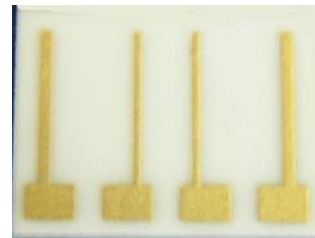
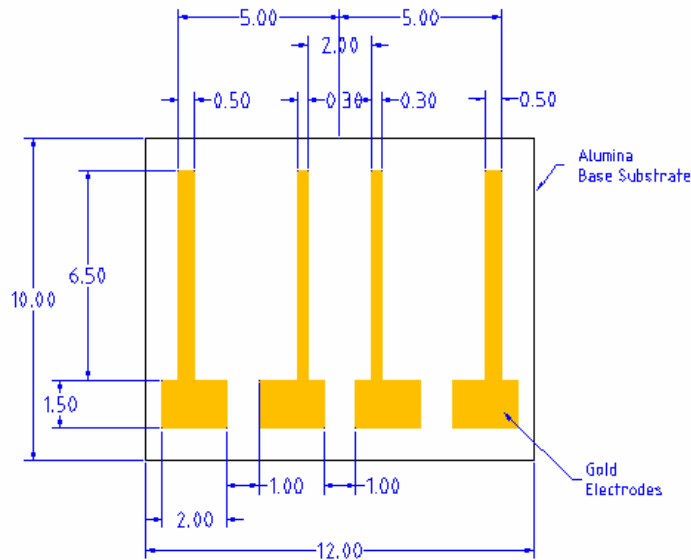


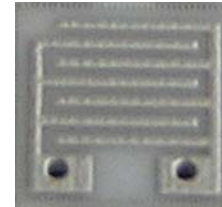
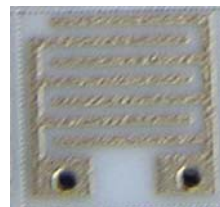
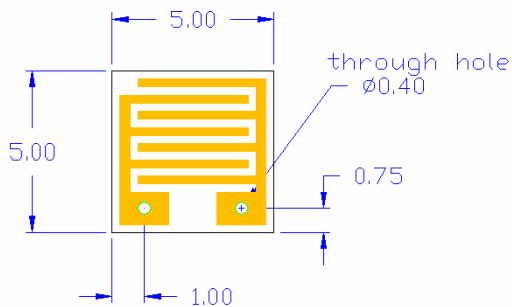
## Electrodes for Sale

The Electronics Design Center sells thick film printed and thin film sputtered electrodes for R&D testing purposes. Please email [lxid3@cwru.edu](mailto:lxid3@cwru.edu) for pricing. All alumina used is CoorsTek ADS-996. Custom electrode design and fabrication is available.



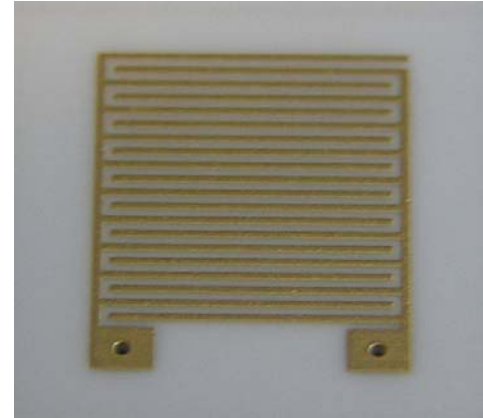
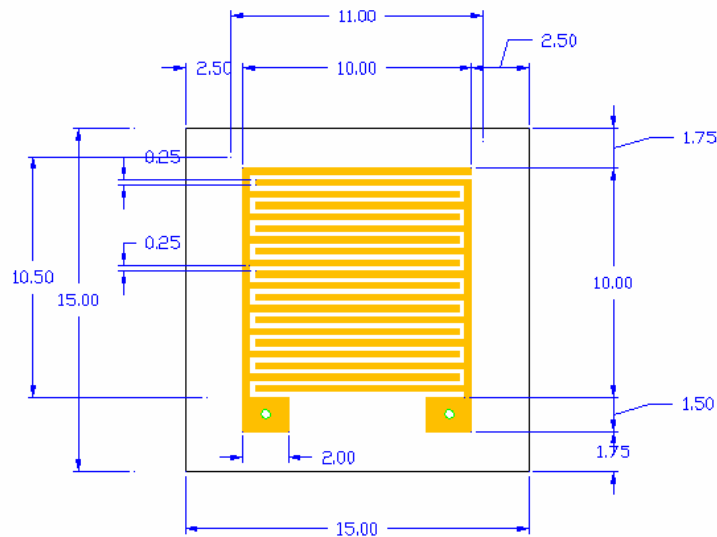
### Item # 100 - 4-Point Probe Electrode

