

Product Specification: PFPC LPM Jumper Product Series

OVERVIEW

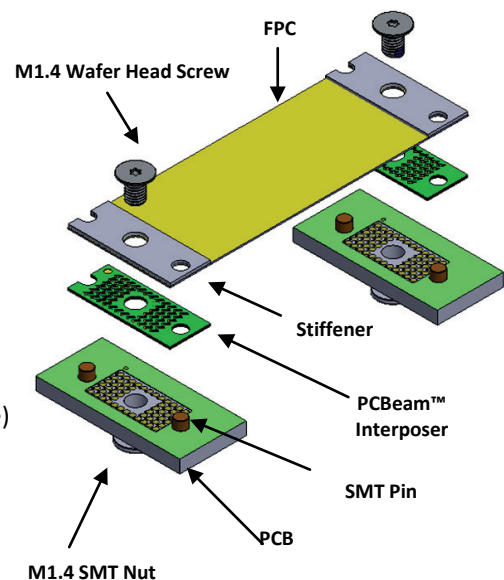
Developed for mobile devices and other space-constrained applications, the Neoconix PFPC LPM Jumper product series provides a flexible electro-mechanical link between two circuit boards, combining an advanced flexible printed circuit (FPC) with ultra-low profile PCBeam™ connectors on both ends.

The connector is fully separable (not soldered) and has exceptional X-Y-Z density combined 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) in the same connector.

The PFPC LPM Jumper product series is part of the Neoconix FPCconnected family of FPC-connector assemblies. The series includes interposer pin count options of 24, 56, and 80 positions. The FPC is custom-designed based on the specific signal, power, and length requirements of a given application.

FEATURES

- High performance PCBeam™ connector technology
- Ultra-low profile, 0.28mm connector thickness
- High density 0.7424mm contact pitch
- Standard pin counts of 24, 56, 80 positions
- Flexibility in FPC length (typically 20mm - 150mm)
- High current to >10A on some configurations
- High speed to >10Gbps
- Meets PCIe3.0 & USB3.1 signal integrity requirements (10Gbps)
- Pick & place compatible standard hardware (pins & nut)
- Additional customization options offered
- Compliant with ROHS 2011/65/EU and IPC-4101B (halogen-free)



Ref 56-Position Assembly

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REFERENCE DRAWINGS

The following reference drawings include a recommended pin map from end to end of the FPC.

- 904-000029 (24 Position)
- 904-000030 (56 Position)
- 904-000031 (80 Position)

PART NUMBER INFORMATION

An PFPC assembly consists of the following items.

- Qty 1 Custom FPC with Integrated Stiffener
- Qty 2 LPM Interposers
- Qty 2 SMT M1.4 Nuts
- Qty 2 M1.4 Wafer Head Screws
- Qty 4 SMT Dowel Pins

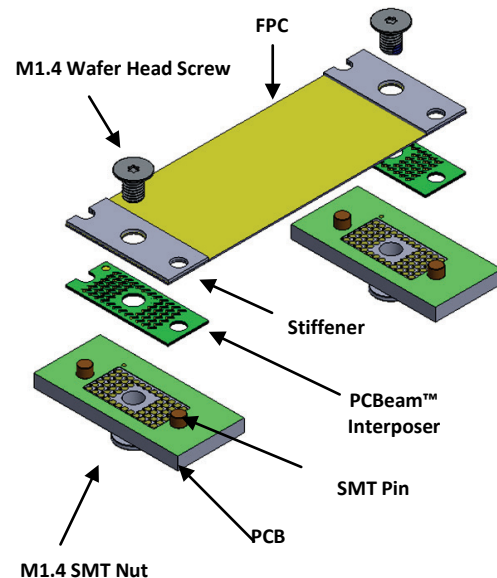
The PFPC products are comprised of multiple discrete items. To order, please select part numbers for each of the 5 components shown in the table below.

