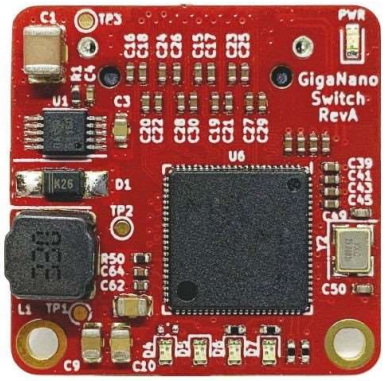
GigaBlox Nano

Tiny 4-port 10/100/1000Mbps Ethernet Switch

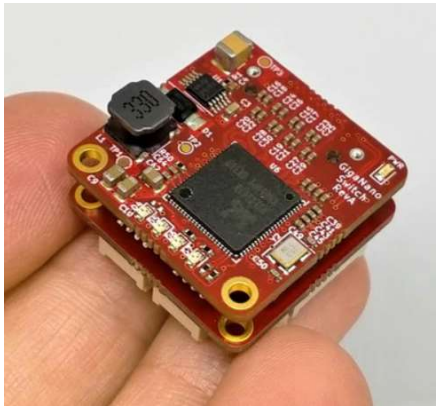


DESCRIPTION

The Amphenol GigaBlox Nano is a tiny form factor 4 port 10/100/1000Mbps (10BASE-T/100BASE-TX/1000BASE-T) layer 2 unmanaged ethernet switch. It has a non-blocking fabric, meaning that 1000Mbps speed can be achieved simultaneously on all ports. GigaBlox Nano is a modular, stackable board which places 4 Ethernet ports onto a Samtec Razor Beam to allow direct integration into any daughterboard design.

FEATURES

- 4 x 10/100/1000M (10/100/1000BASE-T) non-blocking ethernet ports
- Input voltage range from 5.1V to 60V
- -20°C to 80°C Operation Range
- 26 mm x 26 mm board size
- Samtec Razor Beam for power and ports
- Automatic MDI-X crossover
- Auto-negotiation with connected devices
- Unmanaged (out-the-box) functionality



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HOW TO ORDER

Part Number	CF-02BBGGN	GigaBlox Nano

GENERAL SPECIFICATIONS

Voltage Input	5V to 60V DC (65V absolute max)
Supported Protocols	10Base-T, 100Base-TX,1000BASE-T
Power Consumption	260mW idle, 900mW at full switching
Weight	18 grams (without daughterboard)
Size	26mm x 26mm x 8mm
Operating Temperature	-20°C to +80°C
Storage Temperature	-40°C to +120°C

GENERAL OPERATING INSTRUCTIONS

The Amphenol GigaBlox Rugged is designed for use in harsh environments, operating from a nominal supply voltage of 24V, but with the ability to operate from as low as 5V and as high as 60V.

In the simplest case of an unmanaged switch application, GigaBlox Rugged can be operated immediately by following the following steps.

1) Apply a voltage between 5V to 60V to the voltage input terminals.

