



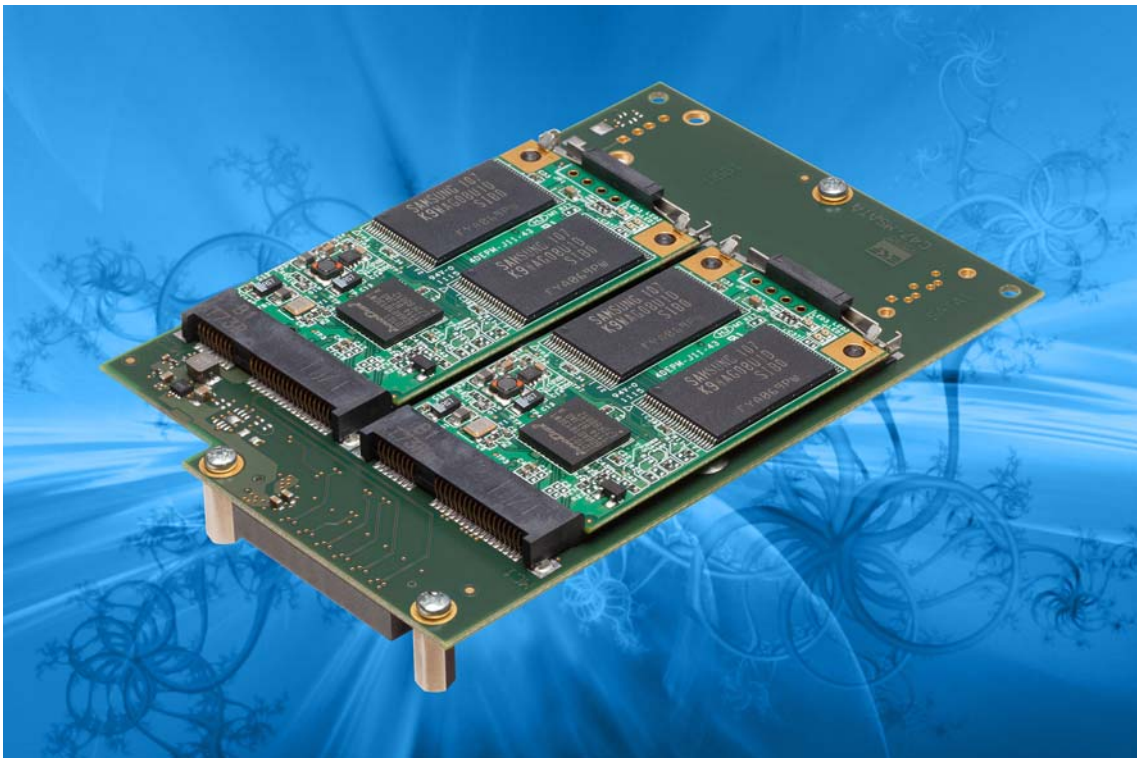
Technical Information

C47-MSATA

Dual mSATA Card Mezzanine Module

SATA & USB

Document No. 6406 • Ed. 6 • 2 December 2011



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About this Manual

This manual is a short form description of the technical aspects of the C47-MSATA, required for installation and system integration. It is intended for the advanced user only.

Edition History

Ed.	Contents/ <i>Changes</i>	Author	Date
1	Technical Information C47-MSATA, English, preliminary edition Text #6406, File: c47_ti.wpd	jj	15 June 2011
2	Added pin assignment SIM1 SIM card holder	jj	28 June 2011
3	Added photos	jj	15 August 2011
4	Added photos C47 pano & PC2-C47 exploded view	jj	22 August 2011
5	Added photo PC1 & C47 front view	jj	26 August 2011
5	Availability of P-SATA4 more clearly described	jj	2 December 2011

Related Documents

For a description of the CCM-BOOGIE or PC1-GROOVE CPU cards, which may act as carrier board with respect to the C47-MSATA, please refer to the correspondent CPU user guide, available by download (change URL accordingly for other potential carrier cards).

Download CPU Card User Guides	
CCM-BOOGIE	www.ekf.com/c/ccpu/ccm/ccm_uge.pdf
PC1-GROOVE	www.ekf.com/p/pc1/pc1_uge.pdf
PC2-LIMBO	www.ekf.com/p/pc2/pc2_ug.pdf
SC1-ALLEGRO	

Nomenclature

Signal names used herein with an attached '#' designate active low lines.

Trade Marks

Some terms used herein are property of their respective owners, e.g.

- ▶ Intel, Core 2 Duo, Core i7, Atom E6xx: ® Intel
- ▶ CompactPCI, CompactPCI PlusIO, CompactPCI Serial: ® PICMG
- ▶ Windows XP, Windows POSReady, Windows 7: ® Microsoft
- ▶ EKF, ekf system: ® EKF

EKF does not claim this list to be complete.

Legal Disclaimer - Liability Exclusion

This document has been edited as carefully as possible. We apologize for any potential mistake. Information provided herein is designated exclusively to the proficient user (system integrator, engineer). EKF can accept no responsibility for any damage caused by the use of this manual.

Standards

Reference Documents		
Term	Document	Origin
mSATA	Jedec MO-300B mSATA SSD Assembly	www.jedec.org
PCI Express® Mini Card	PCI Express® Mini Card Electromechanical Specification	www.pcisig.com
SATA	Serial ATA Specification	www.sata-io.org
USB	Universal Serial Bus Specification	www.usb.org

Feature Summary

Feature Summary	
Form Factor	Proprietary size mezzanine module, fits basically into the 4HP (20.3mm) envelope of the CPU carrier board, typically delivered as a ready to use assembly unit (including the CCM-BOOGIE, PC1-GROOVE or successor CPU card), mounting position right (on top of CPU board)
Host I/F Connector (Bottom Mount to CPU Carrier)	<ul style="list-style-type: none"> ▶ High Speed mezzanine connector suitable for CCM-BOOGIE, PC1-GROOVE and successor CPU carrier boards ▶ up to 4 x SATA 3G channels (RAID option) ▶ 4 x USB 2.0 ports
SATA Usage	<ul style="list-style-type: none"> ▶ SATA1 (from ICH southbridge or PCH on CPU carrier board), bound to the optional internal cable connector SATA1, please note that additional headroom is required beyond 4HP for this option ▶ SATA2 and SATA3 (derived from the CPU carrier board secondary SATA controller), bound to the mSATA module connectors PEMC1 and PEMC2, both channels operated either individually or as SATA RAID level 0/1 dual drive ▶ SATA4 (not supported on all CPU carrier boards), bound to the optional internal cable connector SATA4, option not available together with dual mSATA module sockets, please note that additional headroom is required beyond 4HP for this option
USB Usage	<ul style="list-style-type: none"> ▶ USB1 & USB2 dedicated to optional USB type A cable connectors. Receptacle USB2 not available together with dual mSATA module sockets. Please note that additional headroom is required beyond 4HP for this option. ▶ USB3 & USB4 wired to mSATA sockets PEMC1/PEMC2 for use with USB bound PCI Express® Mini Card modules
mSATA Connectors	<ul style="list-style-type: none"> ▶ Up to 2 x sockets (PEMC1, PEMC2), mechanically identical to the PCI Express® Mini Card specification, suitable for mSATA modules complying with JEDEC MO-300B, or USB 2.0 based PE Mini Cards according to the PCI-SIG specification ▶ Module size full (50.8mm x 29.85mm x 3.75mm) or mini (26.8mm) ▶ SIM card holder available as an option, assigned to PEMC1
Cable Connectors	<ul style="list-style-type: none"> ▶ SATA1 (option), SATA4 (option), for attachment of system internal SATA drives ▶ USB1 (option), USB2 (option), for system internal attachment of USB devices
Thermal Conditions	<ul style="list-style-type: none"> ▶ Operating temperature: 0°C ... +70°C ▶ Option -40°C ... +85°C ▶ Storage temperature: -40°C ... +85°C, max. gradient 5°C/min
Environmental Conditions	<ul style="list-style-type: none"> ▶ Humidity 5% ... 95% RH non condensing ▶ Altitude -300m ... +3000m ▶ Shock 15g 0.33ms, 6g 6ms ▶ Vibration 1g 5-2000Hz
Specials	<ul style="list-style-type: none"> ▶ RoHS compliant ▶ Coating, Sealing, Underfilling on request ▶ Long Term Availability
EC Regulations	<ul style="list-style-type: none"> ▶ EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1) ▶ 2002/95/EC (RoHS)
MTBF	tbd

