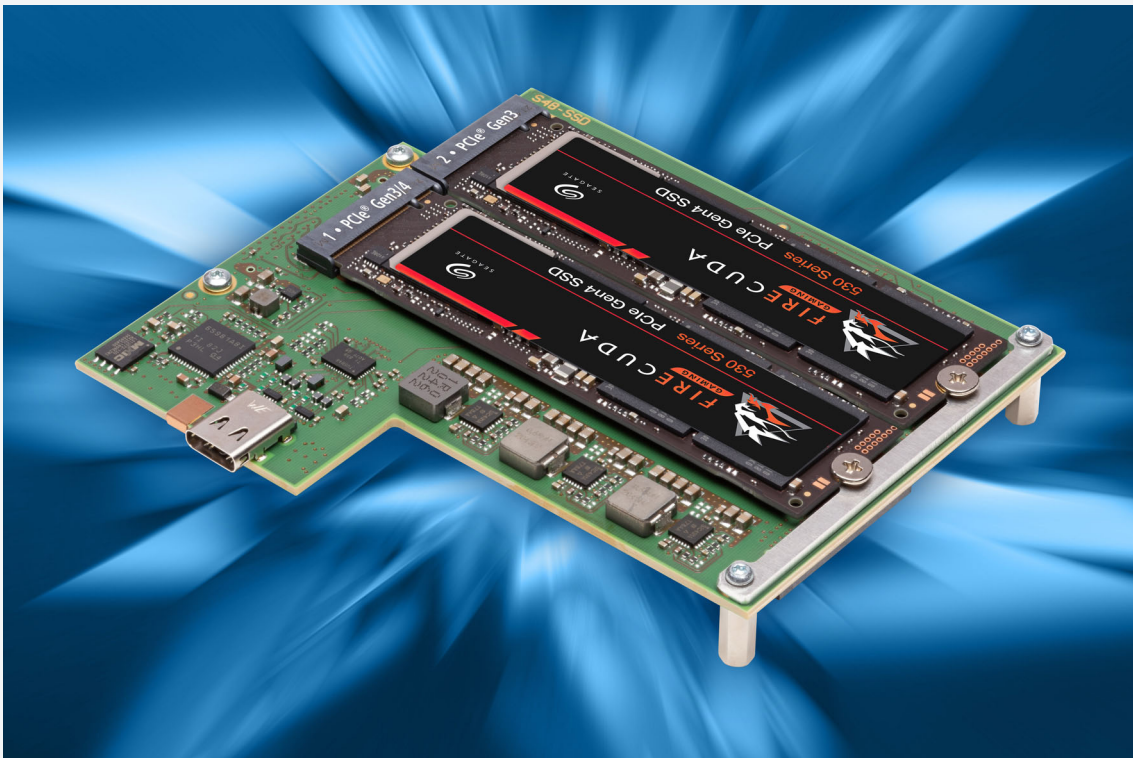




Product Information

S48-SSD

Low Profile Mezzanine Module
Dual NVMe® SSD Storage • PCI Express® up to Gen4



Overview

Available as a mezzanine add-on expansion board e.g. to several CompactPCI® Serial and CompactPCI® PlusIO CPU carrier cards, the S48-SSD provides a mass storage solution, by means of one or two M.2 NVMe SSD modules.

For optimum throughput both M.2 sockets can be populated with PCIe® x4 NVMe type SSDs. The S48-SSD accommodates M.2 modules of variable size, starting at 22mm x 30mm (2230) up to 22mm x 80mm (2280), fixed by screw lock.

As an option, the S48-SSD is available with a Type-C front panel connector, suitable also for the DisplayPort alternate mode.

The S48-SSD connects to the mezzanine expansion connectors HSE1 and HSE2 of the CPU carrier board, maintaining the 4HP (20.32mm) total assembly.

Latest EKF CPU boards establish a PCIe® Gen4 link via HSE1. The associated M.2 socket therefore can be used for a Gen4 SSD.



SC9-TOCCATA w. S48-SSD

Feature Summary

Form Factor

- ▶ Low profile mezzanine module for recent EKF CompactPCI® Serial and CompactPCI® PlusIO CPU boards
- ▶ Proprietary size 84.3mm x 95mm
- ▶ Fits basically into the 4HP (20.3mm) envelope of the CPU carrier board
- ▶ Typically delivered as a ready to use assembly unit (including CPU card)
- ▶ Mounting position on top of a CPU board

M.2 Module Connectors

M1

- ▶ M.2 NVMe® SSD module socket, key Id M, PCIe® x4 *
- ▶ Sourced via HSE1 mezzanine connector
- ▶ Maximum (theoretical) 64Gbps I/O data transfer rate (Gen4 PCIe® 16GT/s) *
- ▶ Autosense option for SATA SSD (depends on carrier card)
- ▶ Module dimensions 2230/2242/2260/2280, screw fixed (2280 w. mounting clip)
- ▶ Module height (Label) S1-S5 D1-D4
- ▶ Module 3.3V power DC/DC regulator can be switched off/on via I2C (BIOS settings)

* Gen4 supported with latest CPU generation (SC9-TOCCATA)

M2

- ▶ M.2 NVMe SSD module socket, key Id M, PCIe® x4 *
- ▶ Sourced via HSE2 mezzanine connector
- ▶ Module dimensions 2230/2242/2260/2280, screw fixed
- ▶ Module height (Label) S1-S5 D1-D4
- ▶ Module 3.3V power DC/DC regulator can be switched off/on via I2C (BIOS settings)

* some carrier cards do not support a PCIe® x4 link width via HSE2 - x1 link only

Type-C Front Panel Connector (Option)

- ▶ Support for Type-C locking plug (dual screw)
- ▶ V_{BUS} over voltage protection
- ▶ USB 3.1 Gen 2 ready (10Gbps SuperSpeed+) for latest CPU chipset generation
- ▶ DisplayPort Alternate Mode (VESA ALT Mode)
- ▶ V_{BUS} power DC/DC regulator can be switched off via I2C (BIOS settings)

Feature Summary

Host I/F Connectors HSE1/HSE2

- ▶ High speed mezzanine connectors
- ▶ Suitable for PCI Express® Gen3/4, USB 5G/10G, DisplayPort
- ▶ Bottom mount male connectors HSE1 and HSE2 (high speed expansion)
- ▶ Mating with the carrier card female connectors HSE1/2
- ▶ Board-to-board height 10.0mm for a 4HP assembly

