



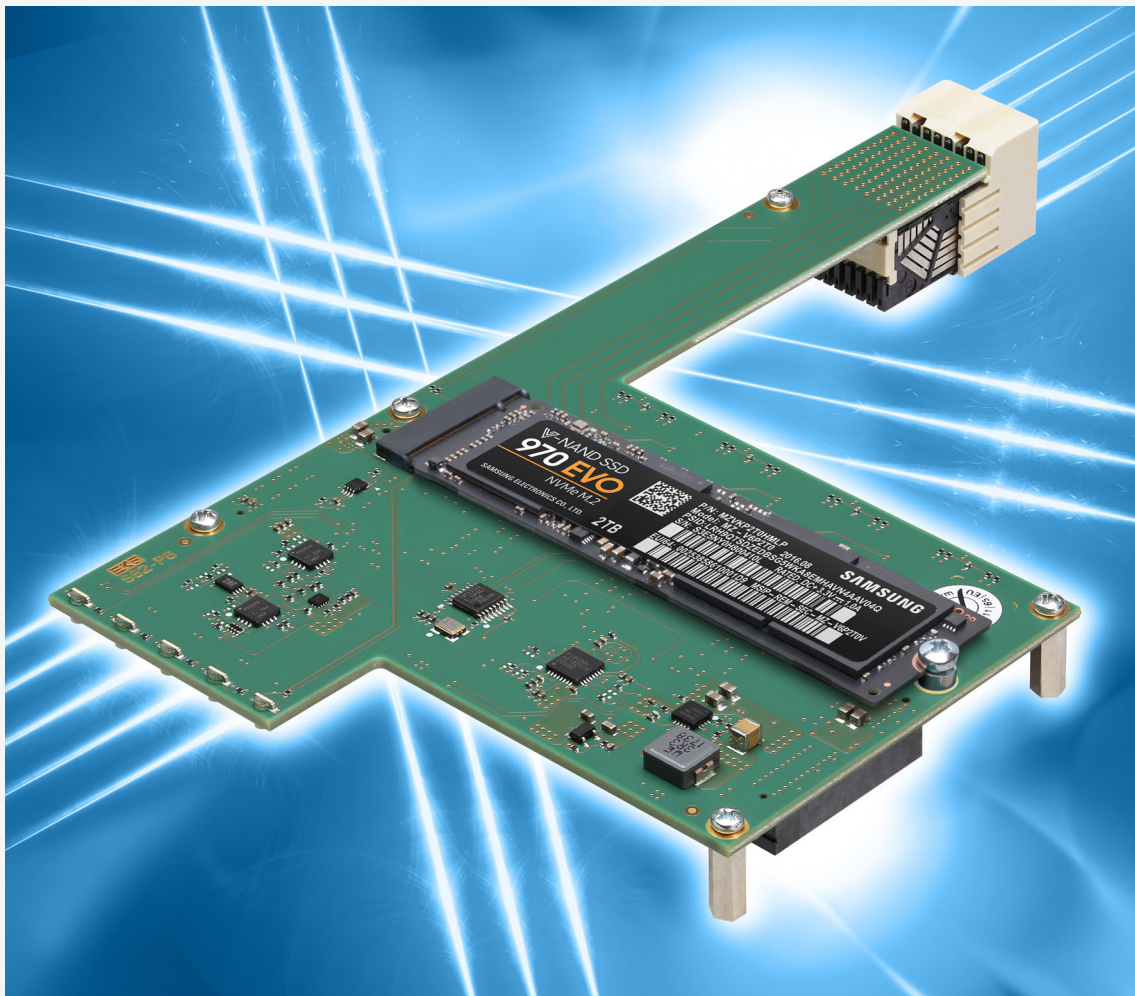
## Product Information

### S83-P6

Low Profile Mezzanine Module

M.2 NVMe SSD Storage • Quad Backplane 2.5Gigabit Ethernet NICs

Preliminary Edition



Similar Photo

## Overview

Available as a mezzanine add-on expansion board e.g. to the SC5-FESTIVAL and successor CPU carrier cards, the main purpose of the S83-P6 is to provide a Solid State Drive mass storage solution, and in addition to supply the backplane with four Gigabit Ethernet ports.

The S83-P6 is equipped with an M.2 PCIe® Gen4 x4 socket, suitable for an NVMe type SSD module. The maximum PCIe® data transfer rate depends on the particular CPU carrier card (16GT/s require SC9-TOCCATA).

Four discrete Gigabit Ethernet controllers are provided on-board, for CompactPCI® Serial backplane communication via the P6 connector according to the 2.5GBASE-T interface standard.

The S83-P6 is equipped in addition with a Type-C front port for attachment of an USB device or DisplayPort monitor.

The Intel® I226-IT 2.5GbE controllers support latest networking features and are backward compatible to 1000BASE-T as originally specified by the CompactPCI® Serial specification. With a suitable Ethernet enabled CompactPCI® Serial backplane, both networking architectures are supported, either single star or full mesh.

The S83-P6 connects to the mezzanine expansion connectors HSE1 and HSE2 of the CompactPCI® Serial CPU carrier board, maintaining the 4HP (20.32mm) total assembly height.



Similar Photo



Similar Photo

## Feature Summary

### *Form Factor*

- ▶ Proprietary size mezzanine module - low profile
- ▶ 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 right (on top of a CPU board)

### *Eligible CPU Carrier Cards*

- ▶ SC4-CONCERTO
- ▶ SC5-FESTIVAL
- ▶ SC8-FLUTE
- ▶ SC9-TOCCATA

### *M.2 Module Connector*

- ▶ Single M.2 socket, maximum M.2 SSD size 2280 (M.2 formerly known as NGFF)
- ▶ Suitable for M.2 NVMe SSD module, key Id M, PCIe® x4 I/F
- ▶ Autosense option for SATA SSD (depends on carrier card)
- ▶ PCIe® x4 up to Gen4 sourced via HSE1 mezzanine connector
- ▶ Maximum (theoretical) 64Gbps I/O data transfer rate (Gen4 PCIe 16GT/s)
- ▶ Module dimensions 2230/2242/2260/2280, screw fixed (2280 w. locking bar)
- ▶ M.2 Module height (Label) S3 - top side component height 1.5mm max., no bottom side components
- ▶ Module 3.3V power DC/DC regulator can be switched off/on via I<sup>2</sup>C (BIOS settings)

### *Type-C Front I/O*

- ▶ USB 3.2 Gen1/2 (5G/10G) depending on CPU carrier card in use
- ▶ DP Alt Mode (DisplayPort 1.2/1.4a MST depending on CPU carrier card)
- ▶ V<sub>BUS</sub> Power DC/DC regulator can be switched off/on via I<sup>2</sup>C (BIOS settings)

### *P6 CompactPCI® Serial Backplane Connector*

- ▶ 4 x 2.5GBASE-T, individual I226-IT NICs
- ▶ Backward compatible to 1000BASE-T CompactPCI® Serial cards
- ▶ For use with Ethernet enabled backplanes (equipped w. J6 connector)
- ▶ Suitable for Star and Mesh Ethernet configured backplanes
- ▶ Suitable for a rear I/O Ethernet module

## Feature Summary

### *Host I/F Connectors*

- ▶ 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 10.8mm for a 4HP assembly