This electrode consists of four gold lines on an alumina substrate. The over all dimensions of the alumina is 12 mm x 10 mm (see drawing above). The electrode is used by spreading material over the four electrodes and then testing the resistivity of the material. This is very useful for designing battery, fuel cell and sensing materials.



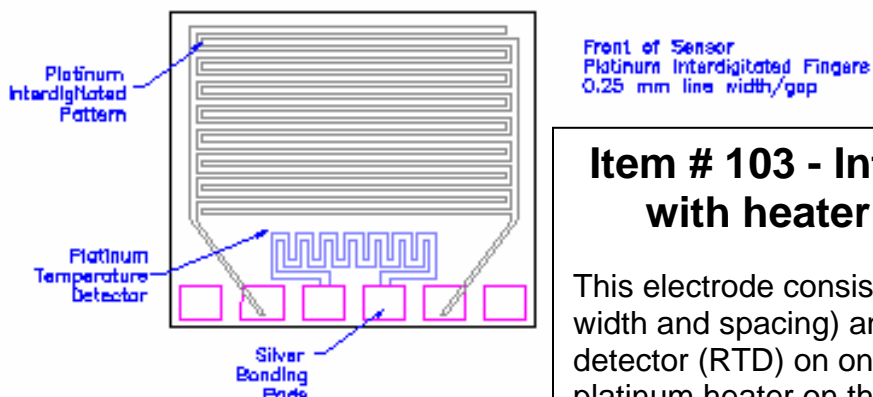
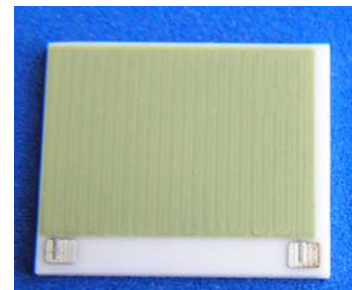
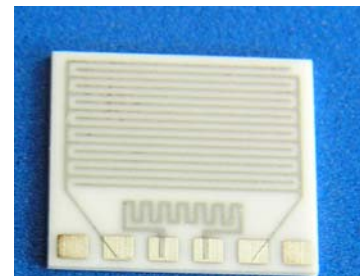
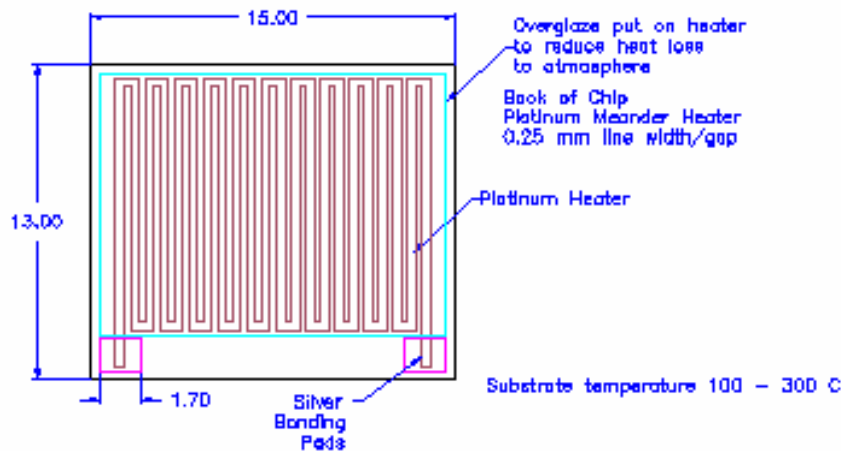
### Item # 101 - Interdigitated Finger Electrode (5x5mm)

This electrode consists of interdigitated gold or silver lines on an alumina substrate. The over all dimensions of the alumina is 5 mm x 5 mm (see drawing above). The electrode is used by spreading material over interdigitated fingers. The holes in the bonding pads allow wires to be threaded through them for electrical connection. Specify gold or silver when requesting pricing.