HSE1

- ▶ PCI Express® x4 support (wired to first M.2 socket)
- ▶ PCIe® Gen4 supported (depends on carrier card)
- ▶ USB 3.1 Gen2 10Gbps support (dedicated to the optional Type-C USB front panel connector)
- ▶ SATA supported (assigned to first M.2 socket, depends on carrier card)

HSE2

- ▶ PCI Express® x4 * support (wired to second M.2 socket)
- ▶ DisplayPort (dedicated to Type-C front panel connector configurable for alternate use)

* some carrier cards do not support a PCIe® x4 link width via HSE2 - x1 link only

Applications

- ▶ Dual M.2 based mass storage (NVMe®/PCIe®)
- ▶ Low profile mezzanine module for EKF CPU Cards
- ▶ 4HP assembly in total for CPU carrier board and S48-SSD mezzanine card
- ▶ Software RAID option
- ▶ Custom specific modifications and alternate design available on request

Feature Summary

Environment & Regulatory

- ▶ Designed & manufactured in Germany
- ▶ Certified quality management according to ISO 9001
- ▶ Long term availability
- ▶ Rugged solution
- ▶ Coating, sealing, underfilling on request
- ▶ RoHS compliant
- ▶ Operating temperature 0°C to +70°C (commercial temperature range) available
- ▶ Operating temperature -40°C to +85°C (industrial temperature range) available
- ▶ Storage temperature -40°C to +85°C, max. gradient 5°C/min
- ▶ Humidity 5% ... 95% RH non condensing
- ▶ Altitude -300m ... +3000m
- ▶ Shock 15g 0.33ms, 6g 6ms
- ▶ Vibration 1g 5-2000Hz
- ▶ MTBF 116.0 years S48-P100, 226.6 years S48-P200 (MIL-HDBK-217F, SN29500 @+40°C)
- ▶ EC Regulatory EN55035, EN55032, EN62368-1 (CE)

All items are subject to change

M.2 modules shown in this document are for reference only, and are not scope of delivery



Suitable CPU Carrier Boards

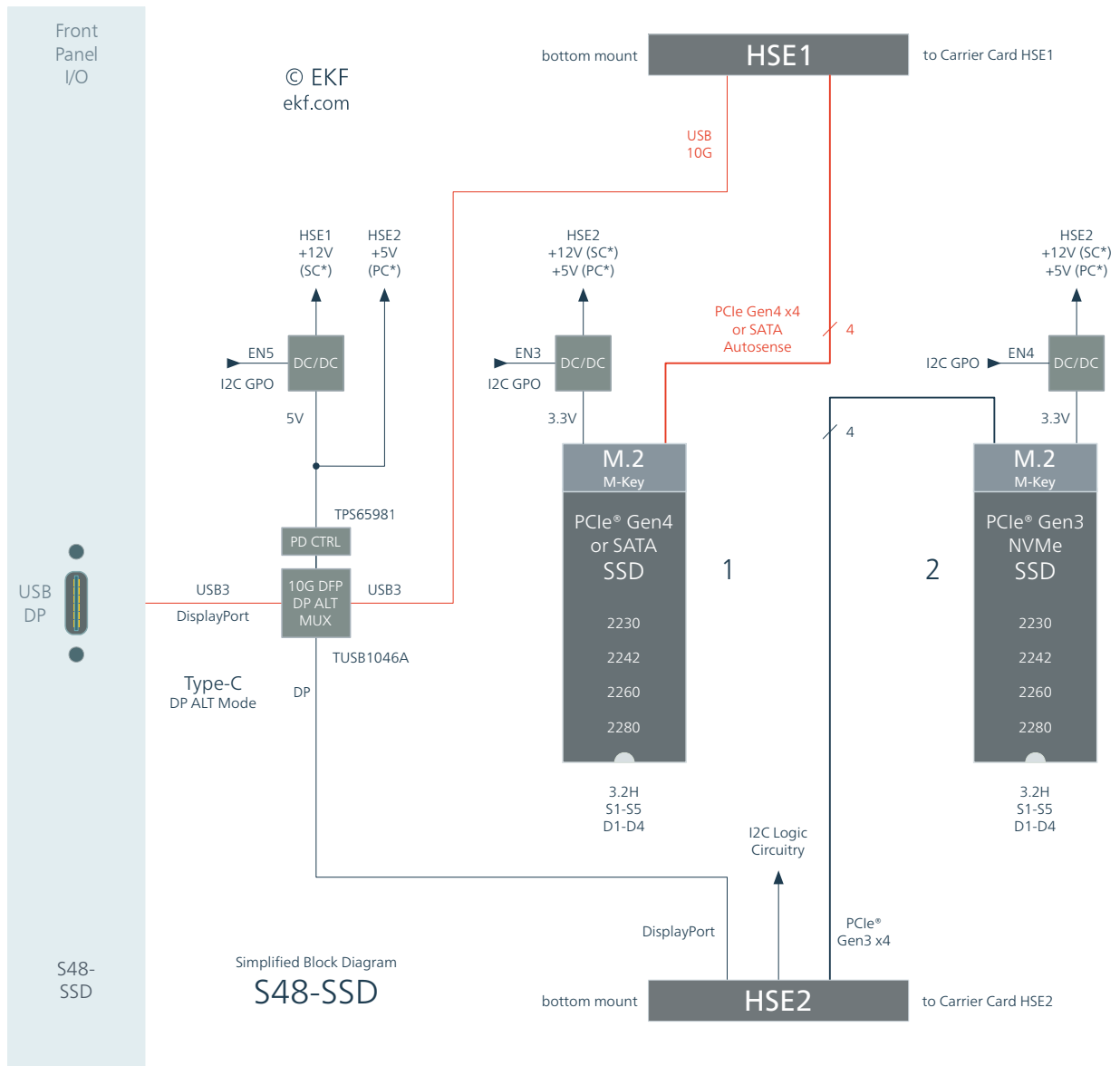
CPU	HSE1			HSE2	
	PCIe®	USB	SATA	PCIe® *	DisplayPort™
PC7-FESTIVAL	Gen3 x4	5Gbps	6G	Gen3 x4	1.2 MST
SC4-CONCERTO	Gen3 x4	5Gbps	6G	Gen3 x4	1.2 MST
SC5-FESTIVAL	Gen3 x4	5Gbps	6G	Gen3 x4	1.2 MST
SC8-FLUTE	Gen3 x4	5Gbps	-	Gen3 x1 **	-
SC9-TOCCATA	Gen4 x4	10Gbps	-	Gen3 x4	1.4a MST