#### HSE1

- ▶ PCI Express® 1x4 support up to Gen4 (dedicated to the NVMe SSD module M.2 socket)
- ▶ PCIe® Gen4 supported (depends on carrier card)
- ▶ USB3 up to 10Gbps support (dedicated to the optional Type-C USB front panel connector)
- ▶ SATA supported (assigned to the M.2 SSD socket, depends on carrier card)
- ▶ Power sourcing 12V/1.5 A maximum continuous current (2 pins)

#### HSE2

- ▶ PCI Express® 4x1 support (dedicated to the PCIe® based on-board Gigabit Ethernet controllers)
- ▶ DisplayPort (for Type-C DP Alt Mode, depends on CPU carrier board)
- ▶ Power sourcing 12V/3.0 A maximum continuous current (4 pins)

### *Gigabit Ethernet NICs*

- ▶ Four individual Intel® I225/226-IT networking interface controllers (NIC)
- ▶ 2.5GBASE-T, 1000BASE-T, 100BASE-TX, 10BASE-T 802.3 specifications
- ▶ -40°C to +85°C operating temperature 10M/100M/1G
- ▶ -40°C to +70°C operating temperature 2.5G (I225)
- ▶ -40°C to +85°C operating temperature 2.5G (I226)
- ▶ UDP, TCP and IP checksum offload
- ▶ 9KB Jumbo Frame support
- ▶ Four transmit and four receive queues
- ▶ IEEE 802.3az Energy Efficient Ethernet
- ▶ Ultra-low power at cable disconnect (5mW)
- ▶ Time Sensitive Networking (TSN)
- ▶ IEEE 1588 - Basic time-sync (Precision Time Protocol)
- ▶ IEEE 802.1AS-Rev - Higher precision time synchronization with multiple (dual) clock masters
- ▶ IEEE 802.1Qav - Credit Based Shaping and Basic scheduling
- ▶ IEEE 802.1Qbu - Frame Preemption
- ▶ IEEE 802.1Qbv - Time Aware Shaper
- ▶ IEEE 802.3br - Interspersing Express Traffic
- ▶ PCIe® PTM for synchronization between the NIC and Host timers
- ▶ Based on four PCI Express® x1 links derived from the mezzanine connector HSE2
- ▶ Driver support for all major operating systems



## Feature Summary

### *Applications*

- ▶ Low profile mezzanine module for EKF CPU Cards (SC5-FESTIVAL and later)
- ▶ 4HP assembly CPU carrier board and S83-P6 mezzanine card
- ▶ Adds SSD mass storage and backplane Ethernet networking to the CPU carrier
- ▶ M.2 based mass storage, 1 x M.2 PCIe x4 socket (NVMe)
- ▶ On-board 2.5GbE NICs for backplane communication and multiprocessing via backplane connector P6, four GbE ports (suitable for single star architecture or full mesh or RIO)
- ▶ Additional monitor via Type-C DP Alt Mode

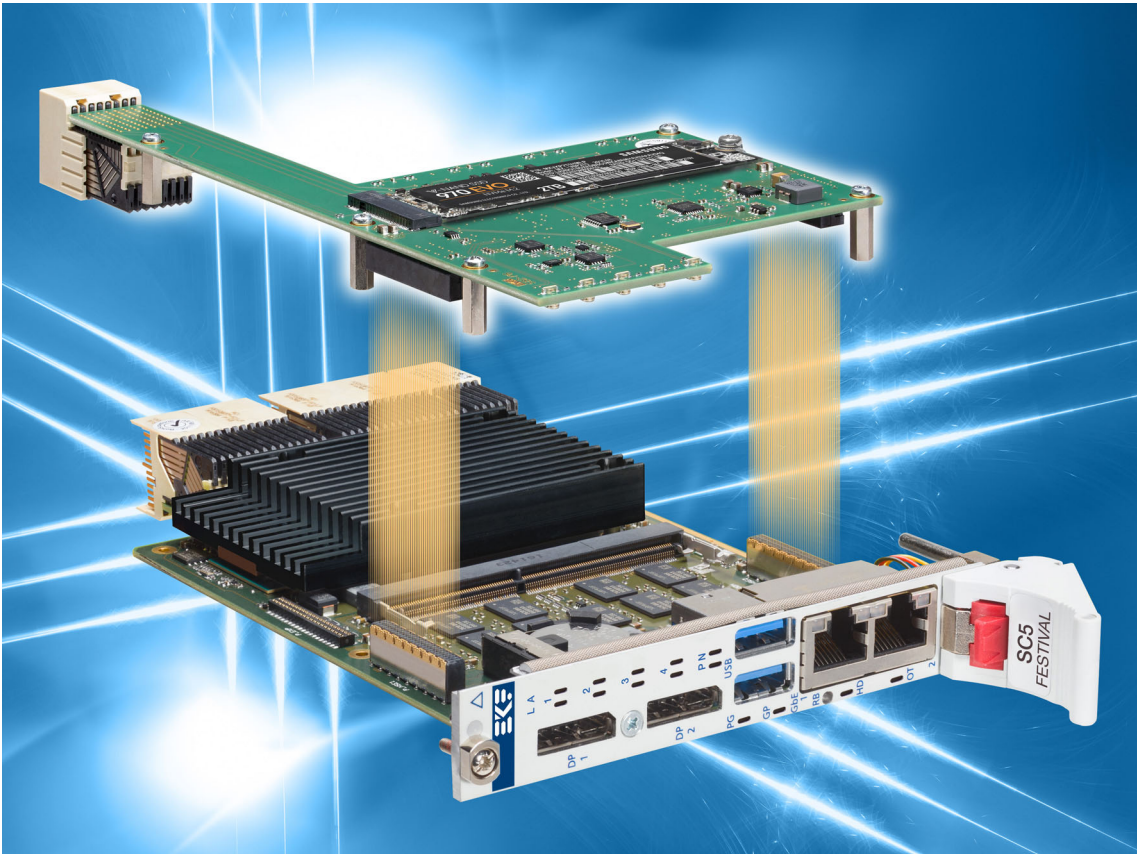
### *Environment & Regulatory*

- ▶ Designed & manufactured in Germany
- ▶ Certified quality management according to ISO 9001
- ▶ Long term availability
- ▶ Rugged solution
- ▶ Coating, sealing, underfilling on request
- ▶ Lifetime application support
- ▶ 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 tbd years
- ▶ EC Regulations EN55022, EN55035, EN62368-1

