

SRD RFID Antenna Assembly Drawing

5/31/2007

Part #: 1616

Revision: Rev A

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Revision History:

Revision	Changes	Revised By	Date
1.0	Initial Release	Gabe Mayo	1/30/07
1.1	Changed ferrite core length, included offset dimension	Mark W. Stevenson	5/29/07
A	Released	Ben Bachrach	5/31/07

Part Description:

The following part is the antenna for the SRD component of the BarMate project.

General:

The assembly shall meet the requirements of the European Union ROHS directives, and shall be capable of withstanding ROHS-compliant assembly temperatures.

Marking:

Packaging container shall be marked with part number and revision of this drawing, and a statement that this product is ROHS compliant.

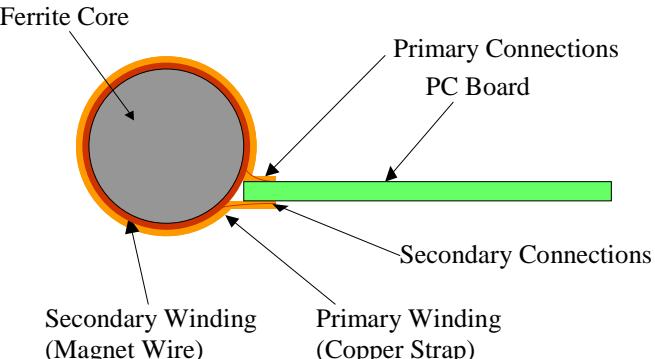
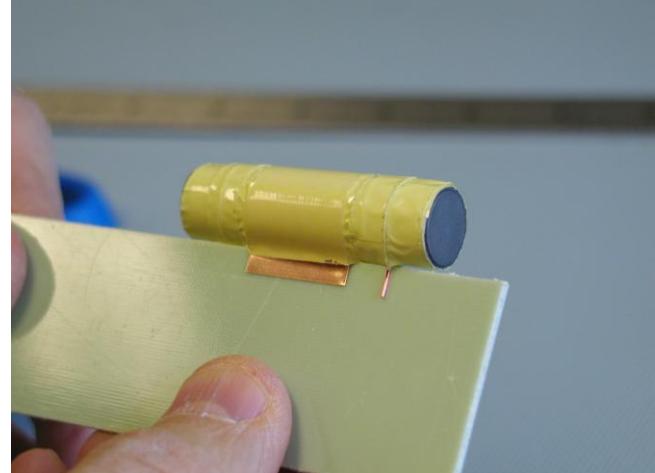
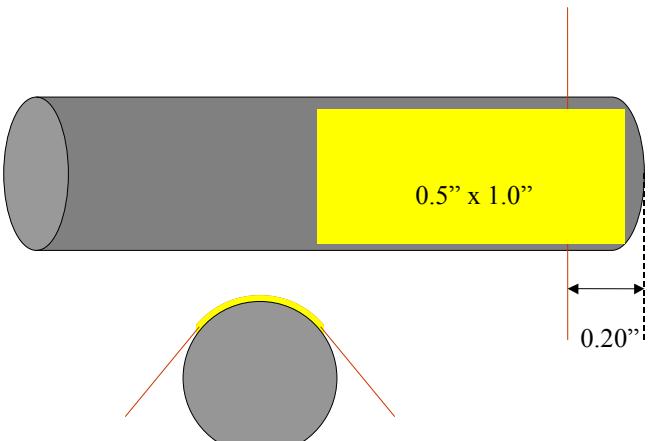
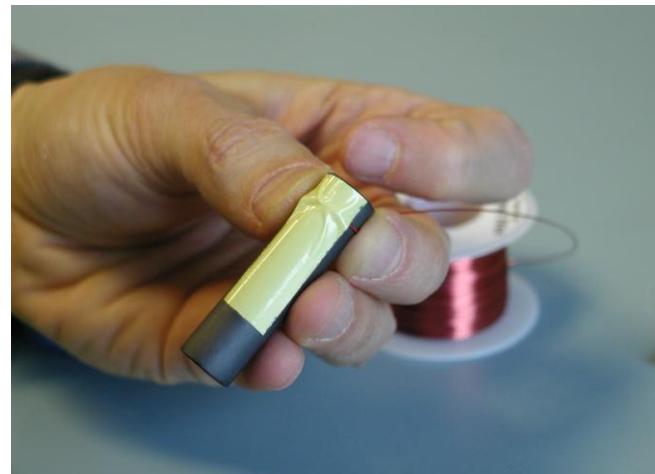
Electrical Characteristics:

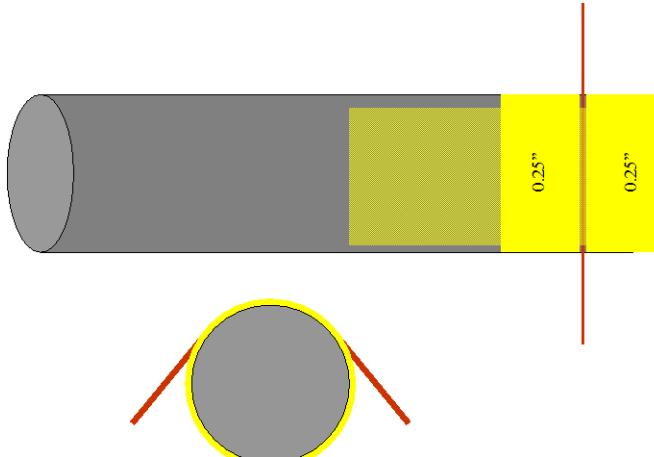
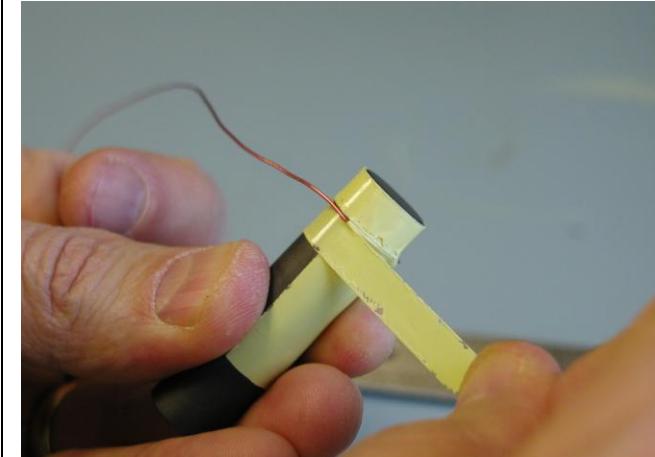
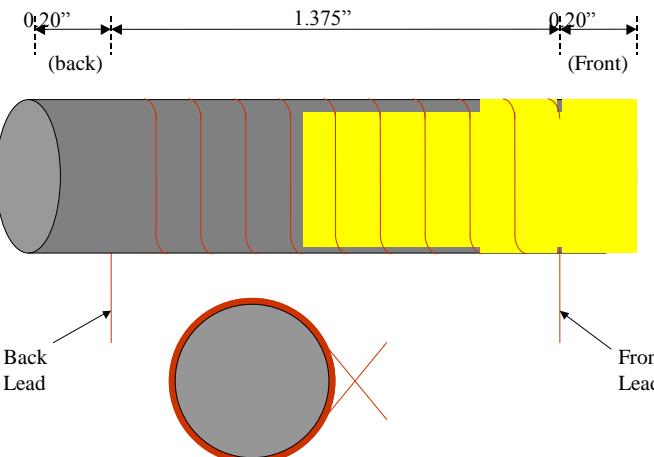
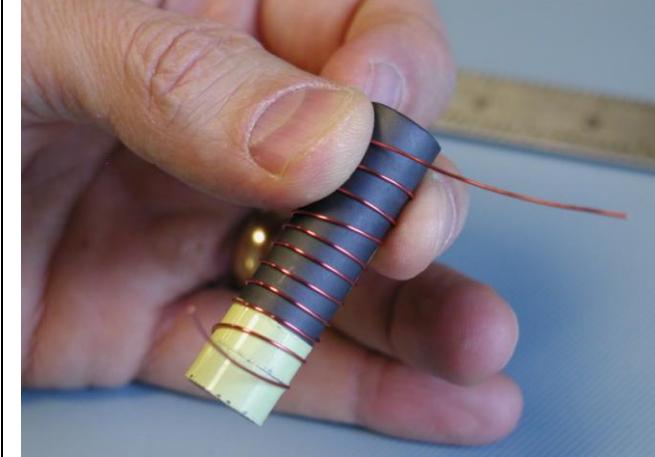
Operating Frequency 13.560MHz
Primary Inductance, (secondary open) 64.2nH $\pm 4\%$
Secondary Resonant Frequency (25.70pF parallel cap) 13.560MHz $\pm 2\%$ at 25C
Q-Factor (secondary resonant at 13.560MHz) >110
Operating Temperature 0C to 60C