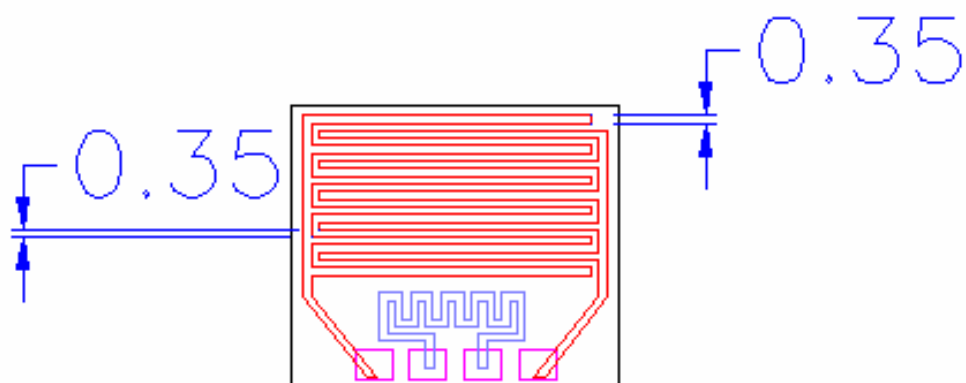
### Item # 102 - Interdigitated Finger Electrode (15x10mm)

This electrode consists of interdigitated gold lines on an alumina substrate. The over all dimensions of the alumina is 15 mm x 10 mm (see drawing above). The electrode is used by spreading material over interdigitated fingers. The holes in the bonding pads allow wires to be threaded through them for electrical connection.



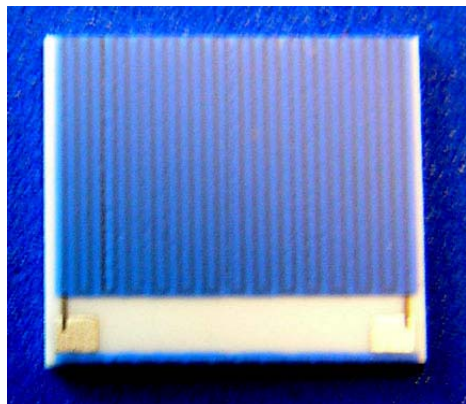
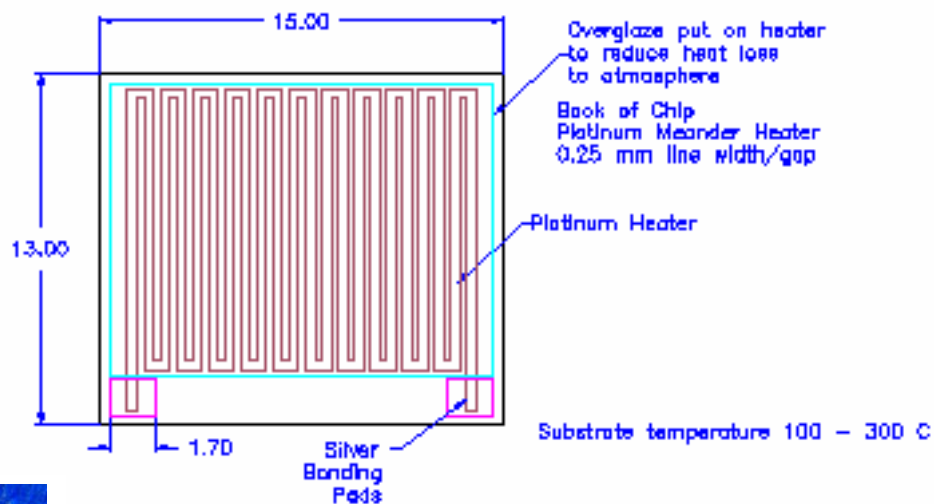
### Item # 103 - Interdigitated Finger Electrode with heater and temperature detector

This electrode consists of interdigitated platinum lines (250  $\mu$ m width and spacing) and platinum resistance temperature detector (RTD) on one side of an alumina substrate and a platinum heater on the other side. The over all dimensions of the alumina is 15 mm x 13 mm (see drawing above). The bonding pads are silver for easier soldering.



