



Silicom FPGA SmartNIC N501x Series

Quad port QSFP28 100 Gigabit Ethernet PCIe Gen4 x16 Intel® Stratix® 10DX FPGA Based

Product Description

The FB4CG@S10D21 FPGA SmartNIC N501x Series is a high-performance programmable PCIe Server adapter-based Intel/PSG Stratix DX210 FPGA. This data sheet describes the Intel FPGA Programmable Acceleration Card featuring the Intel® Stratix® 10DX FPGA. This document provides electrical, mechanical thermal specification. The FB4CG@S10D21 FPGA SmartNIC is targeted to for market-specific acceleration in application such as:



- Network Function Virtualization (NFV)
- Multi-Access Edge Computing (MEX)
- Cyber security
- High-Performance Computing
- Finance
- Mobile network



- Silicom FPGA SmartNIC N5010 base unit 100 Gigabit Ethernet, PCIe Gen4
- Silicom FPGA SmartNIC N5011 base unit plus two Intel E810-CAM1 NIC devices
- Silicom FPGA SmartNIC N5012 base unit plus dual host capability with additional PCIe Gen4 x16 port

Key Features

Host Interface:

- Physical bus connector: x16, 4.0

Intel Network Controller E810-CAM1:

- NIC provides a hardware compatible interface with Linux drivers
- Support Data Plane Development Toolkit (DPDK)

Network Interface:

- IEEE standard: IEEE 802.3 100GbE
- Physical interface: (4) QSFP28
- Multimode SR4 (850nm), Single Mode LR4 (1310nm) or Direct Attached Copper (Twinax)
- Support Sync-E/ 1588 standard (optional feature depending on FPGA image)

Configuration:

- Upload of FPGA configuration to flash via PCIe – with supported image and tool.

On Board Memory:

- DDR4/ 32GByte+ECC (x18 devices)
- HBM / 8GBytes

Board Management:

- Voltage level monitoring
- Thermal shut-down protection
- Over current protection on 12V input

Technical Specifications

General Technical Specifications Adapters:	
Interface Standard:	PCI-Express Base Specification Revision 4.0 (16 GTs)
PCIe Form Factor:	Full height, Full length, Single Slot Active Full height, ¾ length, Dual Slot Passive
PCI Express Card Type:	x16G4, mechanical Note: Can be plug only in PCIe slot of x16
PCI Express Voltage:	+12V ± 8%
On Board Connector Voltage	+12V ± 8%, On board auxiliary power connector to support power over 75W
FPGA:	Intel S10DX Stratix 10 DX HBM2 1SD21BPT2F53E2VG
Network Controller:	(2) Intel E810-CAM1
Network Ports:	(4) x QSFP28 supports: 100G-SR4, 100G-LR4, 100G-Cu (Direct Attached)
Memory:	32GB on board – (2) banks of 16GByte + ECC. Total 32 GByte with ECC, (ping pong is not needed) HBM: 8GByte (2x4 GByte, internal)
Holder:	Metal Bracket
Backplate:	Yes
Target Maximum Power	225W: 75W max from the 12V PCIe Slot 150W max from the PCIe 12Vaux power
FAN: MTTF @50C (Active)	MTTF: 246,963 (HRS) L10: 35,280 (HRs)
Thermal Design:	– Active heat sink, targeted to single socket – Passive heat sink targeted to dual slot – Built-in thermal protection – Passive HS for single slot power limited
Sensors:	– Temperature, FPGA and environment. – Power – Fan speed (Active heat sink sku)
Storage:	-40°C–65°C (-40°F–149°F)
Regulation:	FCC/ CE /, FCC Class A, UL, ROHS
Ports LEDs	(4) Link/ ACT per QSFP28

LEDs	(4) Green on link – (1) status: Red – Power fail, Green – Status OK, Yellow FPGA – Config not done
Dual slot Operating Temperature:	0°C – 45°C (32°F – 113°F), Dual slot Passive heat sink
Dual Maximum Power consumption:	200W
Single Operating Temperature:	0°C – 45°C (32°F – 113°F), Single slot Passive heat sink
Single Maximum Power consumption:	150W

Order Information

P/N	Description	Notes:	Intel name
FB4CG@S10D21-D00P0	Programmable PCI Express Server Adapter Based on Intel FPGA S10DX21	PCIe x16 Gen 4, 4x QSFP28, S10DX21, HBM 8GB Without TimeSync D: 144MbitQDRIV (iTemp/933Mhz) +DDR4 2x16GBDDR4 (32GB) 0: (0) E810-CAM1 0: ¾ Length, 10", No I-pex connectors. P: Passive heat sink, dual slot 0: No SMA	N5010
FB4CG@S10D21-D20P0	Programmable PCI Express Server Adapter Based on Intel FPGA S10DX21	PCIe x16 Gen 4, 4x QSFP28, S10DX21, HBM 8GB Without TimeSync D: 144MbitQDRIV (iTemp/933Mhz) +DDR4 2x16GBDDR4 (32GB) 2: (2) E810-CAM1 0: ¾ Length, 10", No I-pex connectors. P: Passive heat sink, dual slot 0: No SMA	N5011
FB4CG@S10D21-D01P0	Programmable PCI Express Server Adapter Based on Intel FPGA S10DX21	PCIe x16 Gen 4, 4x QSFP28, S10DX21, HBM 16GB Without TimeSync D: 144MbitQDRIV (iTemp/933Mhz) +DDR4 2x16GBDDR4 (32GB) 0: (0) E810-CAM1 1: Full Length, w/ I-Pex connectors (2xPCIE) P: Passive heat sink, dual slot 0: No SMA	N5012