Custom specific modifications or development on request

All items are subject to technical changes

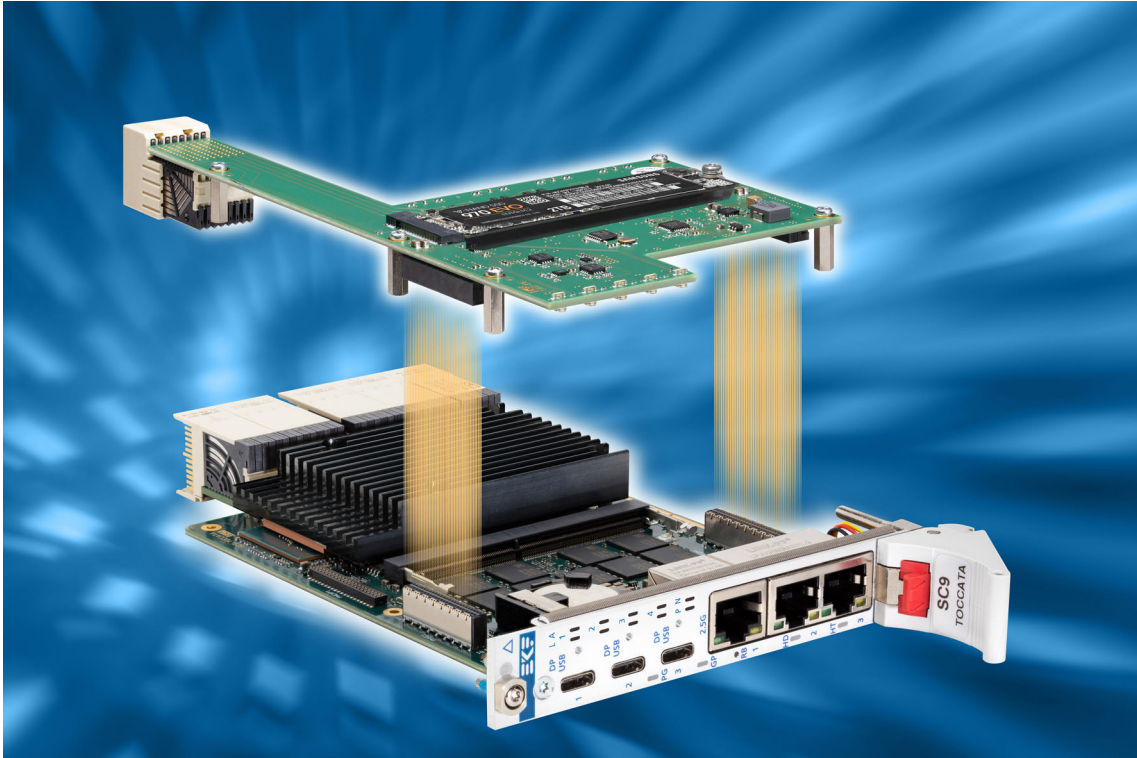
M.2 SSD modules shown in some photos are not scope of delivery



