



## Neoconix PCBeam™ Interposer Design Guide

Neoconix’s PCBeam™ interconnect technology is renowned for the inherent design flexibility it offers. Instead of forcing customers to choose from limited “off-the-shelf” part numbers, Neoconix empowers customers to obtain a design that is customized to their specific application, yet without the high tooling cost and lead-time hurdles that are traditionally imposed for custom products. In fact, customization can often be implemented using proprietary methods such that there is zero tooling charge. A PCB-type manufacturing approach then allows quick-turn prototyping and straightforward design changes to ensure an optimized solution for production.

This document provides basic guidelines for selecting an interposer and integrating properly with your final assembly. However, since this document cannot address all aspects of custom assemblies, it is always recommended that you review your design with Neoconix prior to final implementation.

### 1.0 Layout

Most Neoconix “standard grid” products can be prototyped with no tooling charge. Neoconix supports the grid sizes shown below, including any subset or depopulated grid within the maximum size indicated. Multiples of standard pitches (e.g., 2.0mm or 2.54mm) can also be implemented in this manner.

Array Pitch	Max Grid Size for Std Tool
1.27 mm	50x50
1.00 mm	64x64
0.8 mm	35x35

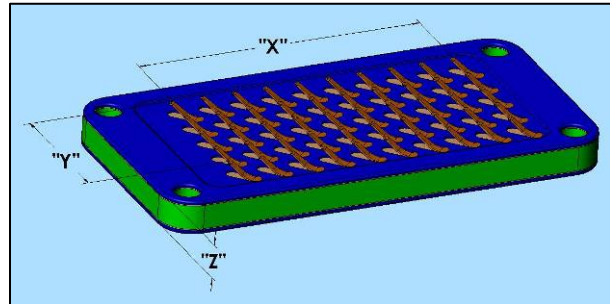


Figure 1: Interposer “standard grid” layout diagram.

Neoconix also supports array sizes larger than these, as well as a multitude of non-standard, irregular array configurations. For these designs, you should contact the factory for further information.

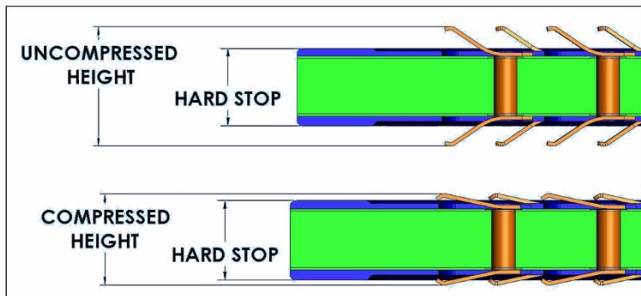


Figure 2: Interposer cross-sectional diagram.

### 2.0 Thickness

With FR-4 (a laminate structure) as its most common base substrate material, Neoconix can offer a wide variety of thicknesses.

Neoconix’s most common nominal “hard stop” thicknesses are 0.8mm, 1.1mm, and 2.8mm, as defined by the diagram on the left. Many other thicknesses are also available.



### 3.0 Contact Element Design

Neoconix offers a variety of contact element designs, depending on the technical requirements of the application. Variables such as pitch, working range, spring constant, and contact redundancy factor into the decision. A few example contact element designs are shown in Figure 2. Please contact the factory for guidance on the recommended contact design for your application.