FPC (X1)	LPM Interposer (X2)	M1.4 SMT Nut (X2)	M1.4 Wafer Head Screws (X2)	SMT Dowel Pins (X4)
Custom P/N (F01-xxxxxx)	LPM-024A (24-pos) LPM-056A (56-pos) LPM-080A (80-pos)	B01-000581	B01-000614 (L=3, P=0.3, if PCB 0.7-1.7mm) B01-000657 (L=4, P=0.3, if PCB 1.7-2.7mm) B01-000658 (L=5, P=0.3, if PCB 2.7-3.7mm)	B01-000589

In this table, "L" corresponds to screw length, and "P" corresponds to thread pitch. A drawing is available for each of the part numbers shown.

Example Line Items to order for 1000 assemblies:

Quantity	Part Number	Description
1,000	F01-351684	FPC
2,000	LPM-056A	LPM Interposer
2,000	B01-000581	SMT Nuts
2,000	B01-000657	M1.4 Screws
4,000	B01-000589	SMT Dowel Pins



Ref 56-Position Assembly

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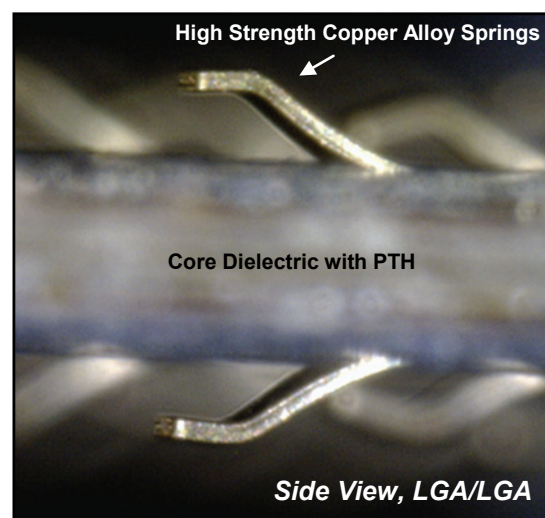
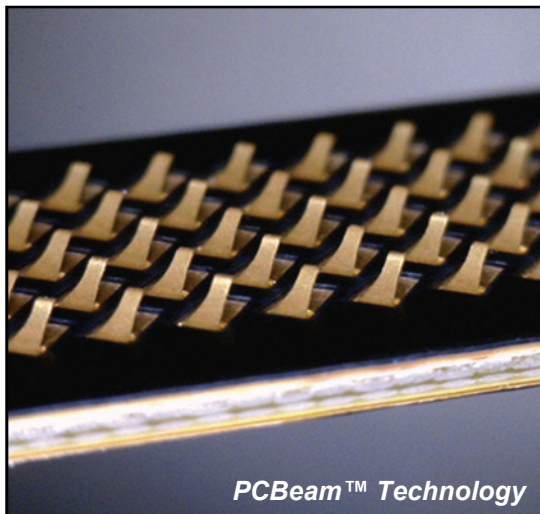
PCBeam™ TECHNOLOGY BACKGROUND:

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 0.28mm 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.



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PFPC LPM JUMPER SPECIFICATIONS

MECHANICAL (LPM Connectors)

Contact Configuration.....	single-beam, LGA/LGA
Contact Pitch.....	0.7424mm
Contact Count.....	24, 56, 80
Typical Load / Contact.....	0.35N (approx. 35g)
Typical Contact Deflection Per Side.....	0.18mm
Typical Contact Deflection Both Sides.....	0.36mm

ELECTRICAL (LPM Connectors)

Current Rating ("signal" config).....	0.8A per position*
Average Resistance per Channel (Connectors).....	<30mΩ
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.....	10 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

Interposer Core Dielectric.....	Halogen-free laminate
Interposer Contact Elements.....	copper alloy
Interposer Contact Plating.....	hard Au over Ni
Interposer Surface Insulator.....	polyimide
FPC Core Dielectric.....	polyimide
FPC Pad Plating.....	ENIG
Halogen-free per IPC 4101B.....	yes
RoHS 2011/65/EU Compliant.....	yes

