

Product Specification: USB 3.2 TYPE-C Bridge Product Series (U31C)

OVERVIEW

The Neoconix USB 3.2 Type-C FPC Bridge solution provides a flexible electro-mechanical link from a USB 3.2 Type-C external port to a product's mainboard. The mainboard *solderless* connection is made with a fully integrated ultra-low profile X-Beam™ connector, which also minimizes board space and offers outstanding reliability. An optimized, high speed and high power flex circuit maintains excellent signal integrity while providing up to 5A of current to and from the mainboard.

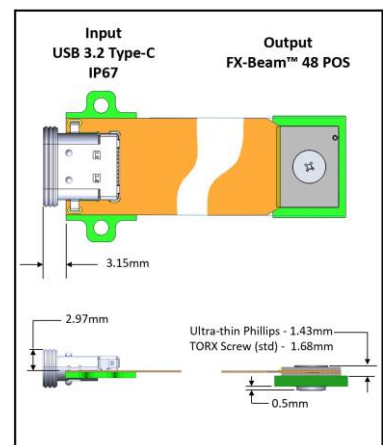
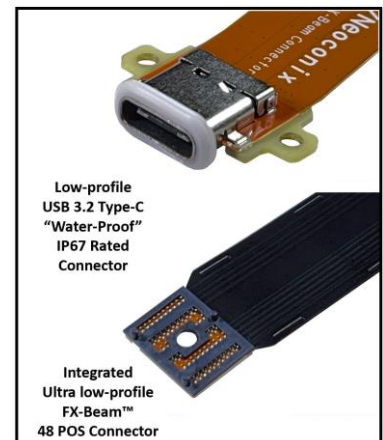
This turn-key solution is intended to simplify the implementation of USB 3.2 Type-C into new mobile platforms, while giving the designer flexibility in where the USB 3.2 connections physically terminate on the board. The U31C product series is part of the Neoconix FPCConnected family of products.

FEATURES

- Includes USB 3.2 Type-C Receptacle + High Speed, High Power FPC + Low Profile X-Beam Connector
- USB 3.2 Speed: up to 10 Gbps
- High Current: up to 5 Amps
- Redundancy in PWR/GND: 15 each
- Impedance: $85 \pm 9 \Omega$
- Highly Reliable, Screw-Down Connection to Mainboard
- Multiple Length Options from 50mm to 120mm
- Low Profile Mainboard Connection: 1.17mm
- Small Footprint to Mainboard: 11.25 x 7.48mm

STANDARD PRODUCT FAMILY

Kit Part Number	Description	FPC Length (mm)
U31CA-FX048F050MA	USB 3.2 Type-C IP67 Rated Jumper	50

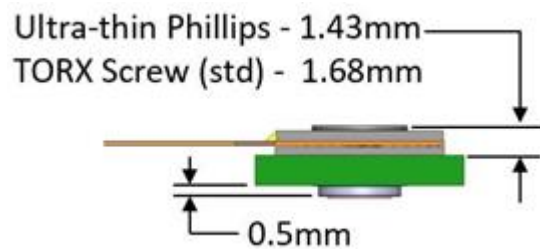


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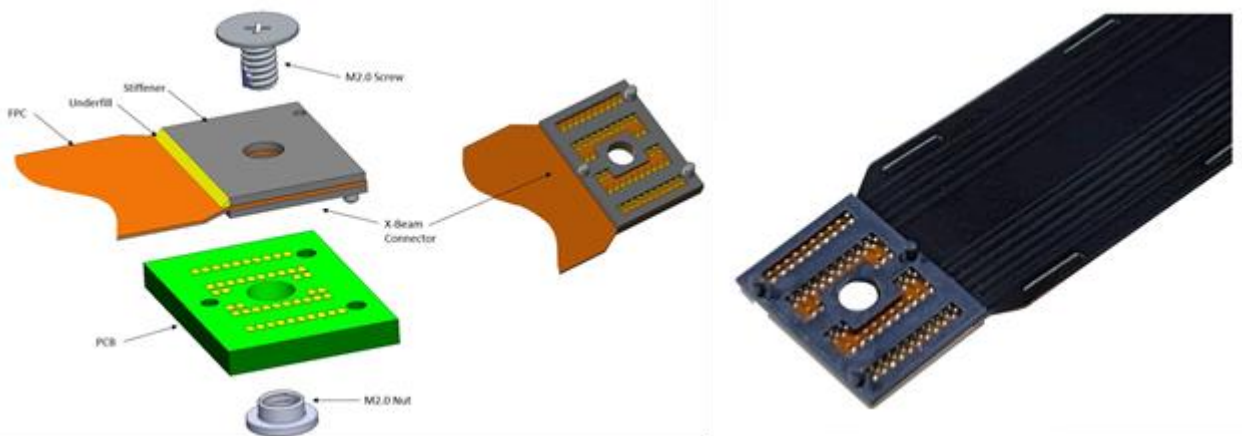
Screw & Nut Hardware