* CPU card HSE2 PCIe® link must be configured accordingly to 1x4

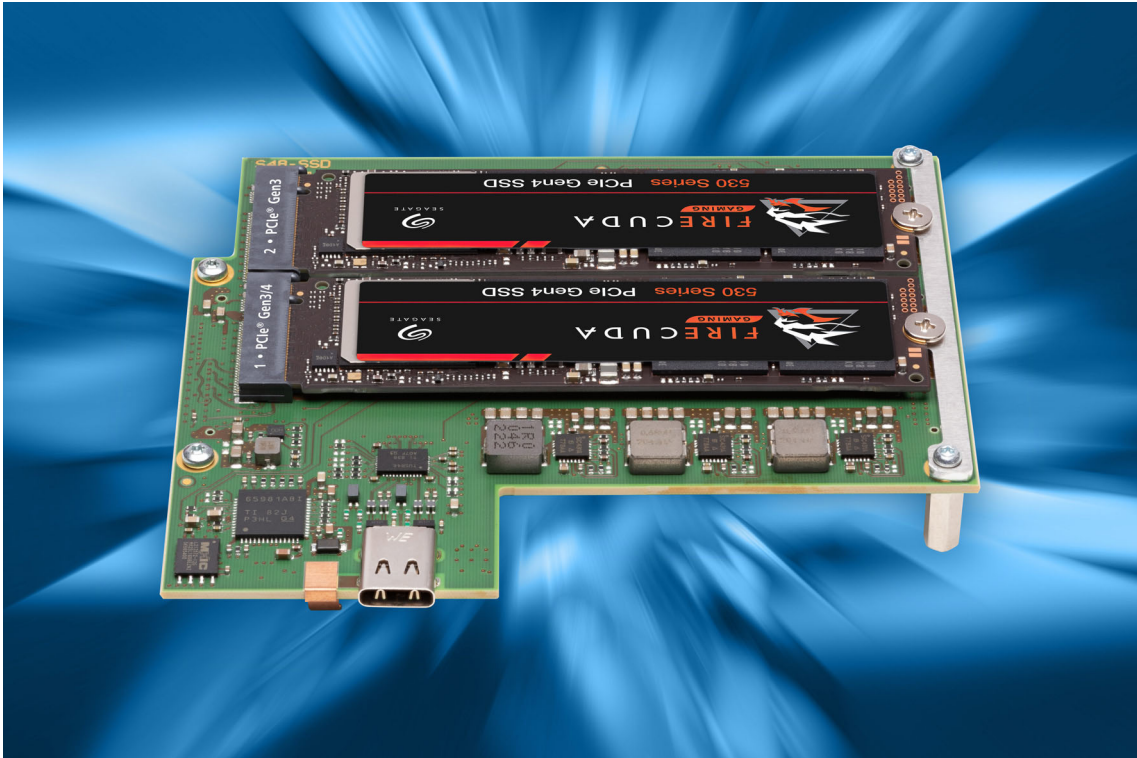
** fixed configuration PCIe® link 4x1 by SC8 CPU card - SSD must establish 1x1 link though



