

15.247 (c) Conducted Band Edge Measurements and Out of Band Emissions

The antenna was disconnected and a fifty ohm load was installed. The signal was then directly coupled into a spectrum analyzer. The output signal from 2.400 to 2.480 Ghz was transmitted so that the fundamental frequency could be observed. No signal above the ambient were observed during this test.

B/E	=	Band Edge
R/B	=	Restricted Band
ME R/B	=	Maximum Emission Restricted Band
Rdg	=	Conducted emission into 50 ohm load
RFS	=	Maximum radiated field strength from 15.209 data on fundamental
RFS-Rdg	=	Maximum field strength minus the delta between the peak conducted and the conducted spurious marker data

$$\text{Formula} = \text{RFS} - (\text{Rdg} - \text{marker data})$$

Example channel 1

$$46.16 \text{ dBuV/m} = 81.8 \text{ dBuV/m} - (7.11 \text{ dBm} - (-28.53 \text{ dBm}))$$

D1	=	Display line at maximum conducted emission
D2	=	-20dB down point

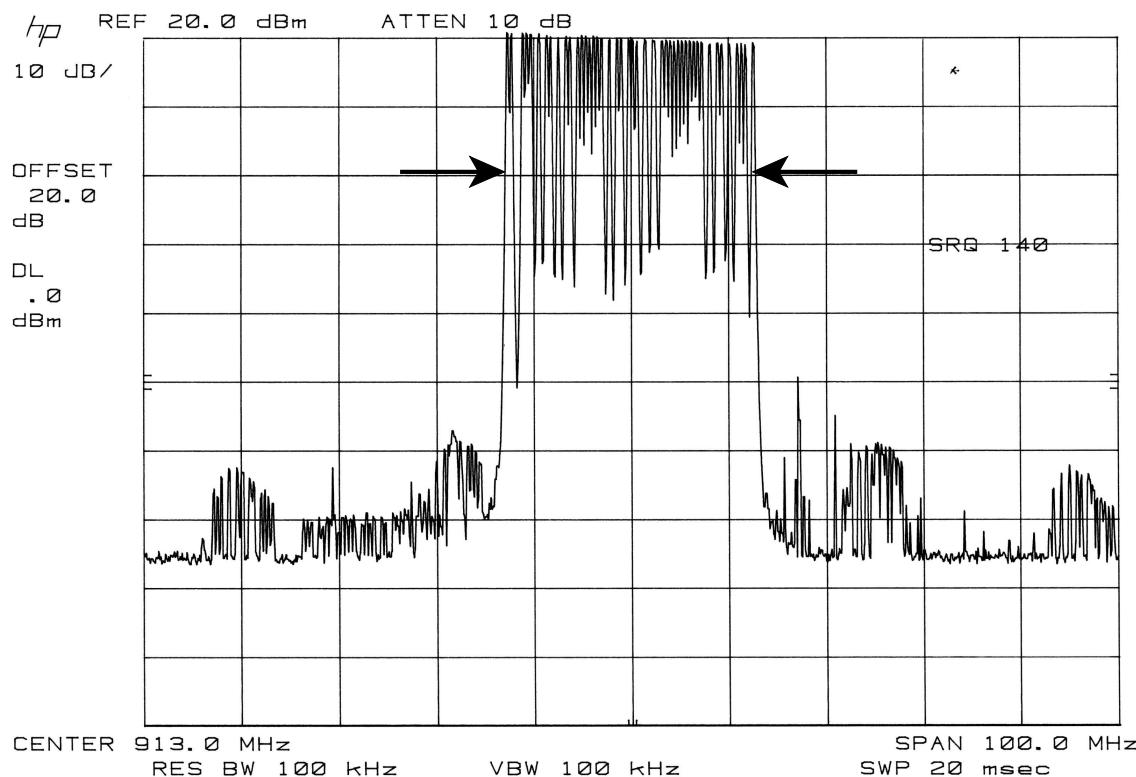
Test Set Up: Same as 15.247 (a,2) 20 dB Emission Bandwidth



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### Band Edge Measurements

DNB Job Number:	58029	Date:	25 Sep 2004	<b>Conformance Standard</b>	
Customer:	ConectiSys Corp. Inc				
Model Number:	HNET 5.0		Serial Number: Proto	FCC Part 15	
Description:	Wireless Power Usage Monitoring System			<b>Clause</b> 15.247(c)	
Ambient Temperature		Relative Humidity	Barometric Pressure		
23 °C		38 %	98.8 kPa		
EUT performed within the requirements of the applicable standard <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>Les Payne</i>					
Band Edge		Limit	Delta	Pass/Fail	
Lower (MHz)	Upper (MHz)	902.00	300 kHz	Pass	
902.30	927.9	927.90	100 kHz	Pass	

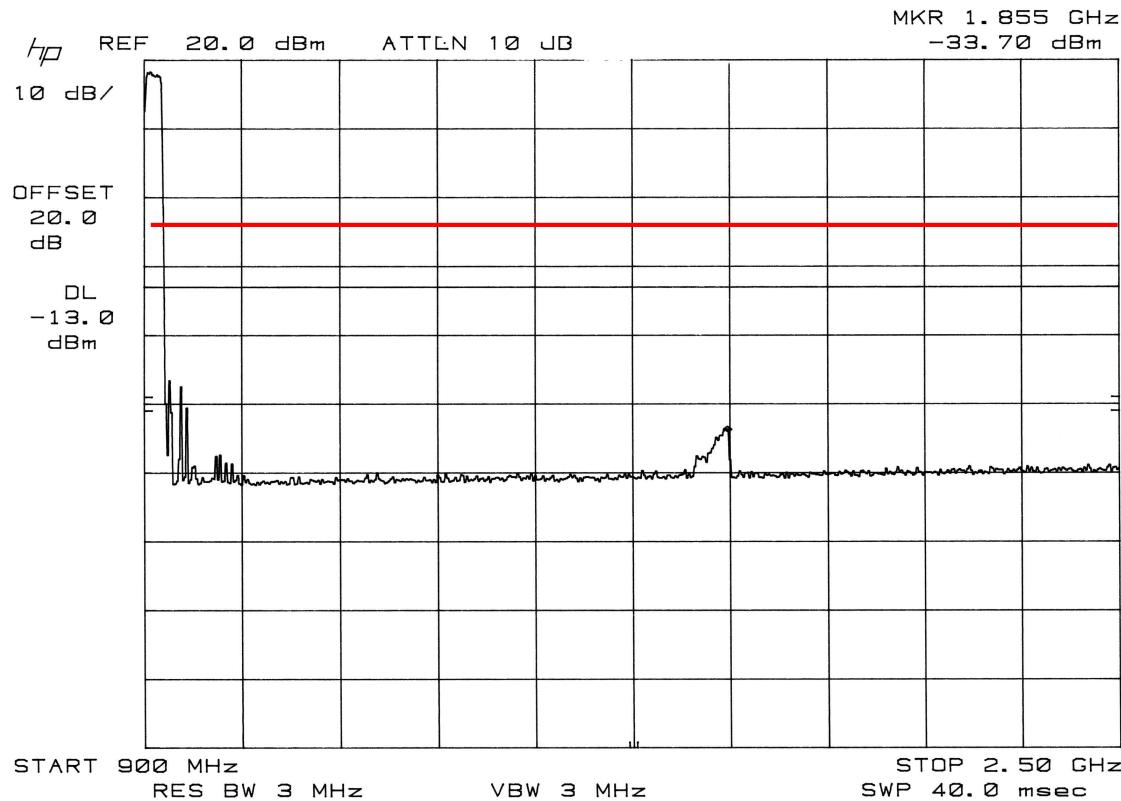




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## Conducted Spurious

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23 °C		38 %	98.8 kPa		
EUT performed within the requirements of the applicable standard <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>Les Payne</i>					
Peak Output Power	Reading	-20dBc	Pass/Fail		
20.0 dBm	18.0 dBm	-2.00 dBm	Pass		

