

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


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

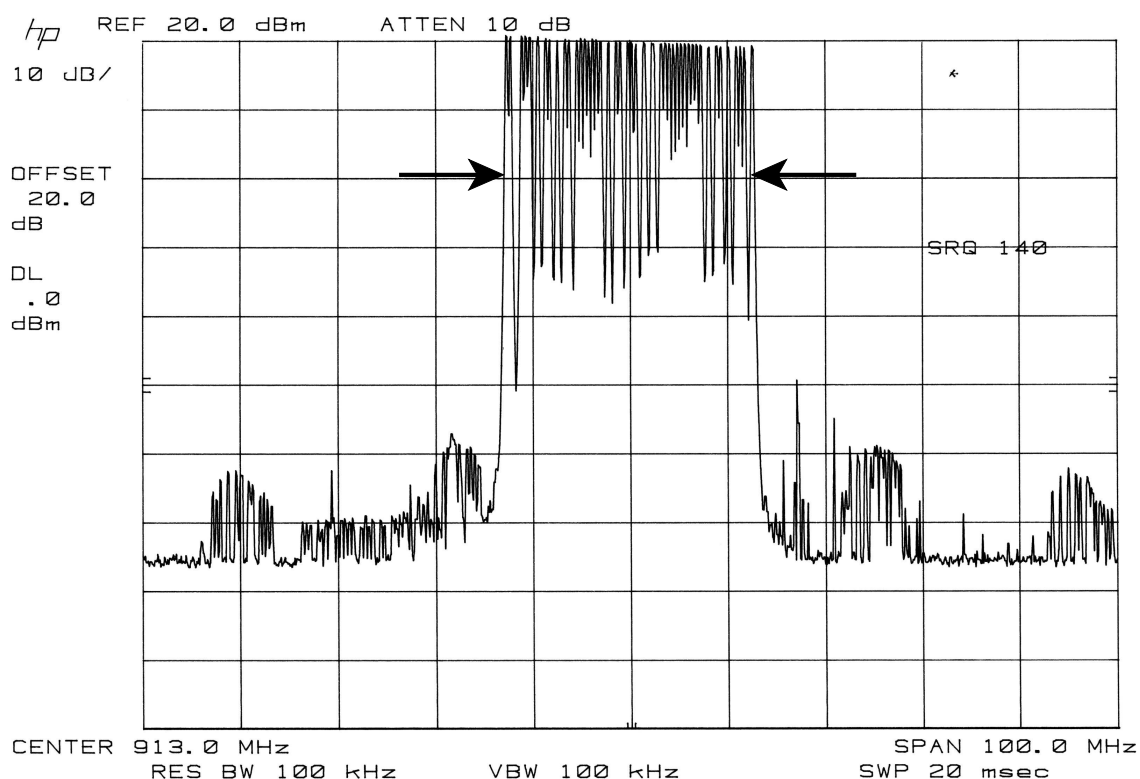
Example channel 1


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

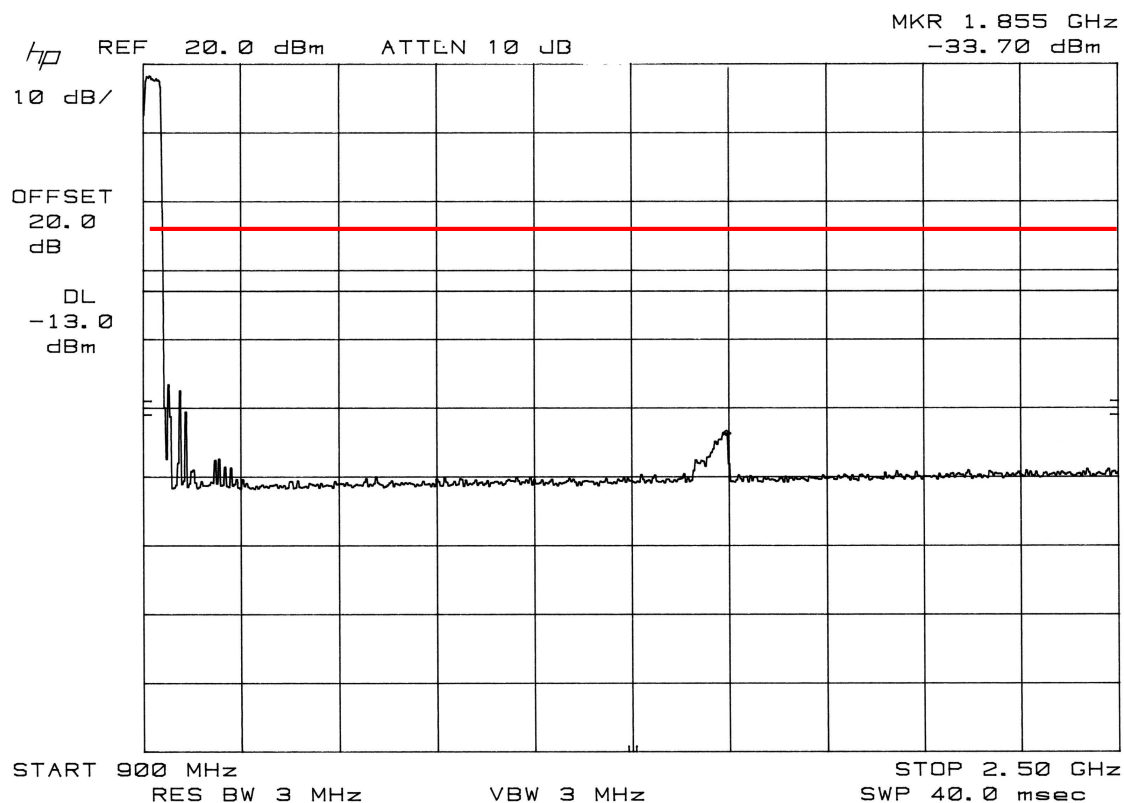
D1	=	Display line at maximum conducted emission
D2	=	-20dB down point