Similar Photo



Similar Photo



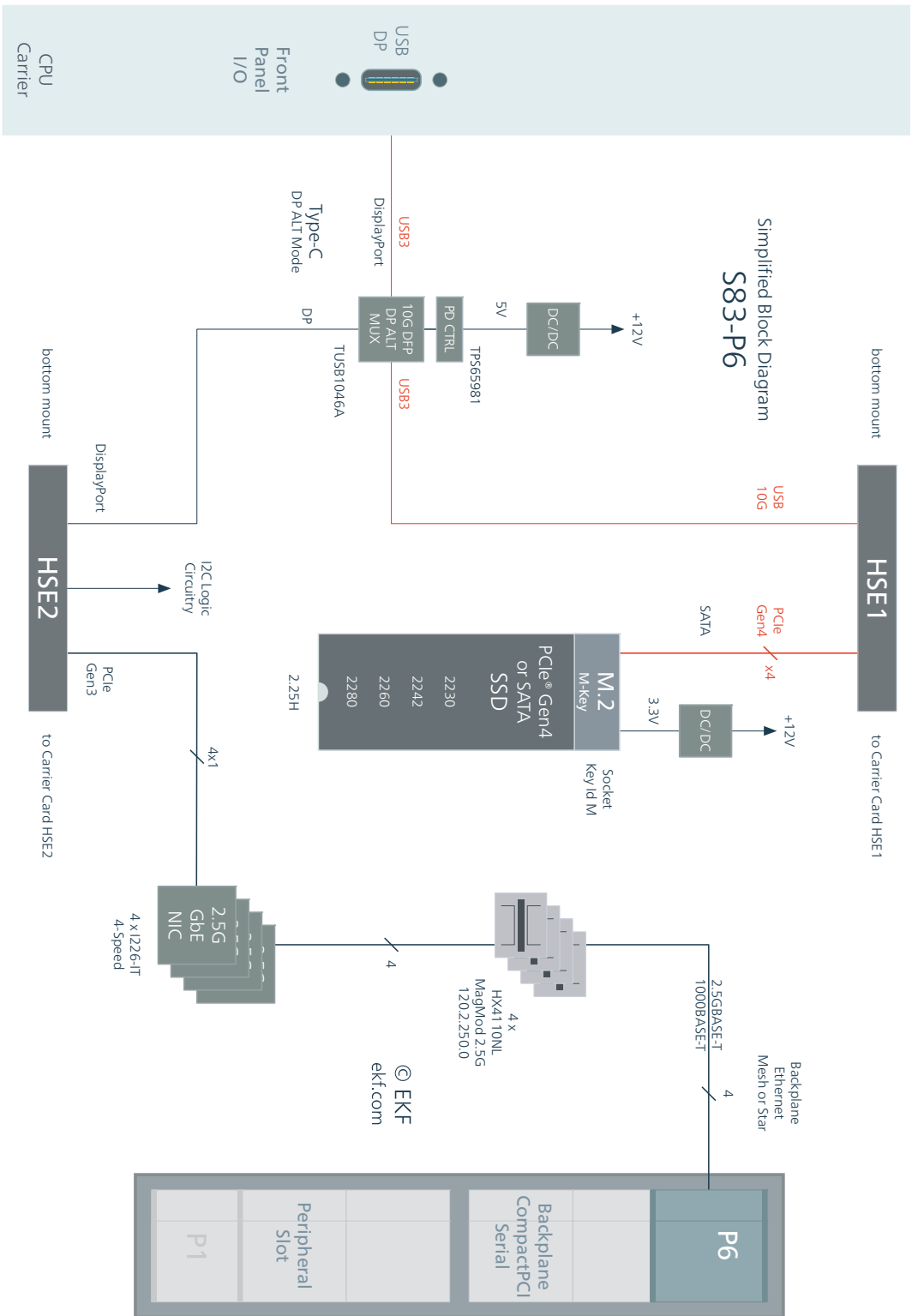
Similar Photo



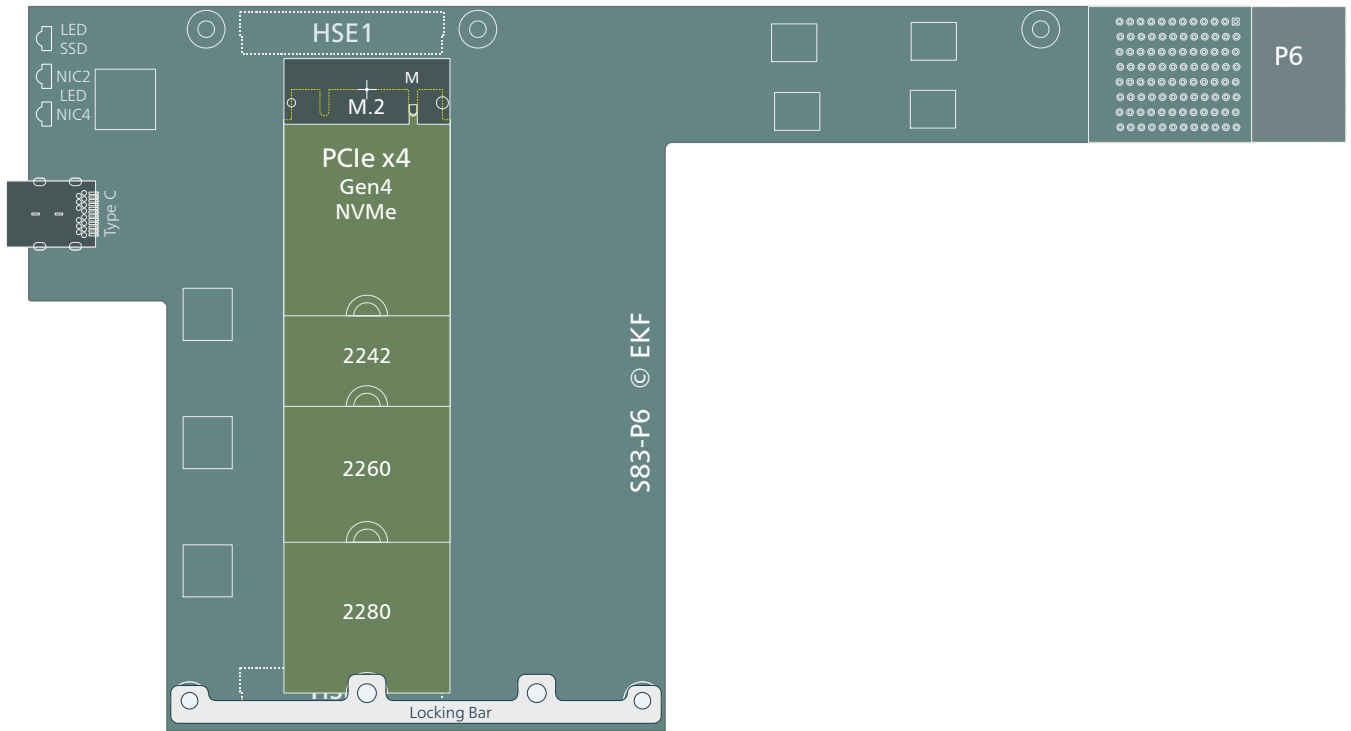
Similar Photo



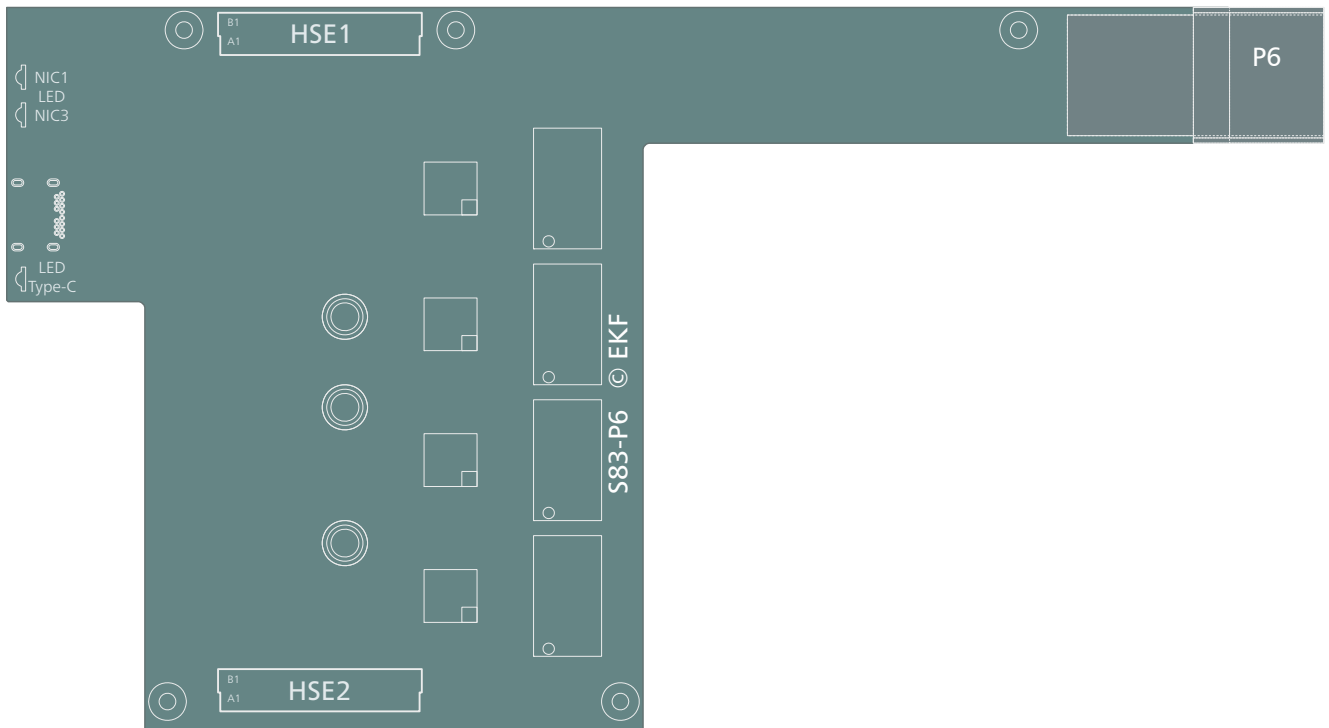
## Block Diagram



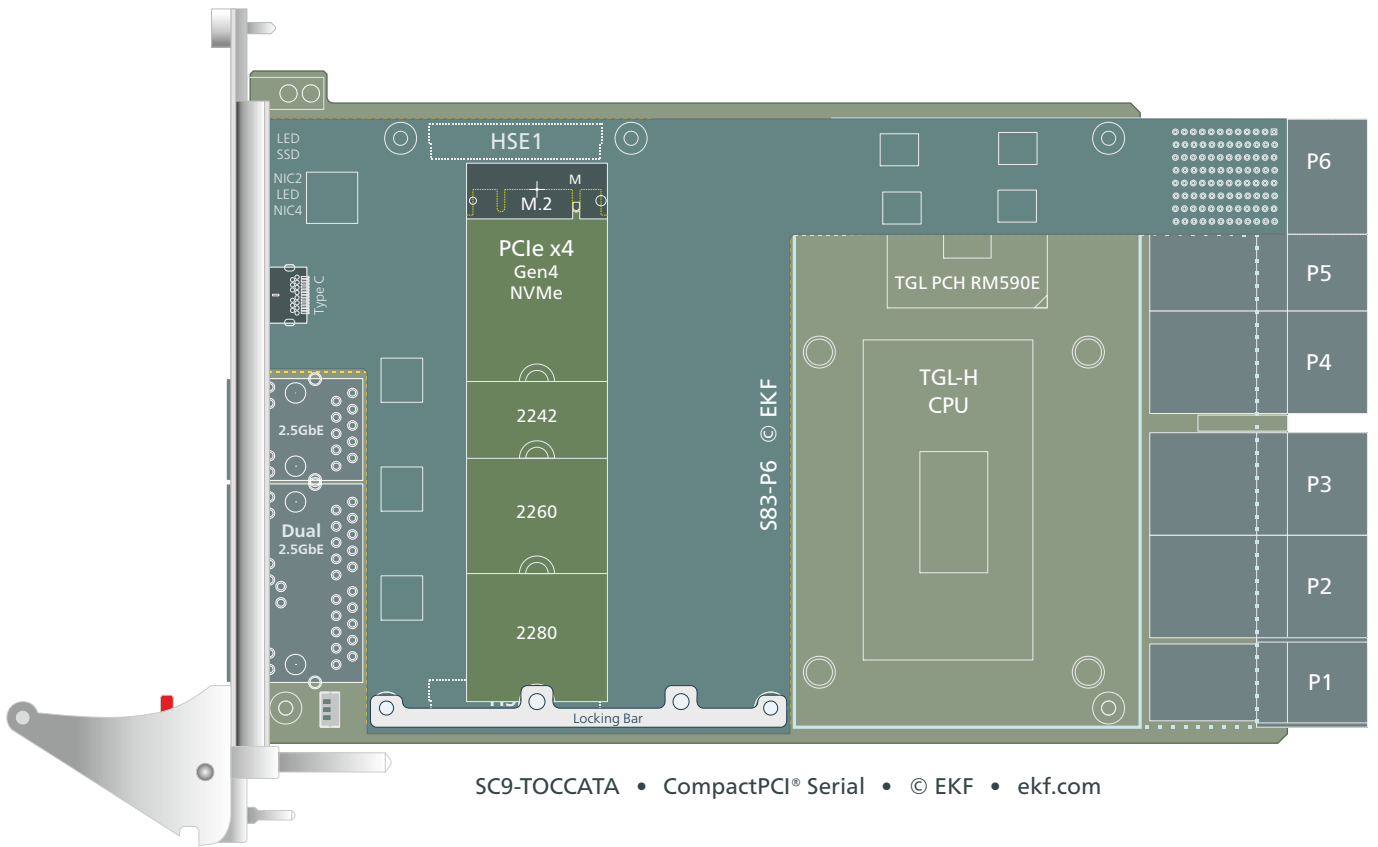
### Top/Bottom View Component Assembly



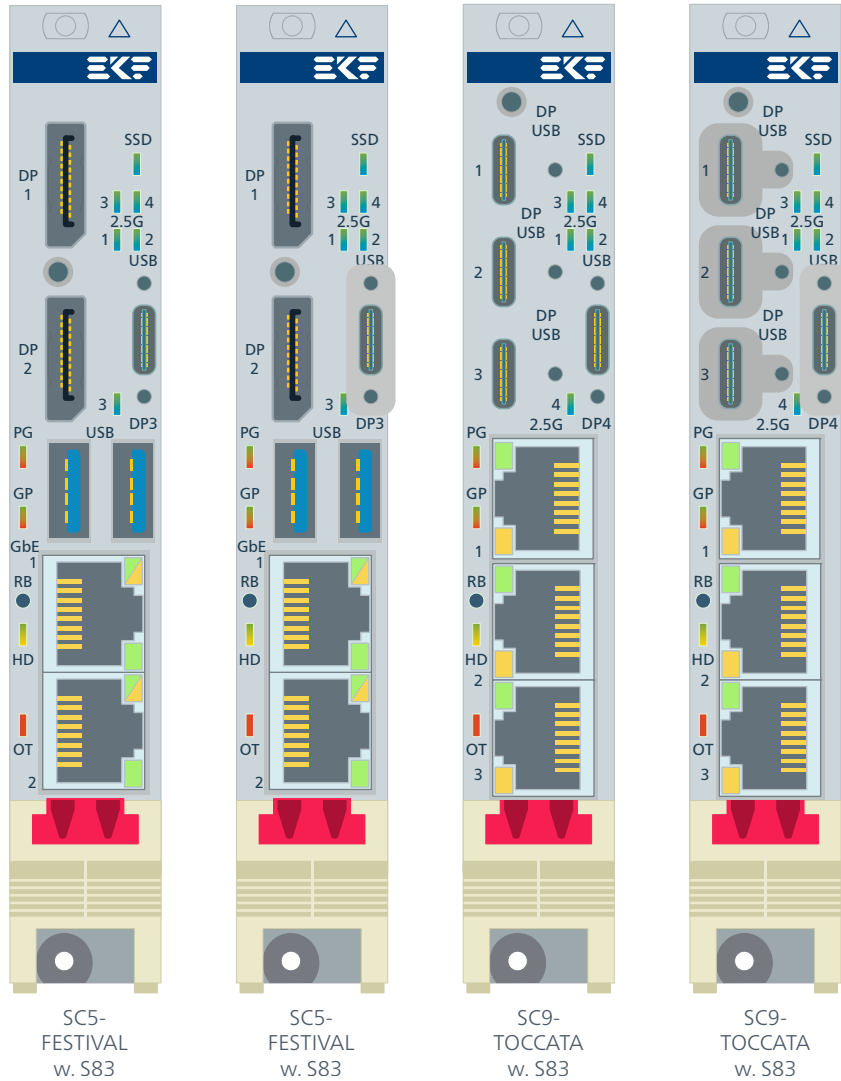
Top View



Bottom View (See Through)



## Front Panel



LED	Function
SSD	M.2 socket power good, NVMe SSD activity
2.5G	Backplane Ethernet ports 1-4 (P6) 2.5GBASE-T & 1000BASE-T green=1Gbps link, orange=2.5Gbps link, blink=activity
