

Product Specification - LPM Connector Family

OVERVIEW

Developed for mobile devices and other space-constrained applications, the Neoconix LPM line of connectors features exceptional X-Y-Z density with a simple, highly reliable screw-down fastening system. With an extremely short electrical path, these products can uniquely combine high speed signaling (>10Gbps) and significant power delivery (>10A) within one connector.

FEATURES

- High performance PCBeam™ connector technology
- Ultra-low profile, 0.43mm connector thickness
- High density 0.7424mm contact pitch
- High current to >10A on some configurations
- High 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)

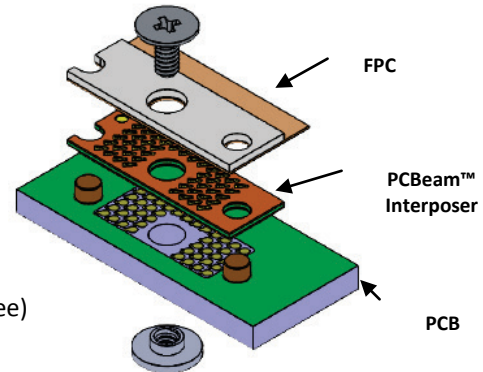
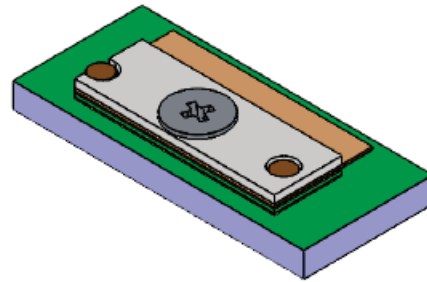
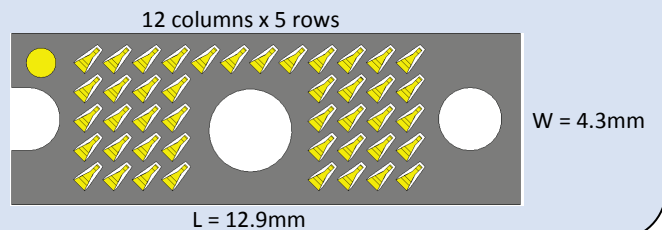


Table 1 LPM Standard Product Family

P/N	Rows	Cols	Pins	Length (mm)	Width (mm)
LPM-012A	3	8	12	9.9	3.6
LPM-016A	4	8	16	9.9	3.6
LPM-020A	4	9	20	10.7	3.6
LPM-024A	4	10	24	11.4	3.6
LPM-028A	4	11	28	12.2	3.6
LPM-032A	4	12	32	12.9	3.6
LPM-034A	5	10	34	11.4	4.3
LPM-036A	4	13	36	13.6	3.6
LPM-039A	5	11	39	12.2	4.3
LPM-040A	4	14	40	14.4	3.6
LPM-044A	5	12	44	12.9	4.3
LPM-049A	5	13	49	13.6	4.3
LPM-054A	7	10	54	11.4	5.8
LPM-056A	6	12	56	12.9	5.1
LPM-062A	6	13	62	13.6	5.1
LPM-068A	7	12	68	12.9	5.8
LPM-075A	7	13	75	13.6	5.8
LPM-080A	6	16	80	15.9	5.1
LPM-082A	7	14	82	14.4	5.8



