

MSP with Captivate™ Technology

Finger Probes

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Overview

- The information in these slides offer a few suggestions, but it is up to the design/manufacturing engineer to validate the performance over time and temperature
- These are by no means the only options – do a google search for other options
- TI did perform experiments with the three options described in the following slides and ranked the in order of performance
 - #1 Gelatin Finger
 - Worked reasonably well (fun to make)
 - Had to experiment with different formulations of mixture, R and C values
 - #2 Conductive Rubber
 - Worked reasonably well
 - Difficult to find
 - #3 Copper Slug
 - due to the curved surface, the coupling is far inferior to the gelatin finger
- None of these options performed exactly like an actual human finger

Gelatin Finger

- Use non-flavored gelatin, glycerin and water to create the finger
- Video showing how to do it.

<https://www.youtube.com/watch?v=guUVc9spVSg>

- 2tbs gelatin
- 2tbs water
- 1tbs glycerin
- Heat in microwave for few seconds

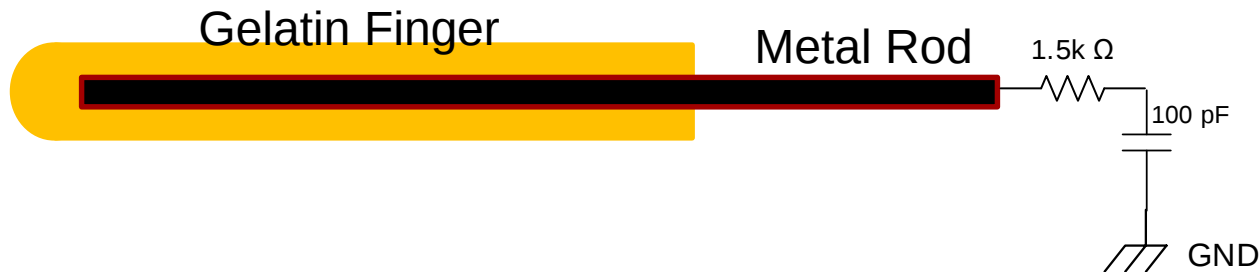


- Soft molding compound to create the mold.



Gelatin Finger

- The gelatin finger has a limited life
- Over time, the finger will begin to dry out and possibly lose some of its coupling characteristics
 - You will need to make replacements
 - How often? You will need to experiment
- Use a metal rod to stiffen the finger and provide mounting to automated test fixture.



Note: The Human Body Model for capacitance, as defined by the [Electrostatic Discharge Association \(ESDA\)](#) is a 100pF capacitor in series with a 1.5k Ω resistor.^[1]

Copper Slug Finger

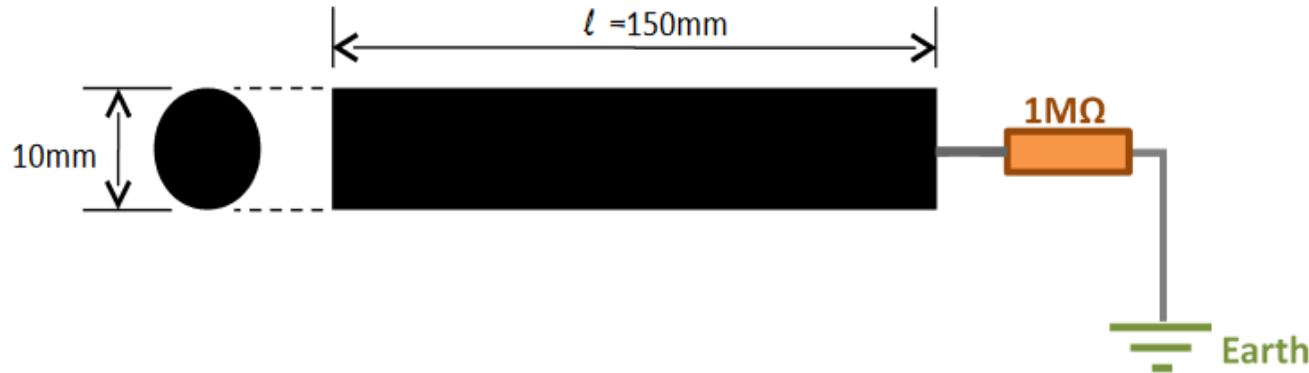
- 12mm copper slug
- ~3 – 4 mm touch area



Construction

- The slug/probe is tied to ground through a 1M ohm resistor
 - Shown here is an example using a conductive rubber

Cylindrical shaped conductive rubber with a length of 150mm and diameter of 10mm can be used as a test finger. The rubber must have resistivity of $\rho \approx 1.0\Omega/\text{mm}$.



- From Azoteq document AZD078 Test Finger Specification

Stainless Steel Finger

- 10mm stainless steel rod polished on the end