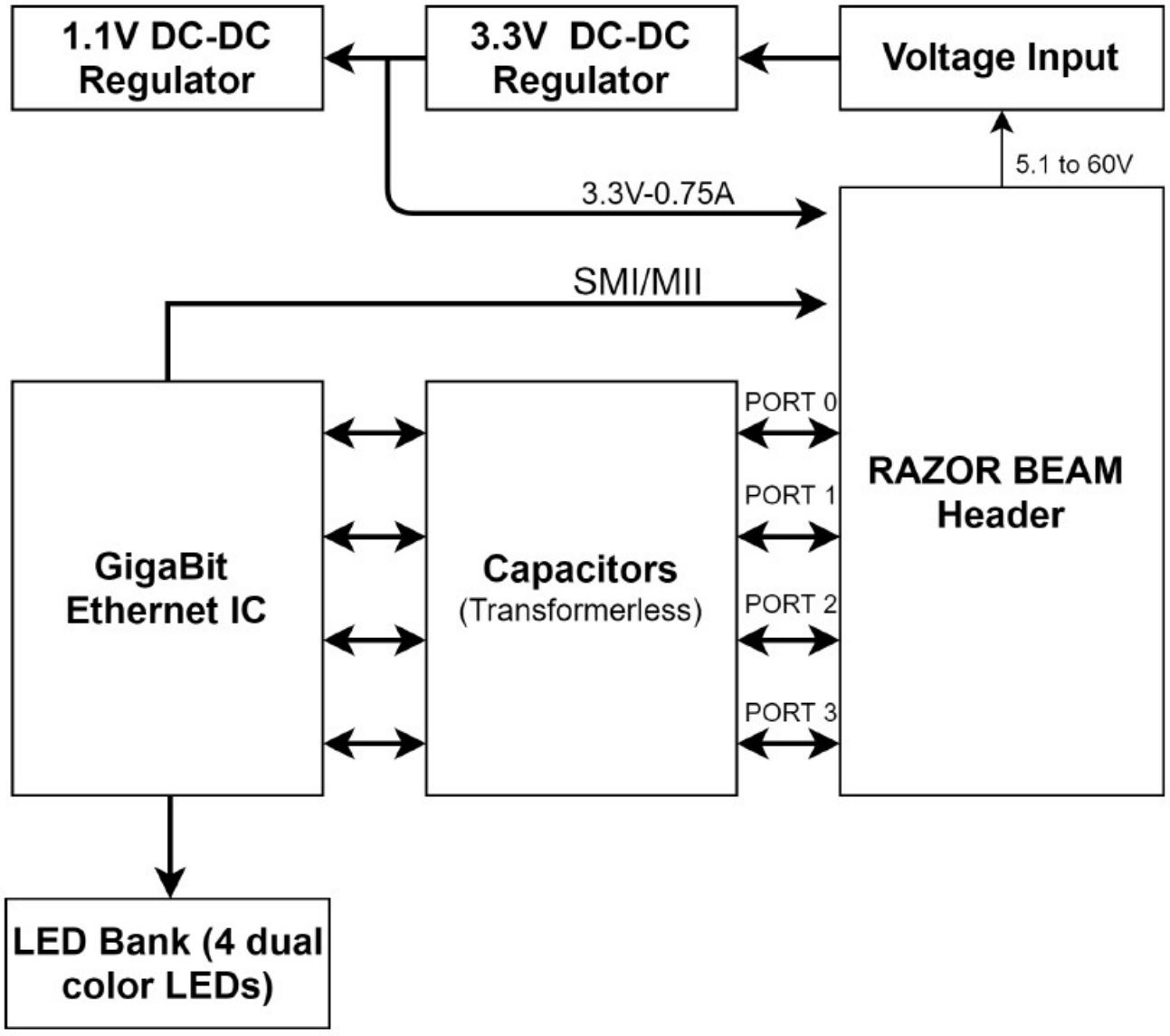
2) Connect external devices to the ethernet ports using RJ45 to Picoblade cables.

3) GigaBlox Rugged will automatically begin auto negotiation with connected devices and begin receiving and forwarding packets to/from all connected devices.

SAFETY INFORMATION

- This device can operate on voltages near and above 60V. Please read this manual before operating.
- This device is provided “as is”. In-application testing prior to integration is recommended.
- This device is provided as an electronic circuit board, and requires integration into chassis for full ingress protection.
- Do not use this product in wet environments without integrating into a chassis.
- Do not operate this product beyond the rated temperature and voltages.

BLOCK DIAGRAM



INCLUDED EQUIPMENT

1 x GigaBlox Nano board

RoHS Certification of Compliance

The Amphenol GigaBlox Nano complies with the RoHS (Restriction of Hazardous Substances Directive) Certificate of Compliance.

HARDWARE INTERFACE

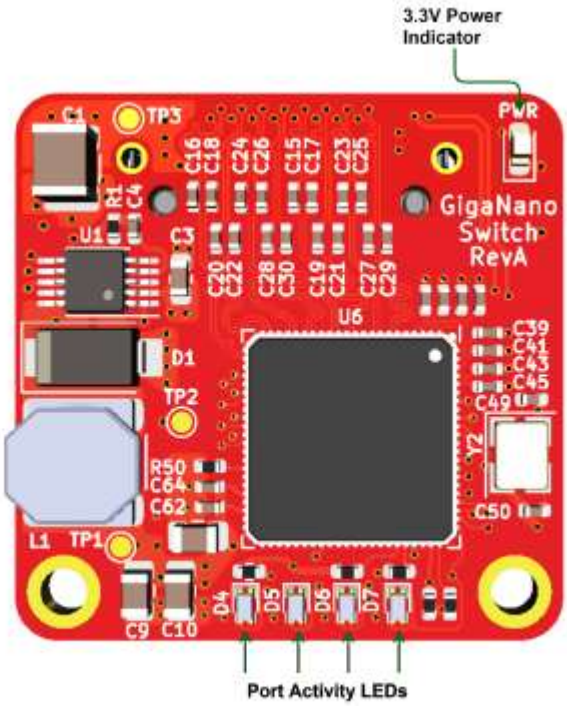


Figure 2: GigaBlox Nano Board Map (front)