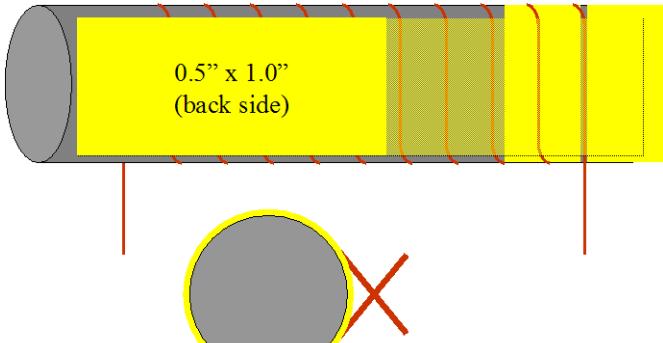
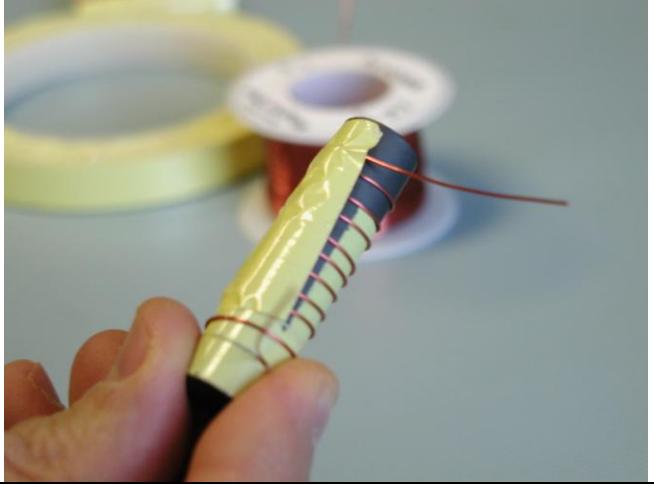
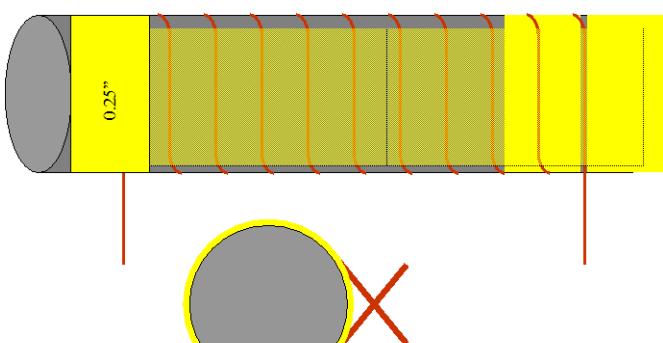
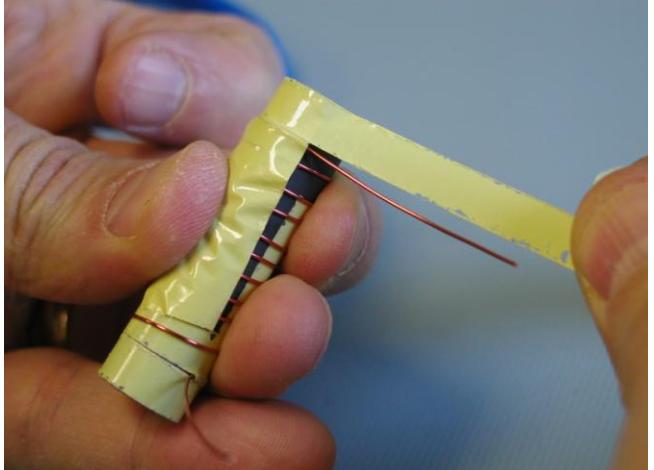
Materials:

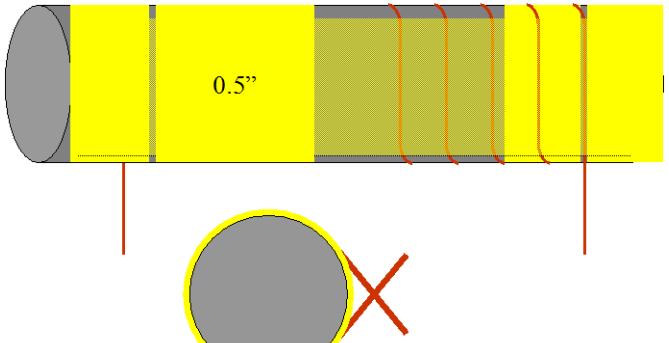
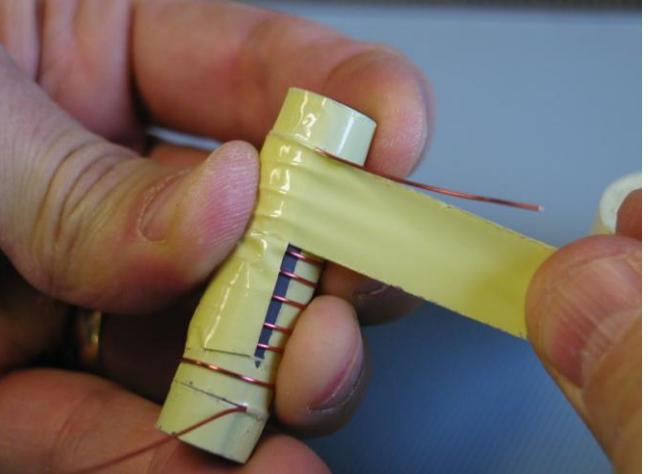
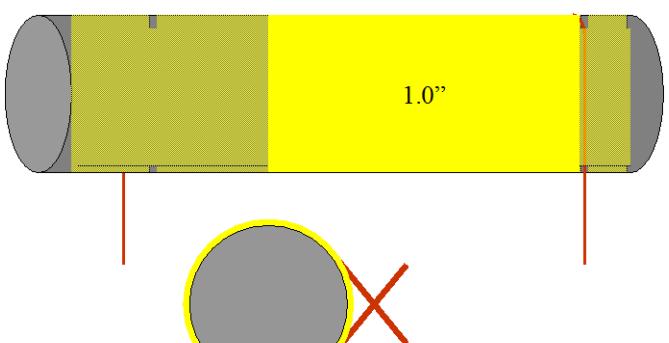
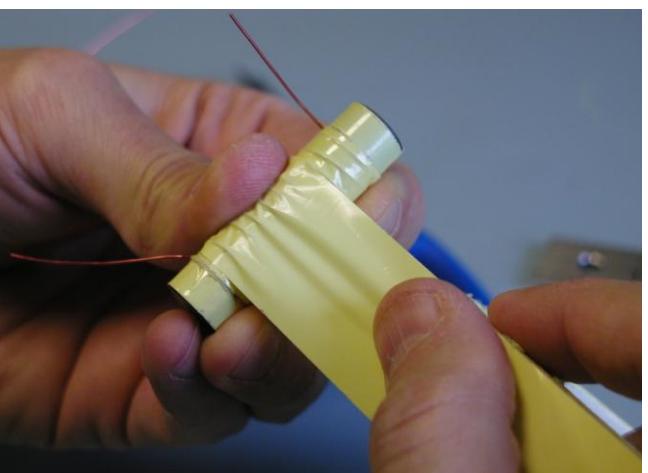
- [1] Ferrite Core, 0.50" x 1.772" (45.0 mm), #61 material, Fair-Rite #
- [2] Magnet Wire, 24 AWG, Solderable, Double Coated
- [3] Barrier Tape, Polyester film, 1" wide
- [4] Barrier Tape, Polyester film, 0.5" wide
- [5] Barrier Tape, Polyester film, 0.25" wide
- [6] Copper Strap, shim stock, 0.003", 0.75 wide, 2.188" long

NOTE: Photographs in right column are for illustrative purposes only.