4 (3)	Type-C Power Good



## Backplane Ethernet

The S83-P6 is equipped with four independent Intel® I225/226-IT Gigabit Ethernet networking controllers. The industrial temperature grade NICs incorporate integrated 2.5GBASE-T Gigabit Ethernet transceivers, which are wired across magnetics modules to the CompactPCI® Serial backplane connector P6.

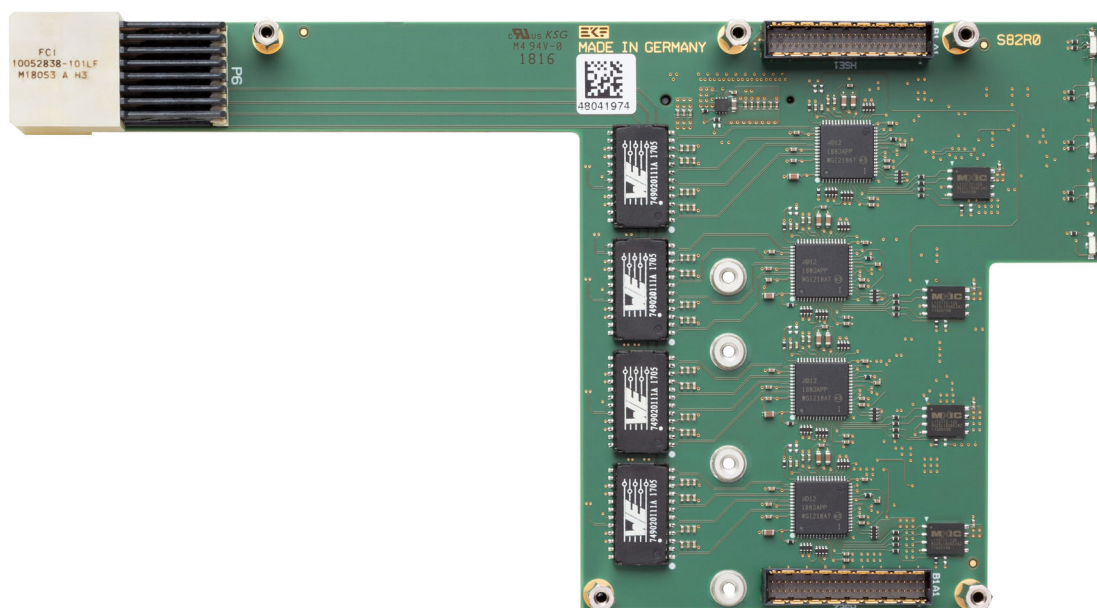
The networking controllers communicate with the CPU carrier card individually via PCI Express® x1 links, passed through the mezzanine interface connector HSE2.