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

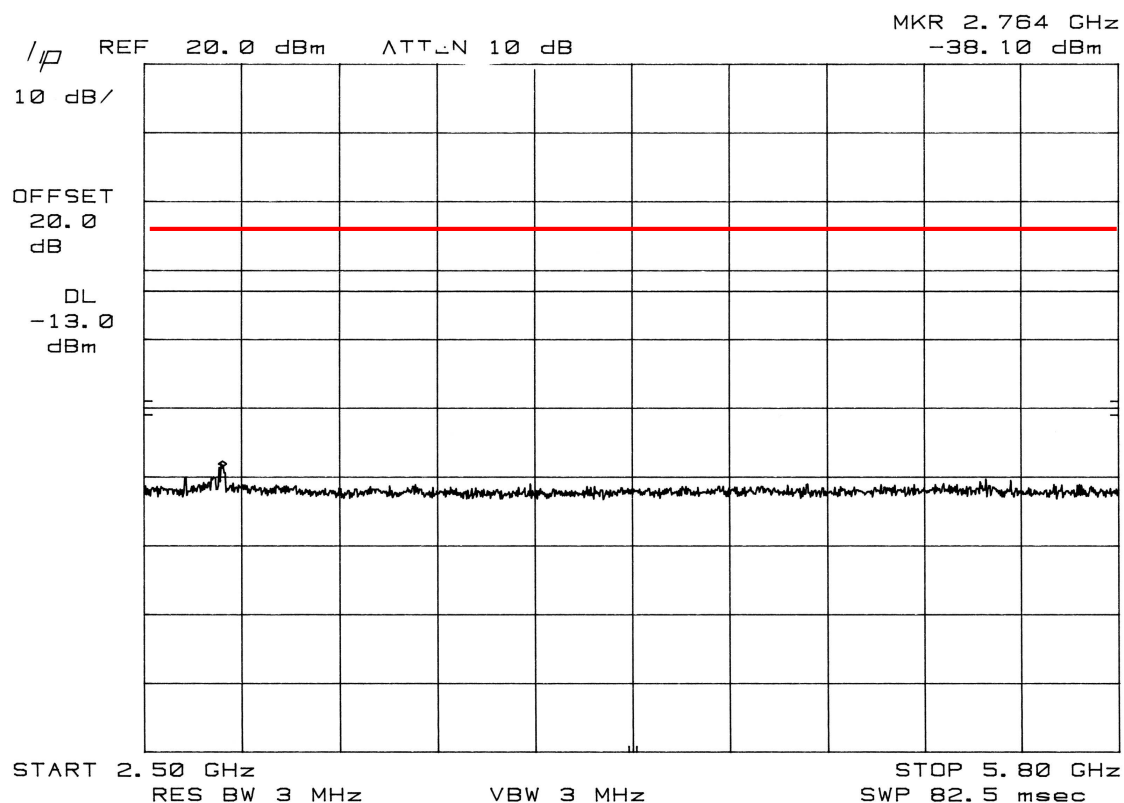
		5969 Robinson Avenue Riverside, CA 92503 (951) 637-2630 FAX (951) 637-2704		Band Edge Measurements	
DNB Job Number:		58029		Date: 25 Sep 2004	
Customer:		ConectiSys Corp. Inc			
Model Number:		HNET 5.0		Serial Number: Proto	
Description:		Wireless Power Usage Monitoring System			
Ambient Temperature		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)				
902.30		902.00	300 kHz	Pass	
	927.9	927.90	100 kHz	Pass	




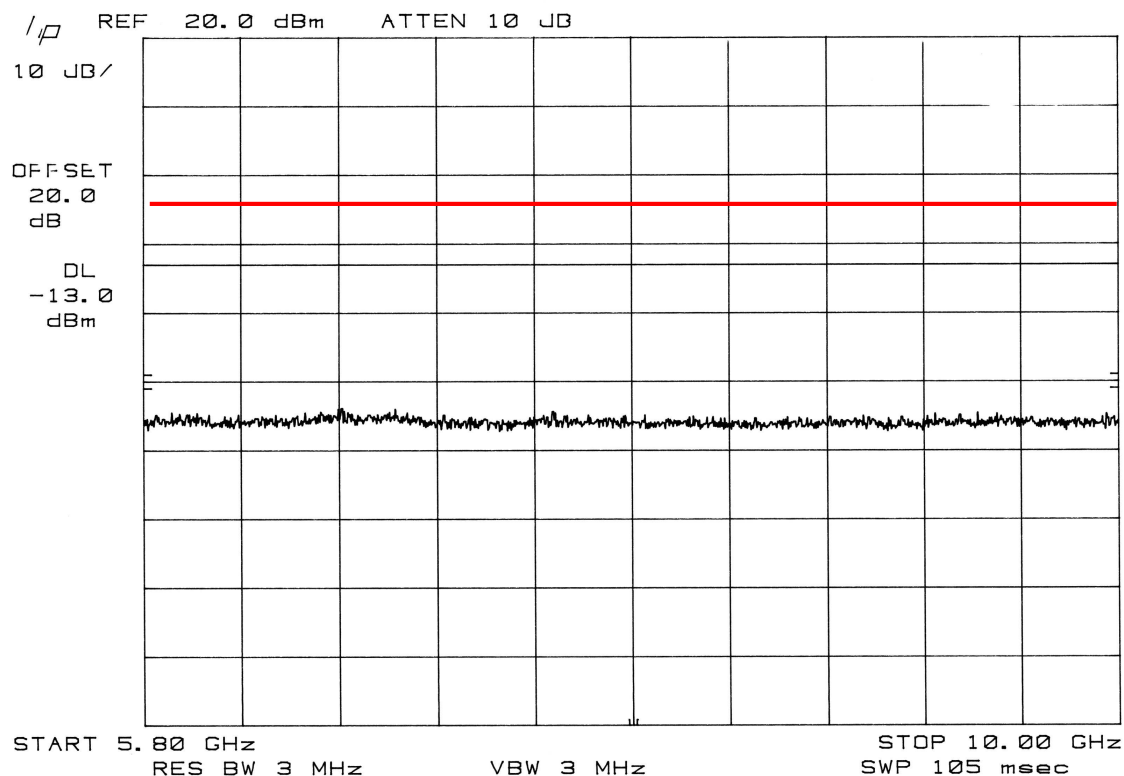
	5969 Robinson Avenue Riverside, CA 92503 (951) 637-2630 FAX (951) 637-2704		Conducted Spurious	
DNB Job Number:	58029	Date:	25 Sep 2004	Conformance Standard
Customer:	ConectiSys Corp. Inc			
Model Number:	HNET 5.0	Serial Number:	Proto	FCC Part 15
Description:	Wireless Power Usage Monitoring System			Clause 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>				
Peak Output Power	Reading	-20dBc		Pass/Fall
20.0 dBm	18.0 dBm	-2.00 dBm		Pass



		5969 Robinson Avenue Riverside, CA 92503 (951) 637-2630 FAX (951) 637-2704		Conducted Spurious		
DNB Job Number:		58029		Date: 25 Sep 2004		Conformance Standard
Customer:		ConectiSys Corp. Inc				
Model Number:		HNET 5.0		Serial Number: Proto		FCC Part 15
Description:		Wireless Power Usage Monitoring System				Clause 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>						
Peak Output Power		Reading		-20dBc		Pass/Fall
20.0 dBm		18.0 dBm		-2.00 dBm		Pass