Example LPM-044A



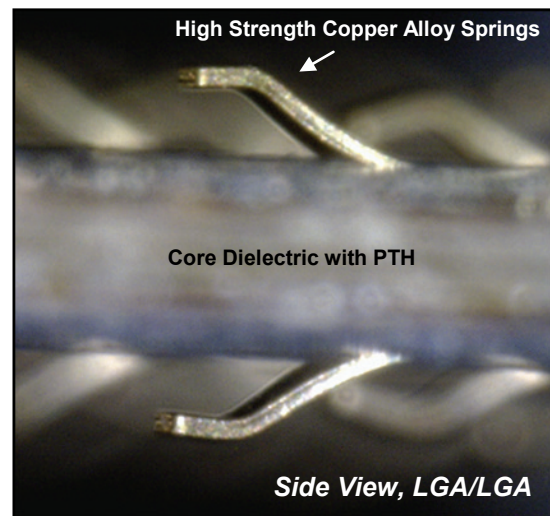
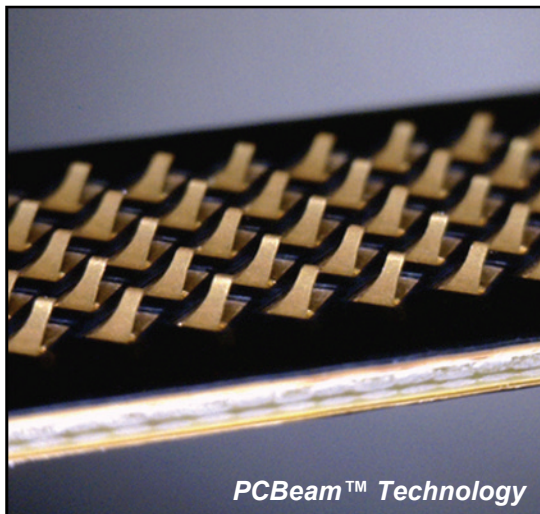
PCBeam™ TECHNOLOGY BACKGROUND:

Neoconix's LPM 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 0.43mm 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 0.43mm
- 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.



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LPM INTERPOSER SPECIFICATIONS

MECHANICAL

Contact Configuration.....	single-beam, LGA/LGA
Contact Pitch.....	0.7424mm
Contact Count.....	12-82
Typical Load / Contact.....	0.35N (approx. 35g)
Typical Contact Deflection Per Side.....	0.18mm
Typical Contact Deflection Both Sides.....	0.36mm

ELECTRICAL

Current Rating.....	0.8 A per position *
Average Resistance.....	< 30mΩ per position
Insertion Loss @ 5GHz (10Gbps).....	< 0.5dB
Dielectric Withstanding Voltage.....	100 VAC
Insulation Resistance.....	100 MΩ

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.....	100cycles form -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
Surface Insulator.....	polyimide
Halogen-free per IPC 4101B.....	yes
RoHS 2011/65/EU Compliant.....	yes

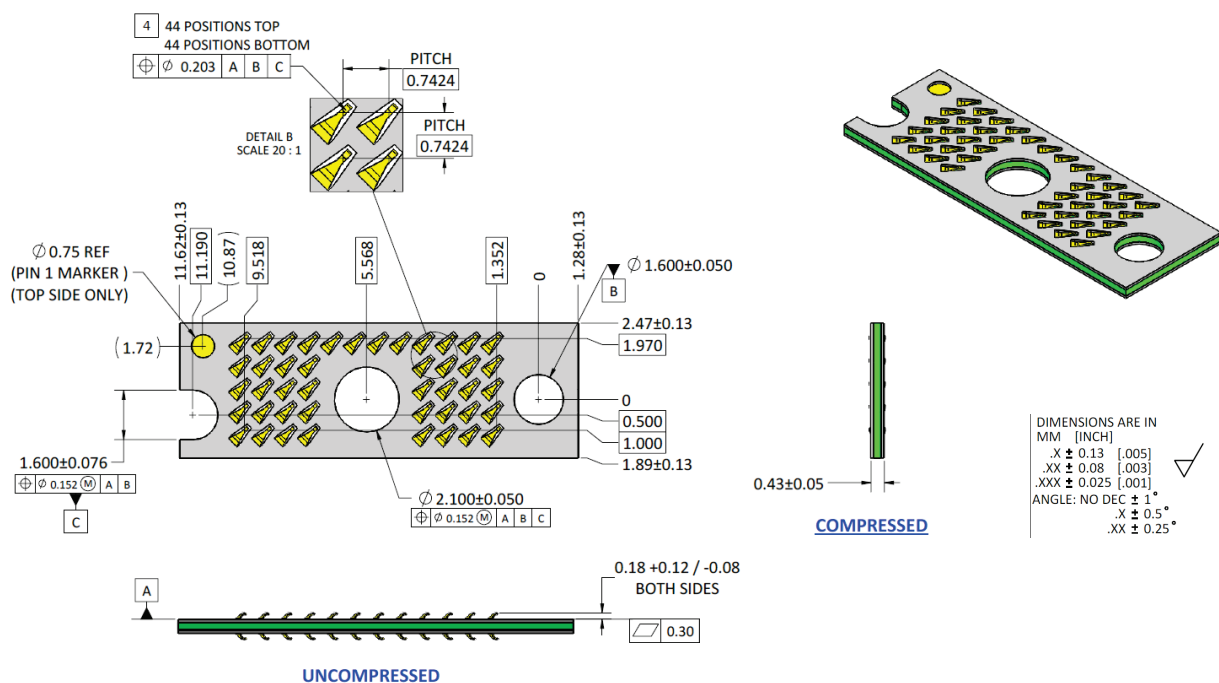
* Current rating is approximation as it depends on customer's pinout and other design details. Please contact Neoconix for input on your specific design

NOTE: Specifications are subject to change without notice.