Not all of the connectors may be present or functional on your actual C47-MSATA board; assembly is highly custom specific. Options may be exclusive, i.e. not necessarily concurrently present. Discuss your needs with EKF before ordering.

Overview

Available as a mezzanine add-on expansion board to the CCM-BOOGIE, PC1-GROOVE and successor CPU carrier cards, the main purpose of the C47-MSATA is to provide dual host connectors for mounting of mSATA SSD modules, as a rugged and fast mass storage media. With both sockets in use, a SATA RAID level 0/1 system can be easily established, for even higher performance and reliability.

MSATA host connectors are mechanically identical to the PCI Express® Mini Card specification. With respect to the signal routing, the C47-SATA allows also for use of USB driven PCI Express® Mini Card modules, as an alternate to mSATA SSDs. There are USB controlled SSDs available in the market, and many wireless PCI Express® Mini Cards are also based solely on the USB data path. Please note however, that no antenna connectors are provided on the C47-SATA for wireless applications. In contrast, such PCI Express® Mini Card modules which need support for a PCI Express® lane cannot be used with the C47-SATA.

Basically, the C47-MSATA is designed to fit into the 4HP (20.32mm) envelope of a CompactPCI® CPU carrier board, so that another 4HP pitch mezzanine expansion board may be stacked above the CPU/C47 assembly in addition. The C47-MSATA accommodates either full-size (50.8mm length, fixed by latch) or mini-size (26.8mm length, screw lock) mSATA modules.

The C47-MSATA can be optionally equipped with one or even two USB 2.0 type A host receptacles ¹⁾. In addition, up to two SATA connectors (latching headers) are optionally available on the C47-MSATA ¹⁾, for attachment of system internal drives by ordinary SATA cable harnesses. Both cable connector options will exceed the 4HP total stack height for the CPU carrier board and C47-MSATA assembly. Please read carefully the respective notes. For some EKF expansion boards slight violations of the 4HP envelope may be tolerable.

¹⁾ Some of the C47-MSATA population options are exclusive to each other, due to space restrictions (see table below).

C47-MSATA Stuffing Options		
mSATA Card or PCIe Mini Card (USB) Host Connector(s) 4HP Envelope Maintained	USB A Host Receptacle(s) 4HP Envelope Slightly Exceeded	Latching SATA Header(s) 4HP Envelope Exceeded with SATA Cable Assy
2 x mSATA Card	up to 1 x USB	up to 1 x SATA header
1 x mSATA Card	up to 2 x USB	up to 2 x SATA headers