If more than four GbE ports are required for backplane usage, consider the S80-P6 mezzanine module as an alternative solution. The S80-P6 is equipped with an advanced GbE switch, and offers the maximum of eight Gigabit Ethernet channels across the backplane.

A CPU carrier card assembly with the S83-P6 mezzanine typically would be inserted into the system slot of a CompactPCI® Serial backplane, suitable for either star architecture networking, or full mesh backplane Ethernet. Both structures allow backplane multiprocessing and other Ethernet bound communication over P6/J6 between CompactPCI® Serial boards, with higher flexibility (and backplane cost) offered by the mesh version.

An alternative application would be rear I/O Ethernet across P6 (this requires a rear I/O enabled backplane slot).

The I226-IT networking controllers are suitable for nearly all applications. Activity and link status of each backplane Ethernet port can be observed from associated front panel LEDs.



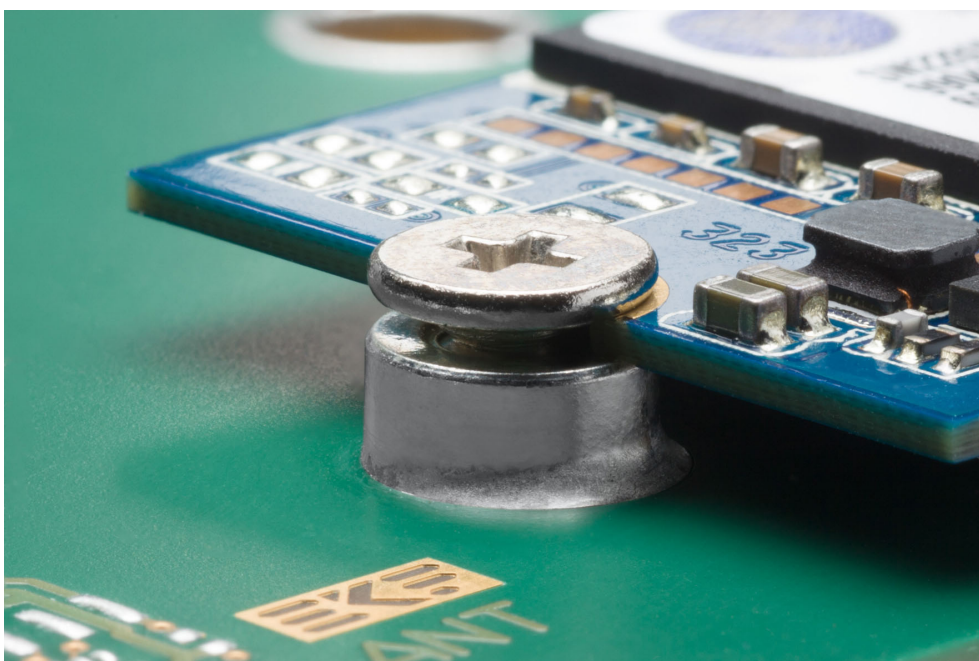
Similar Photo

## Connectors

### M.2 SSD Host Connector

The S83-P6 is provided with an M.2 (formerly NGFF) module host connector. This socket is M-keyed, for a PCIe x4 based SSD module. After inserted, the M.2 module must be locked manually by a screw (M2.5 threaded inserts provided on the PCB), in order to withstand shock and vibration. The S83-P6 accepts module sizes up to 2280, single sided, component height up to 2.0mm (H2.3-S5). A PCIe® x4 NVMe SSD is suitable for demanding applications. Recent operating systems should include NVMe protocol drivers.

Some SSDs (e.g. those which are equipped with a heatsink) may not comply with the *PCI Express M.2 Specification* for H2.3-S5 connectors (2.8mm in total, card PCB and top mount components) and may therefore violate the CompactPCI® Serial 4HP backplane slot pitch. Adding an adjacent CompactPCI® Serial card can then damage both the SSD and/or the board to be inserted!



M.2 Module Fixation (Picture Similar)

Please note that the S83-P6 is a carrier card which typically comes without an M.2 SSD module 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 an M.2 NVMe storage module populated, please contact [sales@ekf.com](mailto:sales@ekf.com) before ordering.

NVMe PCIe x4 M.2 M-Key • Pin 1 - 38 EKF Part #255.50.2.2223.10			
GND	1	2	+3.3V
GND	3	4	+3.3V
PETN3	5	6	NC
PETP3	7	8	NC
GND	9	10	LED1#
PERN3	11	12	+3.3V
PERP3	13	14	+3.3V
GND	15	16	+3.3V
PETN2	17	18	+3.3V
PETP2	19	20	NC
GND	21	22	NC
PERN2	23	24	NC
PERP2	25	26	NC
GND	27	28	NC
PETN1	29	30	NC
PETP1	31	32	NC
GND	33	34	NC
PERN1	35	36	NC
PERP1	37	38	NC



NVMe PCIe x4 M.2 M-Key continued • Pin 39 - 75			
GND	39	40	SMB_CLK *
PETN0	41	42	SMB_DATA *
PETP0	43	44	ALERT *
GND	45	46	NC
PERN0	47	48	NC
PERP0	49	50	PERST#
GND	51	52	CLKREQ#
REFCLKN	53	54	PEWAKE#
REFCLKP	55	56	RSV
GND	57	58	RSV
M-Key	59	60	M-Key
M-Key	61	62	M-Key
M-Key	63	64	M-Key
M-Key	65	66	M-Key
NC	67	68	SUSCLK
PEDET **	69	70	+3.3V
GND	71	72	+3.3V
GND	73	74	+3.3V
GND	75		

\* Logic level 1.8V signals - LSF0204 level shifter to 3.3V on-board

\*\* Used to differentiate between PCIe® and SATA SSD type

PCI Express® M.2 Specification Socket 3 PCIe-based Module Pinout (Module Key M)

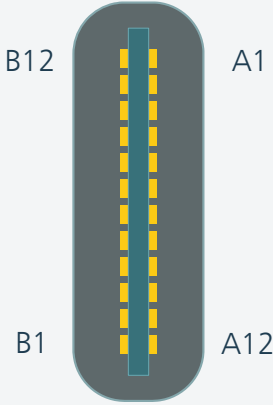


## Type-C Front I/O

As an option, the S83-P6 mezzanine is equipped with a Type-C front panel connector, basically to be used as USB3 DFP (Downstream Facing Ports aka host). With their origin on the CPU carrier card, the USB signals are passed across the mezzanine connector HSE1 to the Type-C. Depending on the CPU board either 5Gbps or 10Gbps data rate is available. The Type-C receptacle is suitable for screw locked cable connectors according to the 'Type-C Locking Connector Specification Rev. 1.0'. Based on the USB PD BMC protocol (CC signals used for communication w. UFP), +5V  $V_{BUS}$  power supply is provided, and a circuit protection prevents from damages caused by external  $V_{BUS}$  over voltage, surge, and ESD.

The Type-C connector in addition offers 'DP Alt Mode' operation, detected via CC wires (BMC protocol). A special multiplexer is used to swap between either USB or DisplayPort based devices, in order to deliver the requested signal type including flip control. When operated as DisplayPort video output, these signals are derived from the CPU carrier card across the mezzanine connector HSE2.