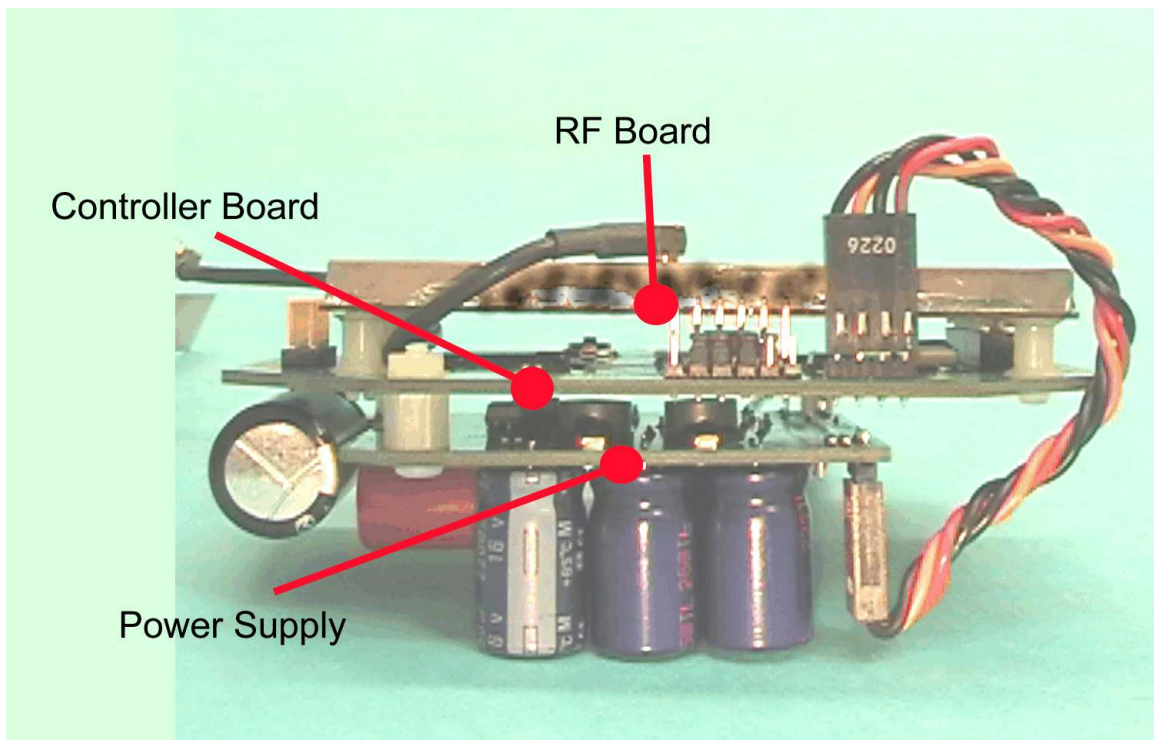
		5969 Robinson Avenue Riverside, CA 92503 (951) 637-2630 FAX (951) 637-2704		Conducted Spurious	
DNB Job Number:		58029		Date: 25 Sep 2004	
Customer:		ConectiSys Corp. Inc			
Model Number:		HNET 5.0		Serial Number: Proto	
Description:		Wireless Power Usage Monitoring System			
		Conformance Standard FCC Part 15 Clause 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>					
Peak Output Power		Reading		-20dBc	
20.0 dBm		18.0 dBm		-2.00 dBm	
				Pass/Fail	
				Pass	



