

# Cascade Impedance Standard Substrate Map

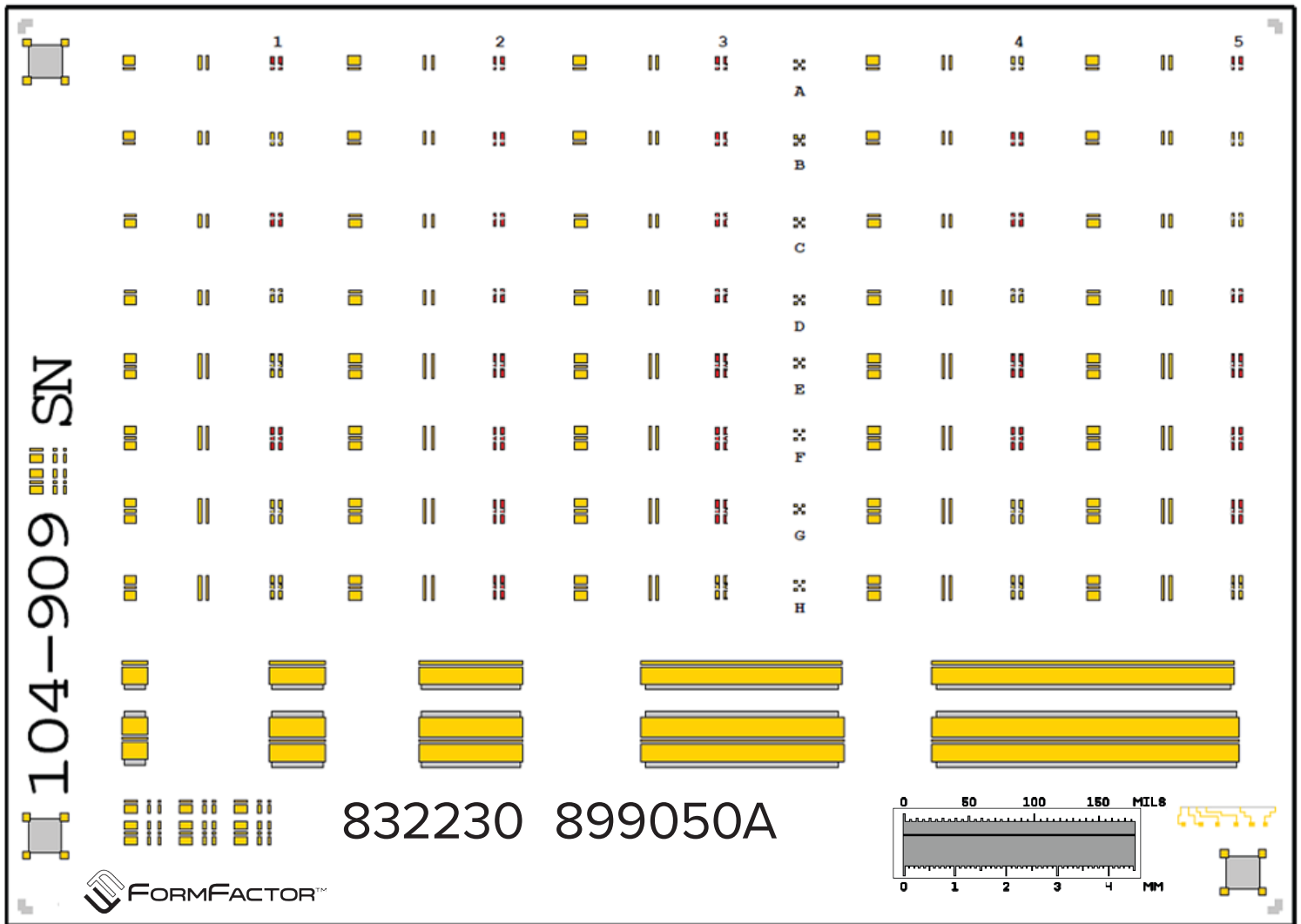
000111100010

➤ Impedance Standard Substrate for 110 GHz and Above

**Pitch:** 50  $\mu\text{m}$  - 150  $\mu\text{m}$ , **Configuration:** Ground-Signal-Ground, Signal-Ground, Ground-Signal