PCB Thickness (mm)	Description	Screw Head Thickness (mm)	Screw Head Type ⁽¹⁾	Screw Part Number ⁽²⁾	SMT Nut Part Number
2.6-4.0	M2x0.40mm pitch, 5mm Screw Length	0.25	#0 Phillips	B01-000659	B01-000654
		0.50	Torx T5	B01-000802	
1.6-2.6	M2x0.40mm pitch, 4mm Screw Length	0.25	#0 Phillips	B01-000660	
		0.50	Torx T5	B01-000801	
1.0-1.6	M2x0.40mm pitch, 3mm Screw Length	0.25	#0 Phillips	B01-000661	
		0.50	Torx T5	B01-000800	
0.6-1.0	M2x0.25mm pitch, 2mm Screw Length	0.25	#0 Phillips	B01-000662	B01-000633
		0.50	Torx T5	B01-000799	

- TORX T5 is standard offering, consult Neoconix on ultra-low profile Phillips availability


X-BEAM™ TECHNOLOGY BACKGROUND:

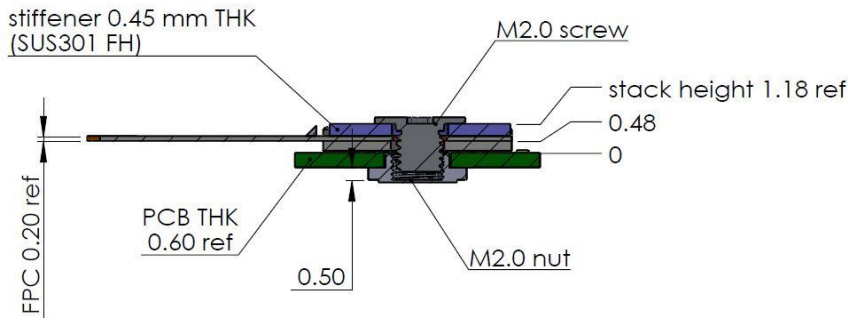
The **X-Beam Connector** integrates the historically proven Neoconix micro-spring design into an over-molded thermoplastic carrier allowing superior electrical performance coupled with ease of assembly in a 1.0-1.2mm total mated height. The ultra low profile design provides excellent signal integrity at USB 3.2 maximum data rates of up to 10Gbps. Highly redundant power and ground contacts (15-positions each) easily handle the USB 3.2 maximum current of 5A, while offering the inherent reliability benefit that redundancy offers.



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X-BEAM 48-POSITION CONNECTOR FEATURES

- Ultra-low profile
- One-step, high reliability screw assembly
- High speed signal contacts to 10Gbps
- Pick & place compatible (SMT nut)
- Compliant with ROHS 2011/65/EU and IPC-4101B (halogen-free)



U31C PRODUCT SPECIFICATIONS

MECHANICAL:

ITEM	DESCRIPTION	REQUIREMENT	COMMENT
M1	USB Connector	Meet "USB type C cable & connector specification"	
M2	X-Beam Compression Force	30 +/-10g normal force per contact	
M3	Recommended X-Beam Screw Torque	0.5~0.8 kg-cm	M2.0 screw
M4	X-Beam Durability Cycles	50	
M5	FPC Pull Force from X-Beam Interposer	2.5 kgf	Along FPC direction

DC ELECTRICAL:

ITEM	DESCRIPTION	REQUIREMENT	COMMENT
DE1	Resistance Per Position (LLCR)	40 mOhm (USB connector) + 50 mOhm (per 10mm FPC length) + 30 mOhm (X-Beam interposer)	
DE2	Resistance variance (ΔR after test)	< 30 mOhm	USB connector + FPC + X-Beam interposer
DE3	Current Rating Capability	5A power + 5A Ground (less than 30C temp rise)	
DE4	Insulation Resistance	>100 MOhm	
DE5	Dielectric Withstanding Voltage	100 V	

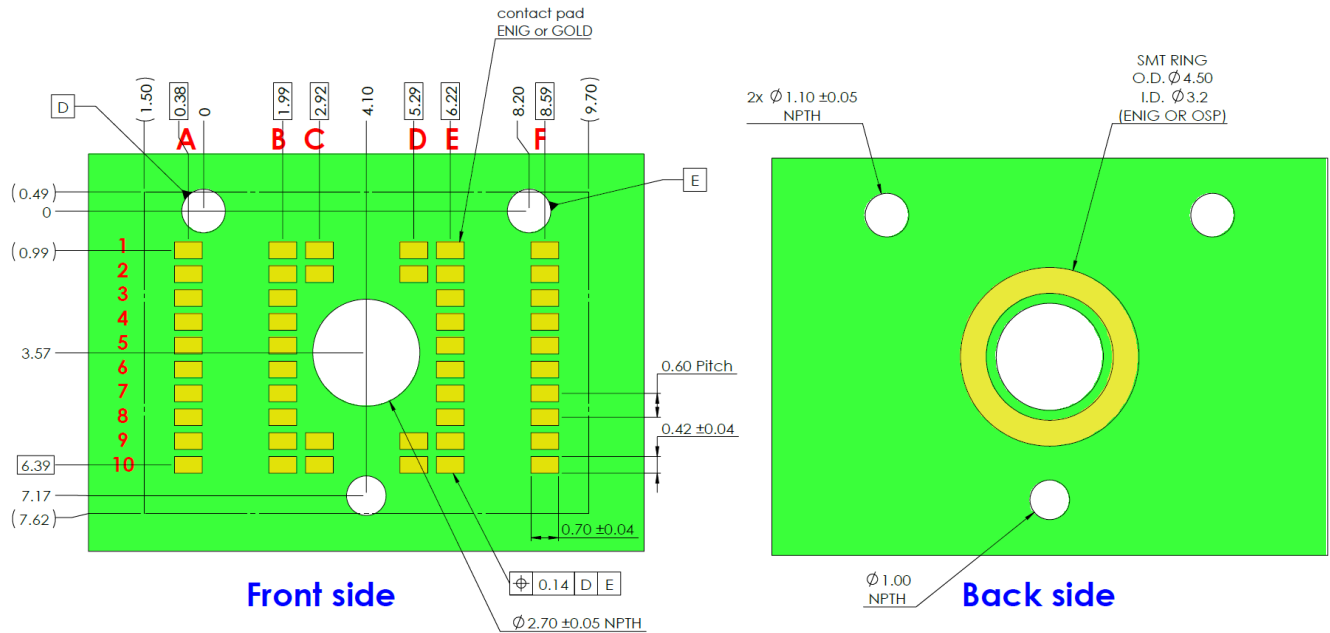
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ENVIRONMENTAL:

ITEM	DESCRIPTION	REQUIREMENT	COMMENT
EN1	Operating Temperature	-40C to 85C	
EN2	Storage Temperature	-40C to 85C	
EN3	Temperature life	105C x 96 hours	Per EIA364-1000, Table 8
EN4	Cyclic Temperature & Humidity	Thermal cycles between 25+/-3°C @ 80% RH & 65+/-3°C @ 50% RH, Ramp times 0.5 hrs & dwell times 1 hr (24 cycles)	EIA 364-31 Specimens shall be mated during test,
EN5	Salt Spray	48hrs, 5% mist	< 30 mOhmΔ,
EN6	Vibration	<30 mOhmΔ No signal discontinuities of more than 1 u-sec during the test.	Duration: 10 minutes per axis for all 3 axes. Frequency Range: 5~500 Hz. 5 to 20Hz (slope): (0.01g ² /Hz) @ 5Hz, (0.02g ² /Hz) @ 20Hz; 20 to 500Hz (flat): Input acceleration is 3.13 g RMS