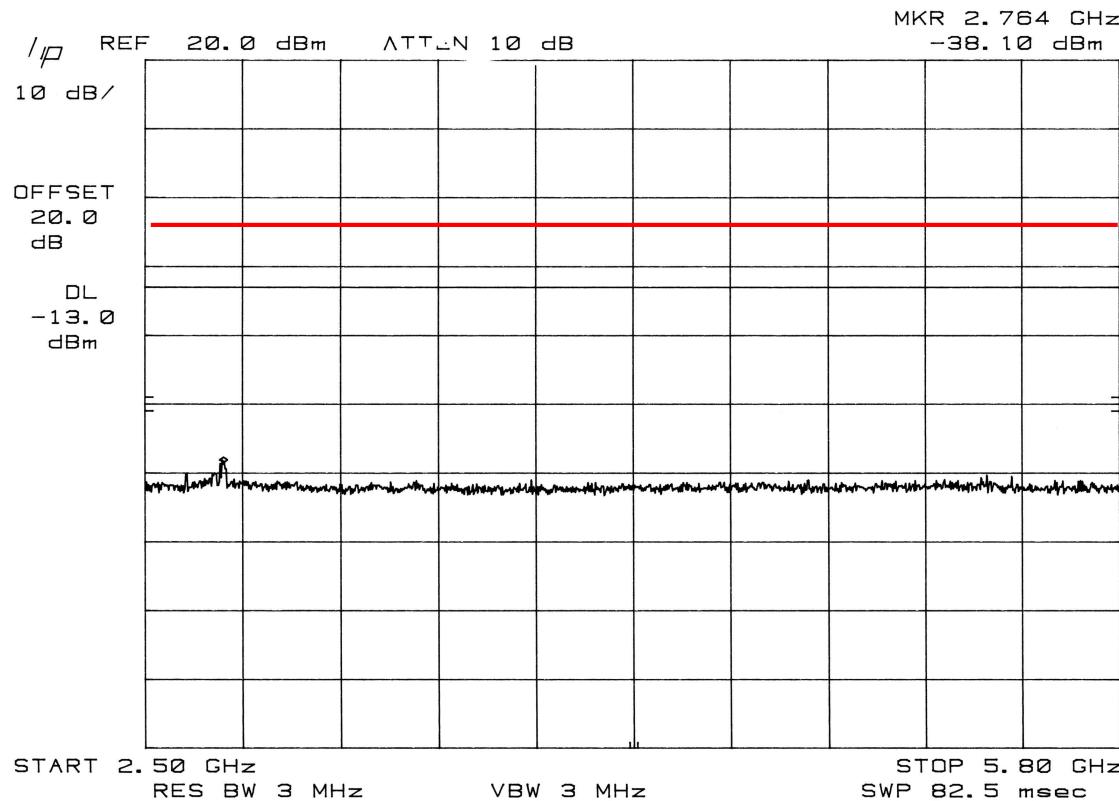




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Peak Output Power	Reading	-20dBc	Pass/Fail		
20.0 dBm	18.0 dBm	-2.00 dBm	Pass		

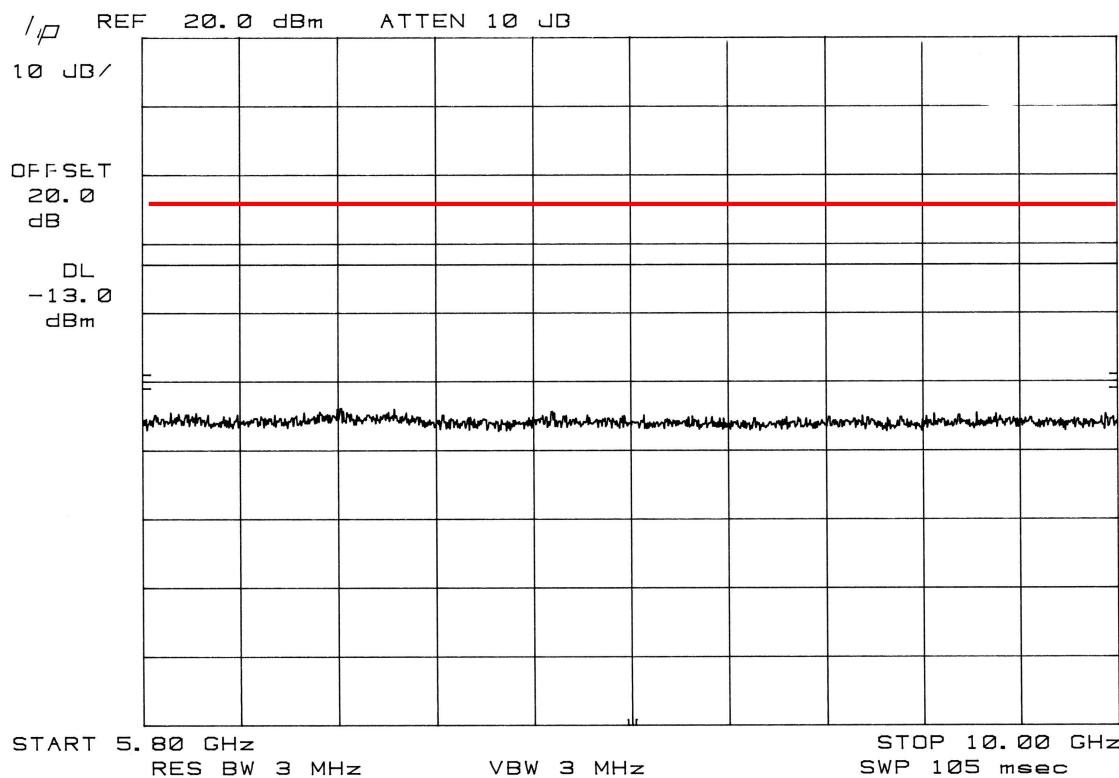




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EUT performed within the requirements of the applicable standard <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>Les Payne</i>					
Peak Output Power	Reading	-20dBc	Pass/Fail		
20.0 dBm	18.0 dBm	-2.00 dBm	Pass		