C47-MSATA Module on CPU Carrier Card



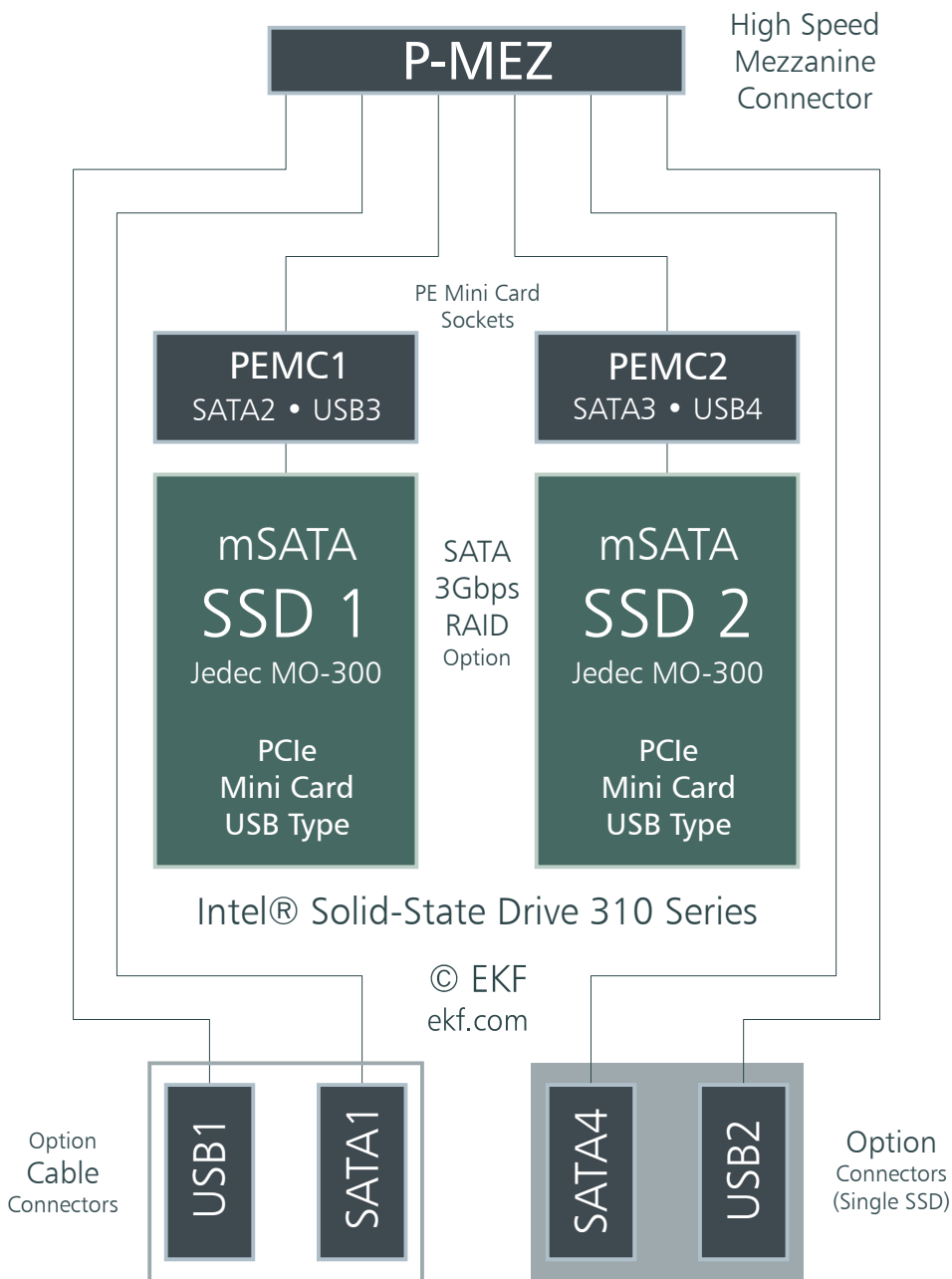
mSATA SSD Card



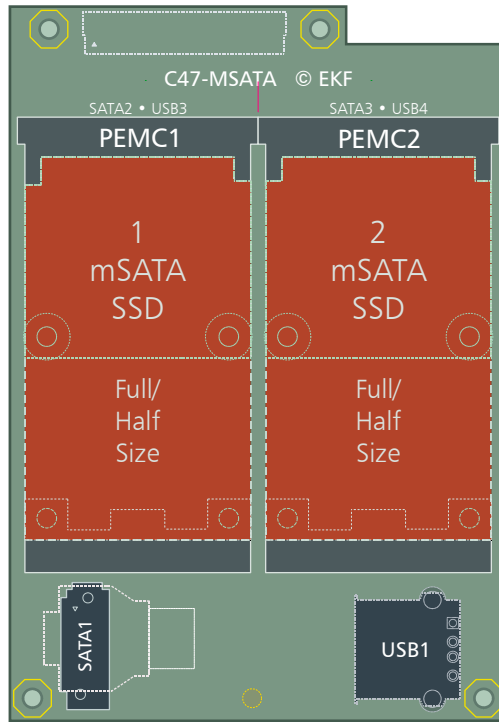
PC1-GROOVE with C47-MSATA RAID Storage Mezzanine Module

Block Diagram

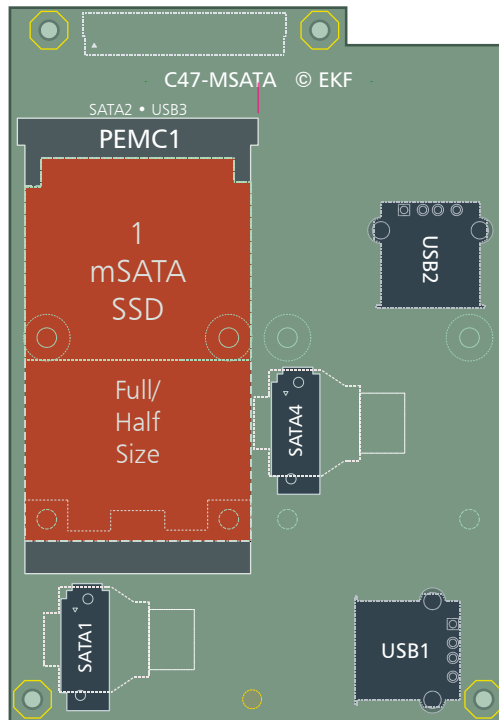
Simplified Block Diagram
C47-MSATA



Top View Component Assembly



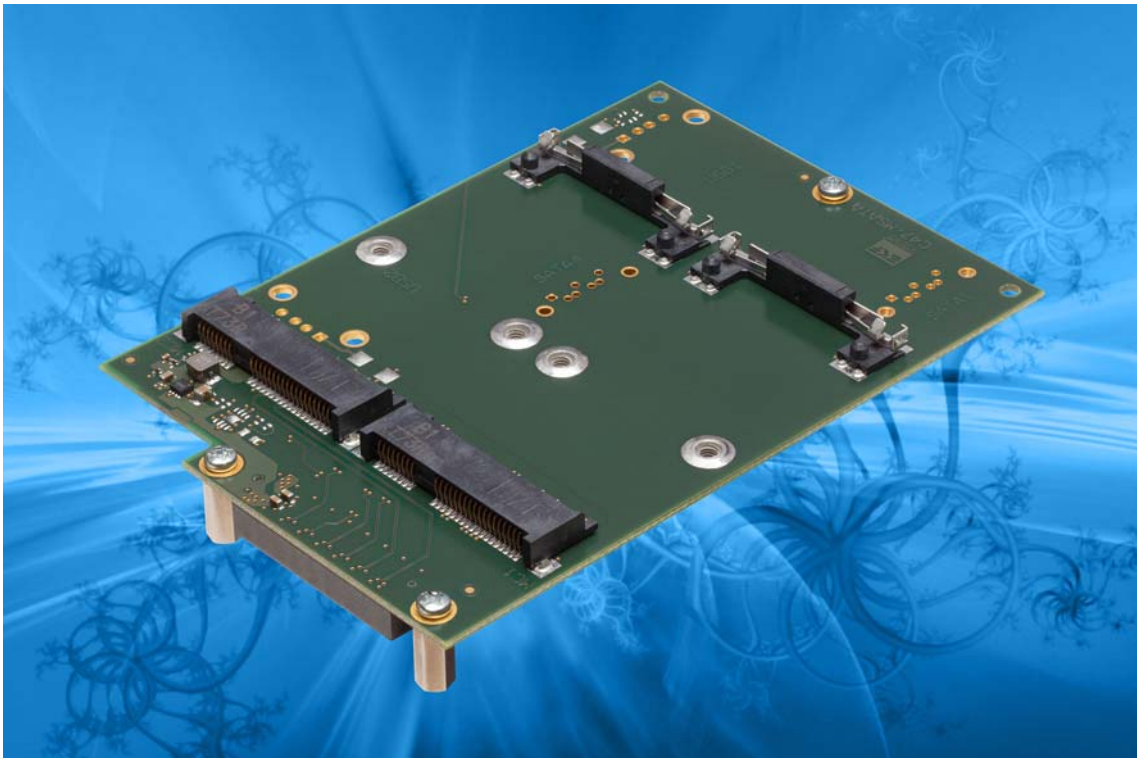
Dual-mSATA Sockets



Single mSATA Socket



C47-MSATA with mSATA Cards



C47-MSATA

Installing and Replacing Components

Before You Begin

Warning

The procedures in this chapter assume familiarity with the general terminology associated with industrial electronics and with safety practices and regulatory compliance required for using and modifying electronic equipment. Disconnect any telecommunication links, networks or procedures described in this chapter. Failure links before you open the system or perform or equipment damage. Some parts of the the power switch is in its off state.



the system from its power source and from modems before performing any of the to disconnect power, or telecommunication any procedures can result in personal injury system can continue to operate even though

Caution

Electrostatic discharge (ESD) can damage components. Perform the procedures described in this chapter only at an ESD workstation. If such a some ESD protection by wearing an metal part of the system chassis or board original ESD protected packaging. Retain the antistatic box) in case of returning the board to EKF for repair.



station is not available, you can provide antistatic wrist strap and attaching it to a front panel. Store the board only in its original packaging (antistatic bag and

Installing the Board Assembly

Warning

This procedure should be done only by qualified technical personnel. Disconnect the system from its power source before doing the procedures described here. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage.

Typically you will perform the following steps:

- Switch off the system, remove the AC power cord
- Attach your antistatic wrist strap to a metallic part of the system
- Remove the board packaging, be sure to touch the board only at the front panel
- Identify the related CompactPCI slot (peripheral slot for I/O boards, system slot for CPU boards, with the system slot typically most right or most left to the backplane)
- Insert card carefully (be sure not to damage components mounted on the bottom side of the board by scratching neighbored front panels)
- A card with onboard connectors requires attachment of associated cabling now
- Lock the ejector lever, fix screws at the front panel (top/bottom)
- Retain original packaging in case of return



Removing the Board Assembly

Warning

This procedure should be done only by qualified technical personnel. Disconnect the system from its power source before doing the procedures described here. Failure to disconnect power, or telecommunication links before you open the system or perform any procedures can result in personal injury or equipment damage.