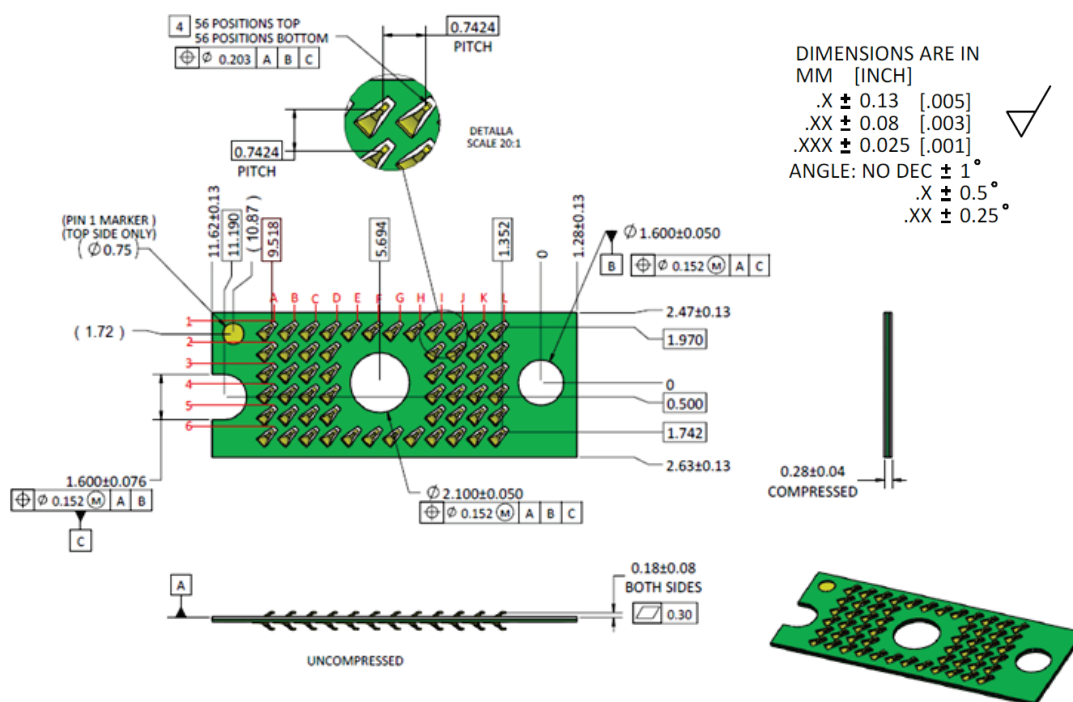
* Current rating is approximation as it depends on customer's pinout and other design details. Please contact Neoconix for input on your specific design

NOTE: Specifications are subject to change without notice.

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DIMENSIONAL INFORMATION – INTERPOSER

(Example = LPM-056A, 56 position)



