	H	1.63	30.73	53.46	0.54	
927.1	1,854.10	25.3	V	1.63	30.73	57.66	-3.66	PK
927.1	2,781.10	19.2	H	2.01	32.71	53.92	0.08	
927.1	2,781.10	18.6	V	2.01	32.71	53.32	0.68	
927.1	3,708.20	15.4	V	2.31	33.27	50.98	3.02	
927.1	3,708.20	17.4	H	2.31	33.27	52.98	1.02	

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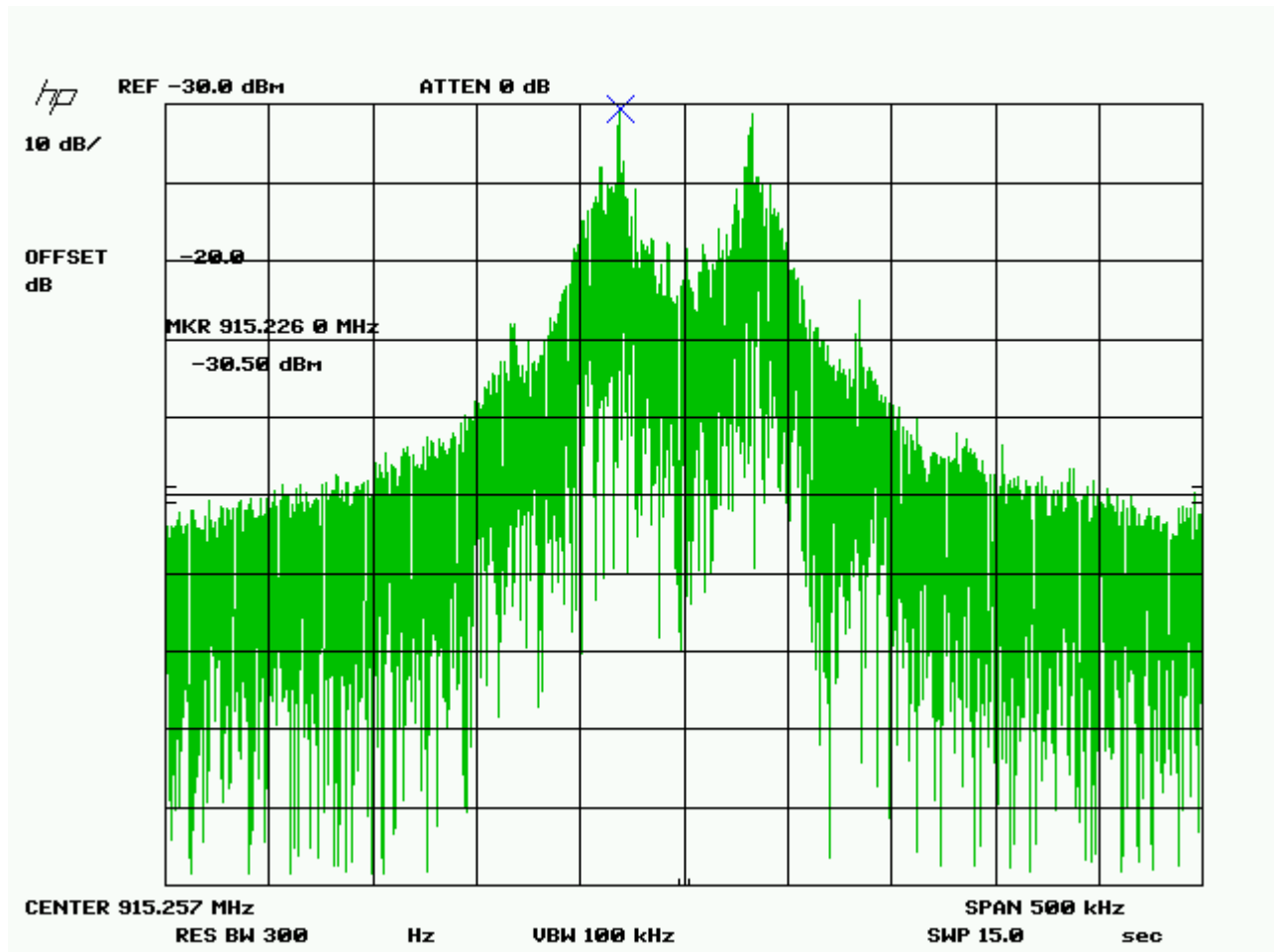
Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB	Note
927.1	4,635.20	12.3	V	2.59	33.93	48.82	5.18	
927.1	4,635.20	12.4	H	2.59	33.93	48.92	5.08	
927.1	5,562.30	9.2	H	2.92	34.69	46.81	7.19	
927.1	5,562.30	9.8	V	2.92	34.69	47.41	6.59	
927.1	6,489.30	9.7	H	3.20	35.69	48.59	5.41	
927.1	6,489.30	10.0	V	3.20	35.69	48.89	5.11	
927.1	7,416.40	10.4	V	3.42	35.52	49.34	4.66	
927.1	7,416.40	10.6	H	3.42	35.52	49.54	4.46	
927.1	8,343.40	10.8	V	3.67	35.77	50.24	3.76	
927.1	8,343.40	10.9	H	3.67	35.77	50.34	3.66	
927.1	9,270.50	10.5	V	3.83	36.27	50.60	3.40	
927.1	9,270.50	11.1	H	3.83	36.27	51.20	2.80	