Typically you will perform the following steps:

- Switch off the system, remove the AC power cord
- Attach your antistatic wrist strap to a metallic part of the system
- Identify the board, be sure to touch the board only at the front panel
- unfasten both front panel screws (top/bottom), unlock the ejector lever
- Remove any onboard cabling assembly
- Activate the ejector lever
- Remove the card carefully (be sure not to damage components mounted on the bottom side of the board by scratching neighbored front panels)
- Store board in the original packaging, do not touch any components, hold the board at the front panel only



Warning

Do not expose the card to fire. Battery cells and other components could explode and cause personal injury.





EMC Recommendations

In order to comply with the CE regulations for EMC, it is mandatory to observe the following rules:

- The chassis or rack including other boards in use must comply entirely with CE
- Close all board slots not in use with a blind front panel
- Front panels must be fastened by built-in screws
- Cover any unused front panel mounted connector with a shielding cap
- External communications cable assemblies must be shielded (shield connected only at one end of the cable)
- Use ferrite beads for cabling wherever appropriate
- Some connectors may require additional isolating parts

Reccomended Accessories

Blind CPCI Front Panels	EKF Elektronik	Widths currently available (1HP=5.08mm): with handle 4HP/8HP without handle 2HP/4HP/8HP/10HP/12HP
Ferrit Bead Filters	ARP Datacom, 63115 Dietzenbach	Ordering No. 102 820 (cable diameter 6.5mm) 102 821 (cable diameter 10.0mm) 102 822 (cable diameter 13.0mm)
Metal Shielding Caps	Conec-Polytronic, 59557 Lippstadt	Ordering No. CDFA 09 165 X 13129 X (DB9) CDSFA 15 165 X 12979 X (DB15) CDSFA 25 165 X 12989 X (DB25)

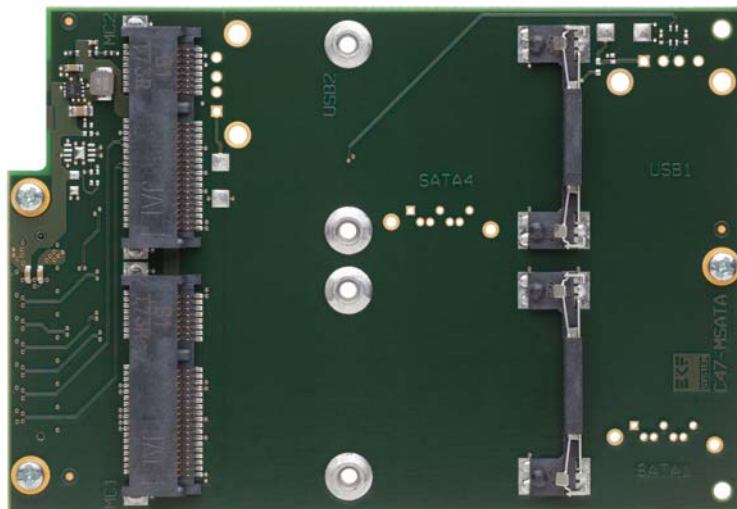
Technical Reference - Connectors

Caution

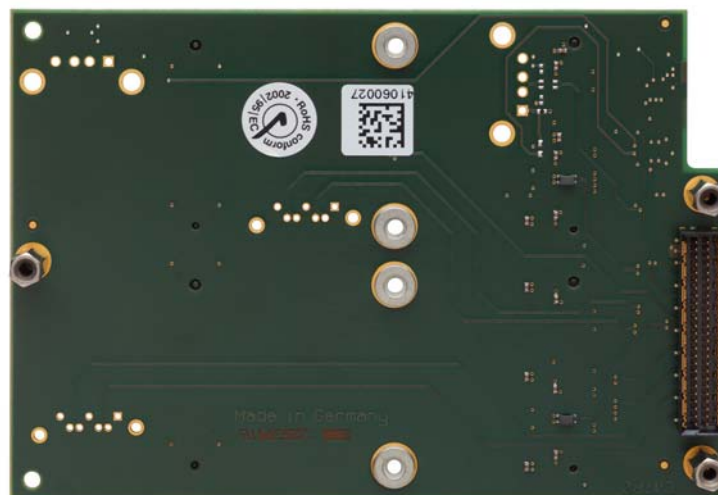
Some of the connectors may provide operating voltage (e.g. +12V, +5V and +3.3V) to devices inside the system chassis, such as internal peripherals. Not all of these connectors are overcurrent protected. Do not use these connectors for powering devices external to the computer chassis. A fault in the load presented by the external devices could cause damage to the board, the interconnecting cable and the external devices themselves.

Please Note

The C47-MSATA mezzanine module may be equipped with several on-board connectors for system internal usage. Not all of these connectors may be present on a particular board. Be sure to specify your individual needs when ordering the C47-MSATA board. Characteristic features and the pin assignments of each connector are described on the following pages.



C47-MSATA (Top)

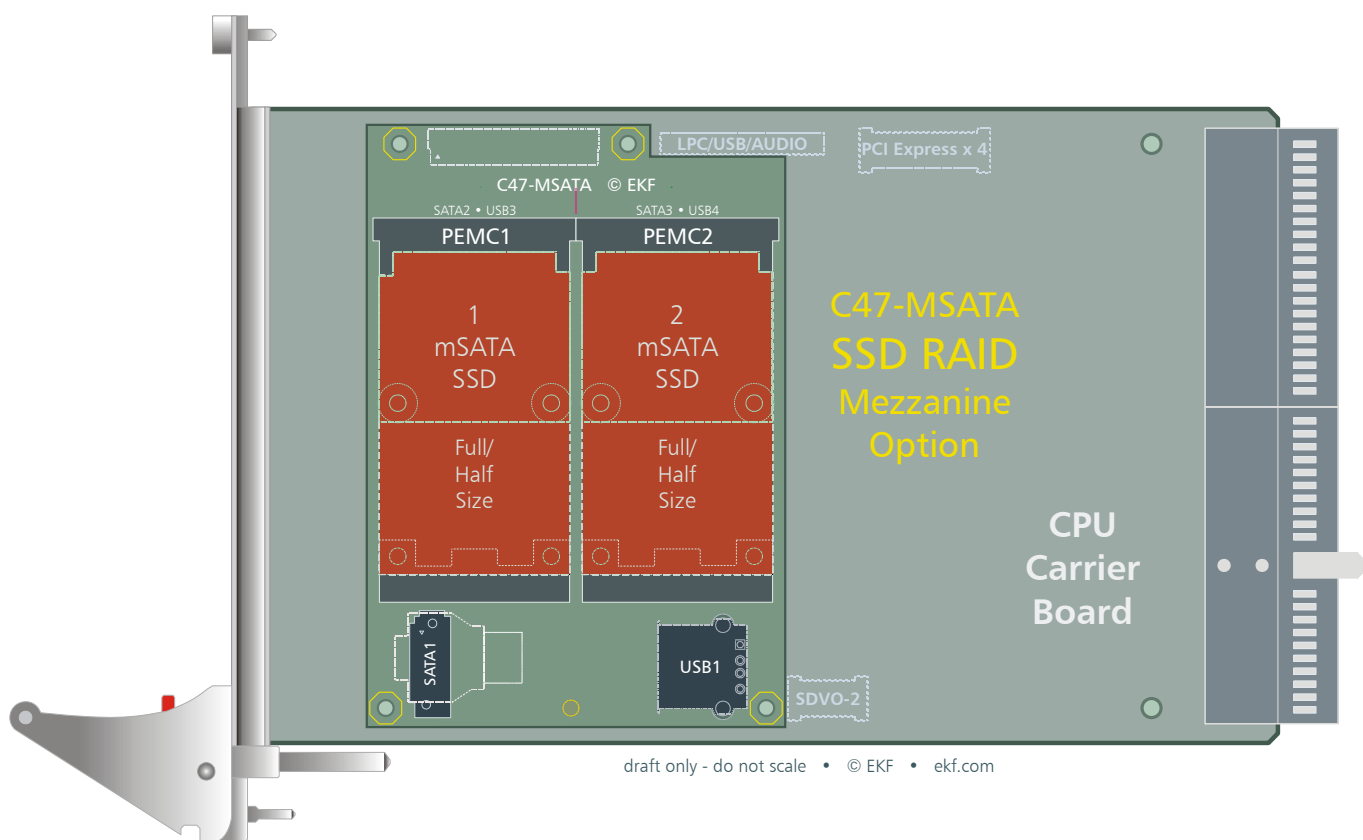


C47-MSATA (Bottom)