### Item # 103a - Interdigitated Finger Electrode with heater and temperature detector

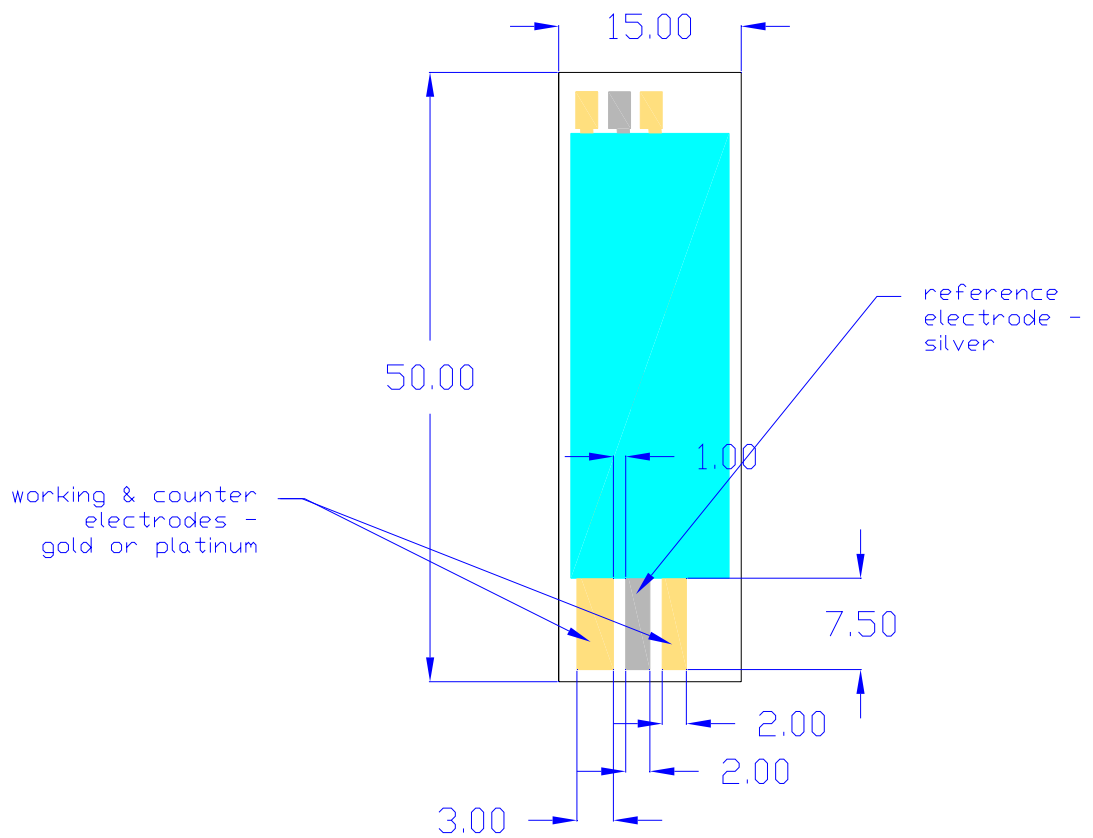
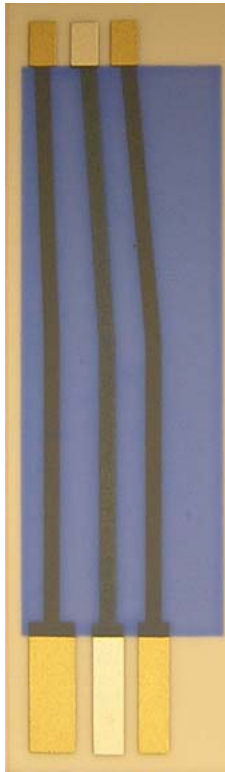
A less costly version of Item 103, 103-a has thicker lines (350  $\mu\text{m}$ ) with a larger gap between them (350  $\mu\text{m}$ ). This electrode consists of interdigitated platinum lines and platinum RTD on one side of an alumina substrate and a platinum heater on the other side. The over all dimensions of the alumina is 15 mm x 13 mm (see drawing above). The bonding pads are silver for easier soldering.