2.1033 (b) (7) Equipment Photographs

Photo 1	Internal	Radio Unit
Photo 2	Internal	RF Board Top
Photo 3	Internal	RF Board Bottom
Photo 4	Internal	Power Supply - Top
Photo 5	Internal	Power Supply - Bottom
Photo 6	Internal	Controller Board
Photo 7	Internal	Wiring Illustration
Photo 8	Internal	Radio Mounting
Photo 9	Internal	Dipole Antenna
Photo 10	Internal	Antenna Close up (Balun)
Photo 11	Internal	Cables
Photo 12	External	Unmounted in Utility Box
Photo 13	External	Mounted in Utility Box - Front
Photo 14	External	Mounted in Utility Box - Side

Photo 1 Internal Radio Unit

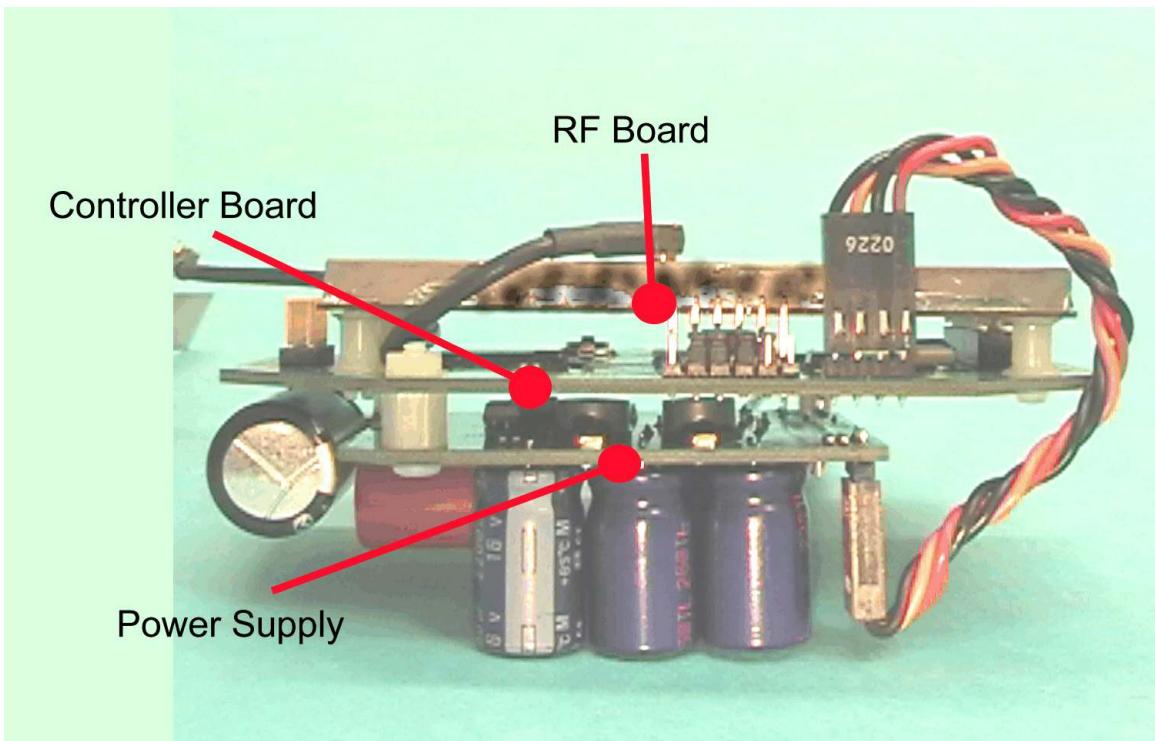


Photo 2

Internal

RF Board Top