I/O Connectors

The C47-MSATA is equipped with several top side connectors. Some of these connectors are available as an option only or exclusive to each other, and therefore may not be functional or even present on your actual board. Assembly of these connectors is highly custom specific. Discuss your needs with EKF before ordering, so that the optimum board configuration for your application will be chosen.

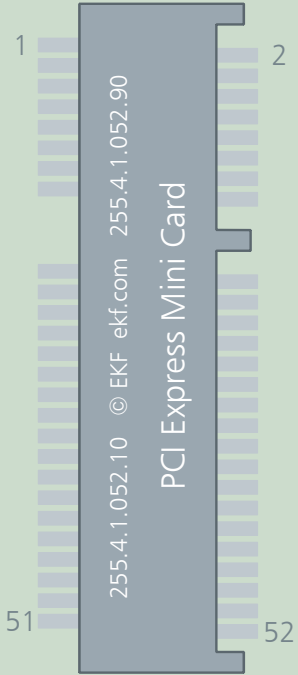
The C47-MSATA is mainly a passive card; high speed serial interface SATA and USB lines are passed from the CPU carrier board to the mezzanine module via matching high speed expansion connectors. EKF CPU boards may differ however with respect to the port number and origin of SATA and USB channels supported across the high speed expansion connector. If in doubt, please consult the related CPU card user guide, and refer to the 'J-HSE' connector description.



C47-MSATA Position on a CPU Carrier Card

mSATA Host Connectors

The C47-MSATA is provided with one or two mSATA Host Connectors. These are suitable for mSATA modules, and also USB 2.0 driven PCI Express® Mini Card modules. After inserted, the mSATA card has to be fixed by a snap-in latch (full-size modules 50.80mm length), or will have to be secured manually by screws (mini size modules 26.80mm length), in order to withstand shock and vibration.

PEMC1 & PEMC2				
mSATA / PCI Express® Mini Card Socket (255.4.1.052.10) & Latch (255.4.1.052.90)				
	NC <i>PCIE_WAKE#</i>	1	2	+3.3V
	NC	3	4	GND
	NC	5	6	+1.5V
	NC <i>CLKREQ#</i>	7	8	NC <i>MC_UIM_C1</i>
	GND	9	10	NC <i>MC_UIM_C7</i>
	NC <i>PCIE_CLK-</i>	11	12	NC <i>MC_UIM_C3</i>
	NC <i>PCIE_CLK+</i>	13	14	NC <i>MC_UIM_C2</i>
	GND	15	16	NC <i>MC_UIM_C6</i>
	NC	17	18	GND
	NC	19	20	NC <i>WDIS#</i>
	GND	21	22	NC <i>RST#</i>
	SATA2(3)_RXP <i>PCIE_RN</i>	23	24	+3.3V
	SATA2(3)_RXN <i>PCIE_RP</i>	25	26	GND
	GND	27	28	+1.5V
	GND	29	30	NC <i>SMB_CLK</i>
	SATA2(3)_TXN <i>PCIE_TN</i>	31	32	NC <i>SMB_DAT</i>
	SATA2(3)_TXP <i>PCIE_TP</i>	33	34	GND
	GND	35	36	USB3(4)_D-
	GND	37	38	USB3(4)_D+
	+3.3V	39	40	GND
	+3.3V	41	42	NC <i>LED_WWAN#</i>
	NC	43	44	NC <i>LED_WLAN#</i>
	NC	45	46	NC <i>LED_WPAN#</i>
	NC	47	48	+1.5V
	NC	49	50	GND
NC	51	52	+3.3V	

As can be seen, PCI Express® Mini Card modules which are based on a PCIe lane (as some WLAN cards) will not work, but most USB controlled PE mini cards can be used.

With two mSATA Solid-State Drives attached, the C47-MSATA allows for RAID level 0/1 operation. On popular EKF CPU boards the corresponding SATA channels 2/3 are generated by a JMicron PCIe to SATA controller, which can be configured for several SATA storage operating modes.

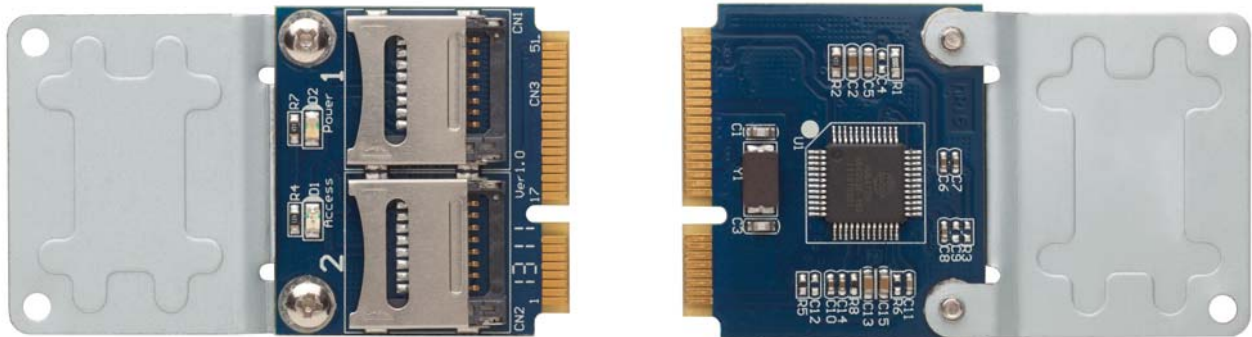
+1.5V is generated from an on-board DC/DC converter, with a maximum regulator output current of 2A in total for both host mSATA connectors. Since typical PCI Express® Mini Card modules have no need for this secondary supply voltage, the DC/DC converter may be left unpopulated for cost sensitive applications.

While the mSATA host connector PEMC1 is populated on all C47-MSATA module versions, PEMC2 is available as an option. If there is demand for either the SATA4 or USB2 cable connectors, PEMC2 cannot be stuffed.

Full size Mini Cards are fixed by a latching (snap-in) element at the module end. A half size Mini Card must be fastened manually by screws M2.5x6mm through corresponding M2.5 soldered nuts provided on the C47-MSATA PCB. 1.5mm height nylon washers are required in addition as spacing elements between the PCB nuts and the half size Mini Card.

Part Numbers for Fixing a Half Size Mini Card		
2	440.42.025.015	M2.5 PCB nut, bottom mount (populated on-board by default)
2	440.26.025.015	Self retaining nylon washer 1.5mm height (spacer)
2	440.28.025.000	Locking washer
2	440.08.025.006	Screw M2.5 x 6mm

Another approach would be to use a mechanical extender on half size Mini Cards, as shown below:



SIM1

Available as an option only, the SIM card holder SIM1 is wired to the PEMC1 Mini Card connector, for applications which require subscriber identification. SIM1 is located on the bottom side of the C47 (towards the CPU carrier card when fixed). Hence, a SIM card has to be inserted into the SIM card holder before fixing the C47-MSATA module to the CPU carrier.