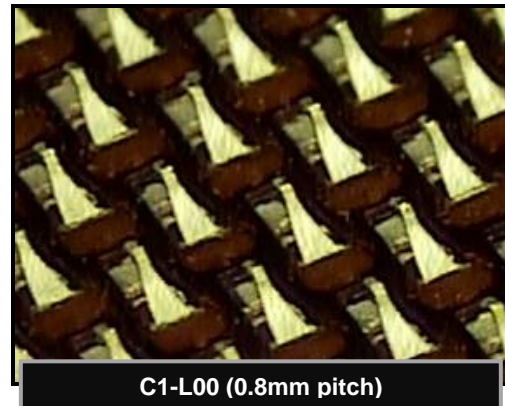
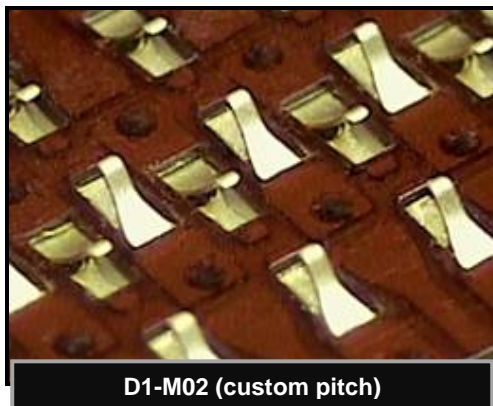
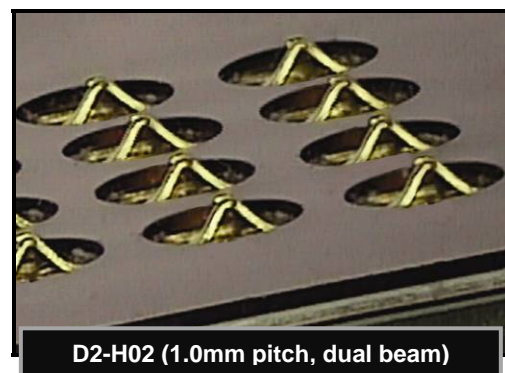
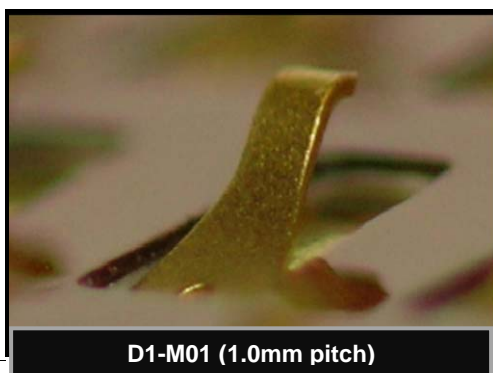


Figure 2: Examples of various PCBeam™ contact element design options.

### 4.0 Mating Boards, Packages, or Flex

PCBeam™ interposers can mate to a variety of substrates, including FR-4, ceramic, and flexible printed circuits (FPC).

The contact elements are designed to interface against gold plated pads. For typical applications, the mating surfaces should have a minimum of 30 micro-inches of hard Au on the pad surface. Plating



thickness can be adjusted upward or downward depending on the number of mating cycles expected in that particular application.

Recommended minimum mating pad size is 0.65mm (26 mils) for a 1.0mm or 1.27mm pitch interposer. If via-in-pad is required, it is recommended that these vias be silver-epoxy filled. If this is not possible, contact the factory for more information.

### **5.0 Alignment & Mating Features**

Neoconix offers tremendous flexibility in the location, shape, and size of alignment and mounting features. Typically, standard dowel pins are incorporated into the customer's mainboard, and then the Neoconix interposer will be produced with a hole & slot to match to customer's dowel pin locations.

In other cases, a "window frame" design is employed to edge-align a package to a board. In this case, the frame-to-board alignment is usually provided by bosses in the frame which align to hole/slot features in the mainboard.

For other alignment/mating options, contact the factory.

### **6.0 Compression Systems**

Compression systems vary widely based on application, space constraints, and number of mating cycles expected. Neoconix will typically provide a clamping solution, although the customer may alternatively choose to design this part of the assembly.

In general, Neoconix contact elements are designed for a recommended compression force of about 40 grams per contact. Figure 3 shows a typical force-deflection-resistance curve for your reference. The compression force required is a function of the planarity variation in your mating surfaces. The more warpage you expect, the more force you should apply. In some cases a backing (stiffener) plate can be used to further improve planarity.