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
other configurations on request	

Type-C Receptacle				
USB Downstream Facing Port (DFP) and VESA DisplayPort Alt Mode				
 <p>© EKF 270.25.24.01 www.ekf.com</p>	GND	b12	a1	GND
	RX1+	b11	a2	TX1+
	RX1-	b10	a3	TX1-
	V <sub>BUS</sub>	b9	a4	V <sub>BUS</sub>
	SBU2	b8	a5	CC1
	D-	b7	a6	D+
	D+	b6	a7	D-
	CC2	b5	a8	SBU1
	V <sub>BUS</sub>	b4	a9	V <sub>BUS</sub>
	TX2-	b3	a10	RX2-
	TX2+	b2	a11	RX2+
	GND	b1	a12	GND

The on-board TUSB1046A crosspoint switch is a highly integrated solution which offers flexible USB Type-C switching and redriving support for USB 3.1 Gen2 10Gbps and DisplayPort Alternative Mode up to 8.1Gbps. Simplified, the chip provides an active switch fabric for USB and DP, including flip control, so that an externally attached device (either USB or DP) is supplied automatically with the suitable interface signals. Even a concurrent configuration with USB SS and DP (two lanes) is supported.

The 4-lane DisplayPort interface is directly passed from the CPU carrier card via HSE2 (3<sup>rd</sup> or 4<sup>th</sup> DP video output on an Intel® CPU/GPU). Both signal groups are inputs to the switch fabric and routed to the Type-C connector with suitable gain and phase correction.

A TPS65981 USB Type-C power delivery controller & power switch has been setup for 3A V<sub>BUS</sub>. TVS diodes and common mode filters are provided for signal protection.

## Mezzanine Connectors HSE1, HSE2

The S83-P6 is provided with two male mezzanine connectors on the bottom side of the PCB, which mate with the female mezzanine connectors on the carrier CPU card, for a resulting board-to-board mounting height of 10.8mm.

### HSE1

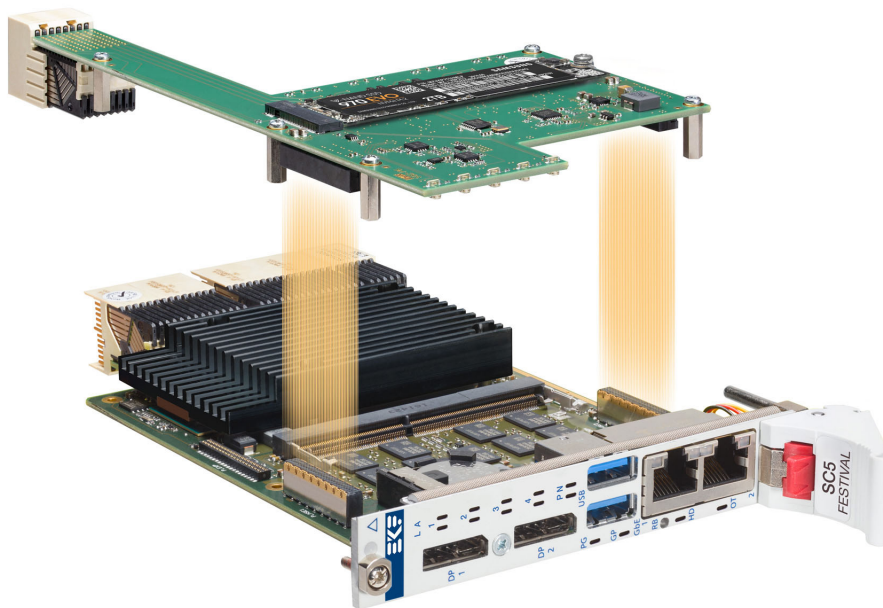
HSE1 is used to pass a PCIe® x4 link from the CPU carrier card to the on-board M.2 NVMe connector, for a suitable SSD mass storage module. Some CPU cards can be configured to switch back to SATA transmission lanes by means of the connector pin a1.

In addition, the USB3 port is in use with the Type-C front connector.

### HSE2

HSE2 is provided to supply the S83-P6 mezzanine with additional PCIe® lanes. A PCIe® x1 link is established for each of the on-board I226-IT Gigabit Ethernet controllers. This requires the CPU carrier card HSE2 connector configured to PCIe® 4x1 (and not PCIe® 1x4 or 2x2).

In addition, a DisplayPort channel is provided, for use together with the front Type-C jack (DP Alt Mode).



Similar Photo

2mm Microspeed male connector for nominal stack height 10mm (B2B 10.8mm)  
 Mating carrier card connector 8mm female Microspeed

High Speed Expansion HSE1				
	CFG_34 *	b1	a1	CFG_12 *
	3_PCIE_TXP	b2	a2	1_PCIE_TXP
	3_PCIE_TXN	b3	a3	1_PCIE_TXN
	GND	b4	a4	GND
	3_PCIE_RXN	b5	a5	1_PCIE_RXN
	3_PCIE_RXP	b6	a6	1_PCIE_RXP
	GND	b7	a7	GND
	4_PCIE_TXP	b8	a8	2_PCIE_TXP
	4_PCIE_TXN	b9	a9	2_PCIE_TXN
	GND	b10	a10	GND
	4_PCIE_RXN	b11	a11	2_PCIE_RXN
	4_PCIE_RXP	b12	a12	2_PCIE_RXP
	GND	b13	a13	GND
	2_USB3_TXP	b14	a14	1_USB2_P
	2_USB3_TXN	b15	a15	1_USB2_N
	GND	b16	a16	GND
	2_USB3_RXP	b17	a17	2_USB2_P
	2_USB3_RXN	b18	a18	2_USB2_N
	GND	b19	a19	GND
	PCIE_CLK_P	b20	a20	1_2_USB_OC#
	PCIE_CLK_N	b21	a21	PLTRST#
	+5VS <sup>1)</sup>	b22	a22	+3.3VS <sup>1)</sup>
	+5VS <sup>1)</sup>	b23	a23	+3.3VS <sup>1)</sup>
	+5VPS <sup>2)</sup>	b24	a24	+3.3VA <sup>3)</sup>
	+12VPS <sup>2)</sup>	b25	a25	+12VPS <sup>2)</sup>

\* CFG\_12 and CFG\_34 = open (10k PU on CPU carrier board) indicating that a PCIe x4 link is requested  
 CFG\_12 is connected to M.2 signal PEDET, low means SATA SSD (SATA not configurable with all CPU cards)

- 1) Power rail switched on in S0 state only
- 2) Power rail switched on in S0-S4 state
- 3) Power always on



2mm Microspeed male connector for nominal stack height 10mm (B2B 10.8mm)  
 Mating carrier card connector 8mm female Microspeed

High Speed Expansion HSE2				
<p>© EKF 275.90.01.068.51 ekf.com                      1.00mm Pitch High Speed Male Connector</p>	3_PCIE_TXP	b1	a1	1_PCIE_TXP
	3_PCIE_TXN	b2	a2	1_PCIE_TXN
	GND	b3	a3	GND
	3_PCIE_RXN	b4	a4	1_PCIE_RXN
	3_PCIE_RXP	b5	a5	1_PCIE_RXP
	GND	b6	a6	GND
	4_PCIE_TXP	b7	a7	2_PCIE_TXP
	4_PCIE_TXN	b8	a8	2_PCIE_TXN
	GND	b9	a9	GND
	4_PCIE_RXN	b10	a10	2_PCIE_RXN
	4_PCIE_RXP	b11	a11	2_PCIE_RXP
	GND	b12	a12	GND
	DP_LANE2_P	b13	a13	DP_LANE0_P
	DP_LANE2_N	b14	a14	DP_LANE0_N
	GND	b15	a15	GND
	DP_LANE3_P	b16	a16	DP_LANE1_P
	DP_LANE3_N	b17	a17	DP_LANE1_N
	GND	b18	a18	GND
	DP_AUX_P	b19	a19	PCIE_CLK_P
	DP_AUX_N	b20	a20	PCIE_CLK_N
	DP_CFG1	b21	a21	GND
	DP_HPDP	b22	a22	SMB_SCL
	PLTRST#	b23	a23	SMB_SDA
	+12VPS 1)	b24	a24	+12VPS 1)
	+12VPS 1)	b25	a25	+12VPS 1)

HSE2 PCIe® can pre-configured 1x4, 2x2, 4x1 via soft-straps (Flash image CPU carrier card). For S83-P6 PCIe® 4x1 is mandatory. If misaligned, only one or two NICs will be present after system enumeration.