SIM1 SIM card socket hinge (top load) EKF Part #219.51.006.20	
c1	UIM Power
c2	UIM Reset
c3	UIM Clk
c4	nc
c5	GND
c6	UIM Vpp
c7	UIM Data
c8	nc

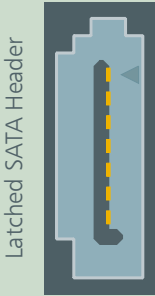
The SIM card holder is a 6-lead hinge style socket, providing a shielding cover with mechanical lock/unlock function. Please note, that there is no antenna connector provided on the C47-MSATA - for wireless applications please consider e.g. a suitable U.FL to SMA cable assembly in combination with a blind front panel, as antenna cable from a PE Mini Card module to an external antenna.

P-SATA1 P-SATA4

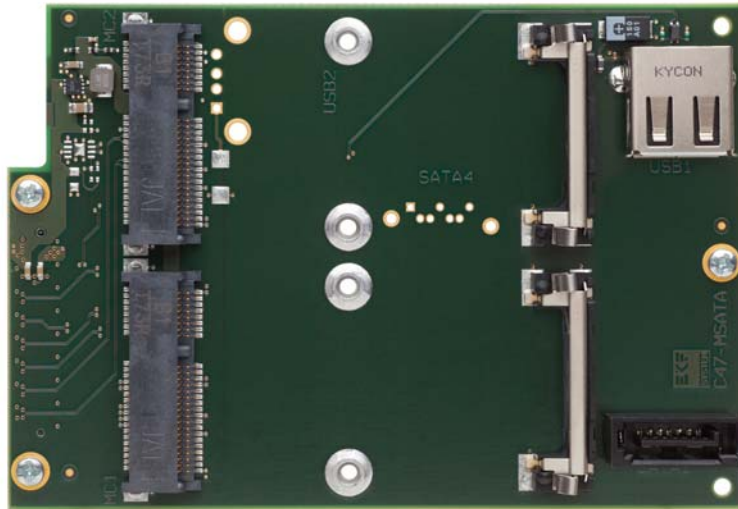
The C47-MSATA can be optionally stuffed with up to two vertical latched SATA signal headers. TX/RX designation of signals are shown with respect to the SATA controller. P-SATA1 corresponds to the carrier board CPU chipset. P-SATA4 is not supported by all CPU carrier boards - please consult the CPU card user guide with respect to its expansion connector J-HSE description. P-SATA4 can be used e.g. together with the PC1-GROOVE and SC1-ALLEGRO CPU carrier cards.

Latching cable assemblies are recommended for reliable industrial usage. Both on-board SATA headers are aligned so, that a cable assembly with R/A plug for system internal attachment of SATA drives can be used.

Usage of P-SATA1/4 exceeds the 4HP total height of the board assembly (carrier board together with C47-MSATA mezzanine) by ~10mm, a cable harness with R/A SATA plug assumed. This is not tolerable for an additional 4HP mezzanine expansion card such as the CCL-CAPELLA or the CCI-RAP. Discuss your actual needs with sales@ekf.de before ordering.

P-SATA1	P-SATA4	#256.007.22.01	Latched Headers
	1	GND	
	2	SATA_TX+	
	3	SATA_TX-	
	4	GND	
	5	SATA_RX-	
	6	SATA_RX+	
	7	GND	

The P-SATA4 receptacle cannot be populated together with the PEMC2 host connector, since both components would overlap each other. Be sure to discuss your needs with sales@ekf.de before ordering.



Option Single SATA & USB Cable Connectors

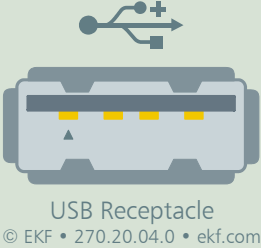
USB1 USB2

As a custom specific option, the C47-MSATA can be provided with one or two USB receptacles. Due to the USB connector dimensions, the total stack height of the CPU carrier board and the C47-MSATA mezzanine module assembly will exceed the 4HP envelope about ~2mm. This may be tolerable in some situations, but should be nevertheless considered. USB cable assemblies with slim and short plugs are also required - not any USB harness matches with the C47-MSATA due to space restrictions. The same issue must be strictly observed if direct attachment of an USB stick (e.g. Flash Drive) is intended - only a very short, low profile stick would be suitable.

The USB2 receptacle cannot be populated together with the PEMC2 host connector, since both components would overlap each other. Be sure to discuss your needs with sales@ekf.de before ordering.

The C47-MSATA USB ports typically are derived from the ICH southbridge or another chipset component on an EKF CPU carrier board for optimum USB performance. As an alternate, the CPU card may be equipped with an USB 2.0 hub controller, which may limit the overall USB throughput on the C47-MSATA when heavy traffic occurs simultaneously on the PEMC host connector USB pins and the USB cable connector(s).

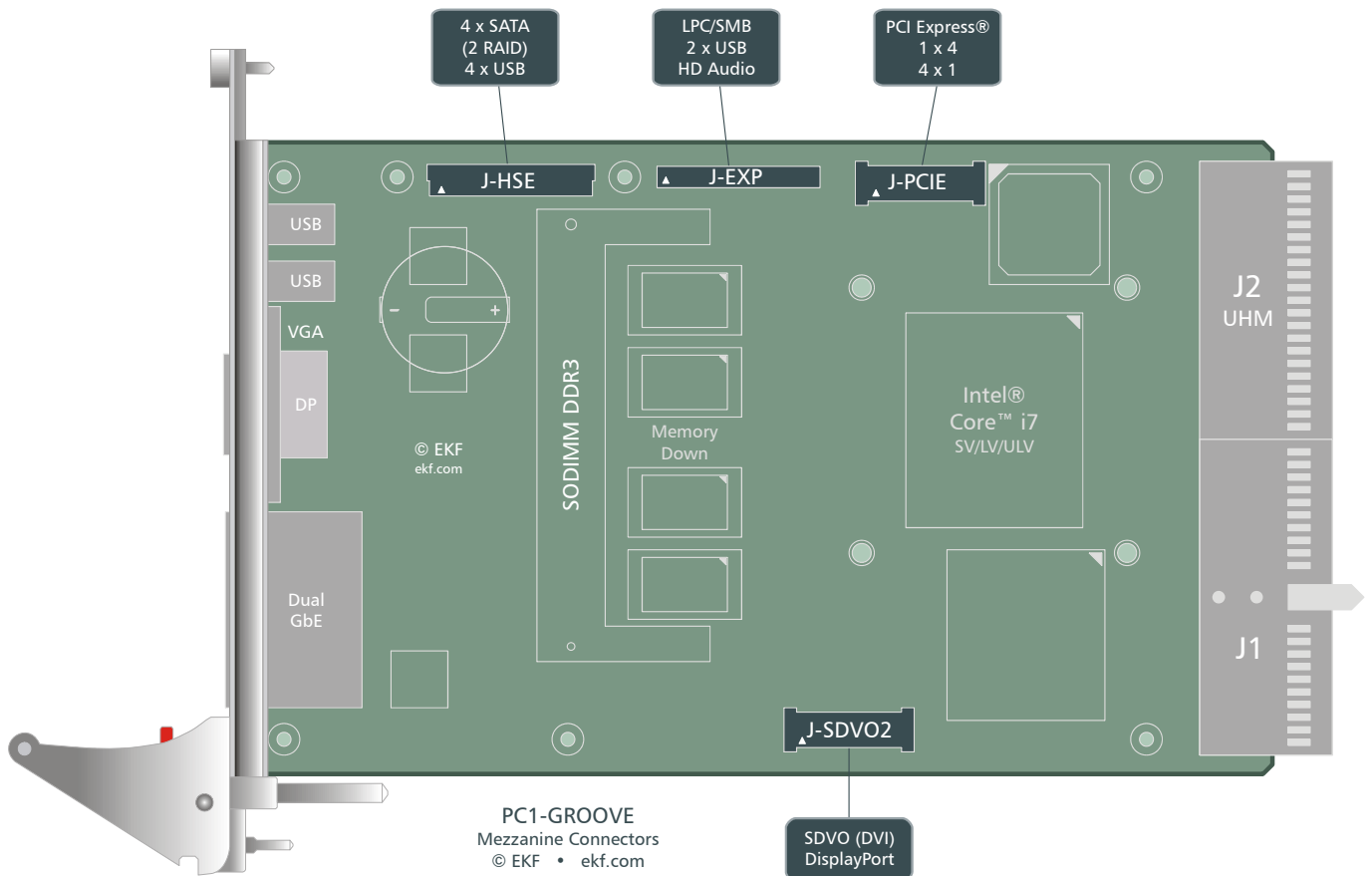
A dual electronic power switch is provided on the C47-MSATA for short-circuit and overcurrent control regarding the USB1/ receptacles (0.5A).