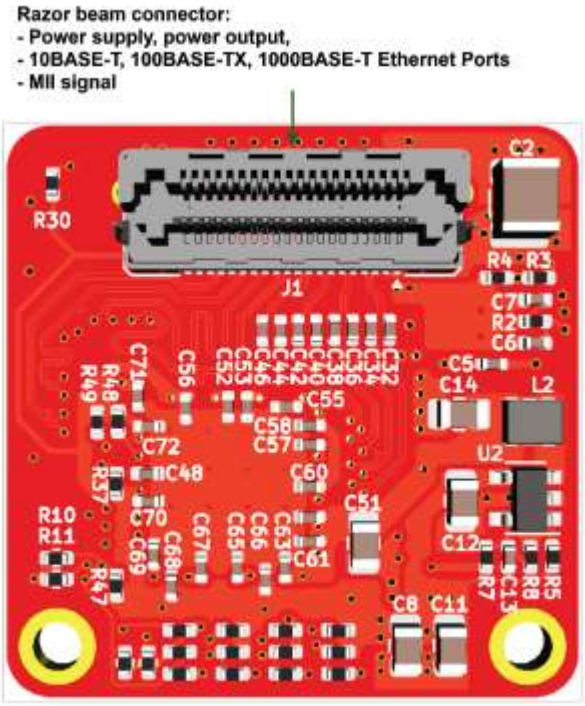


Figure 3: GigaBlox Nano Board Map (back)

CONNECTORS AND PINOUTS

The 4 ports, input voltage and output voltage are placed onto a Samtec Razor Beam™ (MPN: LSHM-120-02.5-L-DV-A-S-K-TR) stackable header. The Razor Beam connector on the GigaBlox Nano Board is shown in figure 4 below.

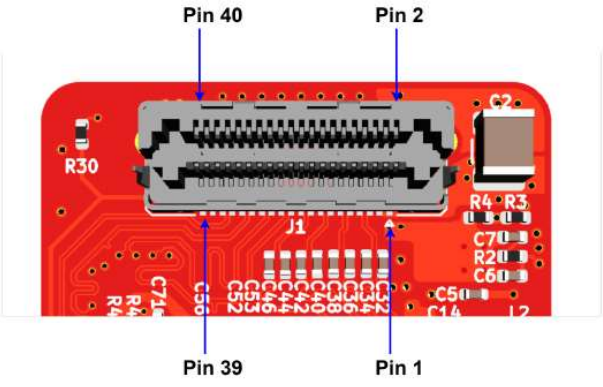


Figure 4: Razor Beam connector

The Razor Beam connector is a hermaphroditic (genderless) connector, meaning the same part is required on the daughterboard for mating. The mating method is shown in figure 5 below.

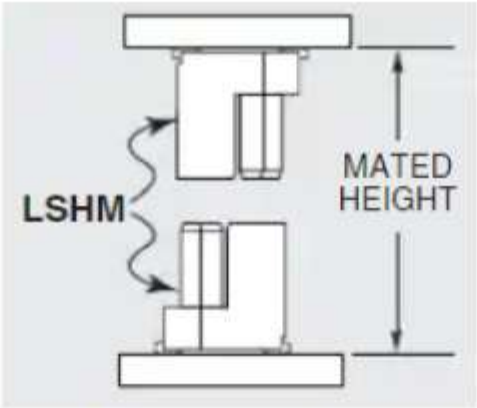


Figure 5: Razor Beam connector self-mating

Connector Part Numbers

Connector on board	Mating header
LSHM-120-02.5-L-DV-A-S-K-TR	LSHM-120-02.5-L-DV-A-S-K-TR

Pin Mapping

The pin mapping between two mated LSHM-120-02.5-L-DV-A-S-K-TR Razor Beam connectors is shown in table 2 below.

Connector A Pin	Connector B Pin	Connector A Pin	Connector B Pin	Connector A Pin	Connector B Pin
1	2	15	16	29	30
2	1	16	15	30	29
3	4	17	18	31	32
4	3	18	17	32	31
5	6	19	20	33	34
6	5	20	19	34	33
7	8	21	22	35	36
8	7	22	21	36	35
9	10	23	24	37	38
10	9	24	23	38	37
11	12	25	26	39	40
12	11	26	25	40	39
13	14	27	28		
14	13	28	27		

Table 2: Pin matching for mating connector

The signal to pin assignments used on GigaBlox Nano is detailed in table 3 below.