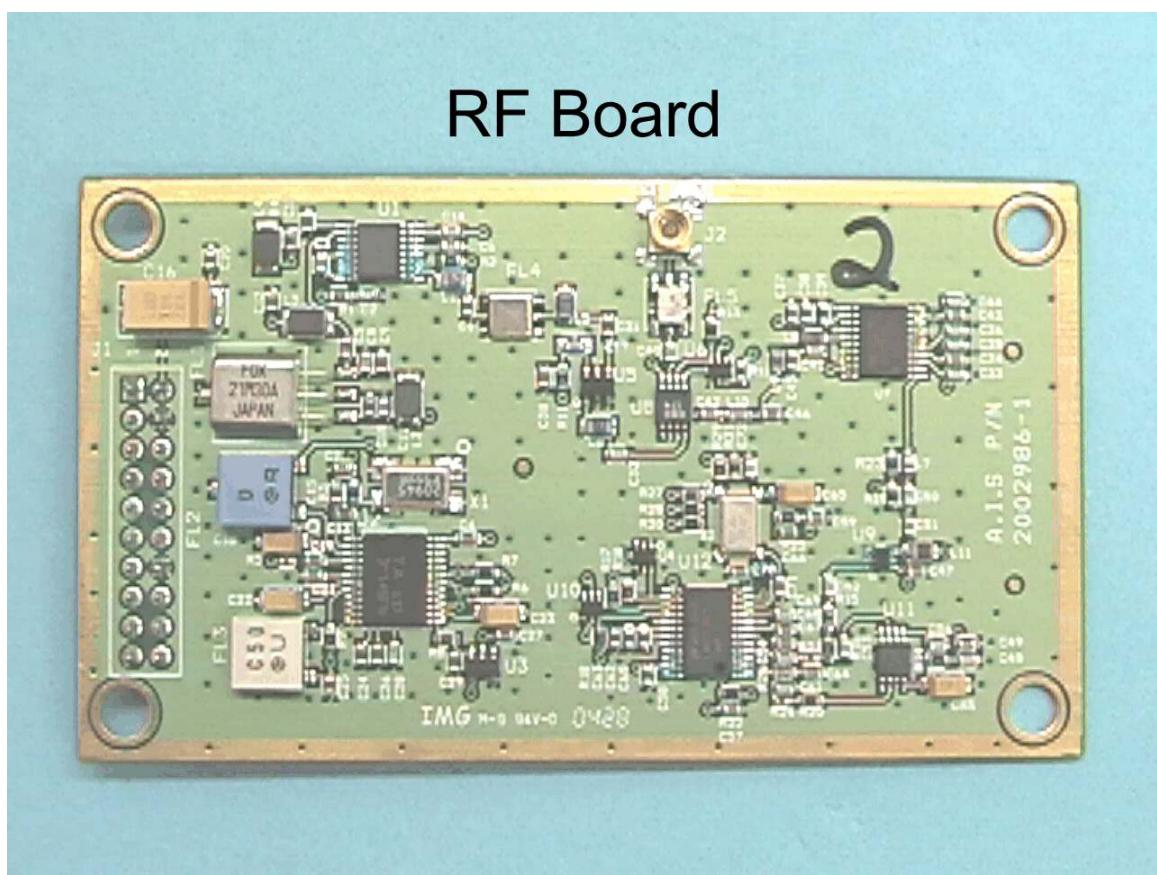


Photo 3

Internal

RF Board Bottom

## RF Board - Back

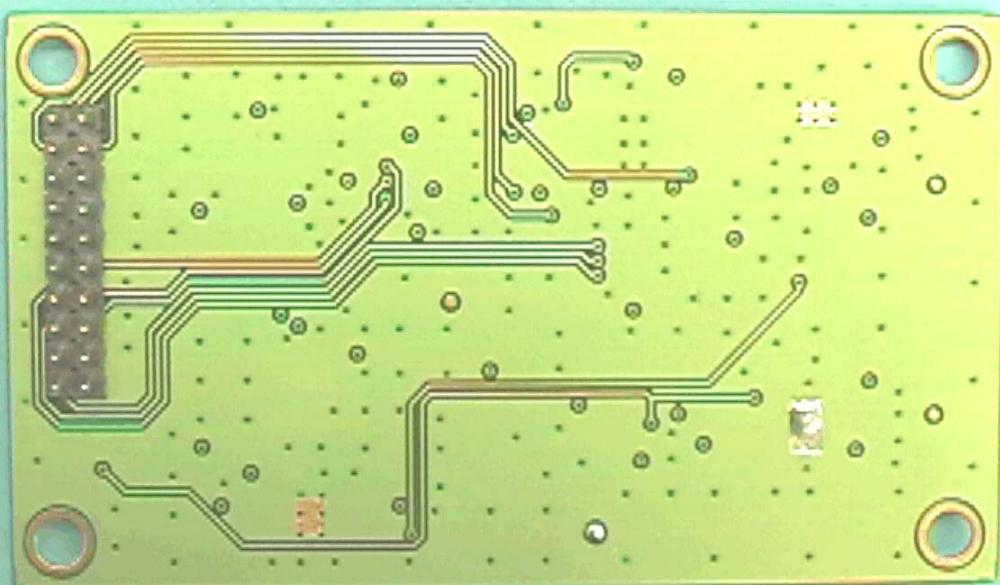


Photo 4

Internal

Power Supply - Top

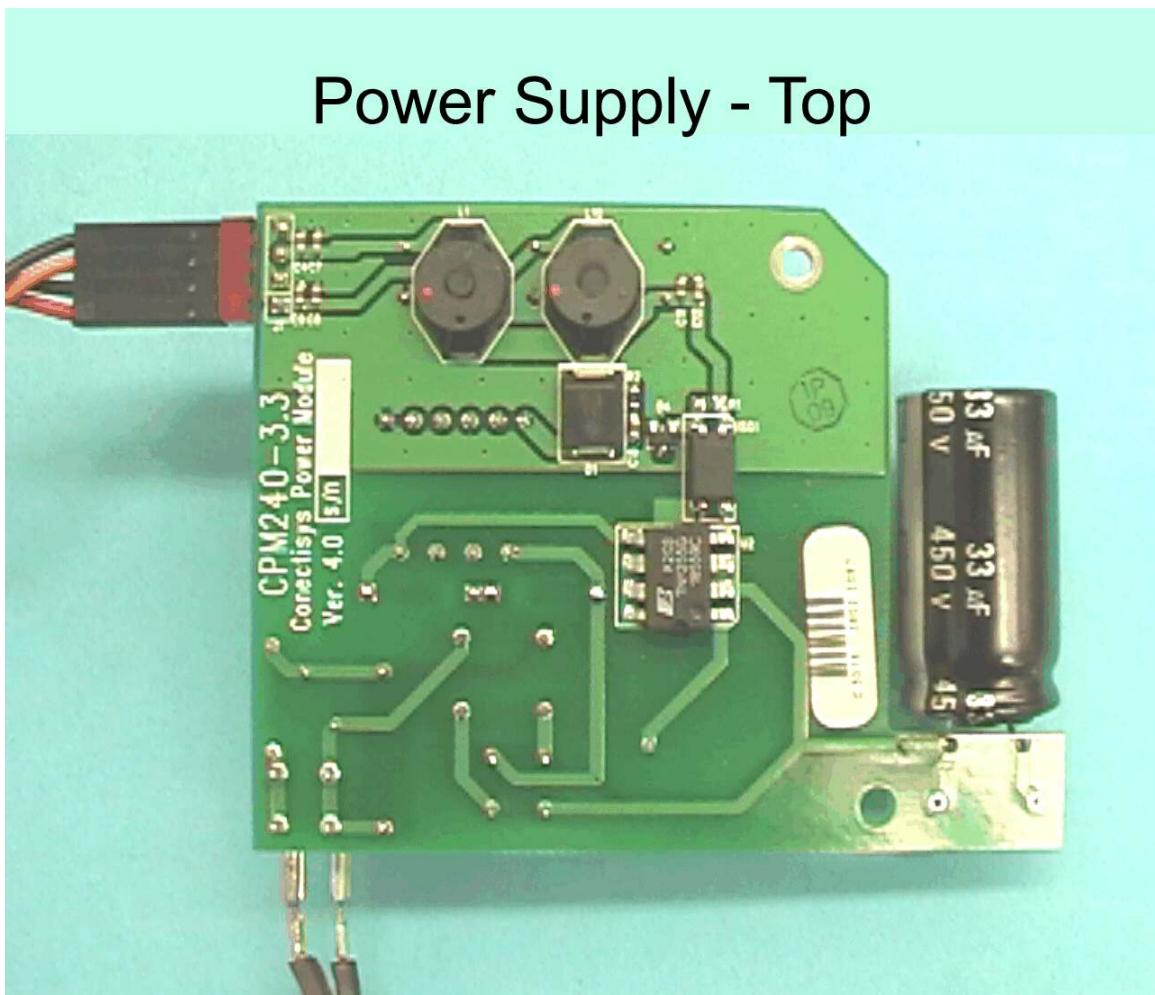


Photo 5

Internal

Power Supply - Bottom

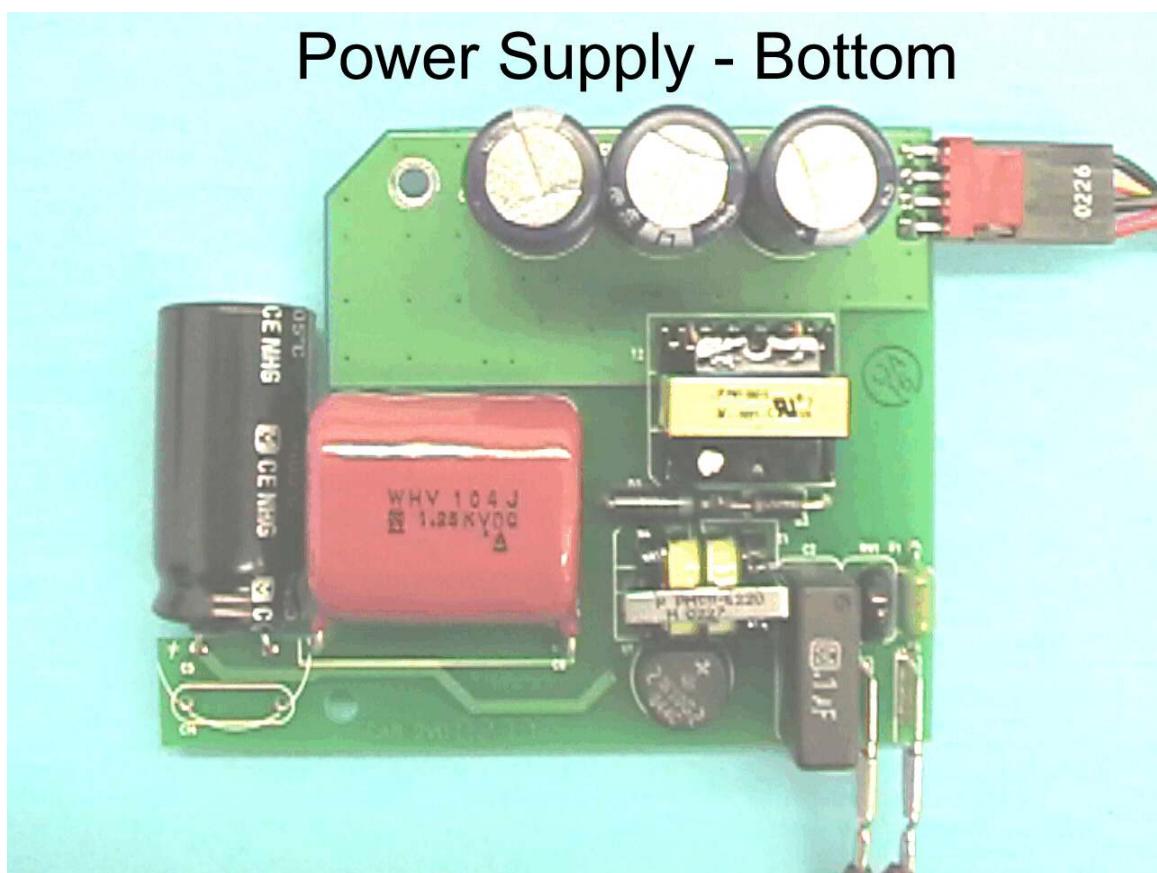


Photo 6

Internal

Controller Board