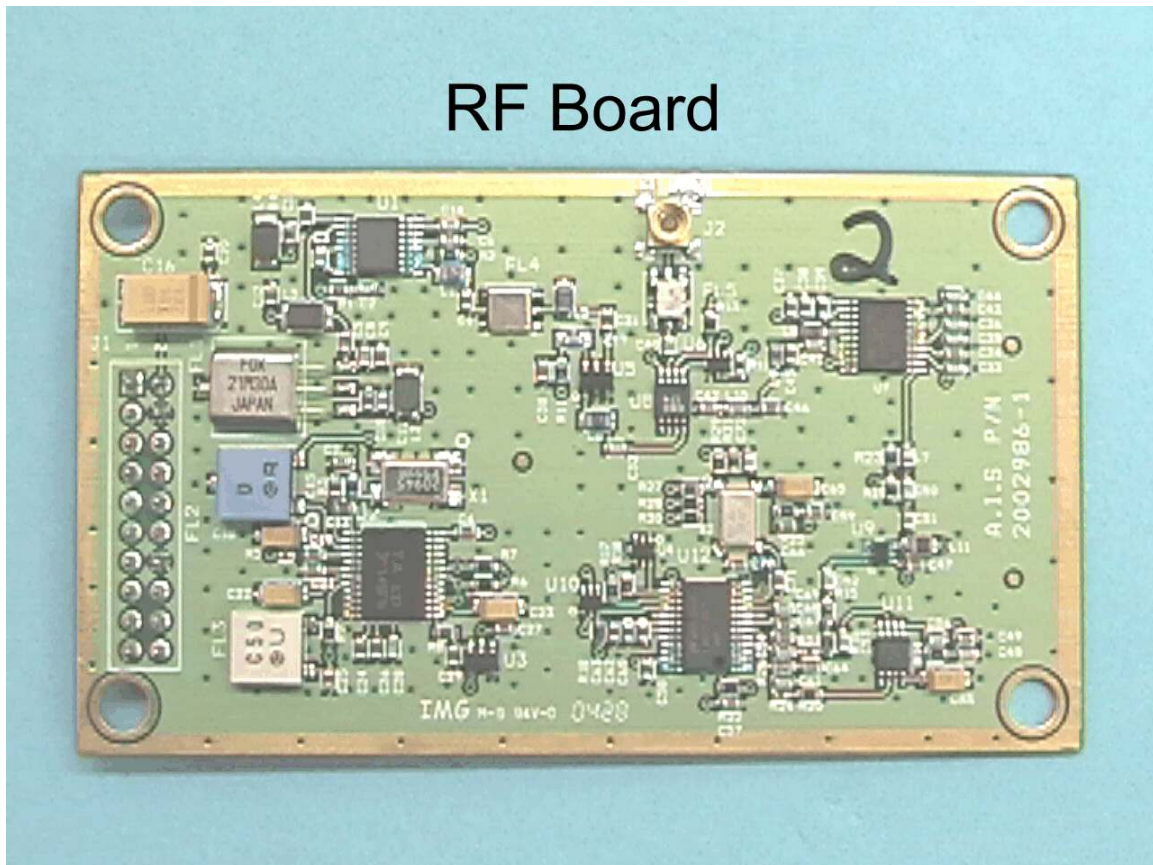
2.1033 (b) (7) Equipment Photographs

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



RF Board



RF Board - Back

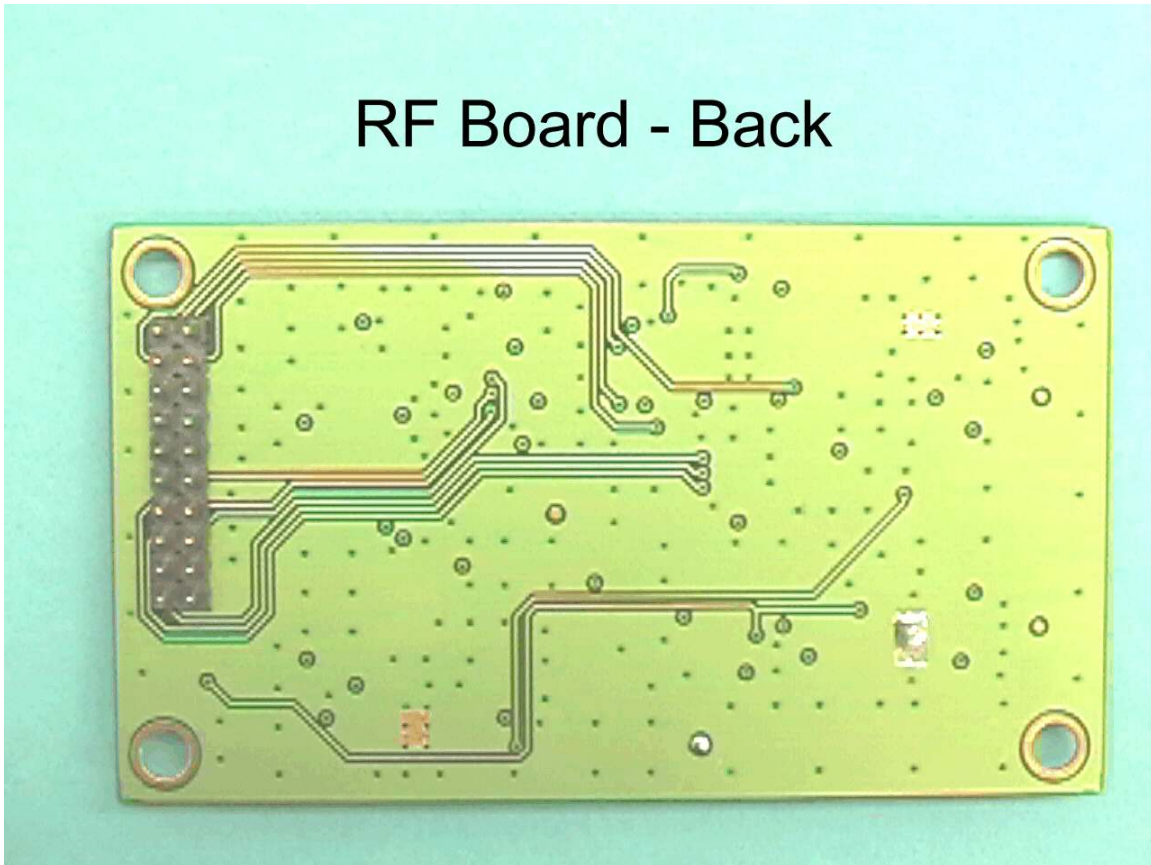