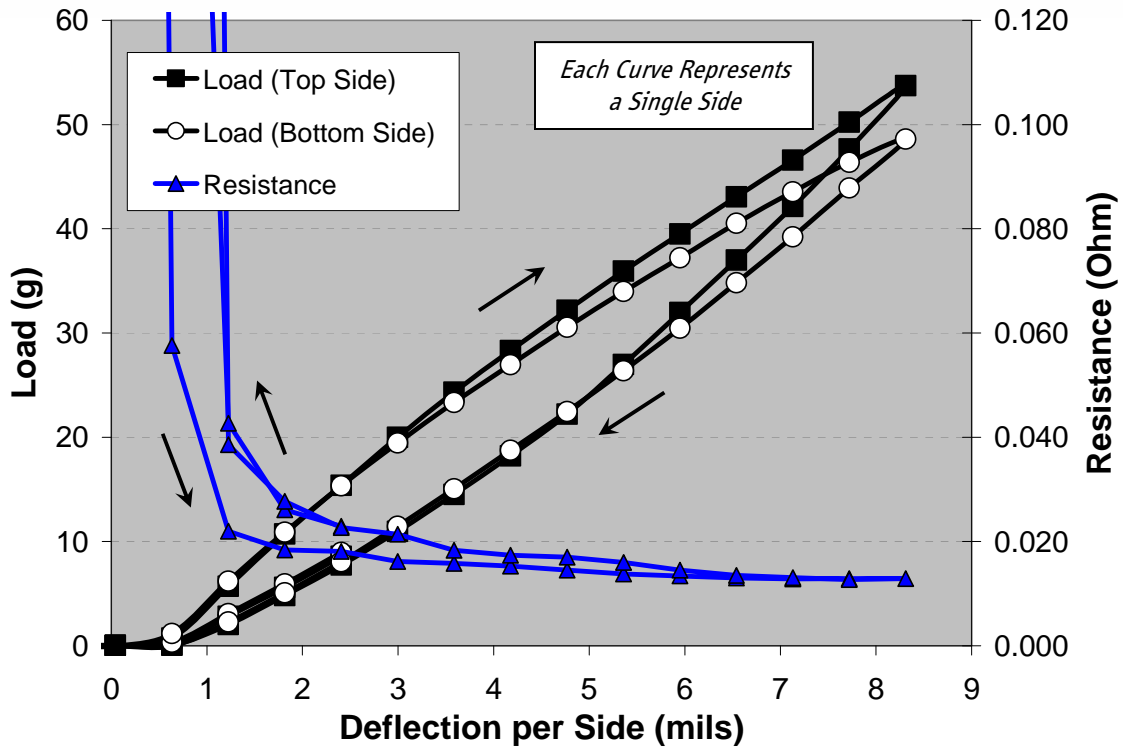
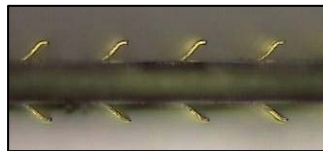
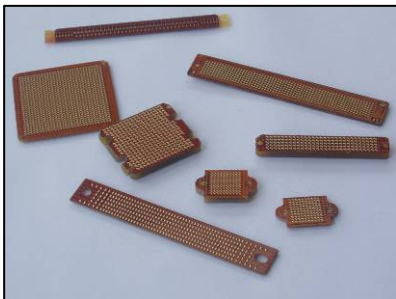


Figure 3: Typical force-deflection-resistance curve, taken on 2<sup>nd</sup> mating cycle on a 1.0mm pitch product (D1-M01).

When required, Neoconix engineering can modify or customize the spring constant of the PCBeam contact elements for your design requirements. Please contact Neoconix for more information.

**Contact Information**

For any other questions or if you have any feedback to provide on this design guide, please email [info@neoconix.com](mailto:info@neoconix.com) or call Neoconix at 408-530-9393 and ask for applications support.