**P/N:** 104-909

**S/N:**



**Substrate specifications:** Material: Alumina; Thickness: 10 mils (254  $\mu\text{m}$ ); Dielectric constant: 9.9

Tips	Thru	Short	Load	Alignment Marks	Verification Lines												
GSG																	
SG				<p><b>Note:</b> An <b>Open</b> is synthesized by raising the probes in air a minimum distance of 250 <math>\mu\text{m}</math> above the chuck surface</p> <p><b>Recommended Overtravel</b> ACP: 75 – 100 <math>\mu\text{m}</math> Infinity: 50 – 75 <math>\mu\text{m}</math></p>	<table border="1"> <thead> <tr> <th>Depay</th> <th>Length</th> </tr> </thead> <tbody> <tr> <td>3 ps</td> <td><math>\approx</math> 450 <math>\mu\text{m}</math></td> </tr> <tr> <td>7 ps</td> <td><math>\approx</math> 900 <math>\mu\text{m}</math></td> </tr> <tr> <td>14 ps</td> <td><math>\approx</math> 1800 <math>\mu\text{m}</math></td> </tr> <tr> <td>27 ps</td> <td><math>\approx</math> 3500 <math>\mu\text{m}</math></td> </tr> <tr> <td>40 ps</td> <td><math>\approx</math> 5250 <math>\mu\text{m}</math></td> </tr> </tbody> </table>	Depay	Length	3 ps	$\approx$ 450 $\mu\text{m}$	7 ps	$\approx$ 900 $\mu\text{m}$	14 ps	$\approx$ 1800 $\mu\text{m}$	27 ps	$\approx$ 3500 $\mu\text{m}$	40 ps	$\approx$ 5250 $\mu\text{m}$
Depay	Length																
3 ps	$\approx$ 450 $\mu\text{m}$																
7 ps	$\approx$ 900 $\mu\text{m}$																
14 ps	$\approx$ 1800 $\mu\text{m}$																
27 ps	$\approx$ 3500 $\mu\text{m}$																
40 ps	$\approx$ 5250 $\mu\text{m}$																
GS																	
	<p><b>Delay:</b> 1.0 ps</p> <p><b>Length:</b> 194 <math>\mu\text{m}</math></p> <p><b>Impedance:</b> 50 <math>\Omega</math></p>		<p><b>Impedance:</b> 50 <math>\Omega</math></p> <p><b>DC accuracy:</b> <math>\pm 0.3\%</math></p> <p>For optimum calibration accuracy only the <b>Red</b>-marked load standards should be used</p>														

All of the above specifications are based on an overtravel (downward movement of probe after initial touchdown on the substrate). 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.

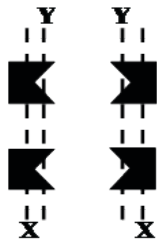


Figure 1: Alignment marks

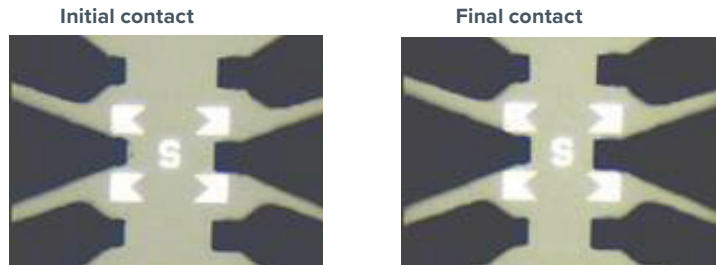


Figure 2: Images showing correct alignment and placement of probe tips

### Calibration Coefficients

Calibration Coefficients are dependent on the probe tip configuration, placement on a standard, and the shape and configuration of the set of standards. This leads to unique calibration coefficients for a unique pair of probe and ISS. Therefore, the calibration coefficients are supplied with the probe not with the ISS.

© Copyright 2018 FormFactor, Inc. All rights reserved. FormFactor and the FormFactor logo are trademarks of FormFactor, Inc. All other trademarks are the property of their respective owners. All information is subject to change without notice.

**Corporate Headquarters**  
7005 Southfront Road  
Livermore, CA 94551  
Phone: 925-290-4000  
www.formfactor.com