Photo 4 Internal Power Supply - Top

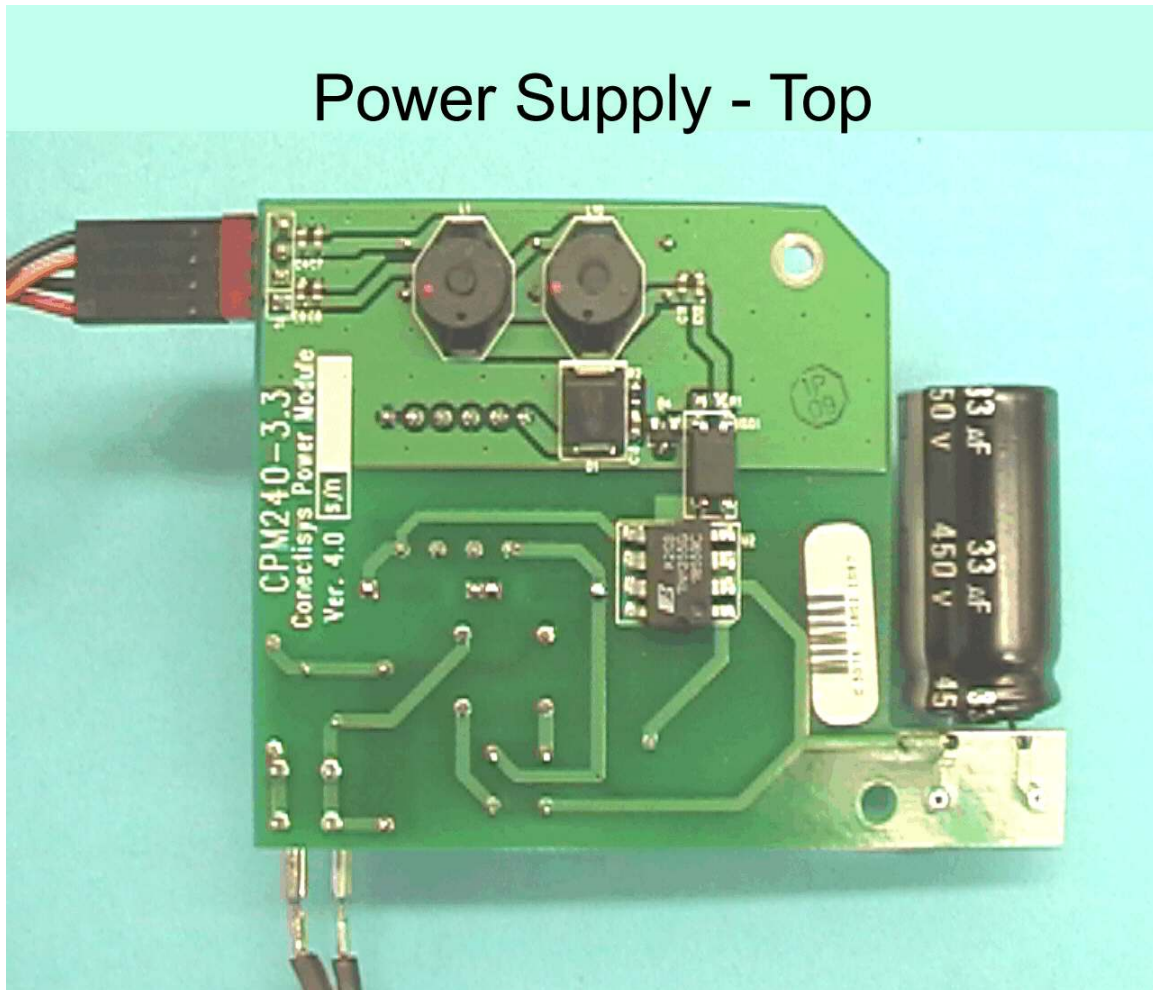


Photo 5 Internal Power Supply - Bottom

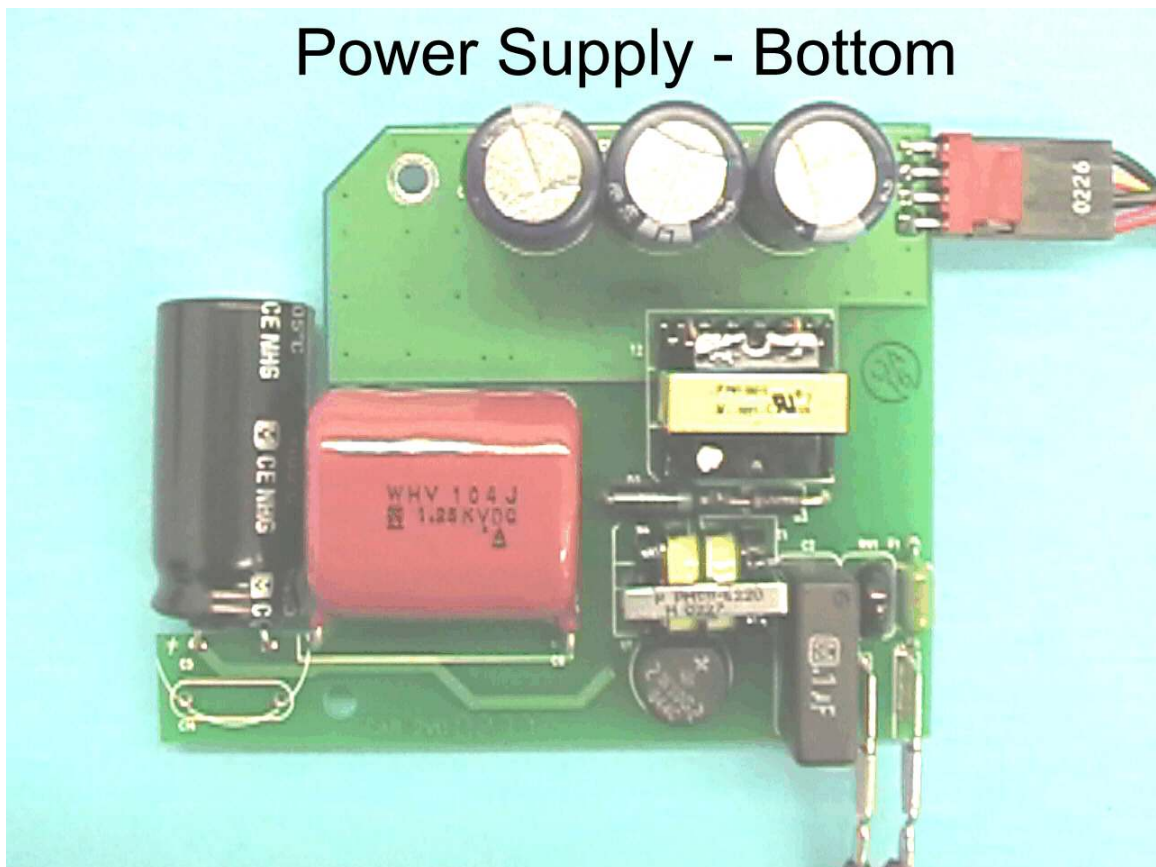