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

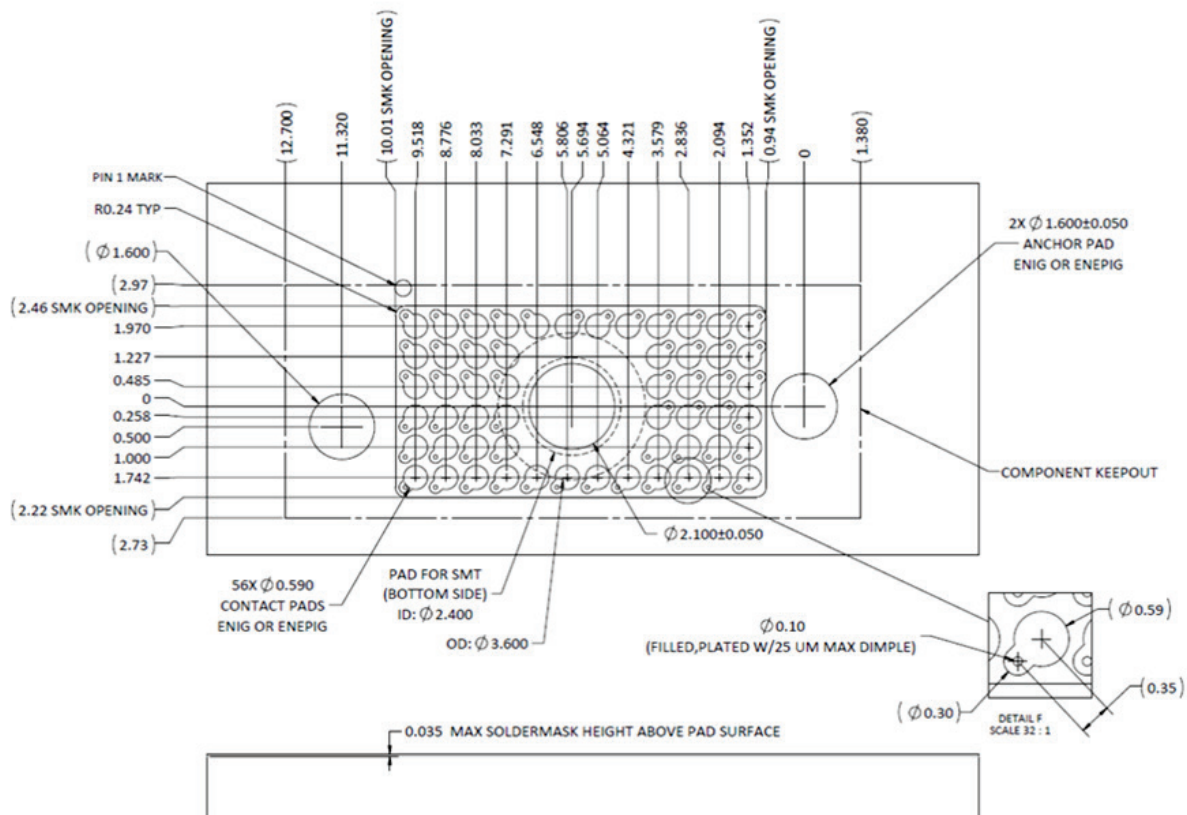
RECOMMENDED PCB DESIGN

(Example = LPM-056A, 56-position)

The recommended pad geometry for the PCB is analogous to the geometry for the FPC. An example 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 needed if the pad size will be smaller than shown below. The pad vias need not be filled and plated if they are offset from the 0.59mm land diameter and do not interfere with the backside nut SMT area (OD = 3.6mm) as shown below. The vias should be filled and plated if they must lie within the 0.59mm land diameter or lie within the backside nut SMT area.



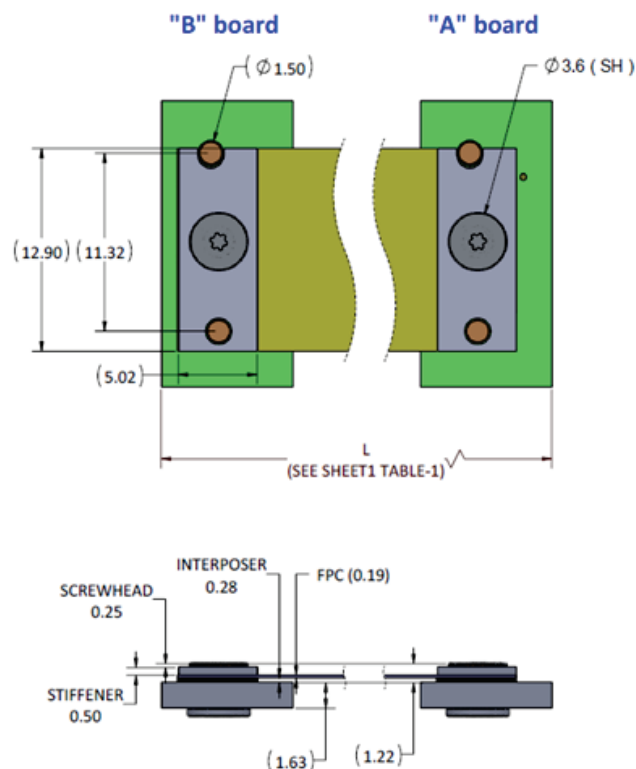
ALIGNMENT & COMPRESSION HARDWARE

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.

The table below provides screw part recommendations based on a 0.19mm FPC thickness and 0.5mm stiffener thickness. If the custom FPC involves a thicker FPC or FPC stiffener, then an adjustment may be needed in screw length selection.