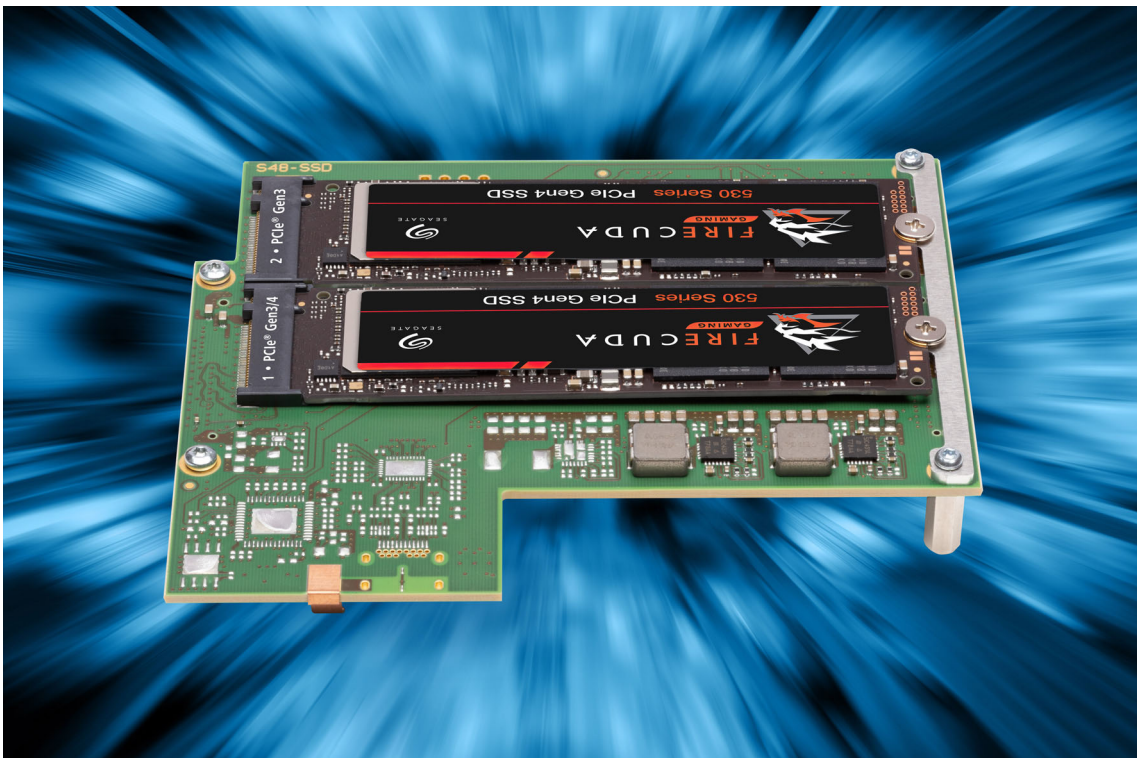
Block Diagram



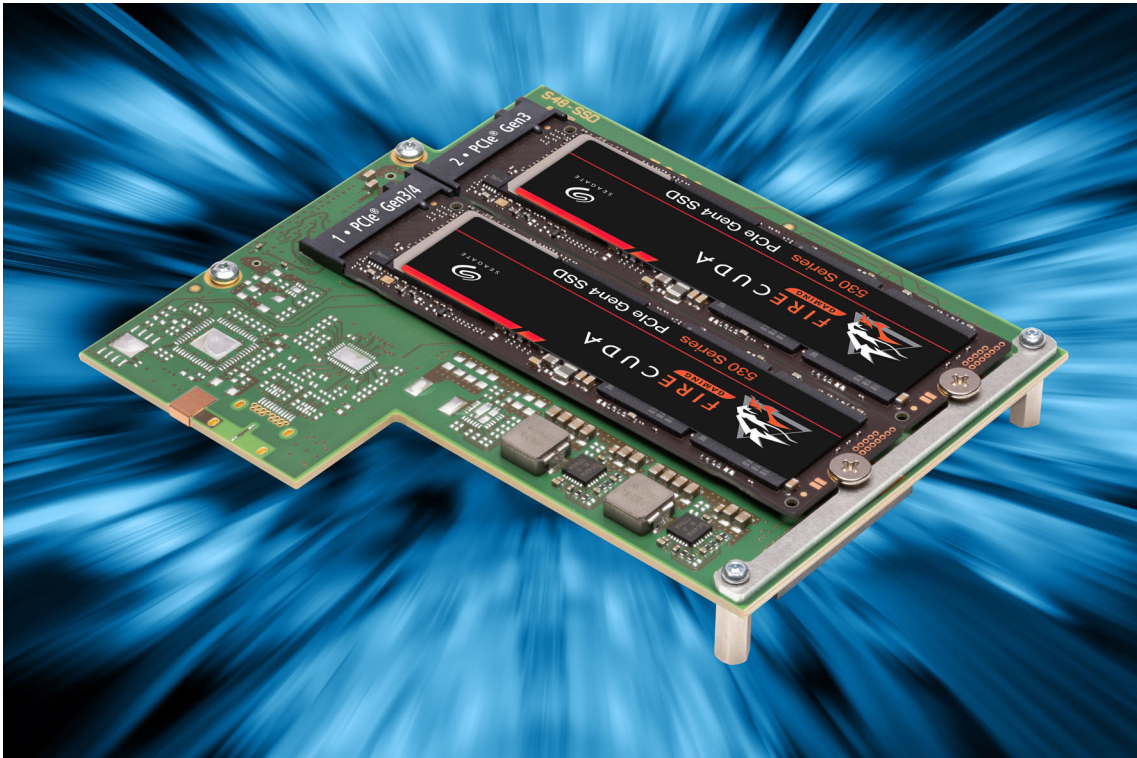
Versions with and w/o Type-C



S48-P100-SSD



S48-P200-SSD



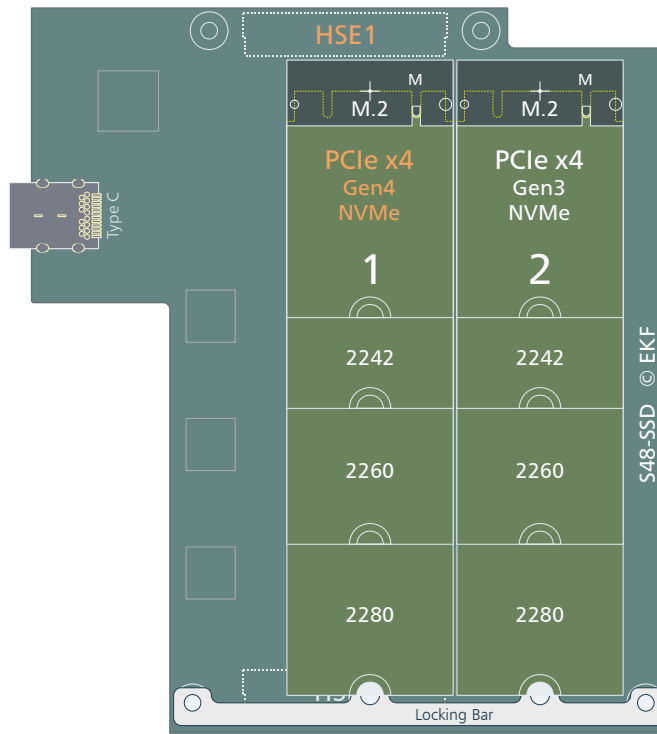
S48-P200 (w/o Type-C)