Pin name	Pin number	Description
VBUS	1	Input supply voltage, 5.1V to 60V
VBUS	3	Input supply voltage, 5.1V to 60V
+3V3	39	Output 3.3V, maximum 0.75A
GND	2	Ground
GND	4	Ground
GND	40	Ground
P0_A_P	35	Port 0 Media Dependent Interface A~D. For 1000Base-T operation, differential data from the media is transmitted and received on all four pairs. For 100Base-TX and 10Base-T operation, only MDIAP/N and MDIBP/N are used. Auto MDIX can reverse the pairs MDIAP/N and MDIBP/N. Each of the differential pairs has an internal 100-ohm termination resistor
P0_A_N	33	
P0_B_P	31	
P0_B_N	29	
P0_C_P	27	
P0_C_N	25	
P0_D_P	23	
P0_D_N	21	
P1_A_P	36	Port 1 Media Dependent Interface A~D. For 1000Base-T operation, differential data from the media is transmitted and received on all four pairs. For 100Base-TX and 10Base-T operation, only MDIAP/N and MDIBP/N are used. Auto MDIX can reverse the pairs MDIAP/N and MDIBP/N. Each of the differential pairs has an internal 100-ohm termination resistor
P1_A_N	34	
P1_B_P	32	
P1_B_N	30	
P1_C_P	28	
P1_C_N	26	
P1_D_P	24	
P1_D_N	22	
P2_A_P	20	Port 2 Media Dependent Interface A~D.

P2_A_N	18	For 1000Base-T operation, differential data from the media is transmitted and received on all four pairs. For 100Base-TX and 10Base-T operation, only MDIAP/N and MDIBP/N are used. Auto MDIX can reverse the pairs MDIAP/N and MDIBP/N. Each of the differential pairs has an internal 100-ohm termination resistor
P2_B_P	16	
P2_B_N	14	
P2_C_P	12	
P2_C_N	10	
P2_D_P	8	
P2_D_N	6	
P3_A_P	19	Port 3 Media Dependent Interface A~D. For 1000Base-T operation, differential data from the media is transmitted and received on all four pairs. For 100Base-TX and 10Base-T operation, only MDIAP/N and MDIBP/N are used. Auto MDIX can reverse the pairs MDIAP/N and MDIBP/N. Each of the differential pairs has an internal 100-ohm termination resistor
P3_A_N	17	
P3_B_P	15	
P3_B_N	13	
P3_C_P	11	
P3_C_N	9	
P3_D_P	7	
P3_D_N	5	
SDA/MDIO	37	EEPROM SMI Interface Data/MII Management Interface (MMD) Data
SCK/MDC	38	EEPROM SMI Interface Clock/MII Management Interface (MMD) Clock

Table 3: GigaBlox Nano connector pin assignments

Daughterboard and Reference Design

Amphenol provides two Daughterboards for use with GigaBlox Nano, the RJConn and the PicoConn.

Daughterboard: PicoConn

GigaBlox Nano PicoConn is a simple breakout board for GigaBlox Nano that routs the 4 ports