Photo 6 Internal Controller Board

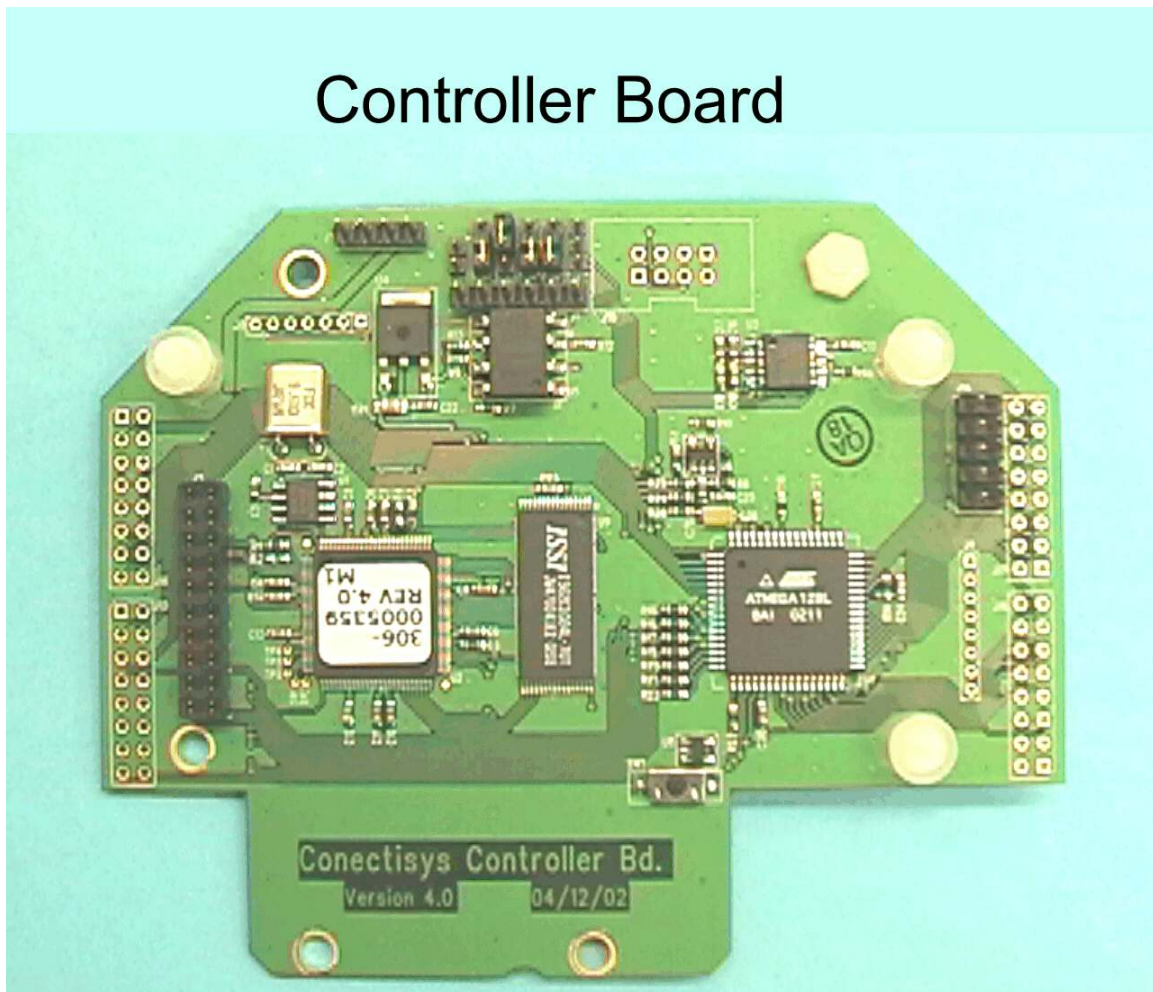


Photo 7 Internal Wiring Illustration

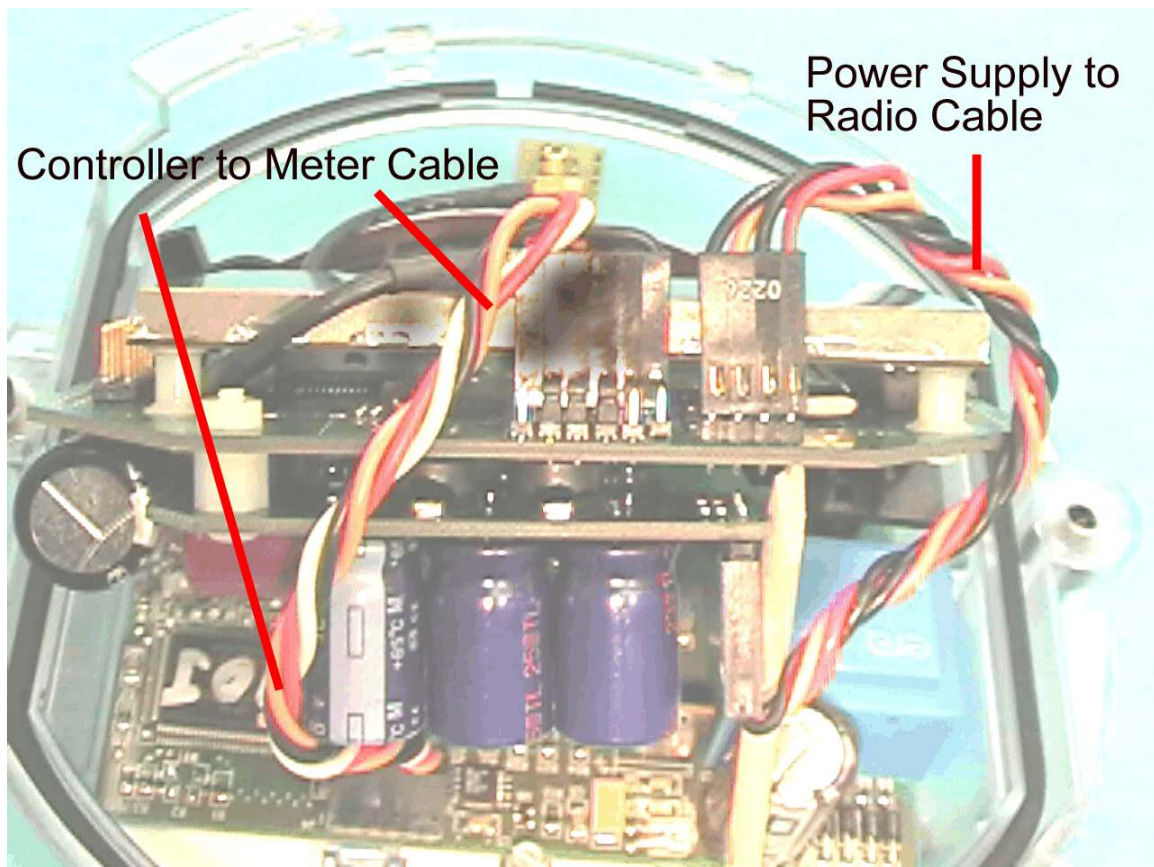
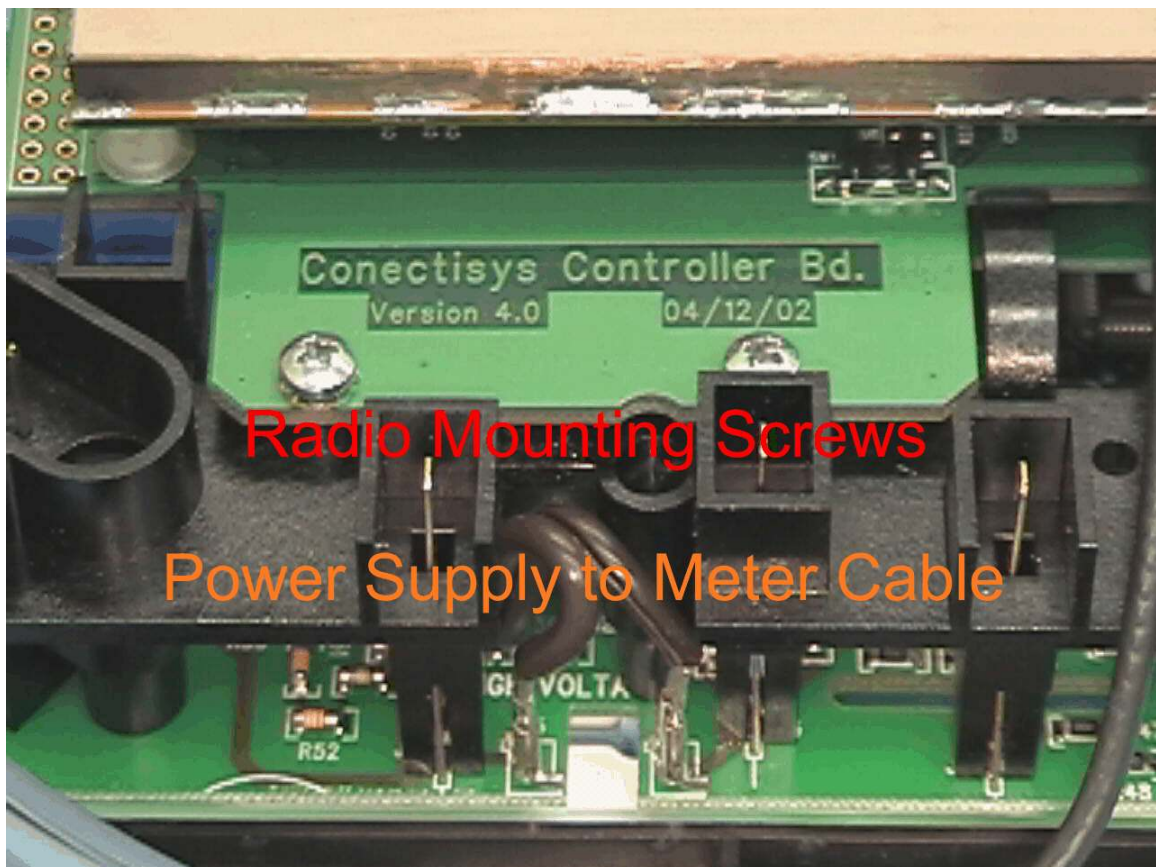