1) Power rail switched on in S0-S4 state

## Suitable CPU Carrier Boards for the S83-P6 Mezzanine

CPU	HSE1			HSE2	
	PCIe®	USB	SATA *	PCIe® **	DisplayPort™
PC7-FESTIVAL	Gen3 1x4	5Gbps	6G	Gen3 4x1	1.2 MST
SC4-CONCERTO	Gen3 1x4	5Gbps	6G	Gen3 4x1	1.2 MST
SC5-FESTIVAL	Gen3 1x4	5Gbps	6G	Gen3 4x1	1.2 MST
SC8-FLUTE	Gen3 1x4	5Gbps	-	Gen3 4x1	-
SC9-TOCCATA	Gen4 1x4	10Gbps	-	Gen3 4x1	1.4a MST

\* HSE1 must be configured for PCIe® 1x4 (default). With some CPU cards also legacy M.2 SATA SSDs would be accepted - there is a hardware auto-sense mechanism established

\*\* CPU card HSE2 PCIe® links must be configured accordingly to 4x1

## Backplane Connector P6

P6 CompactPCI® Serial Peripheral Slot Backplane Connector												
AirMax VS® • EKF Part #250.3.1208.20.02 • 96 pos. 12x8, 18mm width												
P6	A	B	C	D	E	F	G	H	I	J	K	L
8	PU 1)	8 <i>ETH</i> A+	8 <i>ETH</i> A-	PU 2)	8 <i>ETH</i> B+	8 <i>ETH</i> B-	GND	8 <i>ETH</i> C+	8 <i>ETH</i> C-	GND	8 <i>ETH</i> D+	8 <i>ETH</i> D-
7	7 <i>ETH</i> A+	7 <i>ETH</i> A-	GND	7 <i>ETH</i> B+	7 <i>ETH</i> B-	GND	7 <i>ETH</i> C+	7 <i>ETH</i> C-	GND	7 <i>ETH</i> D+	7 <i>ETH</i> D-	GND
6	GND	6 <i>ETH</i> A+	6 <i>ETH</i> A-	GND	6 <i>ETH</i> B+	6 <i>ETH</i> B-	GND	6 <i>ETH</i> C+	6 <i>ETH</i> C-	GND	6 <i>ETH</i> D+	6 <i>ETH</i> D-
5	5 <i>ETH</i> A+	5 <i>ETH</i> A-	GND	5 <i>ETH</i> B+	5 <i>ETH</i> B-	GND	5 <i>ETH</i> C+	5 <i>ETH</i> C-	GND	5 <i>ETH</i> D+	5 <i>ETH</i> D-	GND
4	GND	4 <i>ETH</i> A+	4 <i>ETH</i> A-	GND	4 <i>ETH</i> B+	4 <i>ETH</i> B-	GND	4 <i>ETH</i> C+	4 <i>ETH</i> C-	GND	4 <i>ETH</i> D+	4 <i>ETH</i> D-
3	3 <i>ETH</i> A+	3 <i>ETH</i> A-	GND	3 <i>ETH</i> B+	3 <i>ETH</i> B-	GND	3 <i>ETH</i> C+	3 <i>ETH</i> C-	GND	3 <i>ETH</i> D+	3 <i>ETH</i> D-	GND
2	GND	2 <i>ETH</i> A+	2 <i>ETH</i> A-	GND	2 <i>ETH</i> B+	2 <i>ETH</i> B-	GND	2 <i>ETH</i> C+	2 <i>ETH</i> C-	GND	2 <i>ETH</i> D+	2 <i>ETH</i> D-
1	1 <i>ETH</i> A+	1 <i>ETH</i> A-	GND	1 <i>ETH</i> B+	1 <i>ETH</i> B-	GND	1 <i>ETH</i> C+	1 <i>ETH</i> C-	GND	1 <i>ETH</i> D+	1 <i>ETH</i> D-	GND

pin assignments reflect standard mount P6 connector  
*italic/grey pins are NC (shown for reference only)*

- 1) DECT\_RIO Signal
- 2) DECT\_BPR Signal

On backplanes suitable for Ethernet (either star or mesh) both pins DECT\_\* are tied to GND. Open pins indicate a P6 rear I/O enabled backplane slot. The CPU carrier card with S83-P6 mezzanine must not be inserted into backplane slots which are designated for rear I/O over P6/J6 with an other signal assignment than Ethernet. A RIO module with up to 8 x RJ45 GbE ports is planned by EKF, as an alternate to backplane networking, suitable for an P6/J6 rear I/O enabled backplane slot.

## Ordering Information

Ordering Information
For popular S83-P6 SKUs please refer to <a href="http://www.ekf.com/liste/liste_21.html#S83">www.ekf.com/liste/liste_21.html#S83</a>

Please note that the S83-P6 is a mezzanine board which typically comes without an M.2 module 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 an M.2 NVMe SSD storage module populated, please contact [sales@ekf.com](mailto:sales@ekf.com) before ordering.

## Comparison of Backplane Ethernet Mezzanines

Low Profile CPU Card Mezzanine w. Backplane Ethernet					
Mezzanine	Type	Speed	# Ports	M.2 PCIe®	Front I/O
S80-P6	Switch	1000BASE-T	8	x4 Gen3	-
S82-P6	NIC	1000BASE-T	4	x4 Gen3	-
S83-P6	NIC	2.5GBASE-T	4	x4 Gen4	Type-C

## Alternate Products

Other Low Profile CPU Card Mezzanine Storage Modules	
S20-NVME	M.2 NVMe Socket, 1 x Type-C USB Front I/O
S40-NVME	M.2 NVMe & M.2 SATA Sockets, 2 x Type-C Front I/O
S48-SSD	Dual M.2 NVMe, 1 x Type-C Front I/O

# Beyond All Limits: EKF High Performance Embedded



**Industrial Computers Made in Germany**  
**boards. systems. solutions.**

Document No. 10251 • 26 May 2023

EKF Elektronik GmbH  
Philipp-Reis-Str. 4 (Haus 1)  
Lilienthalstr. 2 (Haus 2)  
59065 HAMM  
Germany



Phone +49 (0)2381/6890-0  
Fax +49 (0)2381/6890-90  
Internet [www.ekf.com](http://www.ekf.com)  
E-Mail [sales@ekf.com](mailto:sales@ekf.com)