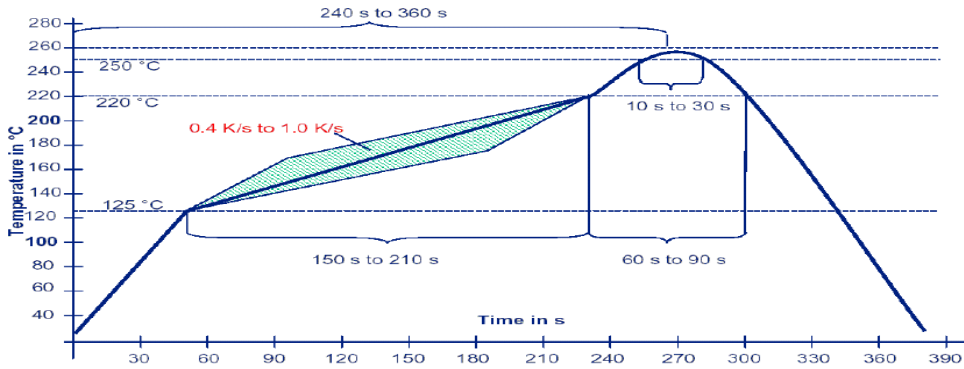
MATERIALS:

ITEM	DESCRIPTION	REQUIREMENT	COMMENT
MA1	Plastic housing	LCP, UL94 v-0	
MA2	Contact Elements	Hi performance copper alloy	
MA3	Contact Plating	Min 5 μ" hard Au over Ni	
MA4	USB metal shield	Stainless steel + nickel plating	
MA5	FPC	PI + adhesive + cu	
MA6	RoHS	ROHS Compliant per 2011/65/EU	
MA7	Halogen-Free	Compliant per IPC-4101B	
MA8	Package	Plastic trays for FPCA T&R for Nut	

APPLICATION NOTES:
A1, PCB footprint (X-Beam Interface):

A2, PCB Pin Assignments:

	A	B	C	D	E	F
1	GND	GND	GND	GND	GND	GND
2	SBU2	VBUS	VBUS	VBUS	VBUS	CC2
3	GND	VBUS			VBUS	GND
4	TX1-	VBUS			VBUS	RX2-
5	TX1+	VBUS			VBUS	RX2+
6	GND	GND			GND	GND
7	RX1-	GND			GND	TX2-
8	RX1+	CC1			SBU1	TX2+
9	GND	GND	VBUS	D+	GND	GND
10	SHIELD	GND	VBUS	D-	GND	SHIELD

PCB pin assignment

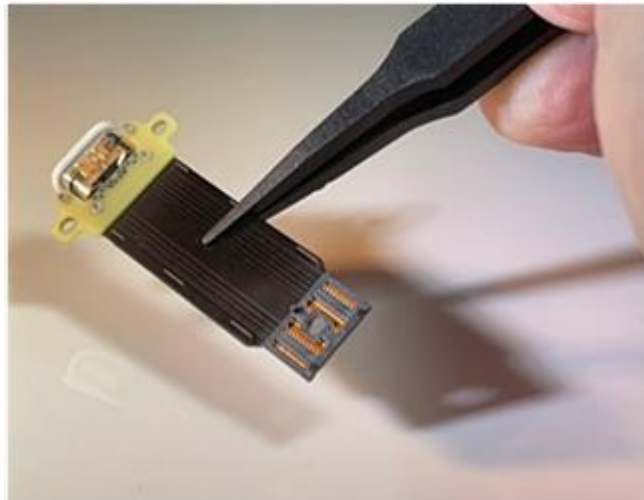
A3, Recommend SMT Nut Reflow Profile:
Reflow profile for MSL testing (260°C)


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
Peaktime	10 s to 30 s (≥ 250 °C)
Cooling rate	≤ 6 K/s
Time from 25 °C to peak	240 s to 360 s