<p>The SRD antenna is constructed with a ferrite core, magnet wire, Copper shim stock, and transformer tape. The Antenna is surface mounted on the side of a PCB as shown</p>		
<p>Step 1a: Secure start of secondary winding lengthwise with tape of material [4]. The wire is located 0.20" from the end of the ferrite rod.</p>		

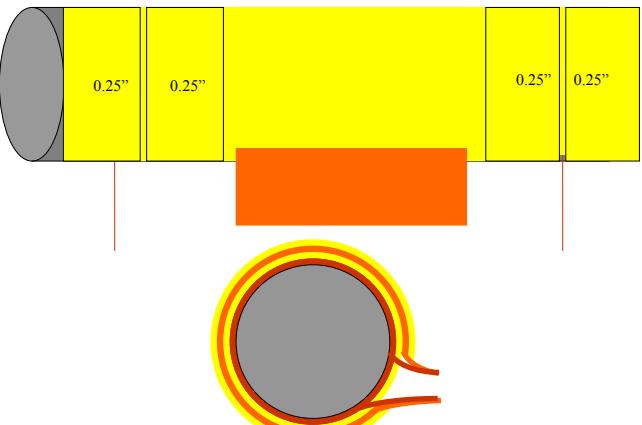
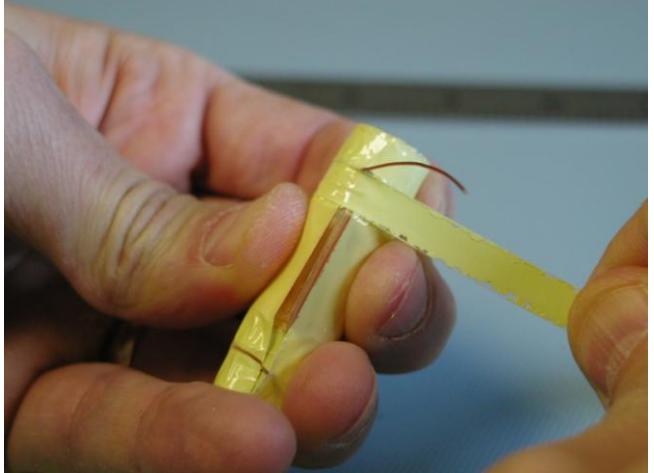
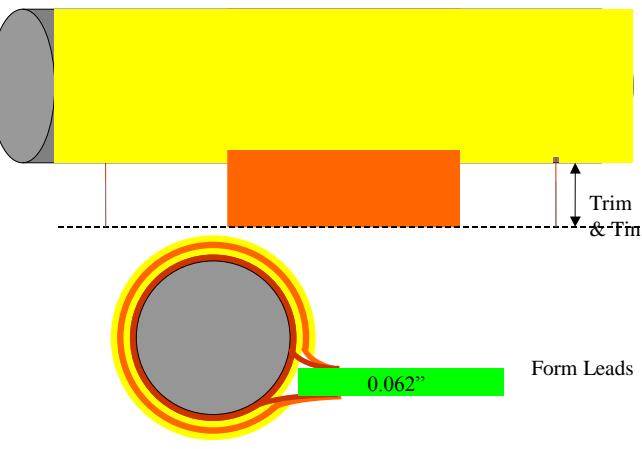
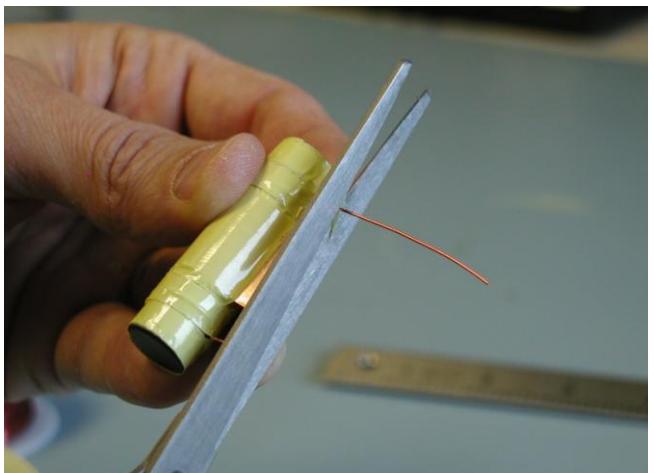
<p>Step 1b: Secure the start of the winding by wrapping 2x transformer tape, material [5] (0.25") at both sides of the wire.</p>		
<p>Step 2:</p> <p>Wind 10 turns of magnet wire, material [2]. The winding should be evenly spread, centered and span 1.375"</p>		