## OCCUPIED BANDWIDTH

**Rules Part No.:** 15.249 (d), RSS-210

**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 15.249.

### Test Data:



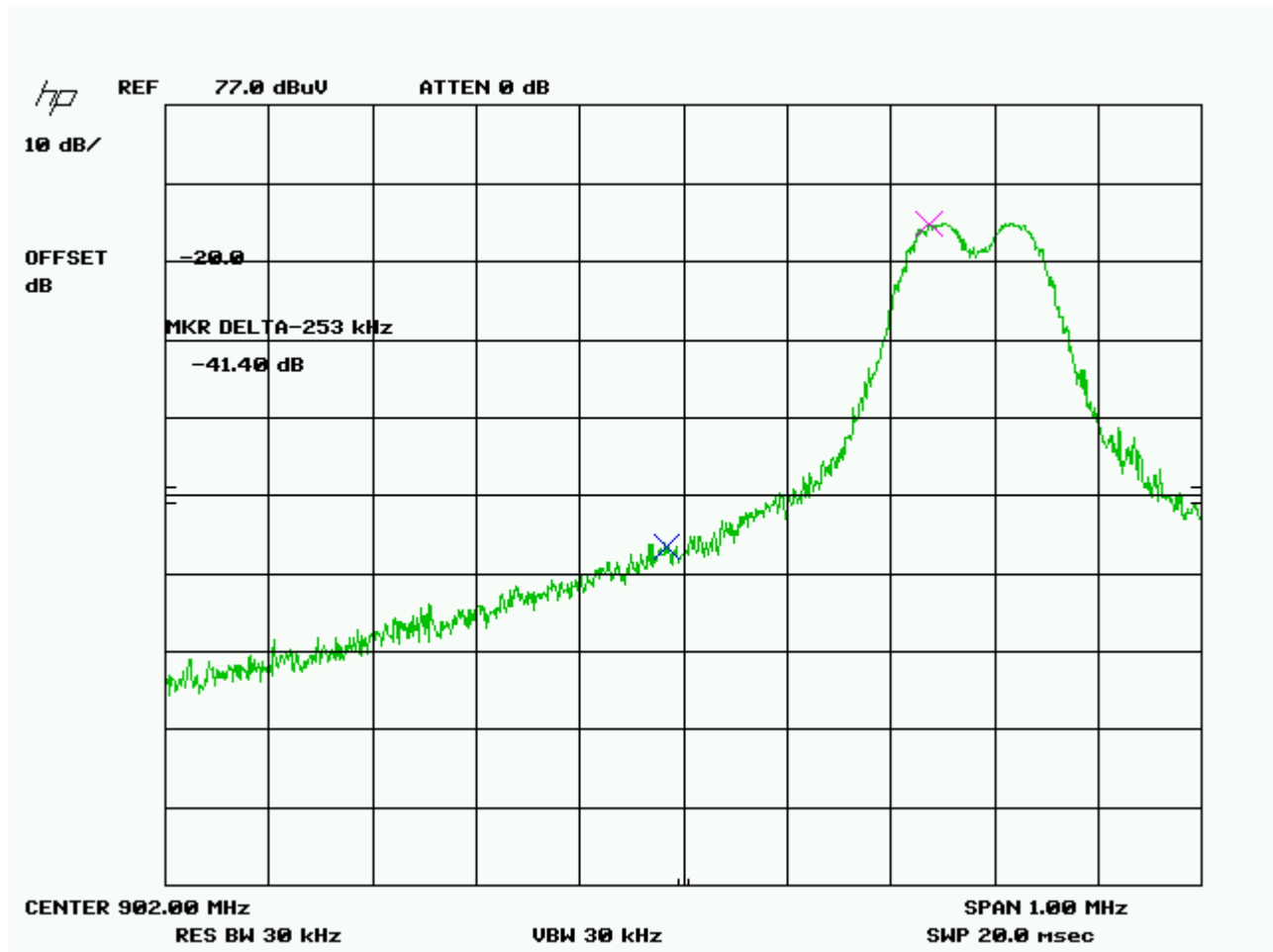
**BAND EDGE COMPLIANCE**

**Rules Part No.:** 15.249 (d), RSS-210

**Requirements:** 54 dBuV/m

**Test Data:**

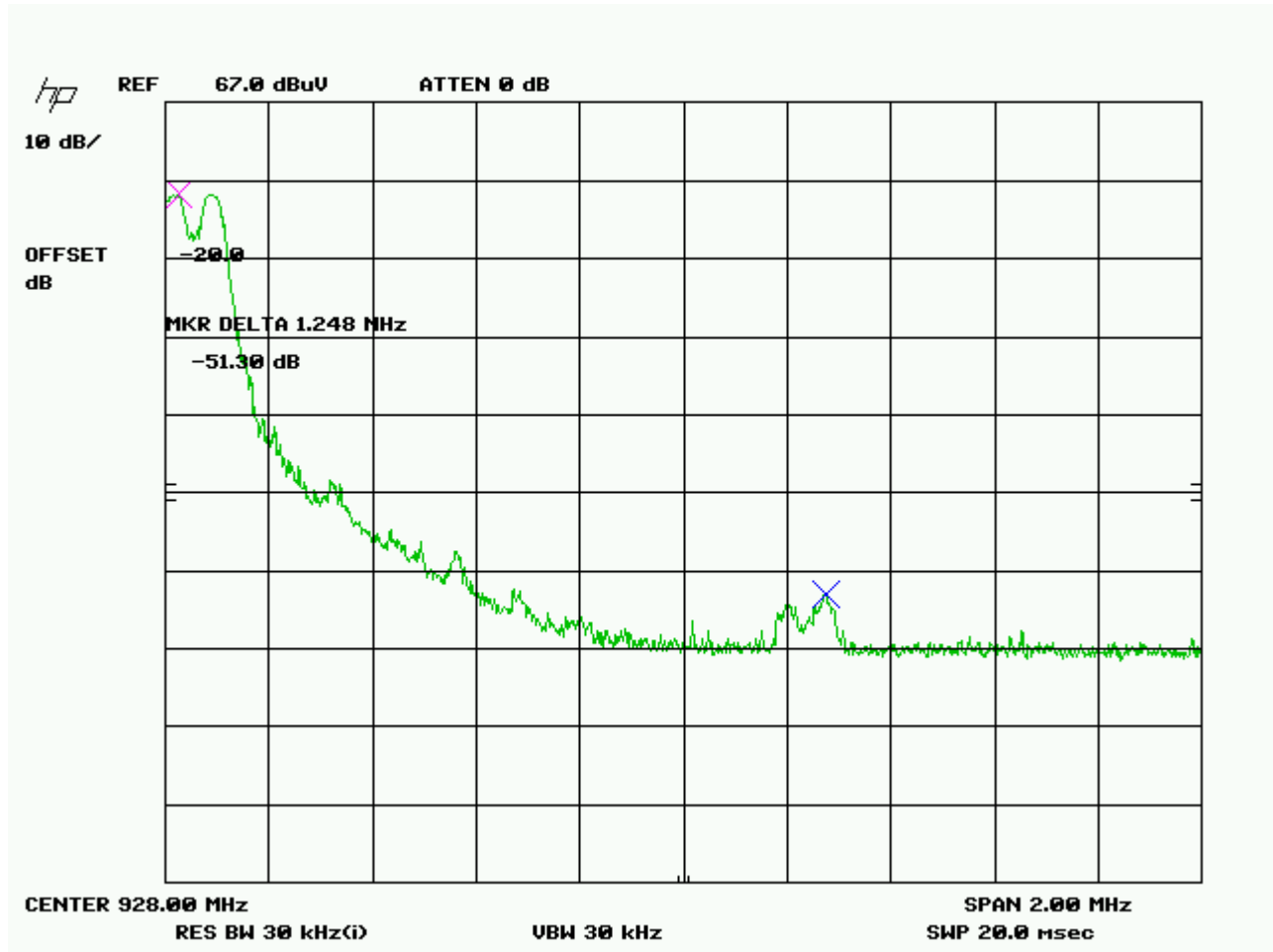
Lower Bandedge



$$90.1 - 41.4 = 48.7 \text{ dBuV/m}$$

$$\text{LIMIT} = 54 \text{ dBuV/m}$$

Upper Bandedge



$$88.8 - 51.3 = 37.5 \text{ dBuV/m}$$

$$\text{LIMIT} = 54 \text{ dBuV/m}$$



## 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
* Decrease with logarithm of frequency		

**Test Data:** The attached graphs represent the emissions read for power line conducted for this device. Both lines were observed.

N/A  
Battery powered DUT.