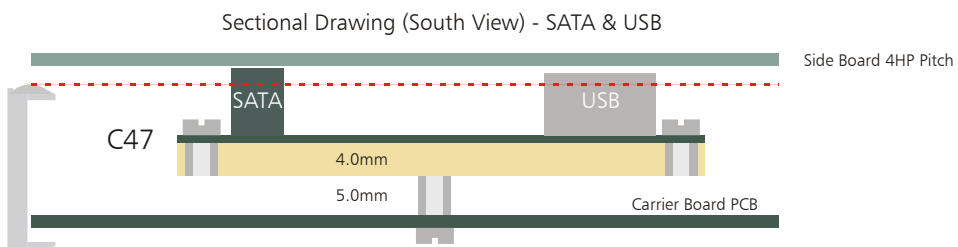
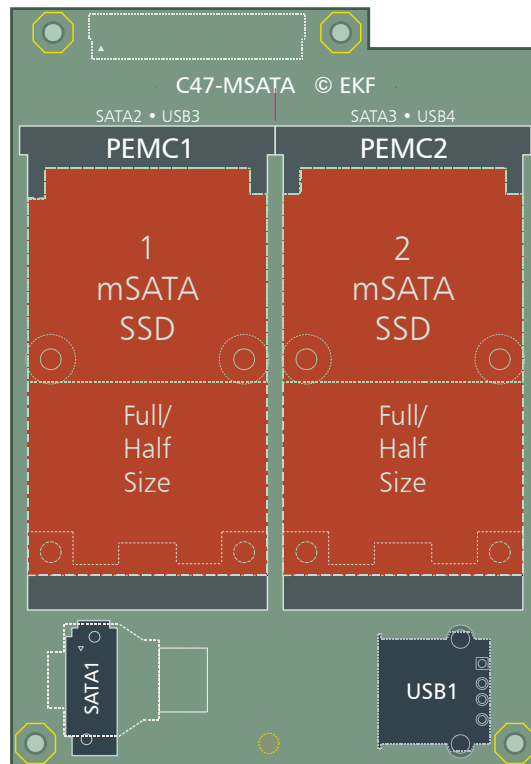
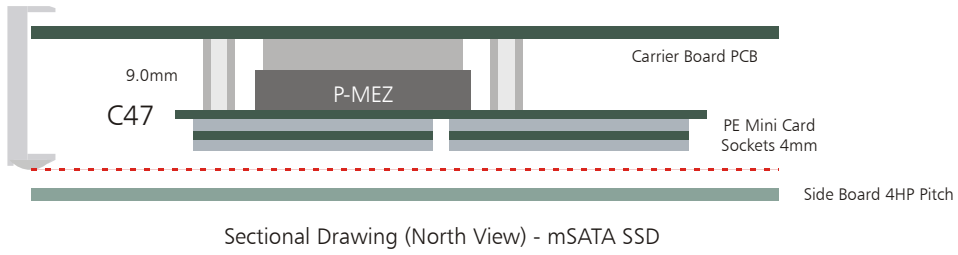
USB Receptacles USB1 & USB2 • 270.20.04.0		
 <p>USB Receptacle © EKF • 270.20.04.0 • ekf.com</p>	1	+5V_USB 0.5A 1)
	2	DATA-
	3	DATA+
	4	GND

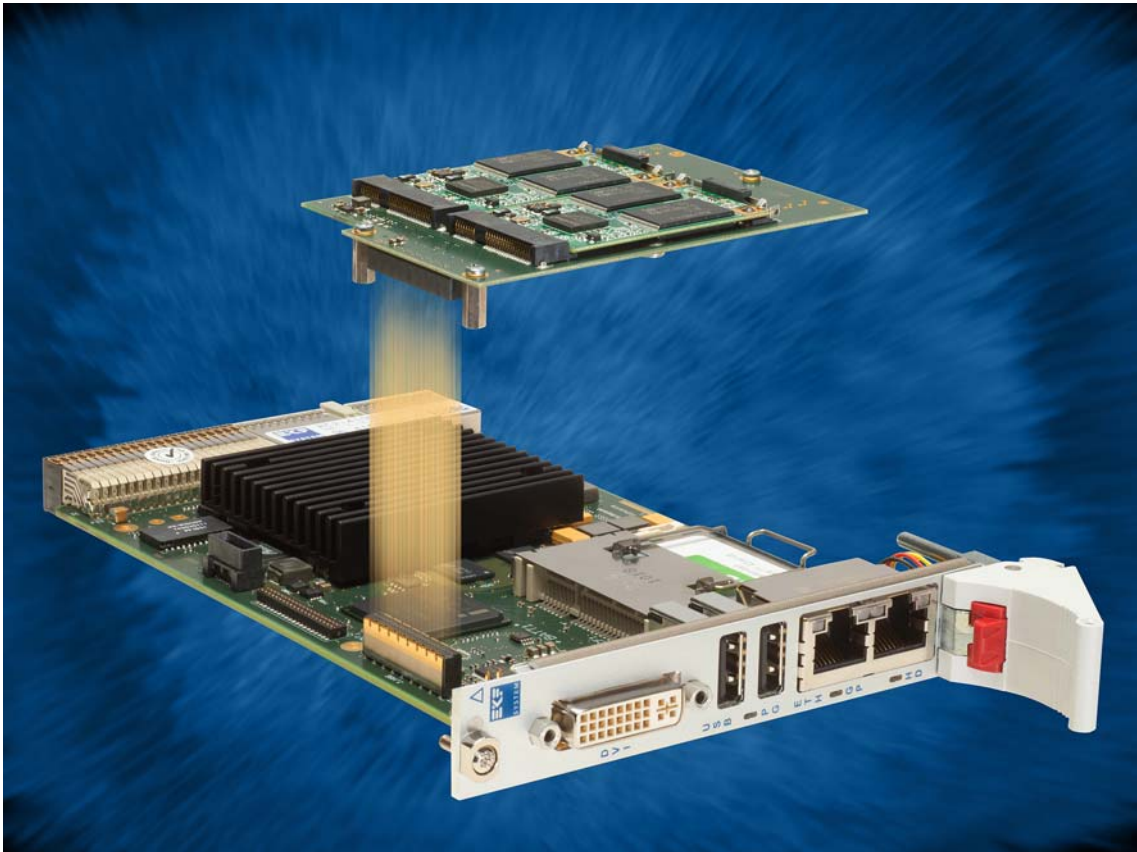
1) Dual Channel Electronic Switch Protection

Inter-Board Connector

The C47-MSATA is equipped with a high speed mezzanine connector P-MEZ, mating with the connector J-HSE on the CCM-BOOGIE or PC1-GROOVE CPU board and its successors. The inter-board connector is situated at the bottom of the C47-MSATA and establishes the data path and power link to the carrier board CPU via J-HSE. Since the C47-MSATA comes typically mounted as a unit together with the CCM-BOOGIE or PC1-GROOVE, there is normally no need for the user to get access to the inter-board connector. It is described here as a reference only and for better understanding of the C47-MSATA.