Screw Length Table

Description	Screw Part Number	PCB Thickness (mm)
M1.4x0.30mm pitch, 5mm Screw Length	B01-000658	2.7-3.7
M1.4x0.30mm pitch, 4mm Screw Length	B01-000657	1.7-2.7
M1.4x0.30mm pitch, 3mm Screw Length	B01-000614	0.7-1.7

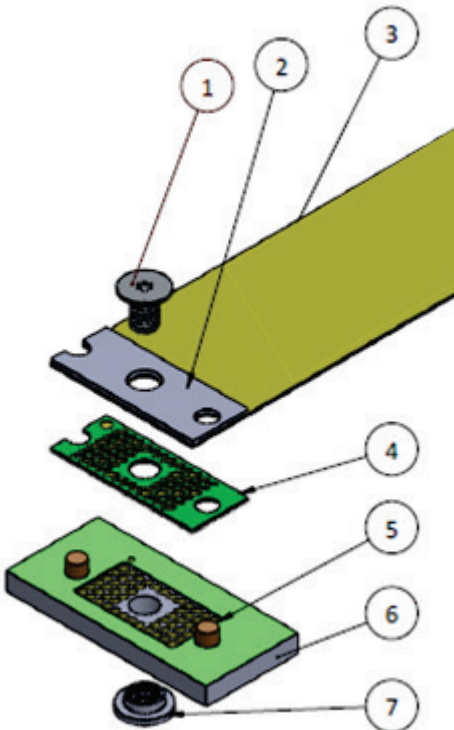


ASSEMBLY INSTRUCTIONS

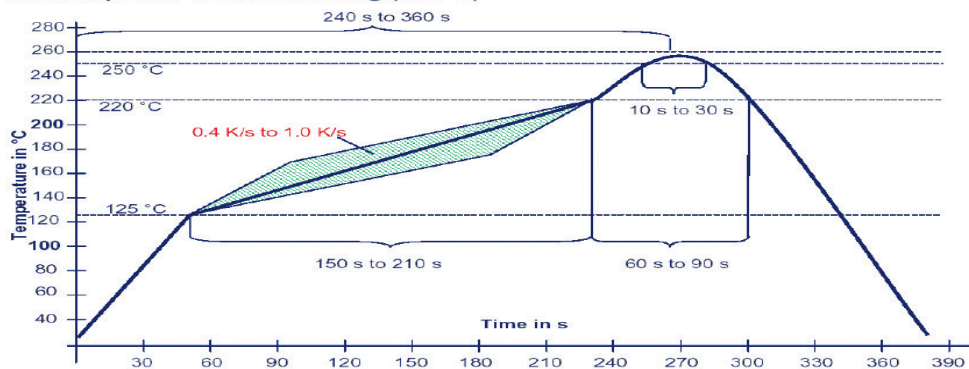
The recommended assembly sequence is as follows:

1. Pre-assemble *nut* and *dowel pins* onto PCBs using traditional lead-free reflow process (see example reflow profile below).
2. 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.
3. Place the FPC over the dowel pins
4. Turn screw to engage connector. Recommended starting torque is 0.8 kg-cm. There should be no air gap visible between the interposer and the mating FPC/PCB. Some torque adjustment 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.



ITEM NO.	DESCRIPTION	Default/QTY
1	SCREW,WAFFERHEAD,M1.4	2
2	STIFFENER	2
3	FPC	1
4	INTERPOSER	2
5	ALIGNMENT PIN	4
6	PCB	2
7	NUT,CUSTOM,M1.4	2

Reflow profile for MSL testing (260°C)


Preheat	125 °C to 220 °C 150 s to 210 s @ 0.4 K/s to 1.0 K/s
Time at T>185 °C	60 s to 90 s
Peak temperature	260 °C -5/+0 °C
Peakttime	10 s to 30 s (≥ 250 °C)
Cooling rate	≤ 6 K/s
Time from 25 °C to peak	240 s to 360 s

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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REVISION HISTORY

Rev A	02/15/2017	Rev A Release
Rev B	12/10/2018	Updated Part Numbers, updated recommended PCB design, Other Minor Updates

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