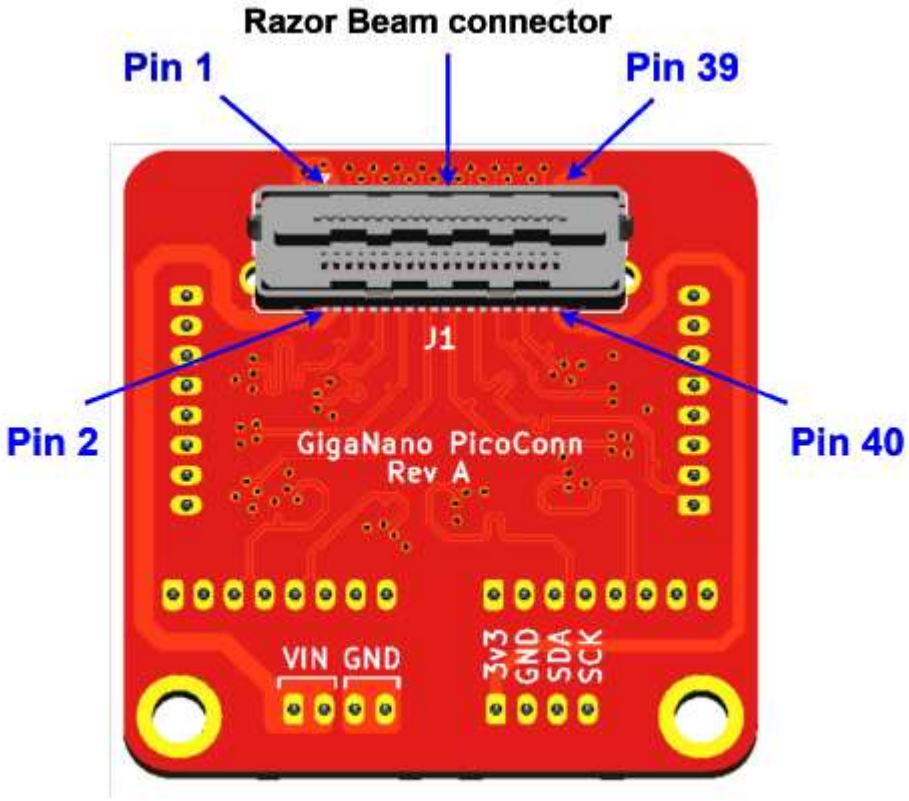


Figure 6: GigaBlox Nano PicoConn Board Map (front)

The mapping used on the connectors is shown below in figures 7 and 8

Figure 7: Mapping of ethernet signals onto PicoBlade connectors.

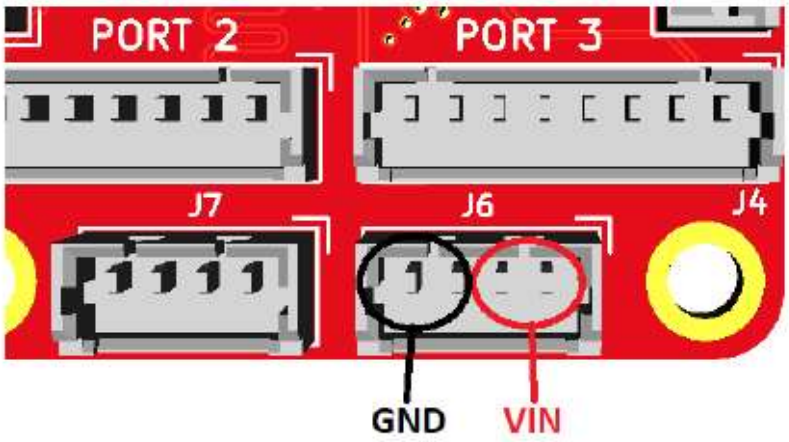


Figure 8: Locations of power and ground onto PicoBlade connectors for the PicoConn board.

Be careful! RJConn uses J7 for power connections, while PicoConn uses J6 for power connections. Plugging power into the wrong connector will break the GigaBlox Nano.

Daughterboard: RJConn

GigaBlox Nano RJConn puts the 4 ports onto traditional RJ-45 mag-jacks allowing use in systems with traditional RJ-45 cables.