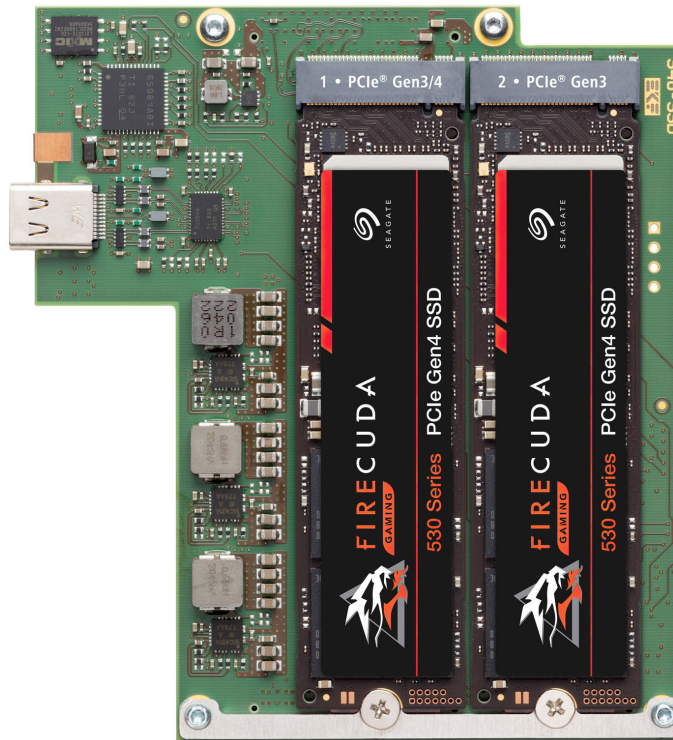


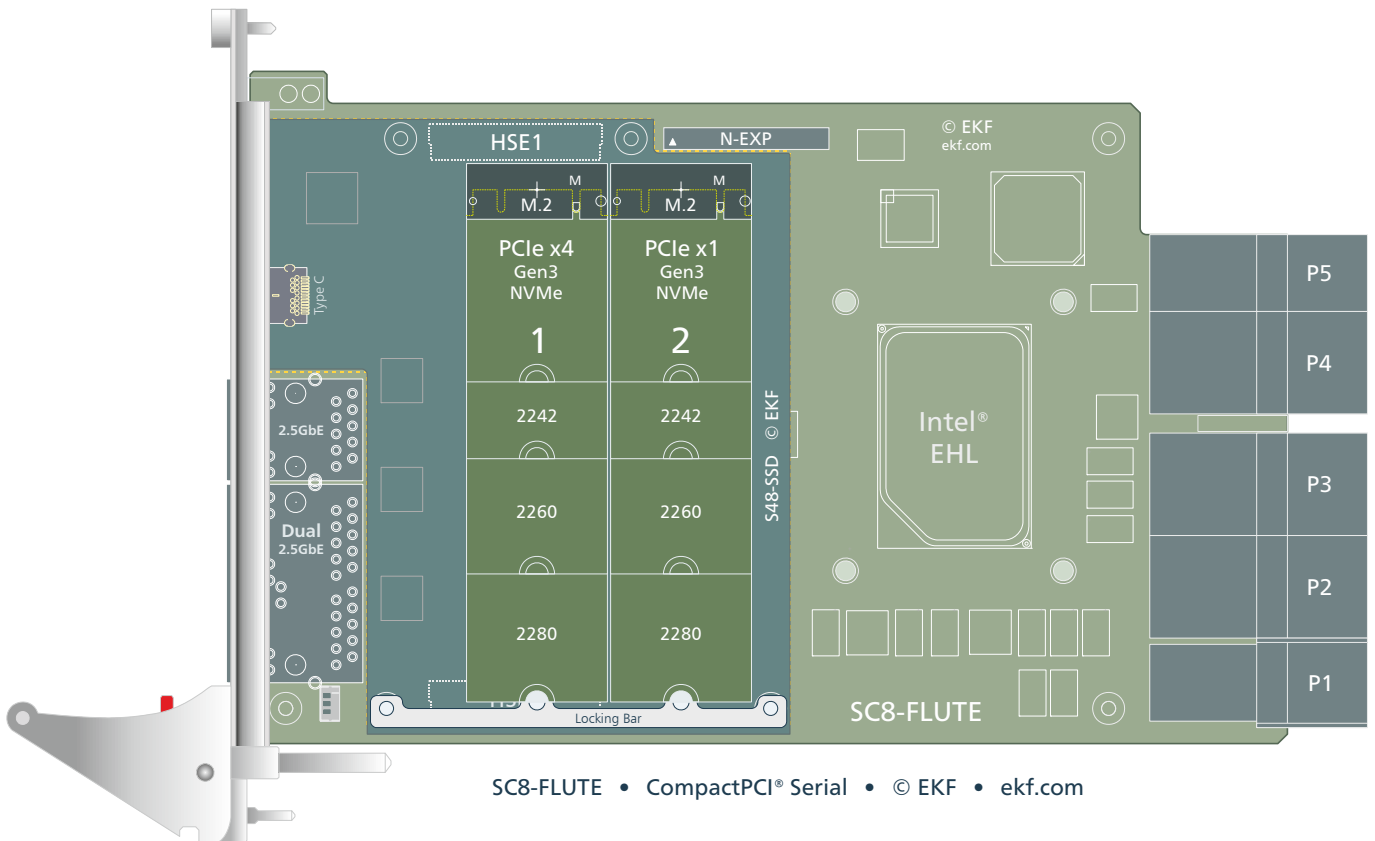
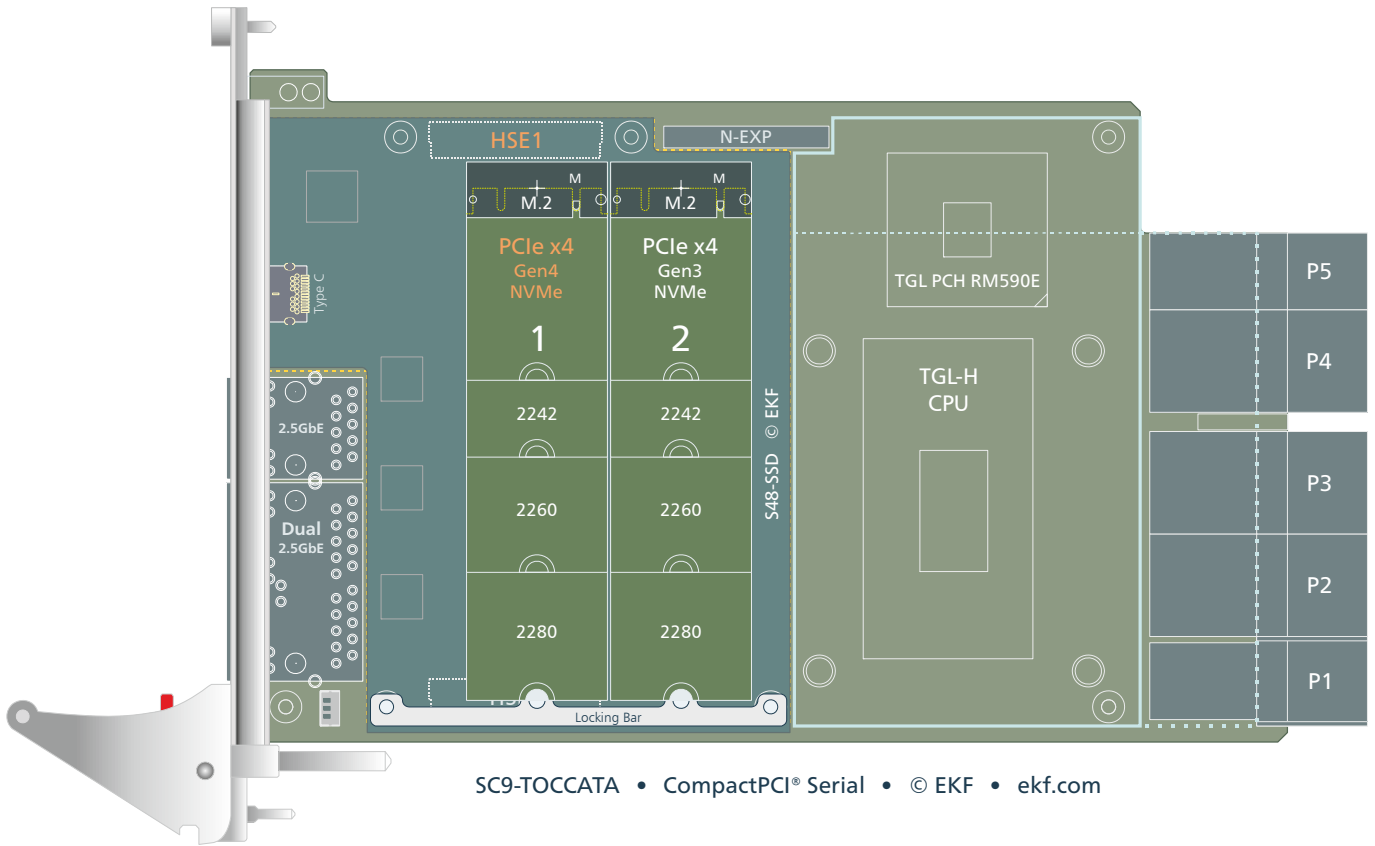
S48-SSD on SC8-FLUTE CPU Carrier Card