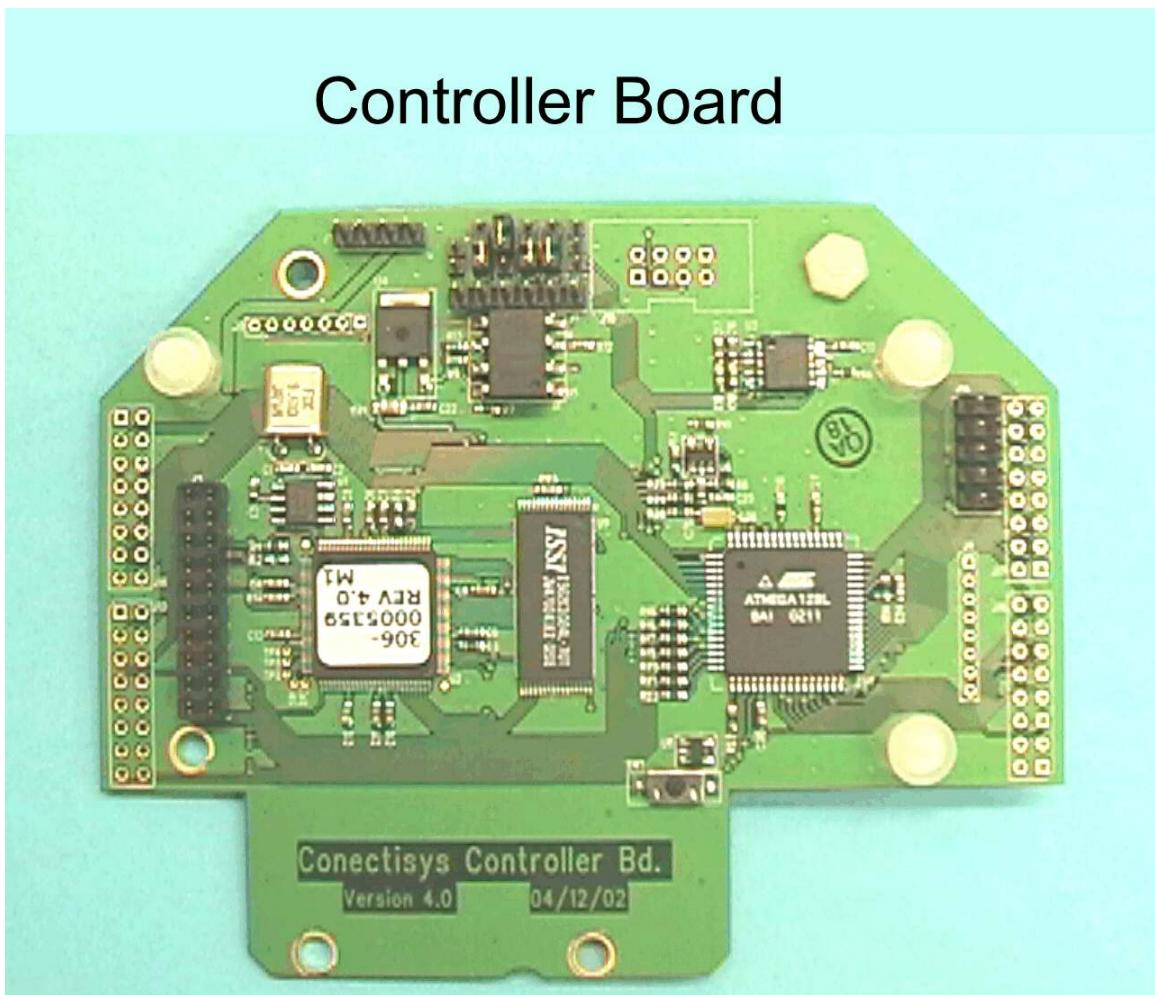


Photo 7

Internal

Wiring Illustration

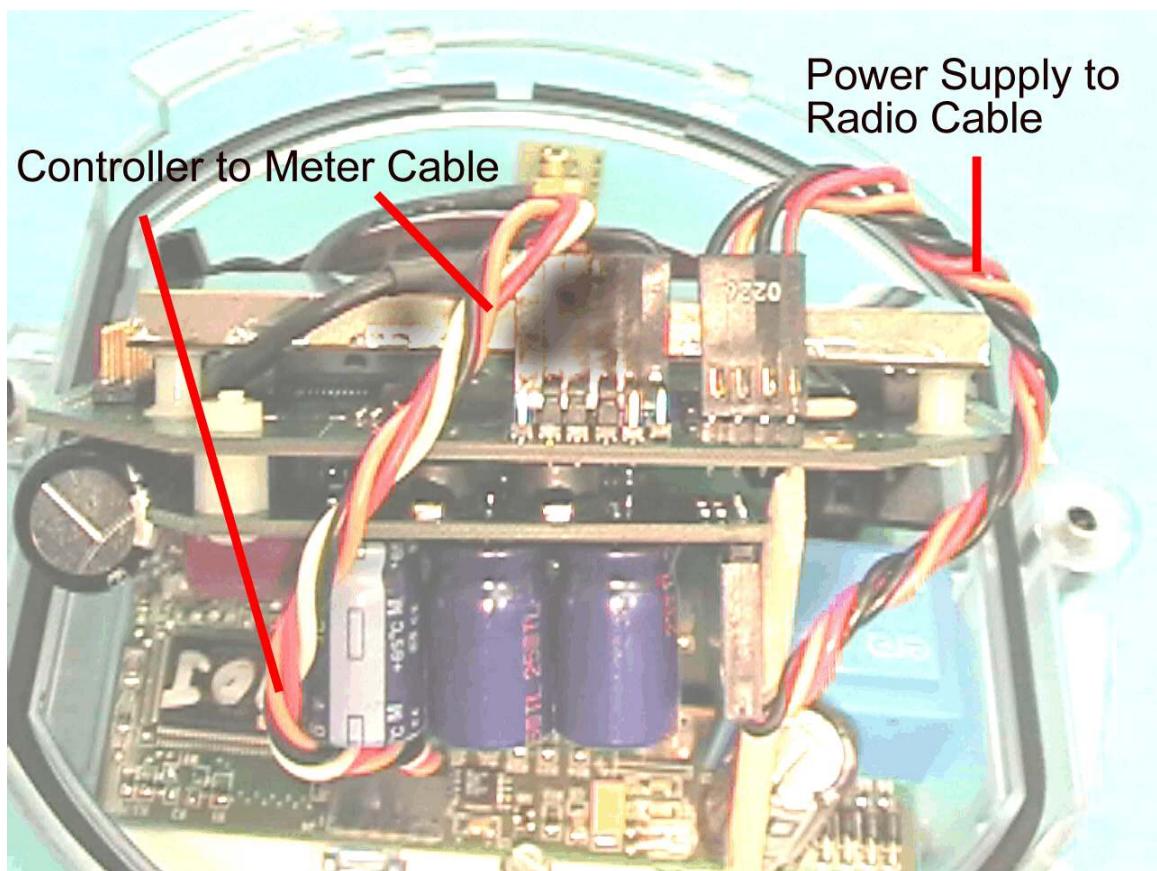


Photo 8

Internal

Radio Mounting

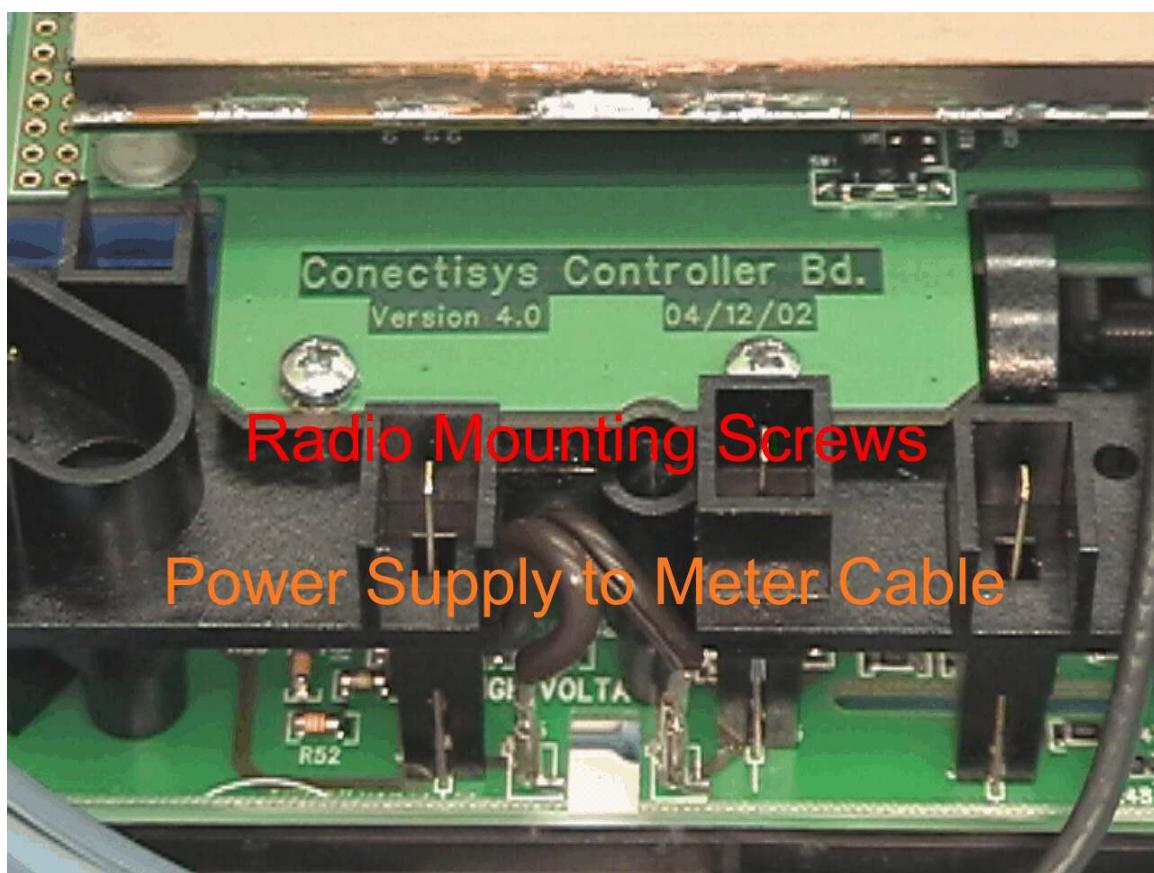


Photo 9

Internal

Dipole Antenna

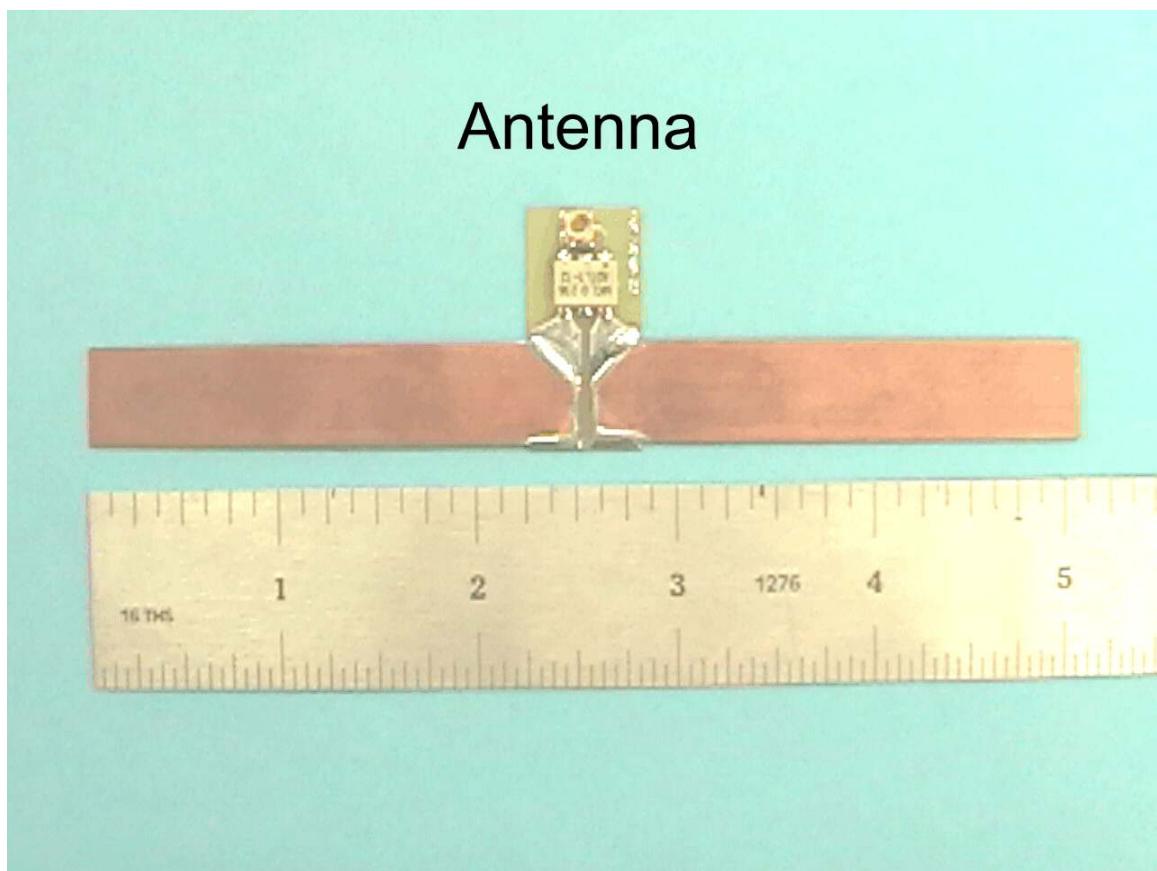


Photo 10 Internal Antenna Close up (Balun)