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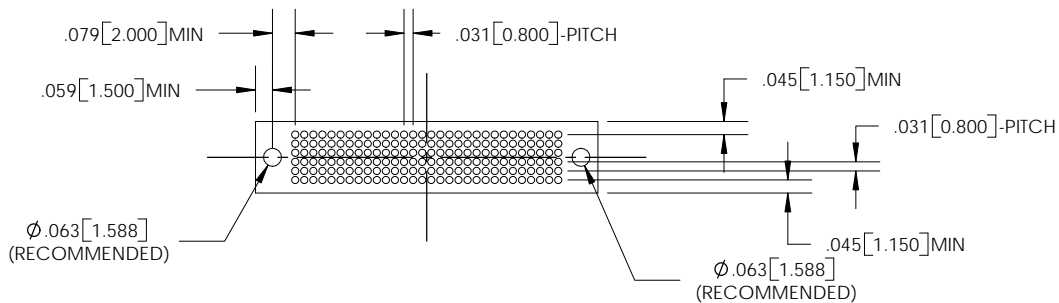
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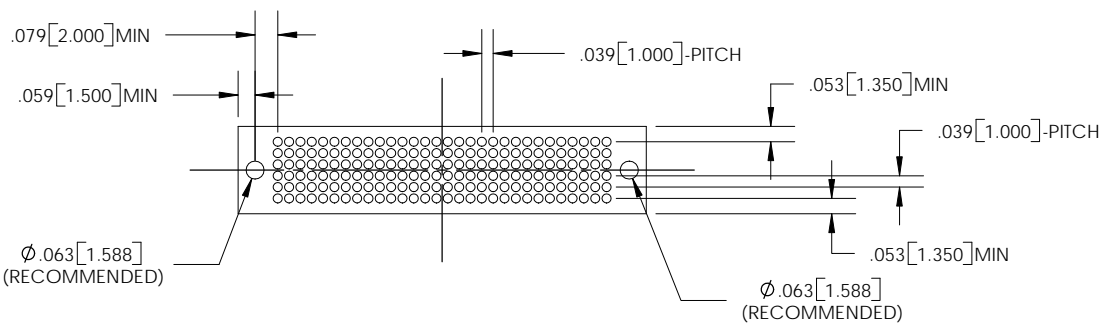
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ZONE	REV.	DESCRIPTION	DATE	APPROVED
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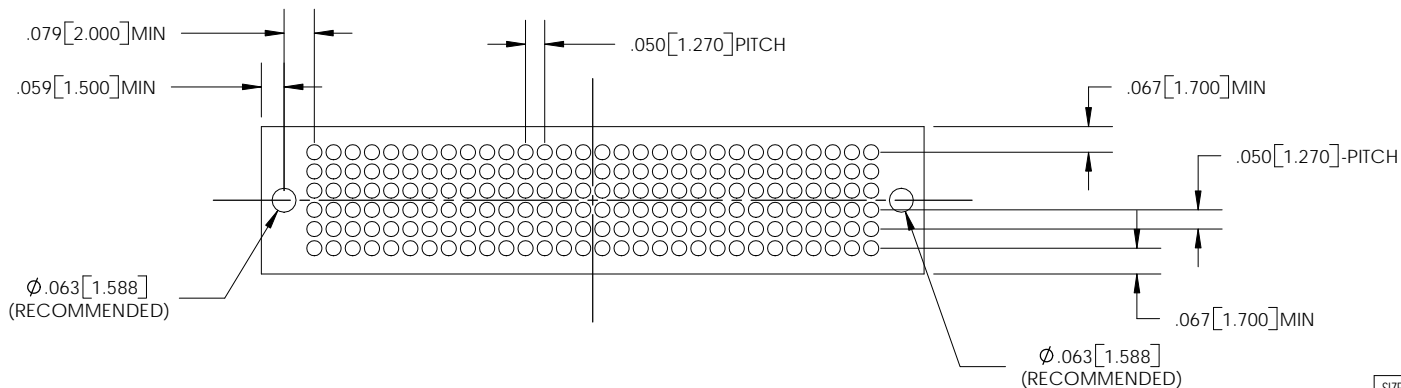
ALL UNITS: INCH[MM]



0.8 MM PITCH



1.0 MM PITCH



1.27 MM PITCH

SIZE	DWG NUMBER:	REV
A	FOOTPRINT REQUIREMENT	01
SCALE:	1.5:1	SHEET 1 OF 1

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