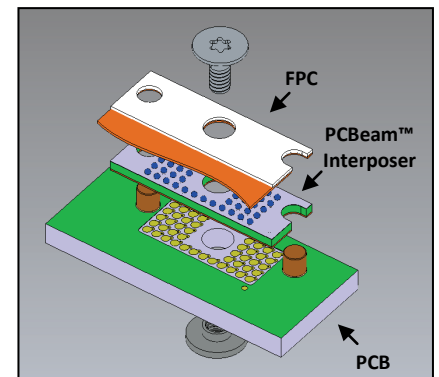


Product Specification - LPS Connector Series

OVERVIEW

The LPS products are solderable versions of those in the Neoconix LPM product series. Also developed for mobile devices and other space-constrained applications, the LPS products feature the same high density, but in a configuration that allows automated pick & place and SMT assembly onto the FPC. Like the LPM family, these products can uniquely combine high speed signaling (>10Gbps) and significant power delivery (>10A) within one connector. Optionally, Neoconix can also provide the corresponding flex circuit, with the connectors already pre-attached.

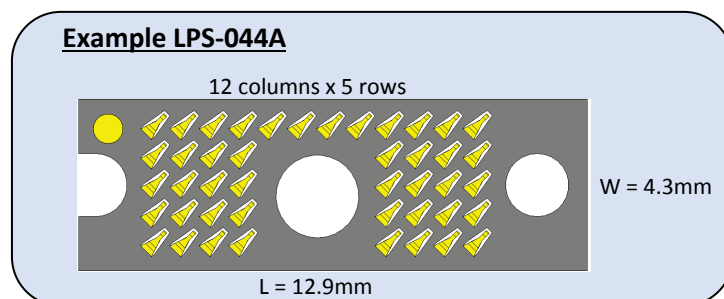
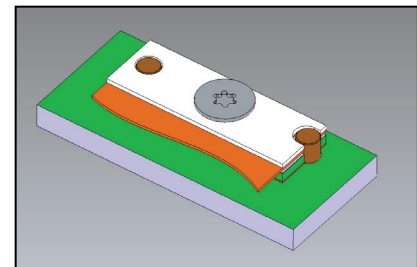


FEATURES

- High performance PCBeam™ connector technology
- Ultra-low profile, <1mm connector thickness
- High density 0.7424mm contact pitch
- High current to >10A on some configurations
- High speed to >10Gbps.
- Meets PCIe3.0 & USB3.1 signal integrity requirements
- Pick & place compatible standard hardware (pins & nut)
- Additional customization options offered
- Compliant with ROHS 2011/65/EU and IPC-4101B (halogen-free)

STANDARD PRODUCT FAMILY

Part Number	Rows	Columns	Pins	Length	Width
LPS-024A	4	10	24	11.4	2.6
LPS-044A	5	12	44	12.9	4.3
LPS-056A	6	12	56	12.9	5.1
LPS-080A	6	16	80	15.9	5.1



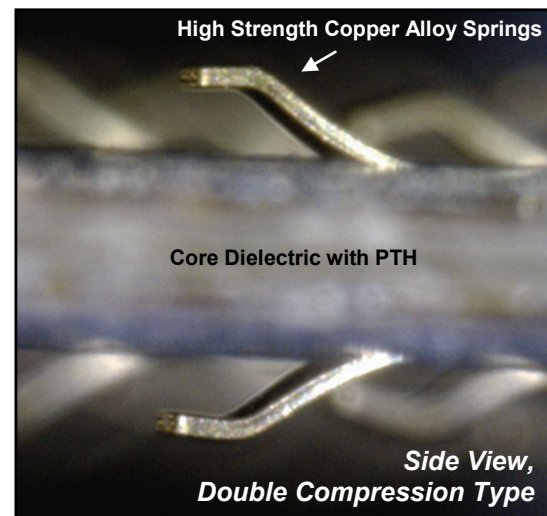
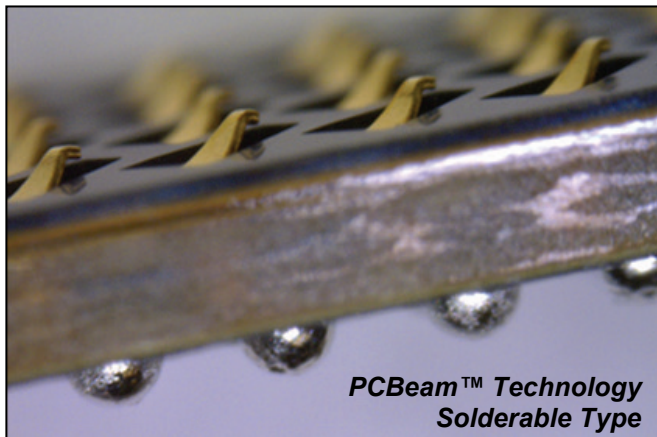
PCBeam™ TECHNOLOGY BACKGROUND:

Neoconix's LPS interposers are built using the innovative PCBeam™ Technology. Based on the principles of printed circuit board processing, this lithography & etch based manufacturing method provides unparalleled design flexibility, precision, and performance. Key features include thinness down to 0.28mm and excellent signal integrity to > 40Gbps.

Neoconix's PCBeam interposers offer many features, include the following:

- Continuous, all-metal spring contacts
- High current carrying capacity to >1.5A per position
- Excellent signal integrity to 40 Gbps+
- Integrated contact elements – no loose pieces
- Low profile to 0.28mm
- A continuum of available thickness options
- High density capabilities at 0.74mm array pitch and 0.5mm row pitch
- Excellent true position capabilities through lithographic patterning
- Optional SMT configuration with solder balls pre-attached on one side of interposer
- High volume manufacturing in China

While the standard products here are defined with specific configurations, Neoconix's PCBeam technology inherently has tremendous design flexibility, so customization is simple. Neoconix can provide interposers, retention hardware, flex circuit assemblies, or any combination thereof.



DOCUMENT NUMBER: AS-000022	REV. A 03/2/2017	Product Specs: LPS Connector Series	AUTHOR: WT	Page 2 of 11
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LPS INTERPOSER SPECIFICATIONS

MECHANICAL

Contact Configuration.....	single-beam, LGA/BGA
Contact Pitch.....	0.7424mm
Contact Count.....	24-82
Typical Load / Contact.....	0.35N (approx. 35g)
Typical Contact Deflection	0.18mm

ELECTRICAL

Current Rating.....	3A-15A, based on config
Average Resistance.....	< 30m Ω per position
Insertion Loss @ 5GHz (10Gbps).....	< 0.5dB
Dielectric Withstanding Voltage.....	100 VAC
Insulation Resistance.....	100 M Ω

ENVIRONMENTAL

Operating Temperature.....	-40°C to 85°C
Storage Temperature.....	-40°C to 85°C
Humidity.....	96 hrs at 90-95% RH and 40°C,
Heat Aging.....	96 hrs, 85°C
Temperature Cycling.....	100 cycles from -40°C-85°C,
Thermal Shock.....	-55°C to 85°C(+/-3°C), 50 cycles
Salt Spray.....	35°C+/-2°C,5%mist,48h
Mechanical Shock.....	50 g, 3 axis
Random Vibration.....	10-55Hz, 3axis, 6h
Insertions.....	50 mating cycles