Photo 8 Internal Radio Mounting



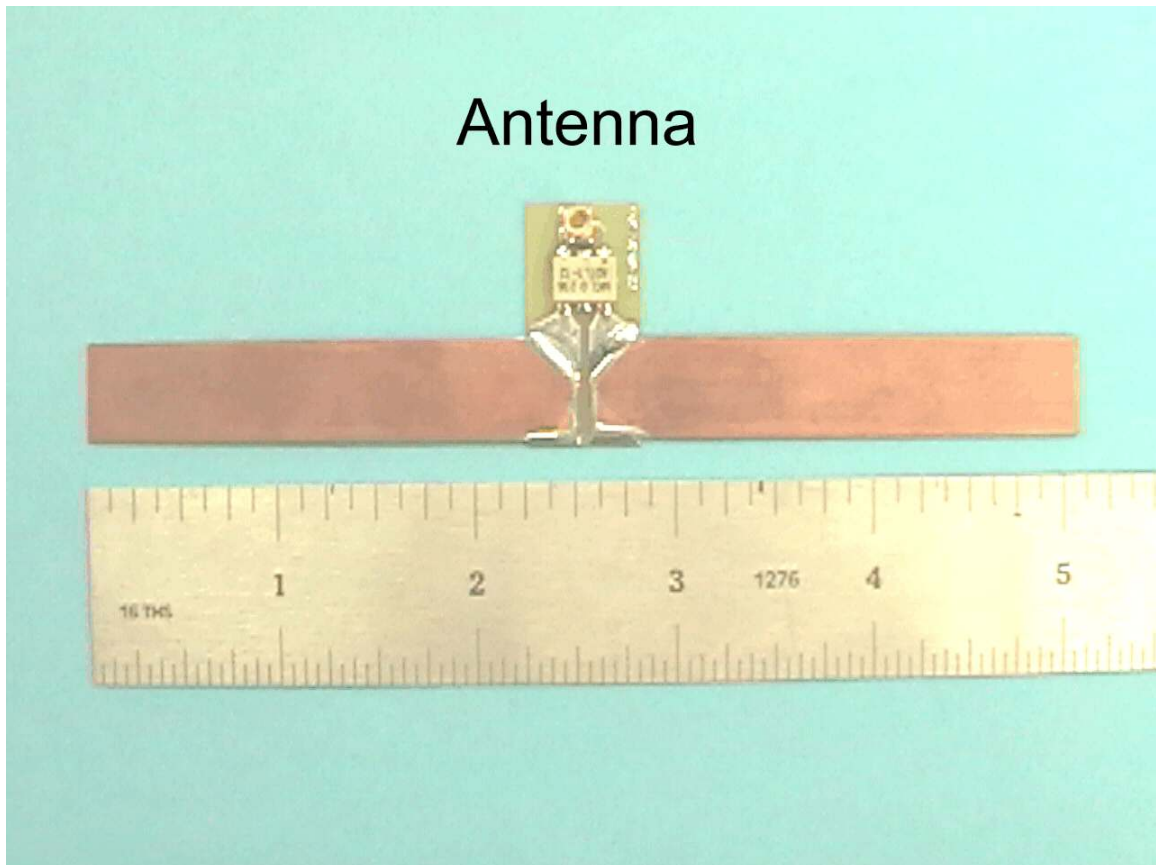
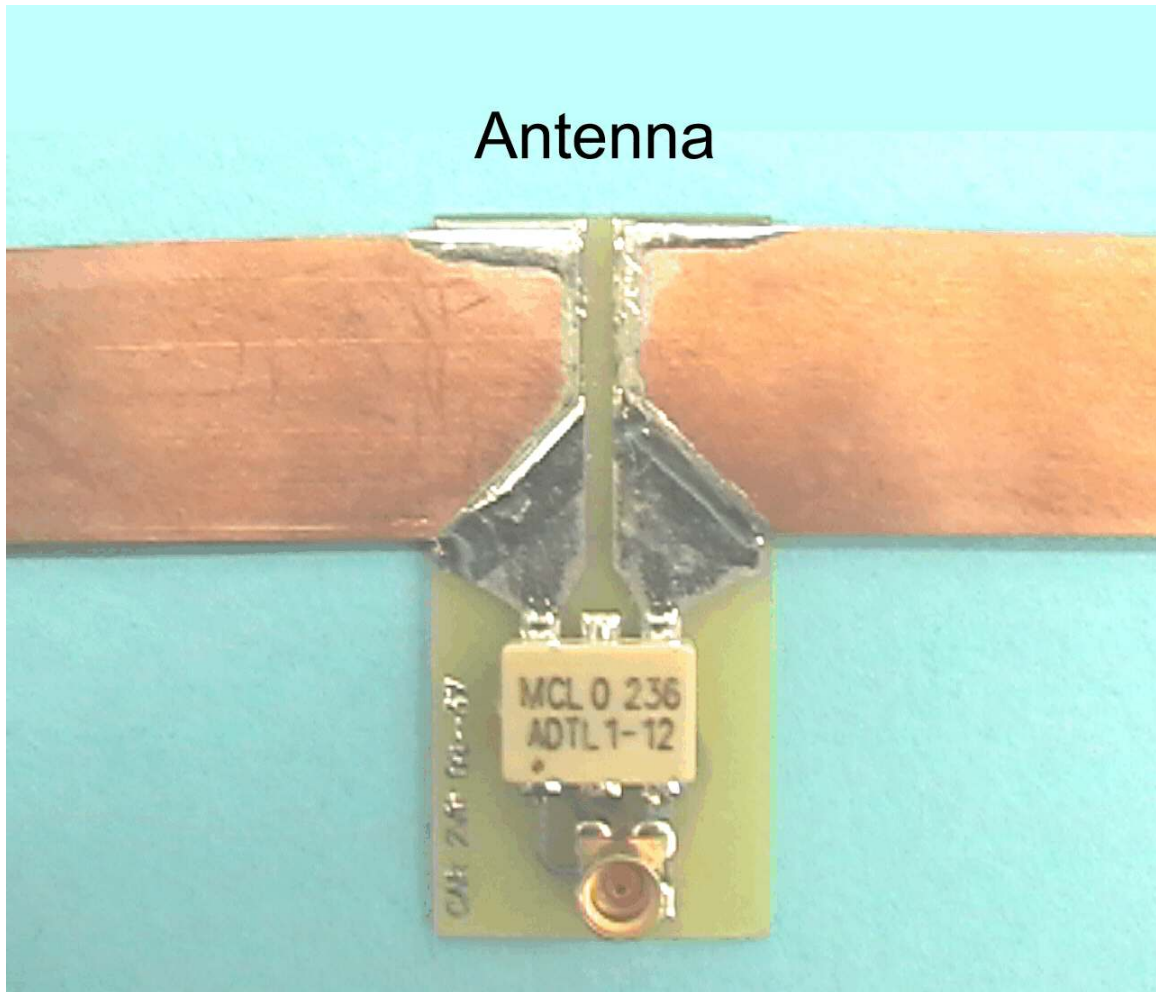