A4, Recommended Assembly Guideline:
1. Typical Tray Packaging

2. Top Tray Removed

3. Foam Retainers Removed

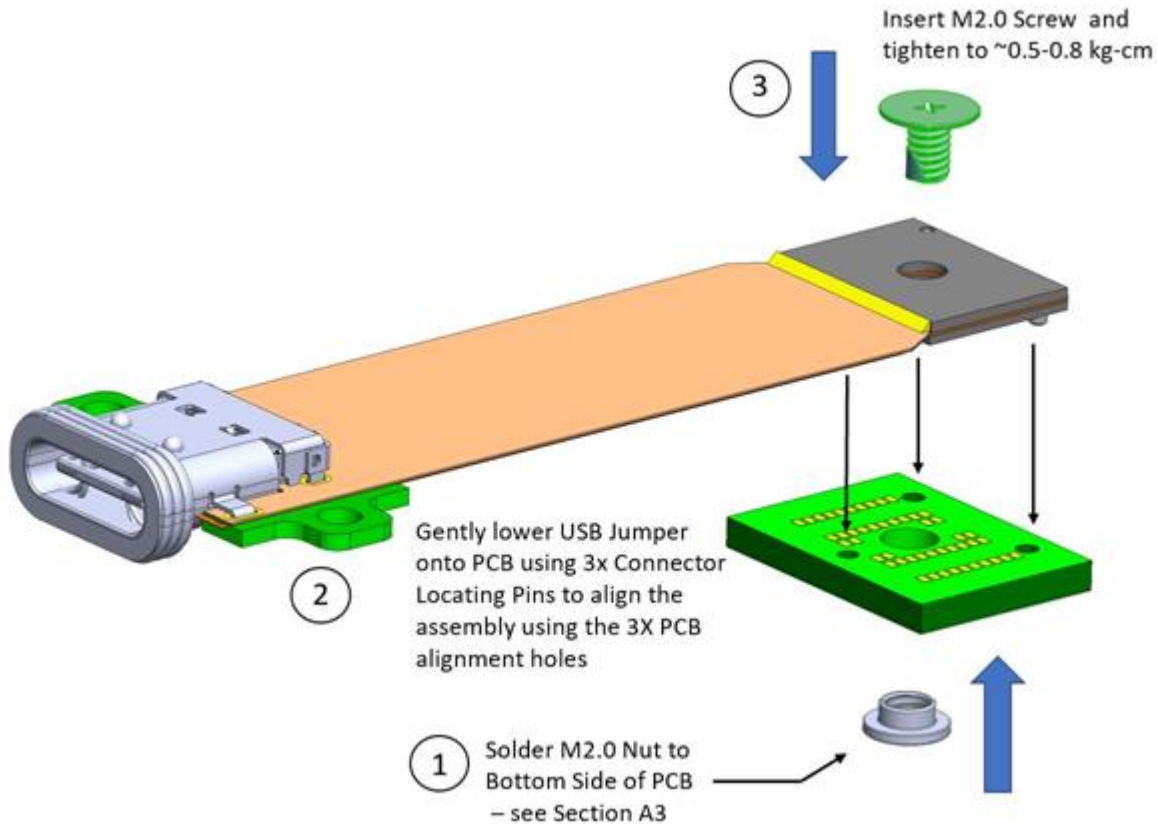
4. Removal of USB Jumper Assembly

A. Carefully remove USB Jumper Assembly from Tray packaging

– recommend plastic tweezer tool or similar.

Take care not to touch any contacts on the 48 POS X-Beam™ Connector at the end of the Jumper Assembly.

B. See Figure A for Assembly Sequence

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Figure A


A5, Handling Guidelines

- The use of latex gloves is recommended when handling connectors. 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.
- Connector cleaning is not needed if the product is kept in original packaging. When necessary, cleaning can be employed with the use of compressed air. Cleaning can also be performed with an ultrasonic bath of isopropyl alcohol (IPA). A 5 minute soak should 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.

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<http://www.unimicron.com/en/product26.htm>
Connector@sz.unimicron.com

REVISION HISTORY

Rev A	12/1/2015	Rev A Release
Rev B	06/21/2021	Mount X-Beam connector on end of flex cable and specify IP67 rating on USB connector

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