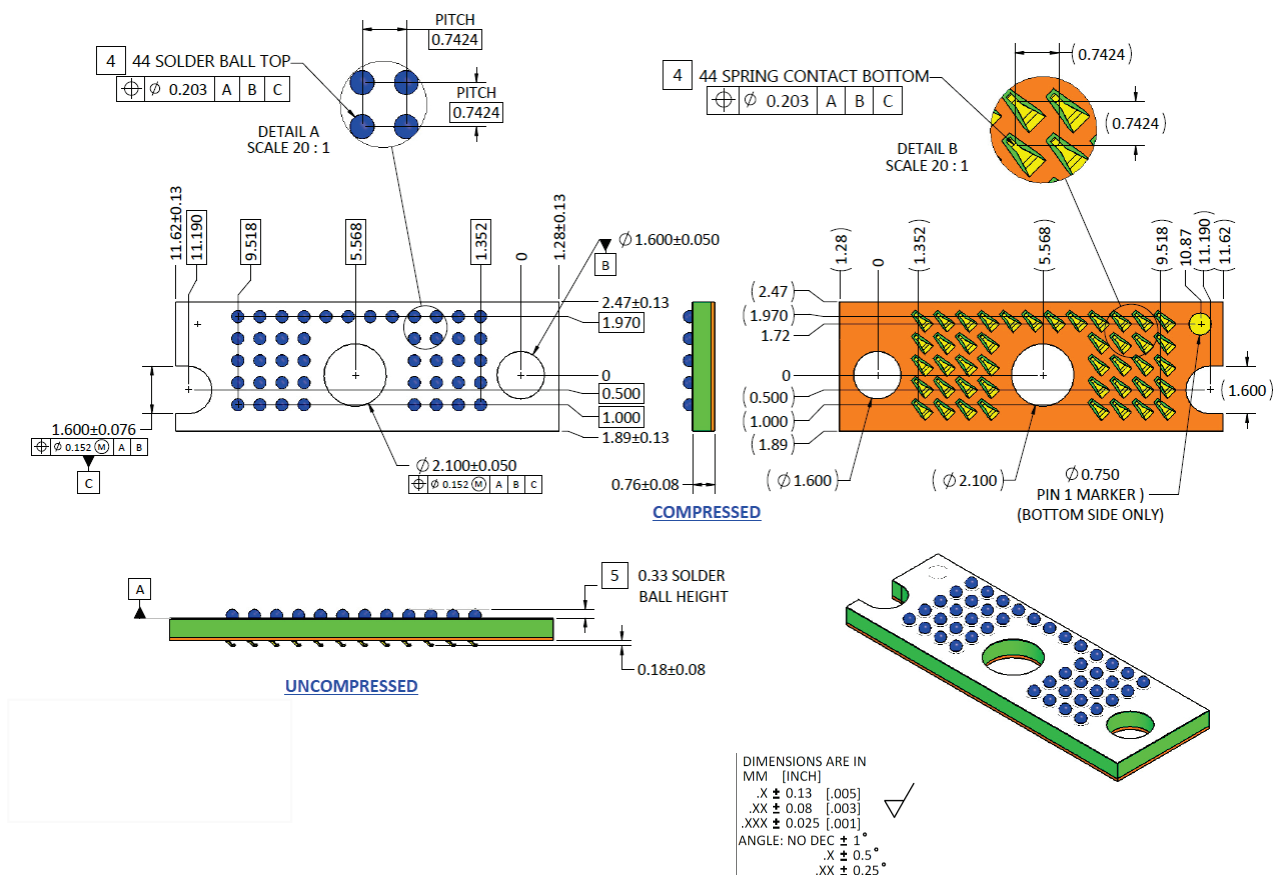
MATERIALS

Core Dielectric.....	Halogen-free laminate
Contact Elements.....	copper alloy
Contact Plating.....	hard Au over Ni
Contact-side Insulator.....	polyimide
Solder-side Insulator.....	LPI soldermask
Halogen-free per IPC 4101B.....	yes
RoHS 2011/65/EU Compliant.....	yes

NOTE: Specifications are subject to change without notice.

DIMENSIONAL INFORMATION – INTERPOSERS

(Example = LPS-044A, 44-position)



Note: This example is for reference only. Please refer to the product drawing for the specific part number of interest.

