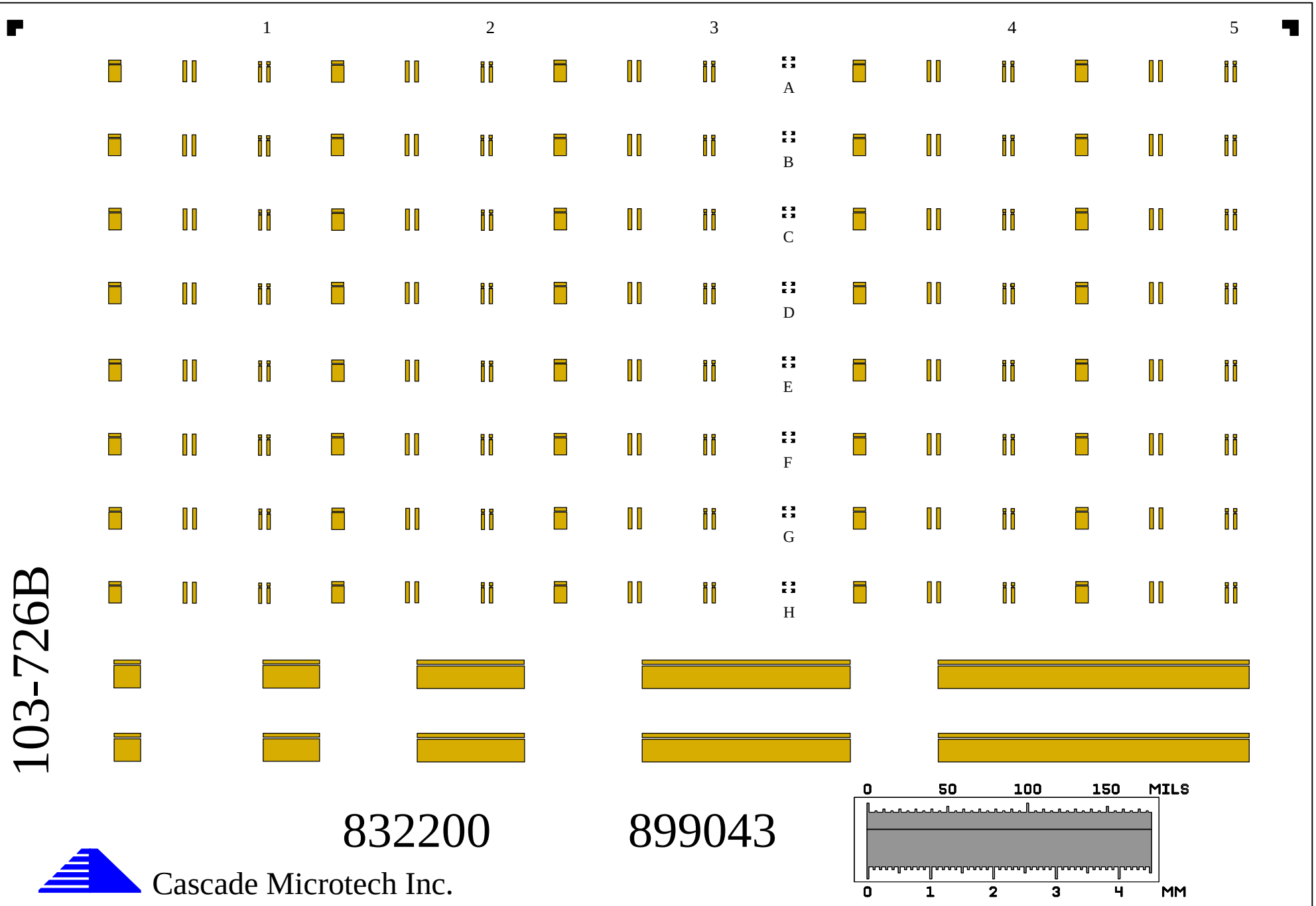
# Impedance Standard Substrate

(**Pitch:** 100 µm – 250 µm, **Configuration:** Signal-Ground)

**P/N:** 103-726 ; **S/N:**

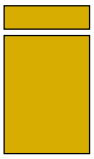
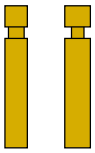
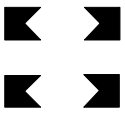
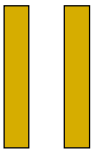
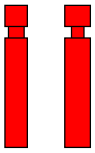



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Cascade Microtech Inc.

## Key to Map

**Substrate specification:** Material: Alumina; Thickness: 625 µm ± 25 µm; Dielectric constant: 9.9

| | | | | | |
|---|---|---|---|---|---|
|  **Thru** | **Thru delay:** 1 ps<br>**Impedance:** Nominally 50 Ω<br>**Dimensions:** Length: 200 µm |  **Load** | For optimum calibration accuracy **only** the **Red** -marked load standards should be used | **Verification Lines**<br><br>Thru Delay ≈ 3 ps; Length ≈ 450 µm<br><br>Thru Delay ≈ 7 ps; Length ≈ 900 µm<br><br>Thru Delay ≈ 14 ps; Length ≈ 1800 µm<br><br>Thru Delay ≈ 27 ps; Length ≈ 3500 µm<br><br>Thru Delay ≈ 40 ps; Length ≈ 5250 µm |  ***A-H*** **Alignment Marks** |
|  **Short** | **Dimensions:** 50 X 250 µm Bars |  **Precision 50 Ω Load** | **DC accuracy**: +/- 0.3 %<br>**Note:**<br>Ensure the bias supply is turned **off** during calibration. Applying bias to the probe during calibration could cause the resistance of the load to change | | **Note:**<br>An **Open** is synthesized by raising the probes in air a minimum distance of 250 µm above the chuck surface |

All of the above specifications are based on an overtravel (downward movement of probe after initial touchdown on the substrate) of 75-125 µm. This amount of overtravel can be set before calibration on the Impedance Standard Substrate (ISS) using the alignment marks (allows precise setting of probe separation and overtravel). Figure 1 shows that initial contact with the edge of the probe tips should be made at reference plane X (midpoint between the outer flat edge and the internal apex). The desired overtravel and thus skate (forward movement of probe tips after initial contact with substrate) is then achieved by adjusting the Z height on the positioner to move the edge of the probe tips to reference plane Y (midpoint between the internal apex and the flag points). This can also be seen from the photographic images shown in Figure 2.

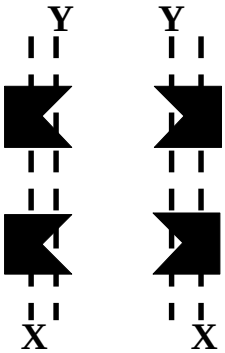



**Figure 1:** Alignment marks




**Figure 2:** Images showing correct alignment and placement of probe tips

## Calibration Coefficients

The standards used in coaxial calibration are unique devices and since they have a unique connector can have only a single electrical characteristic. In on-wafer probing the electrical behavior of the standards are dependent upon the probe and how it is placed. The shape and configuration of the standard will also be important. Therefore, the calibration coefficients are supplied with the probe not with the ISS.


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