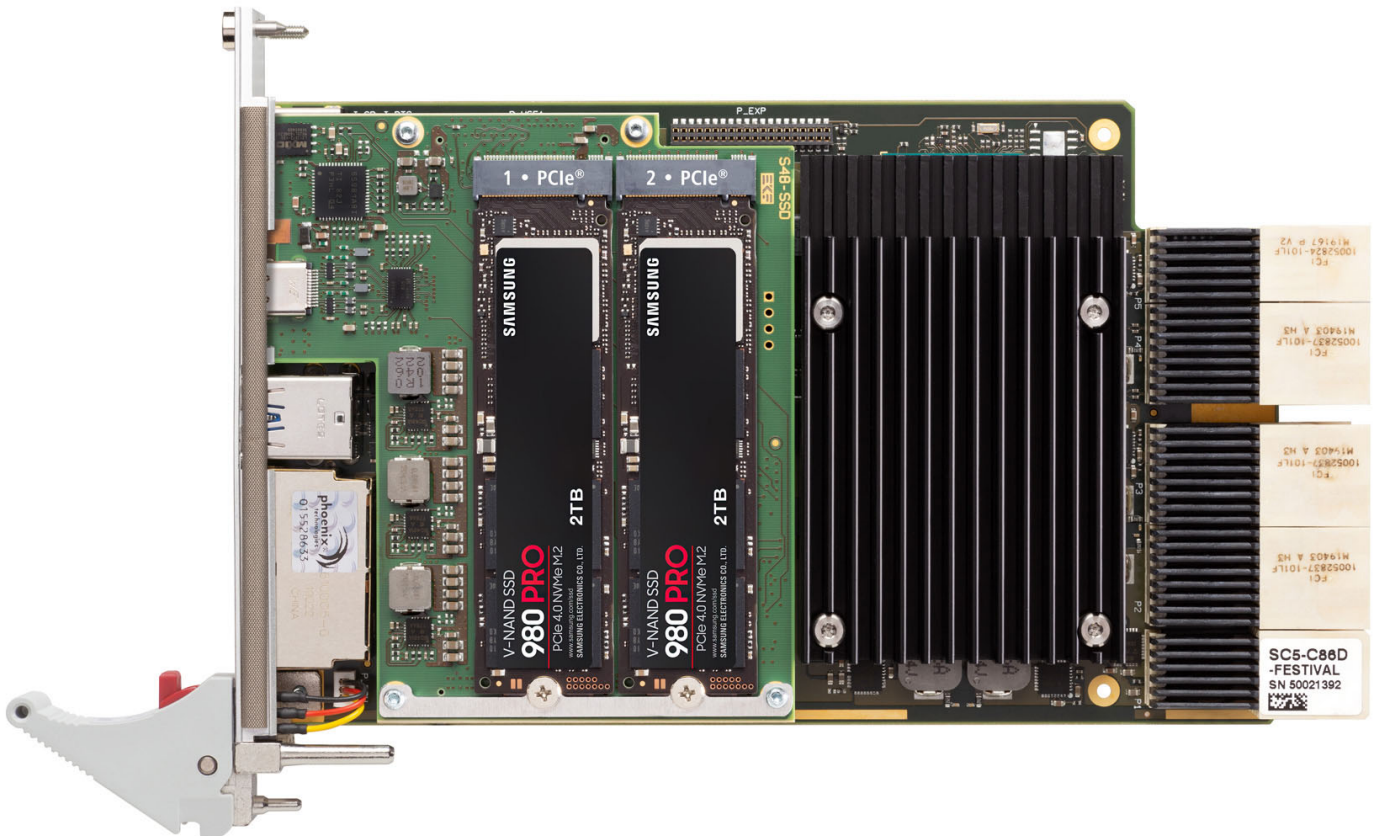
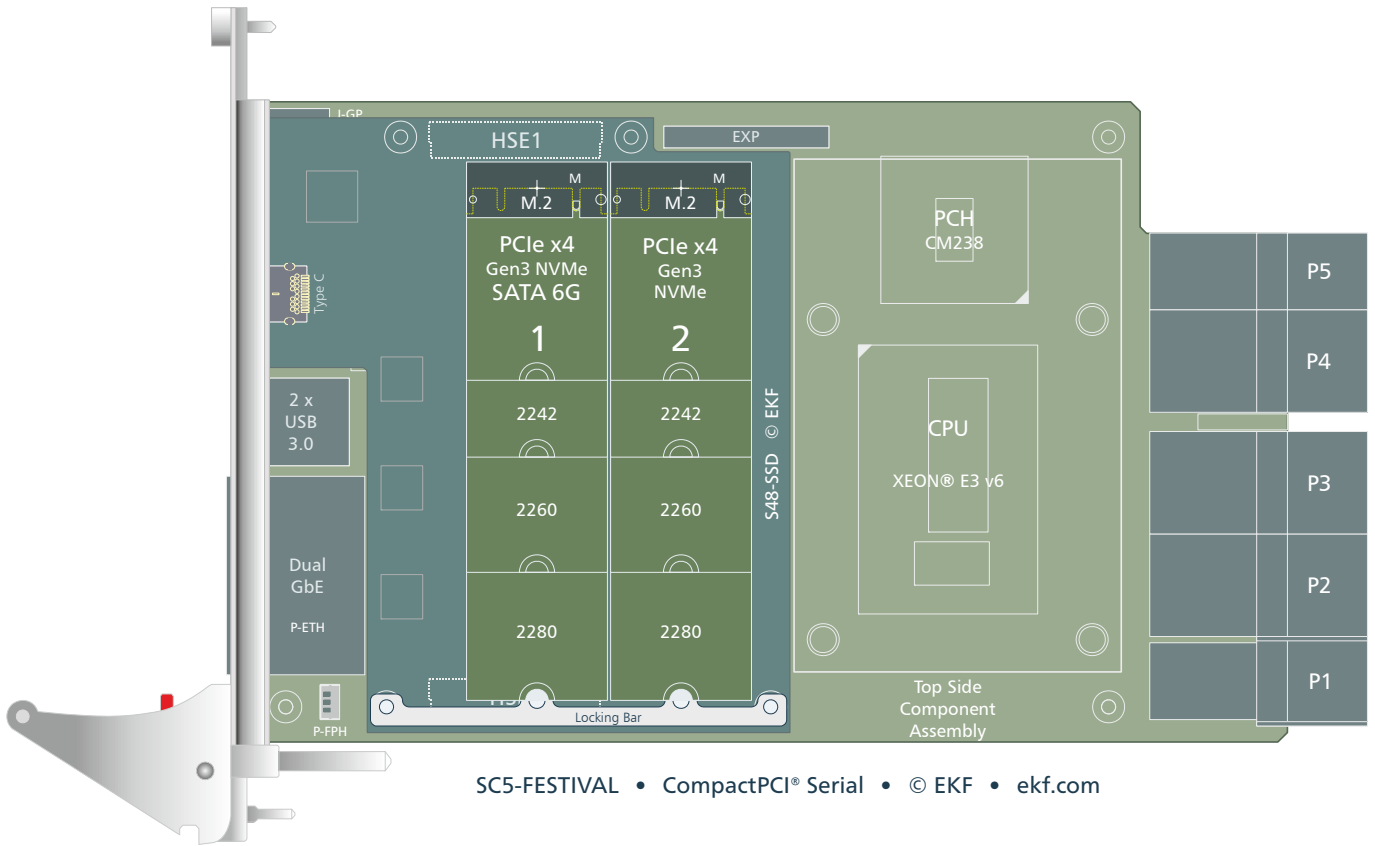
Top View Component Assembly