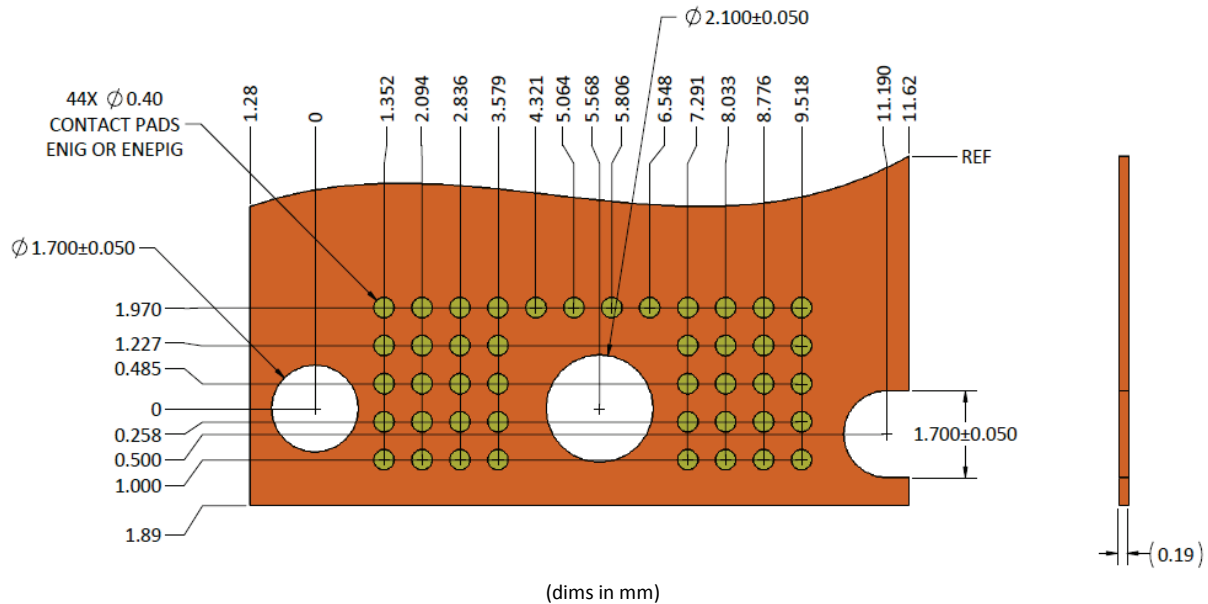
RECOMMENDED FPC DESIGN (solderable interface side)

(Example = LPS-044A, 44-position)

The recommended pad geometry is described below for reference. The recommended soldermask opening is 0.4mm. ENIG, ENEPIG, or CuOSP plating finish can be utilized.

A thermoset adhesive is recommended for stiffener attachment to the back of the FPC. Most pressure-sensitive adhesives (PSA) do not have sufficient adhesion and can allow the stiffener to rotate relative to the FPC. The adhesive outline should be smaller than the FPC outline, since some adhesive will flow laterally during lamination. Recommended nominal clearance from adhesive edge to FPC edge is 0.15mm.

The specific FPC layout recommendation is included in the drawing package for each LPS part number. Note that the LPS connectors can also be soldered onto a rigid PCB.



RECOMMENDED FPC STIFFENER DESIGN

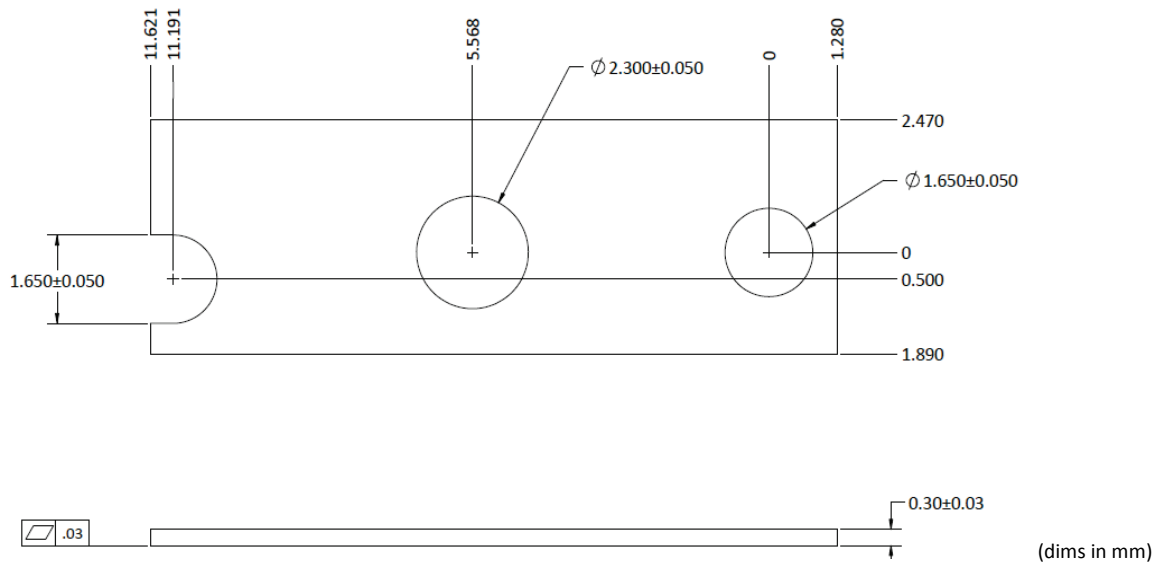
A stainless steel stiffener on the FPC is needed to ensure adequate uniformity of load across the interposer. A SS301 stainless steel material in half-hard or full-hard temper should be used. Detailed stiffener design recommendations are included in each part number's drawing set.