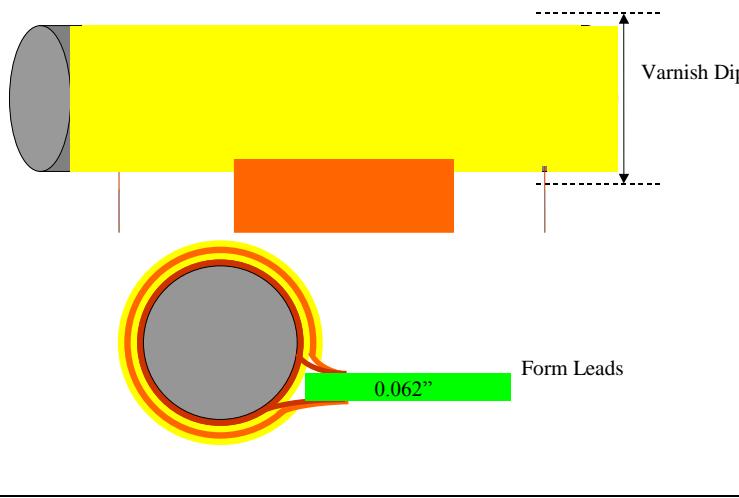
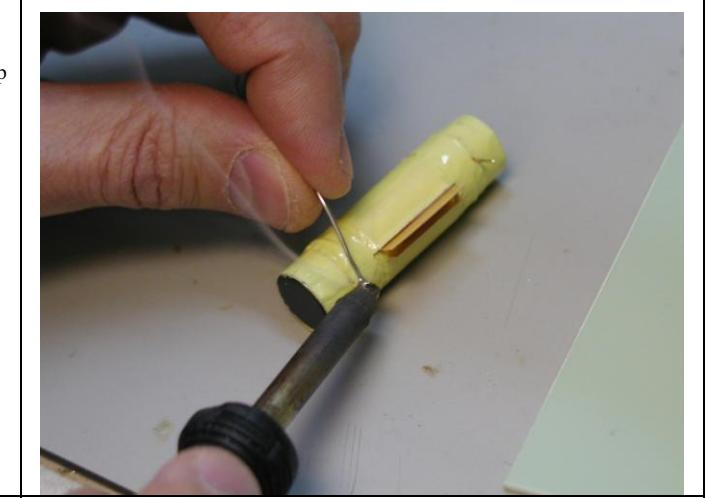
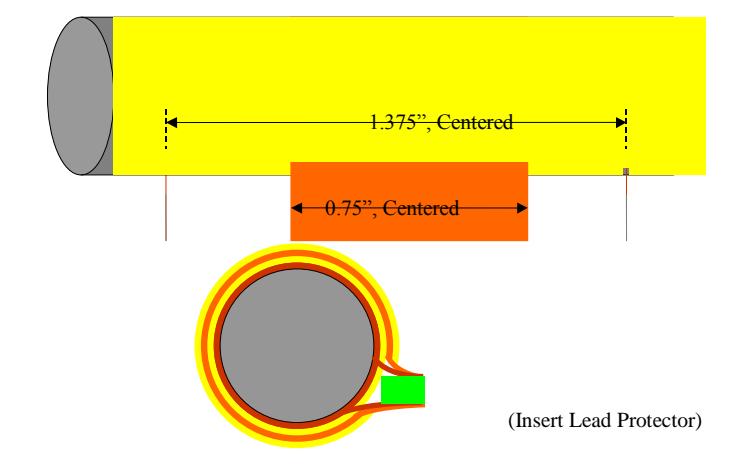
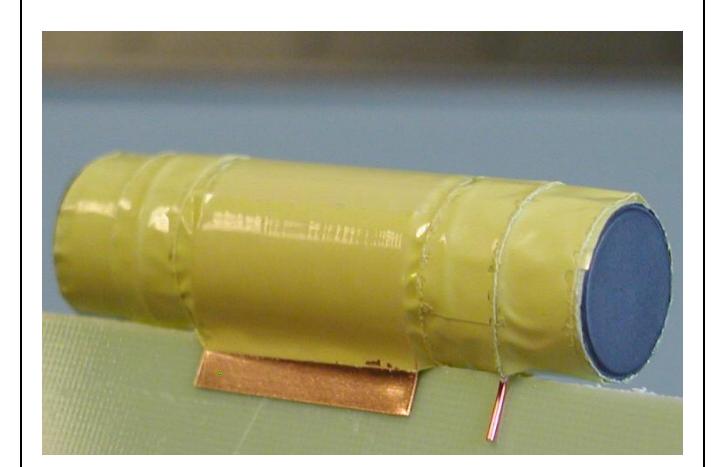
<p>Step3a:</p> <p>Secure the end of the winding by taping it down lengthwise with transformer tape of material [4].</p>	 <p>0.5" x 1.0" (back side)</p>	
<p>Step3b:</p> <p>Secure the end of the winding by wrapping 2x transformer tape, material [5] (0.25") just beyond the end of the winding.</p>	 <p>0.25"</p>	