Photo 10 Internal Antenna Close up (Balun)



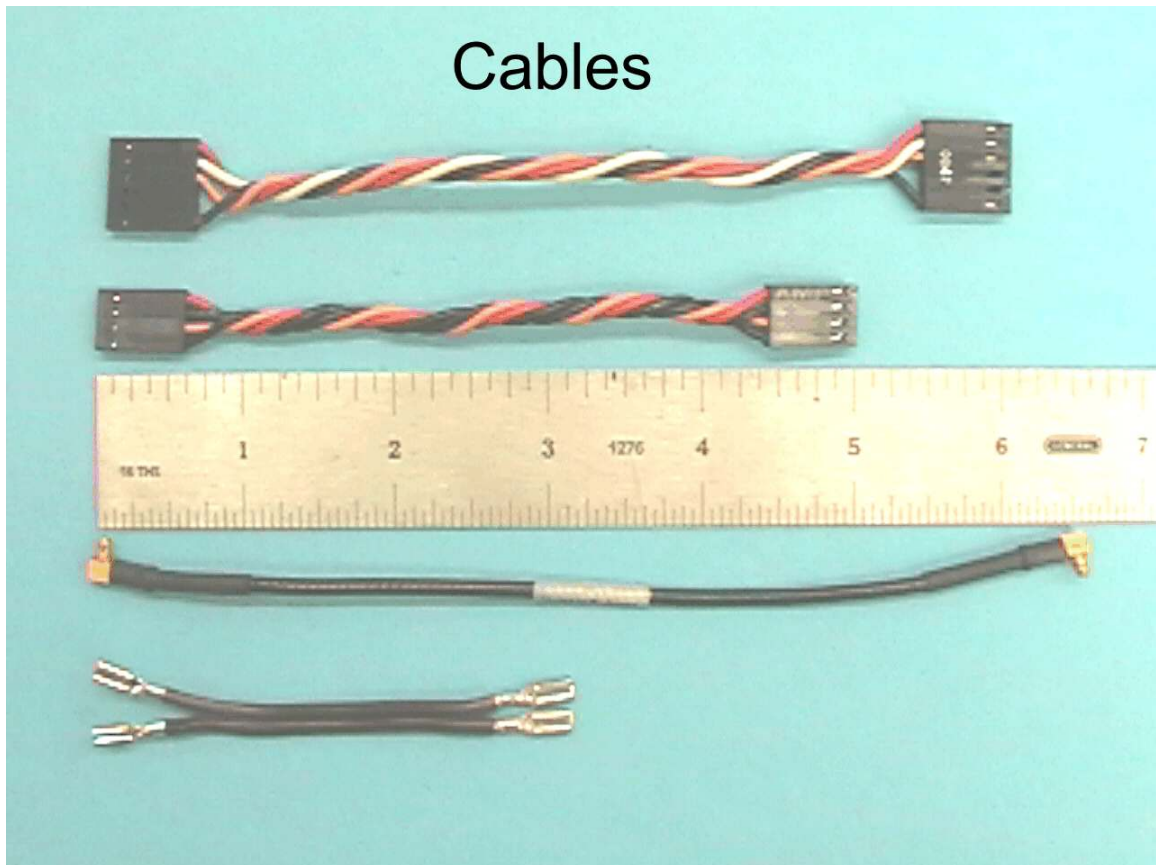


Photo 12 External Unmounted in Utility Box

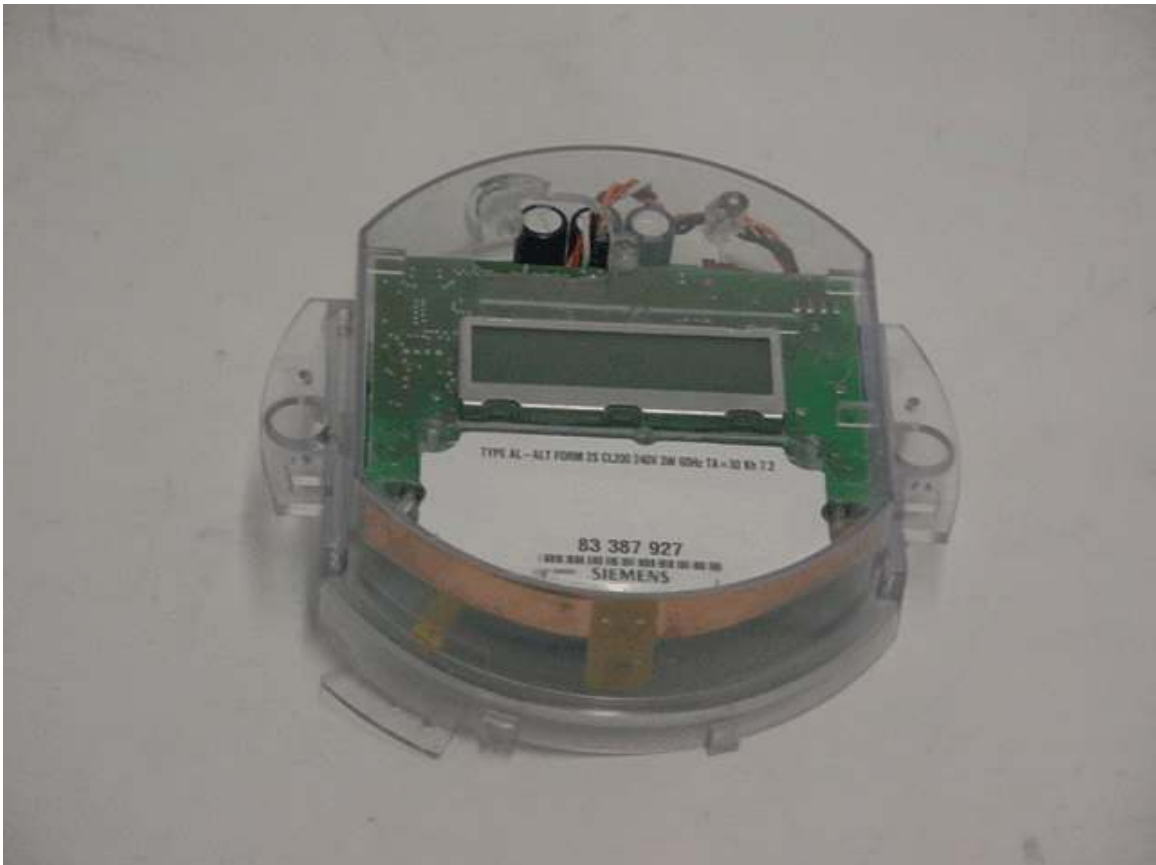


Photo 13 External Mounted in Utility Box - Front



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 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 mW/cm^2

Conclusion: ***Meets MPE limits***

End of Report