The FPC hole/slot is larger than the stiffener hole/slot, and both are oversized relative to the interposer hole/slot. When properly aligned, the FPC hole/slot should not be visible underneath the stiffener. A pin-fixture can be used during stiffener attachment to help ensure proper FPC-to-stiffener alignment.

Connectors with higher pin counts will have a larger reaction load on the FPC, thereby requiring an increase in stiffener thickness. Recommended stiffener thickness for each LPS part number is included in each part number's

DOCUMENT NUMBER: AS-000022	REV. A 03/2/2017	Product Specs: LPS Connector Series	AUTHOR: WT	Page 5 of 11
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drawing set. Note that if lower strength stiffener materials are chosen, then stiffener thickness must be increased accordingly.



RECOMMENDED PCB DESIGN (separable interface side)

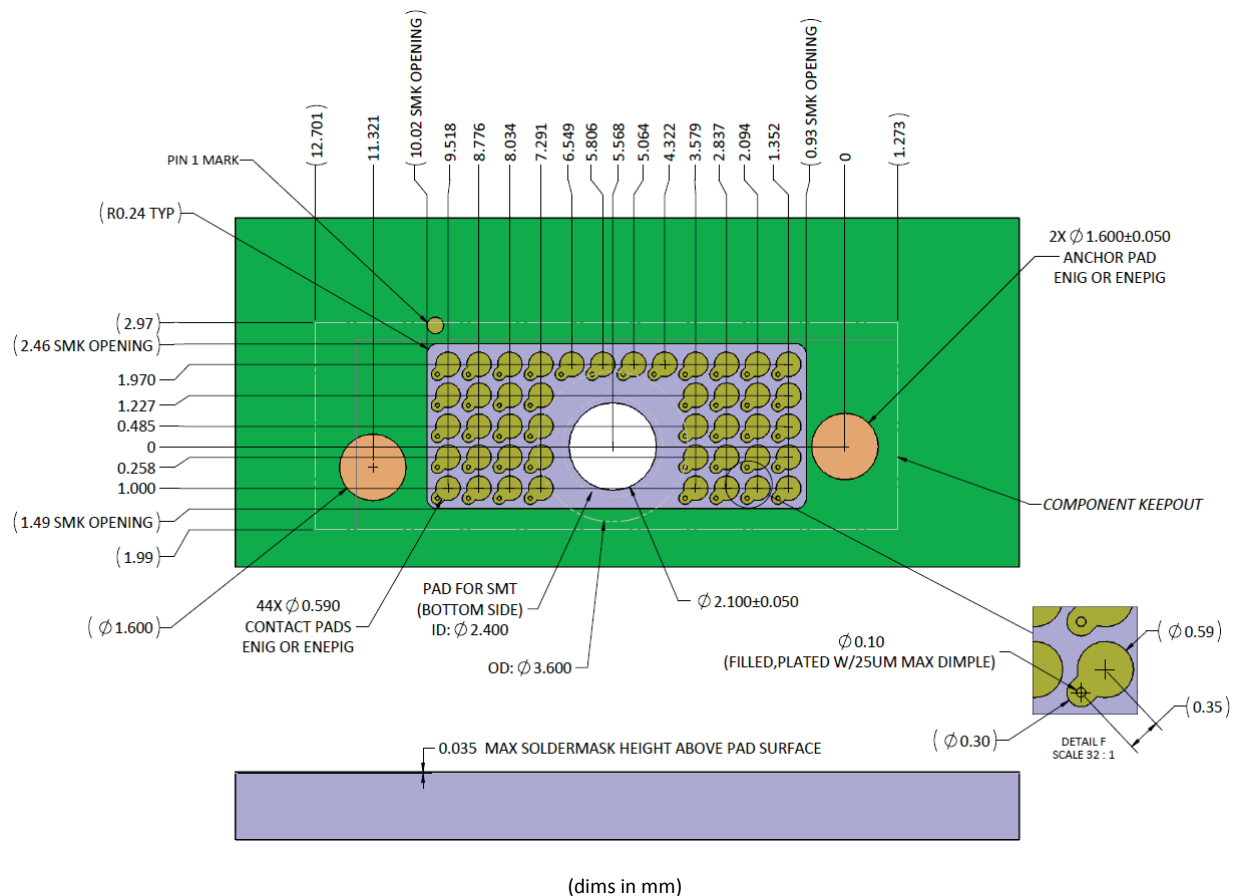
(Example = LPS-044A, 44-position)