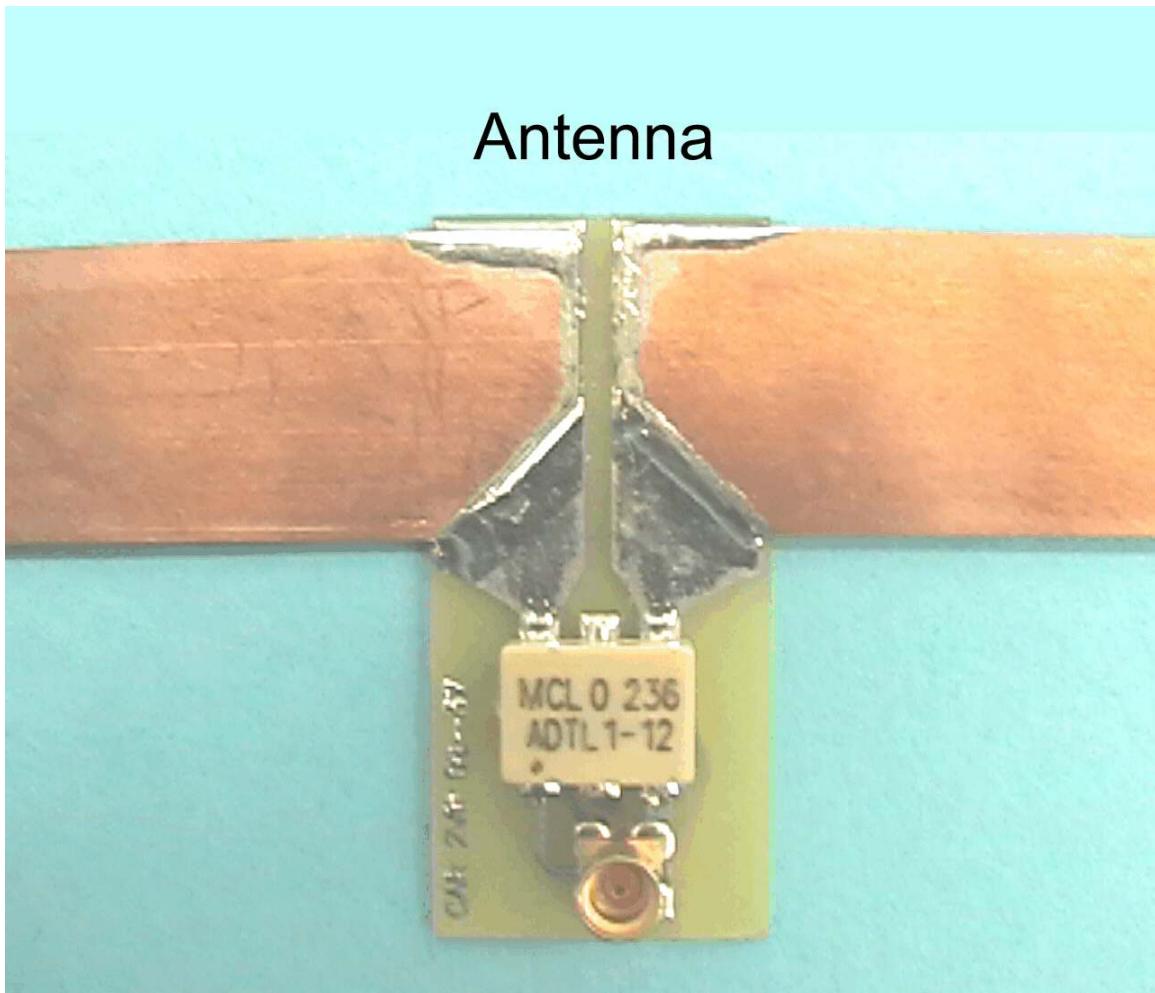


Photo 11 Internal Cables

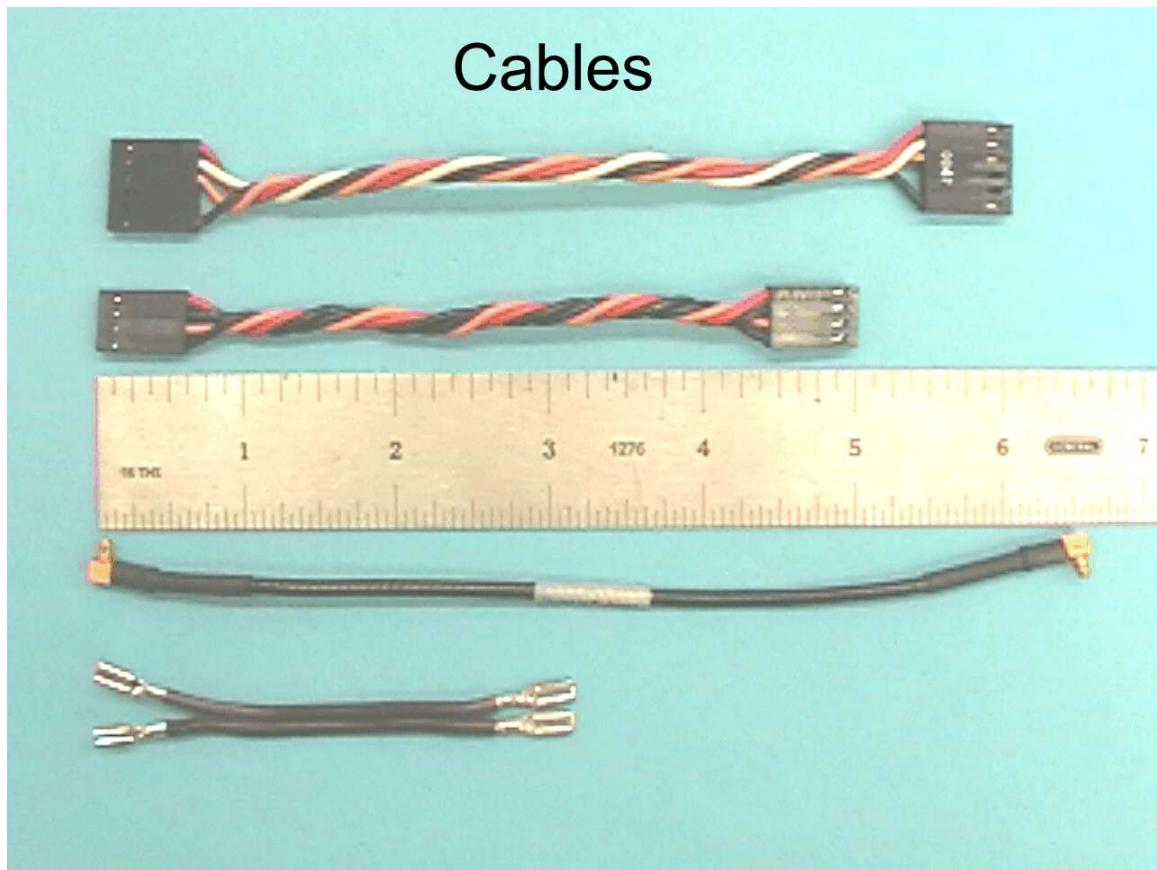


Photo 12      External      Unmounted in Utility Box

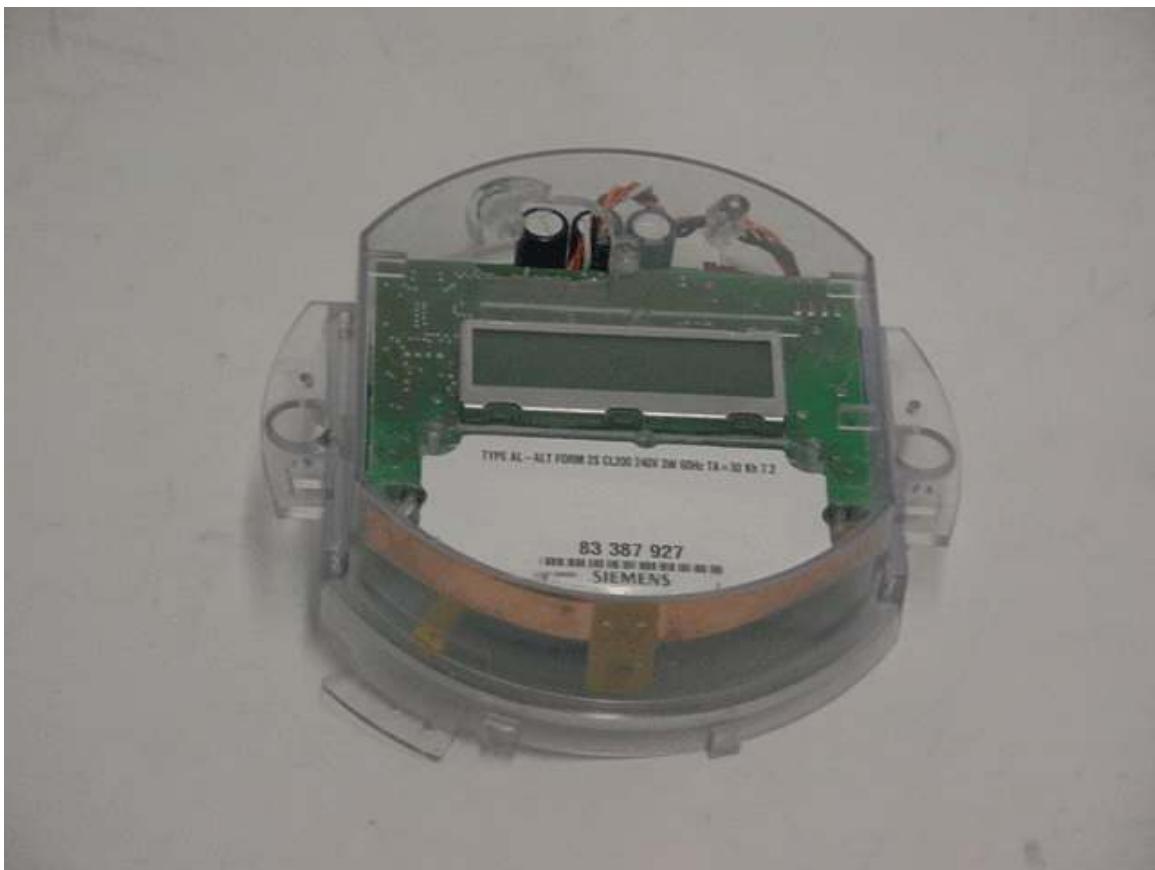


Photo 13      External      Mounted in Utility Box - Front



Photo 14      External      Mounted in Utility Box - Side



## 15.247 (2,b,5) RF Exposure Requirements

Reference CFR 47 Part 1.1307(b)(1)

RF Exposure – MPE Calculations (902 - 928 MHz Band)

Transmitter Power: 160 mW

Antenna Gain: 0 dB (For calculations 0dB gain assumed actual antenna has a loss)

Cable loss: 0 dB

Frequency range: 902 - 928 MHz

Assumptions

1. A single  $\frac{1}{4}$  wavelength radiating antenna is assumed.
2. Closest exposure distance is assumed to be 20 cm

Calculations

The following results shall be assumed to be accurate for the far-field only. These predictions will over-estimate power density in the near-field. Based on the use of a  $\frac{1}{4}$  wavelength radiator, a distance of 20 cm is considered to be in the far-field for all cases.

$$S = PG/4\pi R^2$$

P is 100 mW

G is 0 dB (Antenna gain – loss)

R is 20 cm

$$S = 0.032 \text{ mW/cm}^2$$

For Occupational/Controlled Exposure

From 300 to 1500 MHz, power density limit is  $f/1500 \text{ mW/cm}^2$   
@ 902 MHz, power density limit is  $3.01 \text{ mW/cm}^2$

For General Population/Uncontrolled Exposure

From 300 to 1500 MHz, power density limit is  $f/1500 \text{ mW/cm}^2$   
@ 902 MHz, Power density limit is  $0.60 \text{ mW/cm}^2$

Conclusion: ***Meets MPE limits***

End of Report