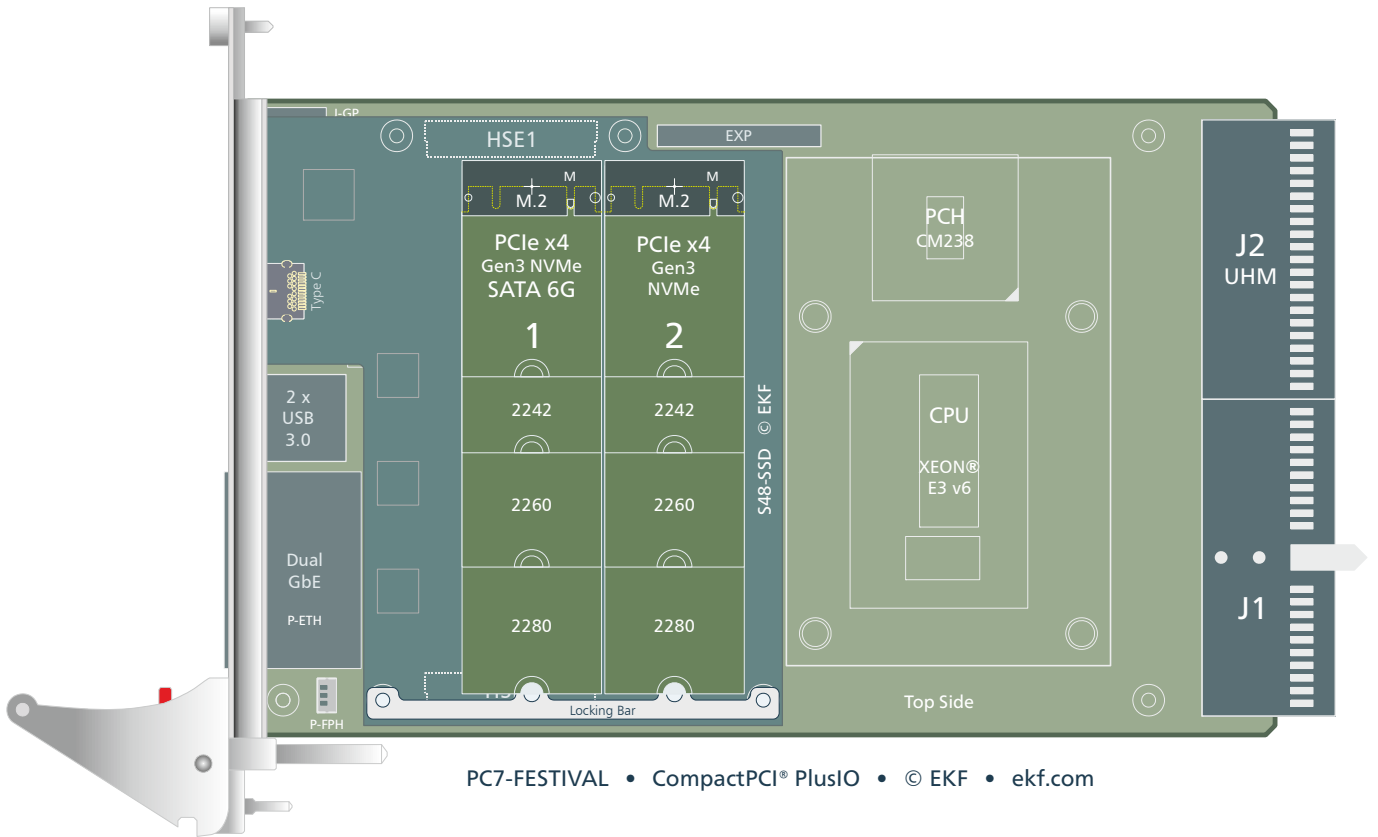


S48-SSD w. SC9-TOCCATA • © EKF • ekf.com

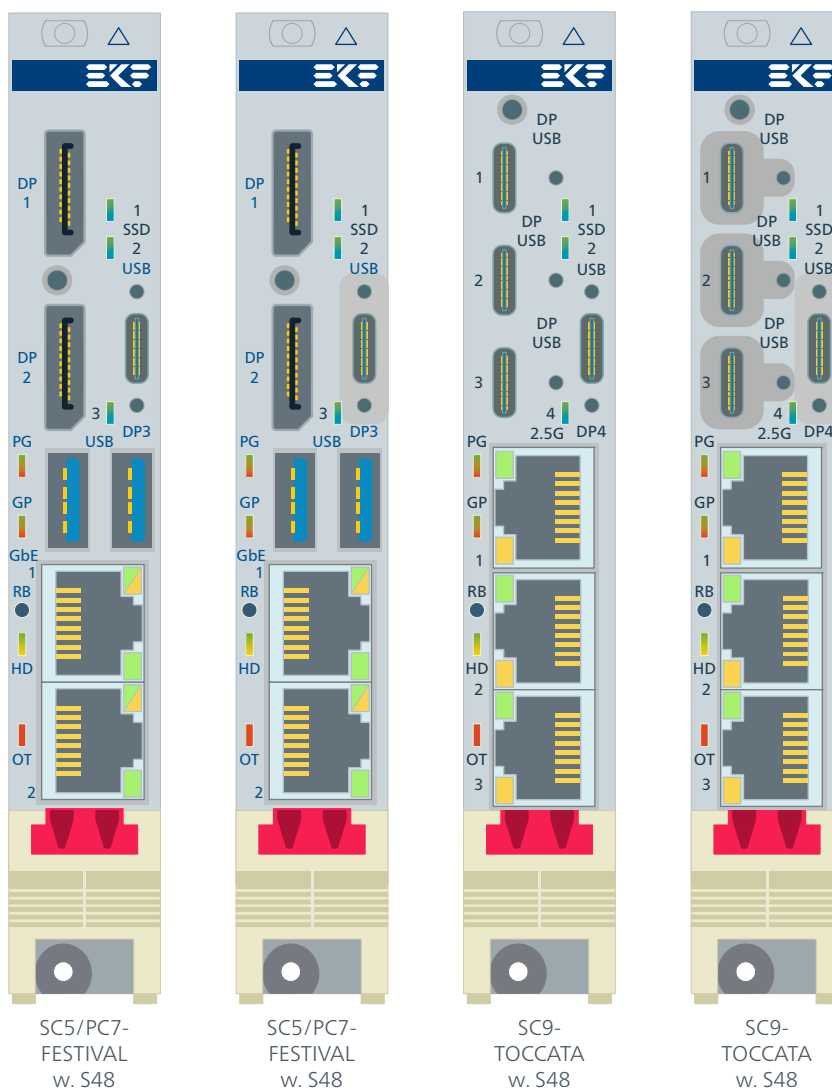








Front Panel



LEDs (S48 Mezzanine only)				
		green	blue	red
1	M.2 Socket 1	SSD ready enabled/powerd	SSD activity	SSD reset/error condition tbd by BIOS
2	M.2 Socket 2	SSD ready enabled/powerd	SSD activity	SSD reset/error condition tbd by BIOS
3/4	Type-C 3 rd /4 th USB/DP	USB normal mode green/blue = USB/DP mix	DP Alt mode green/blue = USB/DP mix	off = noflip, weak = flip *

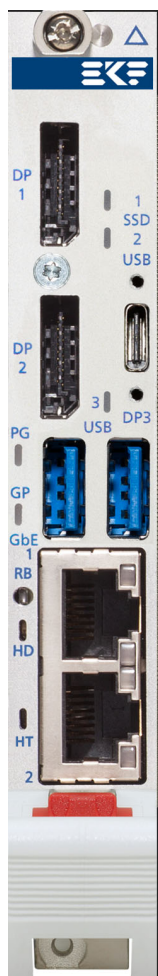
* this is not an error condition, connector orientation status signal only for testing procedure



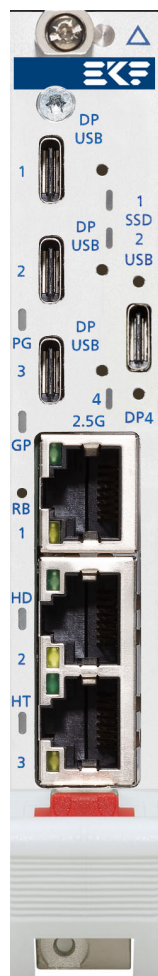
Type-C Screw Locking

For rugged applications, the front panel is provided with M2 threads, suitable for dual screw Type-C locking plugs, according to the 'USB Type-C Locking Connector Specification' (15mm pitch).

Type-C Cable Assemblies	
270.25.9.10.10	Type-C cable assembly with locking connectors, 1m
270.25.9.20.01	Type-C to Type-A (female) cable adapter, 10cm
270.25.9.50.20	Type-C DP Alt Mode 4k @60Hz cable assembly, 2m



SC5-FESTIVAL & S48-P100 (with Type-C)



SC9-TOCCATA & S48-P100 (with Type-C)

Front Panel CPU Carrier & S48-SSD

Ordering

Typically, the low profile mezzanine module comes as a ready-to-use assembly together with the particular CPU carrier card.

Ordering Information	
For popular S48-SSD SKUs please refer to www.ekf.com/liste/liste_21.html#S48	
S48-P100-SSD	with USB Type-C connector
S48-P200-SSD	without USB Type-C connector

Please note that the S48-SSD is a carrier card which typically comes without M.2 module(s) populated, unless otherwise expressly ordered. Photos shown within this document and at other places may be equipped with M.2 modules just for application demonstration. If you need a turnkey solution with M.2 NVMe and/or M.2 SATA storage modules populated, please contact sales@ekf.com before ordering.



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