The recommended pad geometry for the PCB is shown below for reference. Detailed recommendations for each part number are included in each part number's drawing set.

The PCB mating pads must be gold plated. An ENIG or ENEPIG plating finish is recommended since this also provides good solderability for the alignment pins and nut.

With the FPC or PCB layout, it is possible to deviate from the pad geometry shown, but a Neoconix review is suggested, and a separate tolerance analysis may be required, especially if the pad size will be smaller than shown below.

DOCUMENT NUMBER: AS-000022	REV. A 03/2/2017	Product Specs: LPS Connector Series	AUTHOR: WT	Page 6 of 11
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ALIGNMENT & COMPRESSION HARDWARE

Neoconix has developed standard hardware that can be used across all parts in the LPS family. The hardware consists of the following:

1. P/N B01-000639: SMT Alignment pins, OD=1.5mm, L=1.5mm, 2 per assembly
2. P/N B01-000581: M1.4 SMT Nut
3. *P/N B01-000XXX: M1.4 Waferhead Screw, L=Xmm

The alignment pins and SMT nut are provided in tape & reel packaging and can be reflowed to the PCB using normal Pb-free reflow procedures. The alignment pins ensure proper X-Y position of the interposer and FPC, while the screw provides the necessary z-axis compression to engage the connector. The nut is soldered to the back-side of the PCB, and is shipped with a polyimide cover to facilitate pick & place.

DOCUMENT NUMBER: AS-000022	REV. A 03/2/2017	Product Specs: LPS Connector Series	AUTHOR: WT	Page 7 of 11
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*Please note that the standard screw has been designed for common stack-ups (PCB + Interposer + FPC + Stiffener). The appropriate screw length will depend on PCB thickness used. See screw length reference table below.

Screw Length Table

Description	Screw Part Number	PCB Thickness (mm)
M1.4x0.30mm pitch, 5mm Screw Length	B01-000658	2.4-3.4
M1.4x0.30mm pitch, 4mm Screw Length	B01-000657	1.4-2.4
M1.4x0.30mm pitch, 3mm Screw Length	B01-000614	<1.4