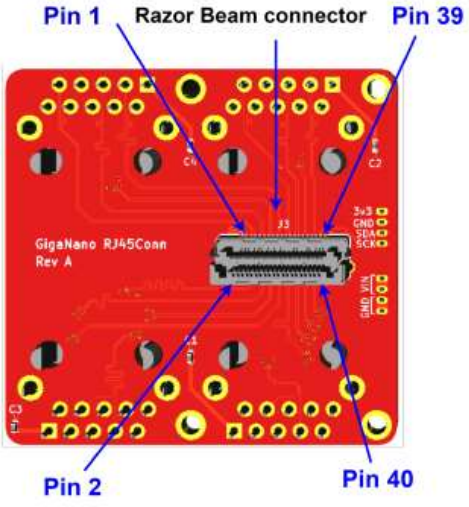


Figure 9: GigaBlox Nano RJConn *Board Map (front)*

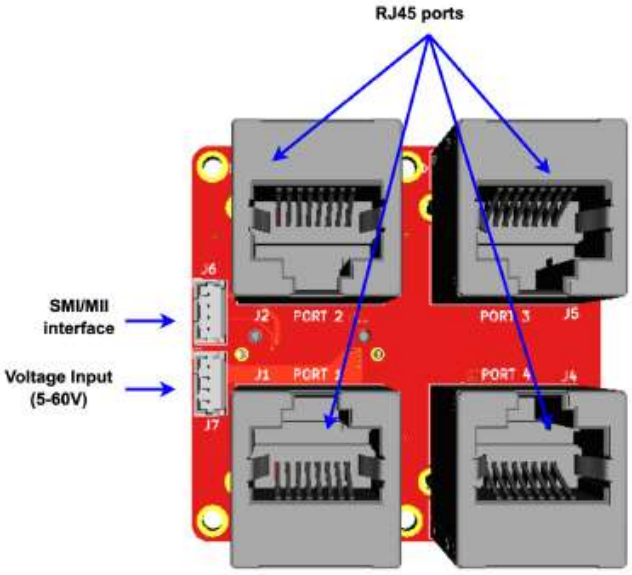


Figure 10: GigaBlox Nano RJConn *Board Map (back)*

Reference Design

Reference design for the Razor Board connector on daughterboards. Figure 12 below shows the correct signal mapping to use on any daughterboard for GigaBlox Nano.

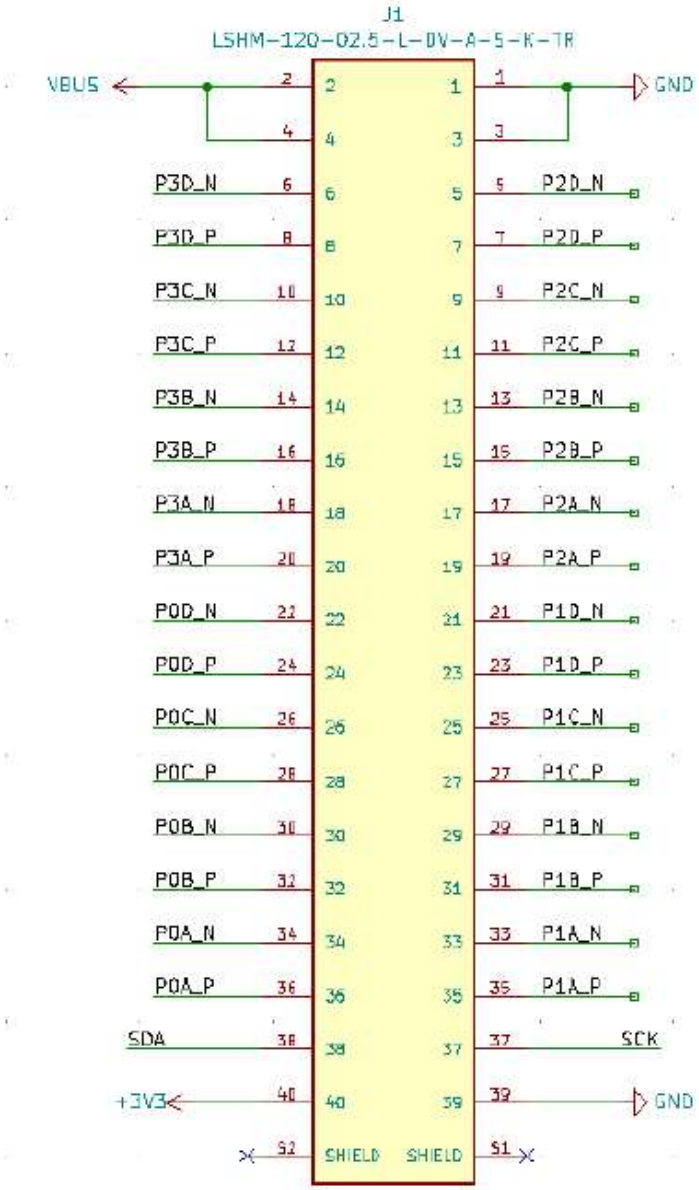


Figure 11: RAZOR BEAM connector on Daughterboards

OTHER NOTES

LEDs

There are 5 LEDs on GigaBlox Nano in total. None of the LED signals can be taken off board.

The 3V3 Power Indicator LED (**Green**) indicates that voltage is present on the 3V3 line. It should be solid green in normal operation.

Each Port Activity LED (**Red**/**Green**) corresponds to a specific port. They indicate activity on each port and will blink when there is traffic on a port. The color of the LED indicates the link speed, with **Red** meaning 10/100M speed, and **Green** meaning 1G speed. They should be solid off when a port is not connected to any device, and they should blink under normal operation. A solid LED indicates either constant traffic, or a fault with the port.

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