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DIMENSIONAL INFORMATION – INTERPOSERS

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



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

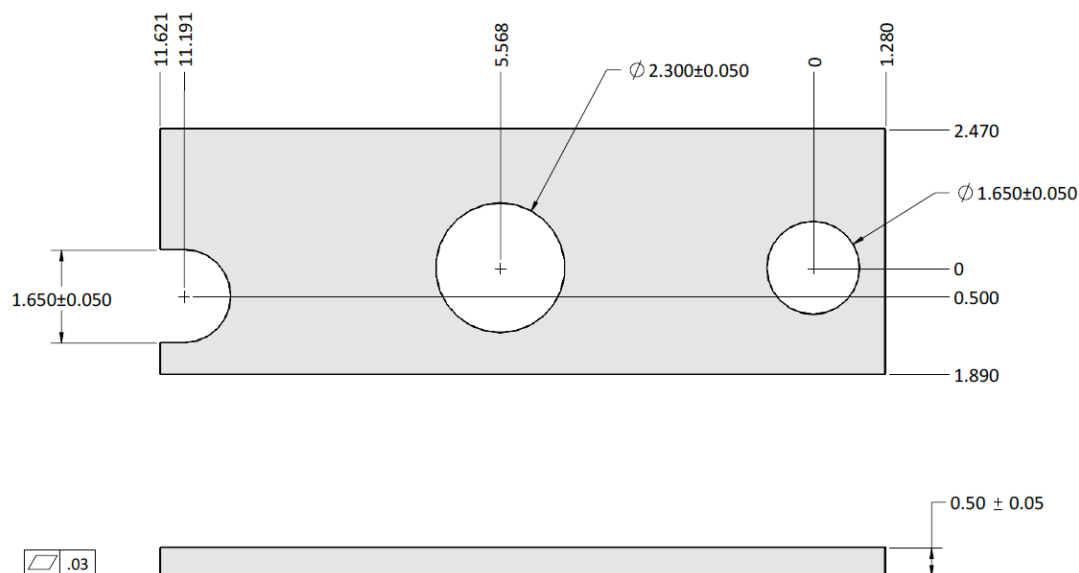
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RECOMMENDED FPC STIFFENER DESIGN

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.

Alignment of the stiffener onto the FPC is important, since the FPC material is very thin and could deform when forced against the alignment pins. The stiffener alignment hole and slot are oversized relative to the FPC hole and slot. The stiffener position should be ± 0.050 from the FPC, such that the stiffener does not overhang the FPC opening. A pin-fixture can be used during assembly to help ensure proper FPC-to-stiffener alignment.

Connectors with higher pincounts will have a larger reaction load on the FPC, thereby requiring an increase in stiffener thickness. Recommended stiffener thickness for each LPM part number is included in each part number's drawing set. Note that if lower strength stiffener materials are chosen, then stiffener thickness must be increased accordingly.



(dims in mm)

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ALIGNMENT & COMPRESSION HARDWARE

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

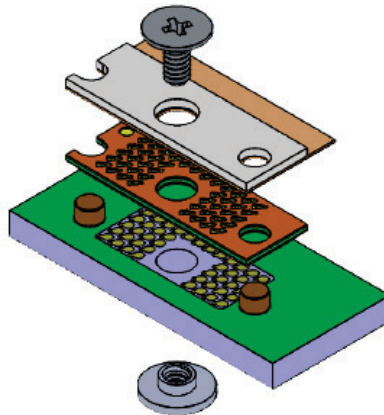
1. P/N B01-000589: Alignment pins, 1.5mm OD, 2 per assembly
2. P/N B01-000581: M1.4 SMT Nut
3. **P/N B01-000614: M1.4 Waferhead Screw, L=Xmm

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.