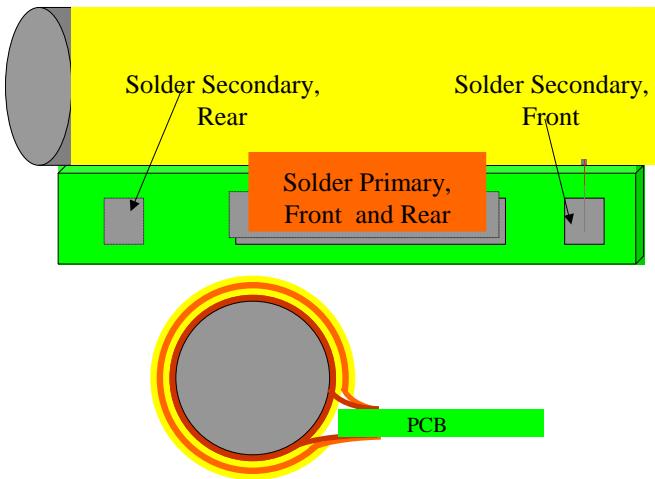
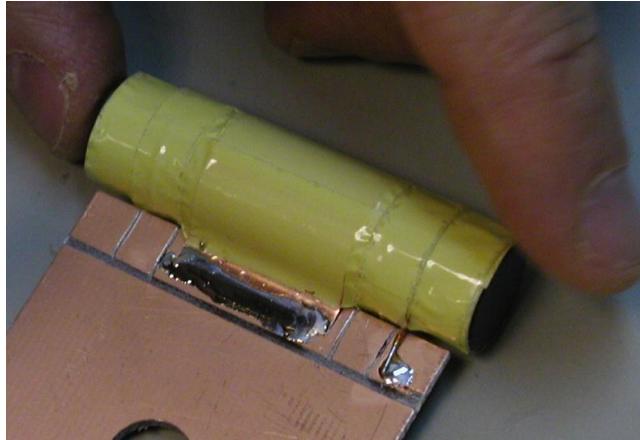
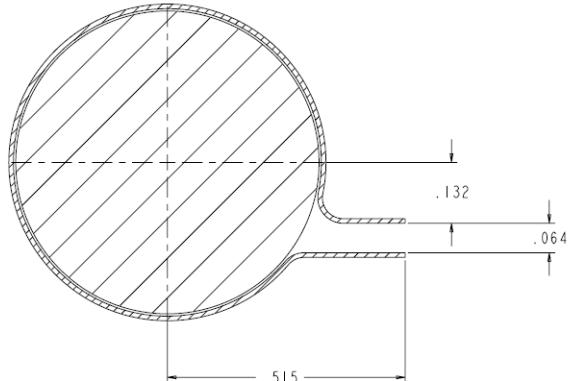
<p>Step3c:</p> <p>Wrap 2x material [4] (0.50") just inside the end of the winding.</p>		
<p>Step3d:</p> <p>Wrap 2x material [3] (1.00") just inside the opposing end of the winding.</p> <p>Note: Leads should exit through the gap between the wrappings.</p>		