### Item # 104 - Platinum Heater

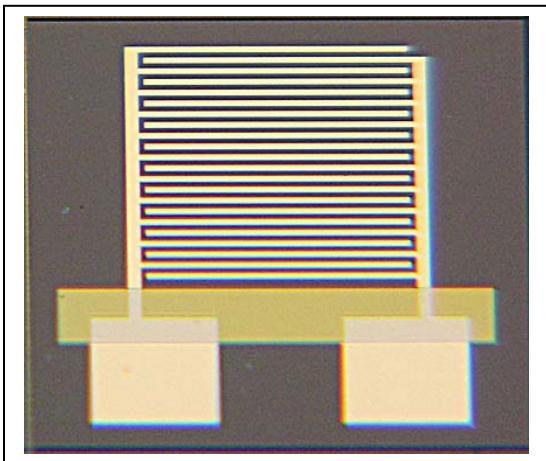
This electrode consists of a thick film platinum heater on an alumina substrate. The other side of the alumina is blank. The over all dimensions of the alumina is 15 mm x 13 mm (see drawing above). The bonding pads are silver for easier soldering.

Available resistances range from 50 to 250 ohms. Lower resistances have thicker platinum lines and are capable of having more power put through them. The more power, the higher temperature that the heaters can put out. The platinum and silver materials can withstand 850  $^{\circ}\text{C}$ .

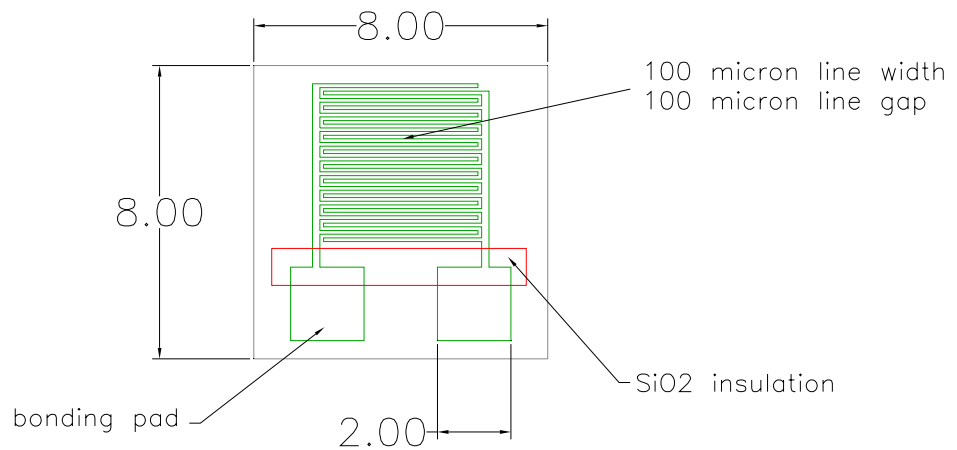


### Item # 105 – 3 electrode electrochemical sensor (105- gold/silver/gold or 105-platinum/silver/platinum)

This electrode consists of a thick film working, counter and reference electrodes on an alumina substrate. The other side of the alumina is blank. The working and counter electrodes are available in gold or platinum. The reference electrode is silver that is easily chlorodized to become a standard silver chloride reference electrode.



Thin Film sputtered platinum (1500 Angstroms thick) on 0.3 mm thick silicon substrate



dimensions in mm

### Item # 106 –Thin Film Interdigitated Platinum Finger Electrodes

This electrode consists of interdigitated platinum lines on a silicon substrate. The over all dimensions of the silicon is 8 mm x 8 mm). The electrode is used by spreading material of interest over the interdigitated fingers. Line spacing on this item is 100 microns, smaller than the 250 microns on the thick film interdigitated fingers, and is excellent for testing materials that are not as conductive.