**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.

Table 2 Recommended screw length vs PCB thickness

PCB Thickness (mm)	Description	Head Thickness (mm)	Head Type	Head Thickness (mm)	Part Number
2.7-3.7	M1.4x0.30mm Pitch, 5mm Length	0.25	#0 Phillips	0.25	B01-000658
		0.50	Torx T5	0.50	B01-000798
1.7-2.7	M1.4x0.30mm Pitch, 4mm Length	0.25	#0 Phillips	0.25	B01-000657
		0.50	Torx T5	0.50	B01-000797
0.7-1.7	M1.4x0.30mm Pitch, 3mm Length	0.25	#0 Phillips	0.25	B01-000614
		0.50	Torx T5	0.50	B01-000796

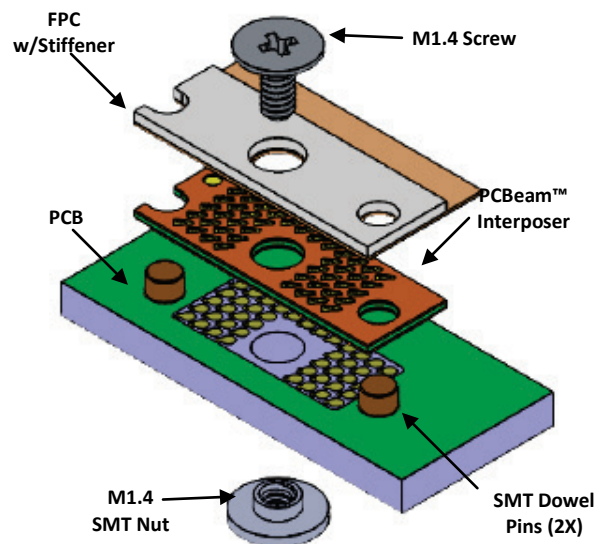


ASSEMBLY INSTRUCTIONS

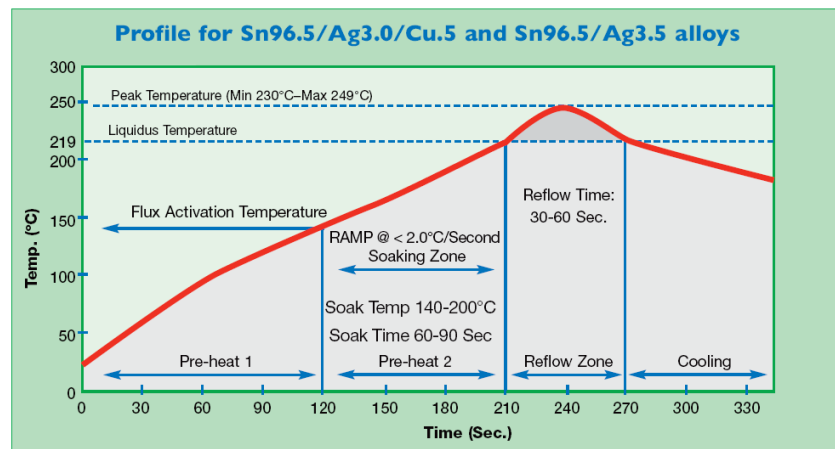
The recommended assembly sequence is as follows:

1. Pre-assemble *nut* and *dowel pins* onto PCB using traditional lead-free reflow process (see example reflow profile below).
2. Pre-attach *stiffener* onto FPC using a conductive thermoset adhesive (TSA), such as Tatsuta CBF300 or similar.
3. Using reverse-action plastic tweezers, pick-up interposer from its center screw hole and place over dowel pins. Orient so the indicator on the interposer lines up with corresponding indicator on PCB.
4. Place the FPC over the dowel pins
5. Turn screw to engage connector. Recommended starting torque is 0.5 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 0.4N of contact force is applied by each of the contact element positions. For example, an 80-position interposer would exert approximately 32N (or 7Lbs) of normal force.



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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.

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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.

Corporate Headquarters:

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Connector@sz.unimicron.com

REVISION HISTORY

Rev A	07/01/2015	Rev A Release
Rev B	11/06/2017	Added screw table and updated current carrying capacity
Rev C	12/10/2018	Updated recommended PCB pad layout
Rev D	08/07/2019	Updated connector thickness, recommended starting torque, drawings
Rev E	11/13/2020	Updated screw hardware options

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