<p>Step 4: Wrap 0.75" copper strap, Material [6]</p>	<p>Wrap Copper Strap Centered on Ferrite 0.75" x 2.188"</p>	
<p>Step 5: Secure Strap lengthwise with 1.0" transformer tape, Material [3] as shown.</p>	<p>1.0" tape, Top Side 1.75"</p>	

<p>Step 6a:</p> <p>Form leads on Magnet wire and copper strap to mate 0.062" thick spacer, offset by 0.132" below center. Dimensions for offset are shown end of document.</p> <p>Note: Leads are formed on front and back of spacer.</p>		
<p>Step 6b:</p> <p>Secure ends of formed leads by taping them down lengthwise with transformer tape of material [4].</p>		

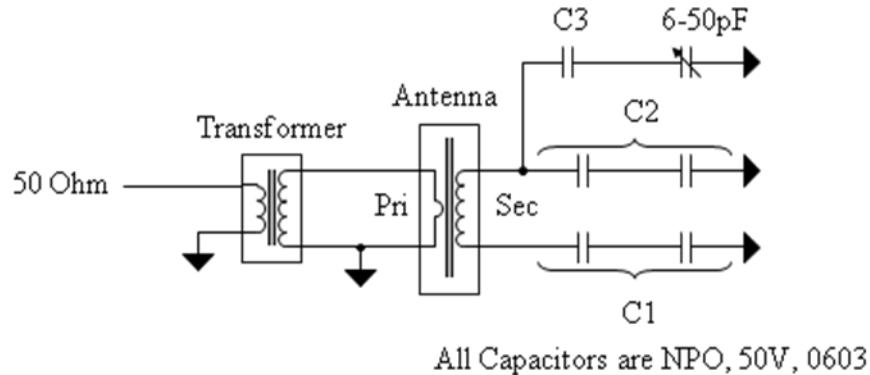
<p>Step 6c:</p> <p>Secure the ends by wrapping 2x transformer tape, material [5] (0.25") just at both sides of each lead (4 wrappings).</p>		
<p>Step 7a: Trim Leads</p> <p>Note: Trimming may take place at an earlier or later step.</p>		

<p>Step 7b: Tin the leads and dip in Varnish</p> <p>Note: Tinning and Varnish may take place at an earlier or later step.</p>	 <p>Diagram showing the component with leads being tinned (yellow area) and a varnish dip applied (yellow area). A green bar indicates a lead thickness of 0.062".</p>	
<p>Step 7c: Insert 0.062" spacer to protect formed leads.</p>	 <p>Diagram showing the component with a 0.062" spacer inserted to protect the formed leads. The spacer is centered, with dimensions of 1.375" and 0.75" indicated. A green bar indicates the lead thickness. The text "(Insert Lead Protector)" is also present.</p>	 <p>Photograph of the component with a yellow insulation sleeve and a lead protector.</p>

PCB Mounting Example		
SRD antenna Copper Strap detail: Copper strap needs to be formed according to the following drawing to comply with plastics design. Revised 05/07/07		 <p>SECTION A-A</p>

Antenna Circuit Example

Murata TZ03Z500E169B00 (NPO ± 300 ppm)



Operating Frequency 13.560MHz

Typical Thermal Stability (0C to 60C) ± 15 kHz

Typical Q-Factor 110 to 130 at 25C

Input Impedance 50 Ohm

Max Input Power +30dBm

C1,C2,C3 values (pF) 47,47,47..