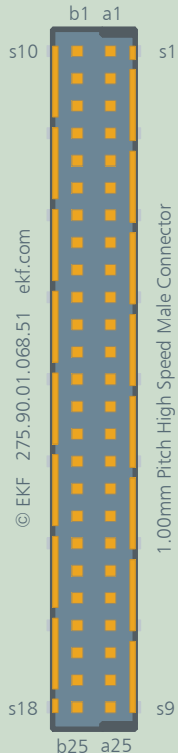


C47-MSATA Mezzanine over CPU Carrier Card

P-MEZ

The connector P-MEZ is a 1 mm height shielded male pin header. Its counterpart on the CPU carrier board is J-HSE, a 8mm height receptacle, for a nominal headroom of 9mm between the boards.

P-MEZ SATA & USB Mezzanine Interface 1.00mm Pitch Male Connector 1mm Height (275.90.01.068.51)				
	GND	b1	a1	GND
	SATA3_TXP 4)	b2	a2	SATA1_TXP 3)
	SATA3_TXN 4)	b3	a3	SATA1_TXN 3)
	GND	b4	a4	GND
	SATA3_RXN 4)	b5	a5	SATA1_RXN 3)
	SATA3_RXP 4)	b6	a6	SATA1_RXP 3)
	GND	b7	a7	GND
	SATA4_TXP	b8	a8	SATA2_TXP 4)
	SATA4_TXN	b9	a9	SATA2_TXN 4)
	GND	b10	a10	GND
	SATA4_RXN	b11	a11	SATA2_RXN 4)
	SATA4_RXP	b12	a12	SATA2_RXP 4)
	GND	b13	a13	GND
	USB3_P	b14	a14	USB1_P
	USB3_N	b15	a15	USB1_N
	GND	b16	a16	GND
	USB4_P	b17	a17	USB2_P
	USB4_N	b18	a18	USB2_P
	GND	b19	a19	GND
	USB3_OC#	b20	a20	USB1_OC#
	USB4_OC#	b21	a21	USB2_OC#
	+5VS 2)	b22	a22	+3.3VS 1)
	+5VS 2)	b23	a23	+3.3VS 1)
	+5V	b24	a24	+3.3V
	RSVD	b25	a25	+12V



- 1) 2) Switched voltages from carrier board, according to CPU sleep state S0
- 3) This SATA channel has been derived from ICH southbridge or other chipset component
- 4) These SATA channels are derived from the additional secondary PCIe SATA controller, RAID 0/1/10 capable

Notes:

- ▶ All s# connector pins (shield) are tied to GND
- ▶ All TX/RX designations with respect to SATA controller (TX controller = RX drive, RX controller = TX drive)

Schematics

Complete circuit diagrams for this product are available for customers on request. Signing of a non-disclosure agreement would be needed. Please contact sales@ekf.de for details.

EKF reserves the right to refuse distribution of confidential information material for any reason that EKF may consider substantial.

Ordering Information

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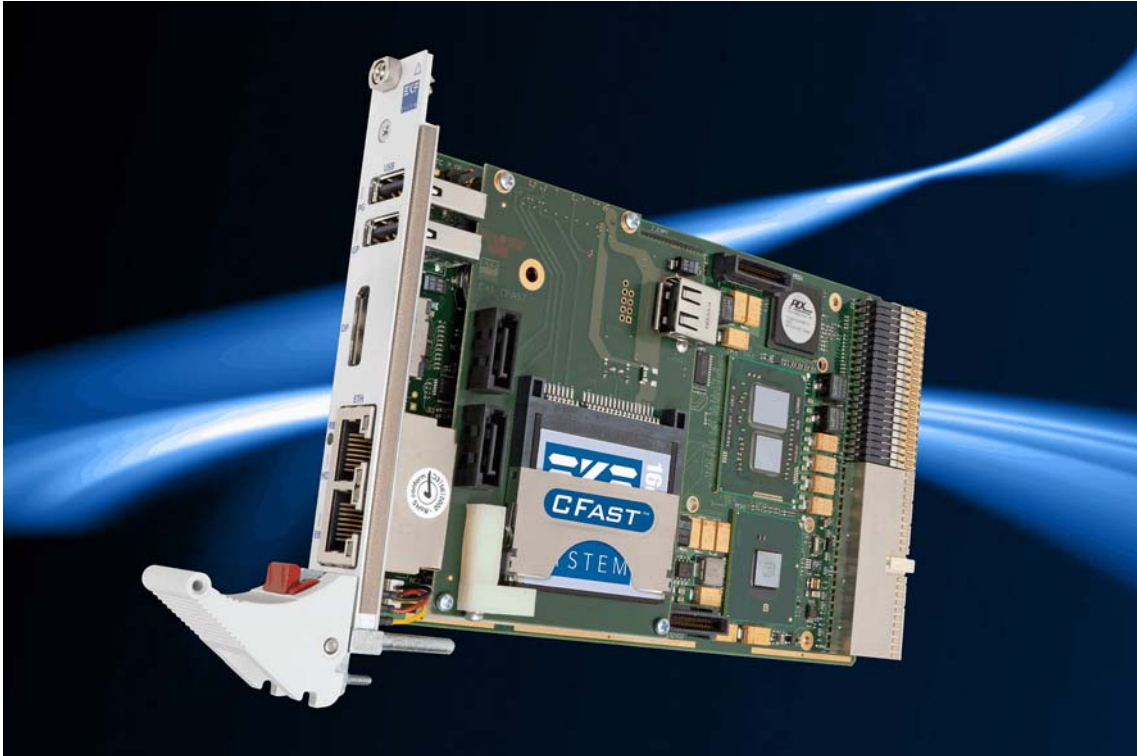
For popular C47-MSATA SKUs please refer to www.ekf.com/liste/liste_20.html#C47

Alternate Products

Low Profile CPU Card Mezzanine Storage Modules		
C40-SCFA	CompactFlash®	www.ekf.com/c/ccpu/c40/c40_tie.pdf
C41-CFAST	CFast™	www.ekf.com/c/ccpu/c41/c41_tie.pdf
C42-SATA	Micro SATA	www.ekf.com/c/ccpu/c42/c42_tie.pdf



C40-SCFA



C41-CFAST on CPU Card



C42-SATA on CPU Card



C47-MSATA on CPU Card



Versatile Low Profile Mezzanine Storage Solutions



RAID Option with C47-MSATA - Fast and Reliable



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