PICK & PLACE CAP & PACKAGING

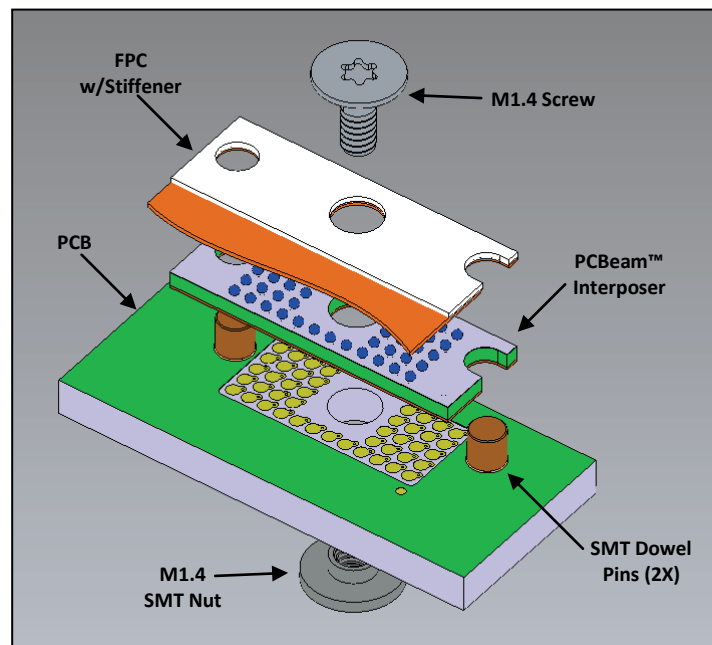
The LPS interposers ship with a cap. This cap has a flat surface for vacuum pickup during pick & place, and also helps protect the contacts from accidental handling damage. The capped interposers ship in standard tape & reel packaging.

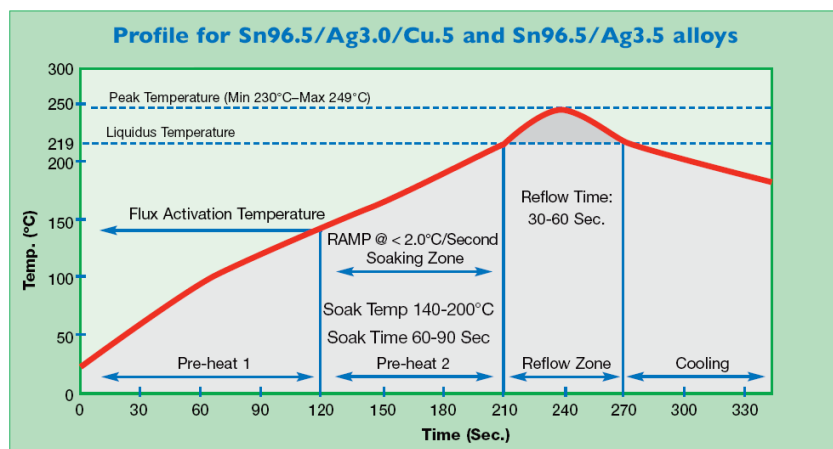
ASSEMBLY INSTRUCTIONS

The recommended assembly sequence is as follows:

1. Pick & place and surface mount *nut* and *dowel pins* onto PCB using traditional lead-free reflow process (see example reflow profile below).
2. Pick & place and surface mount interposer onto FPC with pre-attached stiffener.
3. Place the FPC/interposer assembly over the dowel pins
4. Insert and turn screw to engage connector. Recommended starting torque is 0.8 kg-cm. Some optimization testing may be required for your specific assembly.

Compression hardware can be custom designed when desired. Please ensure that the hardware solution provides sufficient rigidity assuming 0.35N of contact force is applied by each of the contact element positions. For example, an 80-position interposer would exert approximately 28N (or 6.3Lbs) of normal force.





Recommended Solder Profile for SAC305 Solder.

HANDLING GUIDELINES

- The use of latex gloves is recommended when handling interposers. As with any normal force connector, avoid touching contact tips and handle the product only by its edges.
- Mating surfaces should be clean prior to assembly. Foreign contaminants can result in opens or shorts after assembly.
- Interposer cleaning is not needed if the product is kept in original packaging. When necessary, cleaning can be employed with the use of compressed air. Direct the flow of air in the direction that the contact elements are pointing. Cleaning can also be performed with an ultrasonic bath of isopropyl alcohol (IPA). A 5 minute soak can be followed by a 10 minute bake at 65°C.
- When not in use, please keep product stored in original packaging.

ORDERING INFO

To obtain a quotation, please contact the Neoconix sales office at sales@neoconix.com or 408-530-9393. Please include the part number(s) of interest.

Custom interposers and hardware are also available from Neoconix. Please contact the factory for more information.

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DOCUMENT NUMBER: AS-000022	REV. A 03/2/2017	Product Specs: LPS Connector Series	AUTHOR: WT	Page 10 of 11
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REVISION HISTORY

Rev A	03/02/2017	Initial Release
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