



## Product Information

SA4-COUNTRY • *CompactPCI*<sup>®</sup> *Serial* • PCI Express<sup>®</sup> Card Adapter

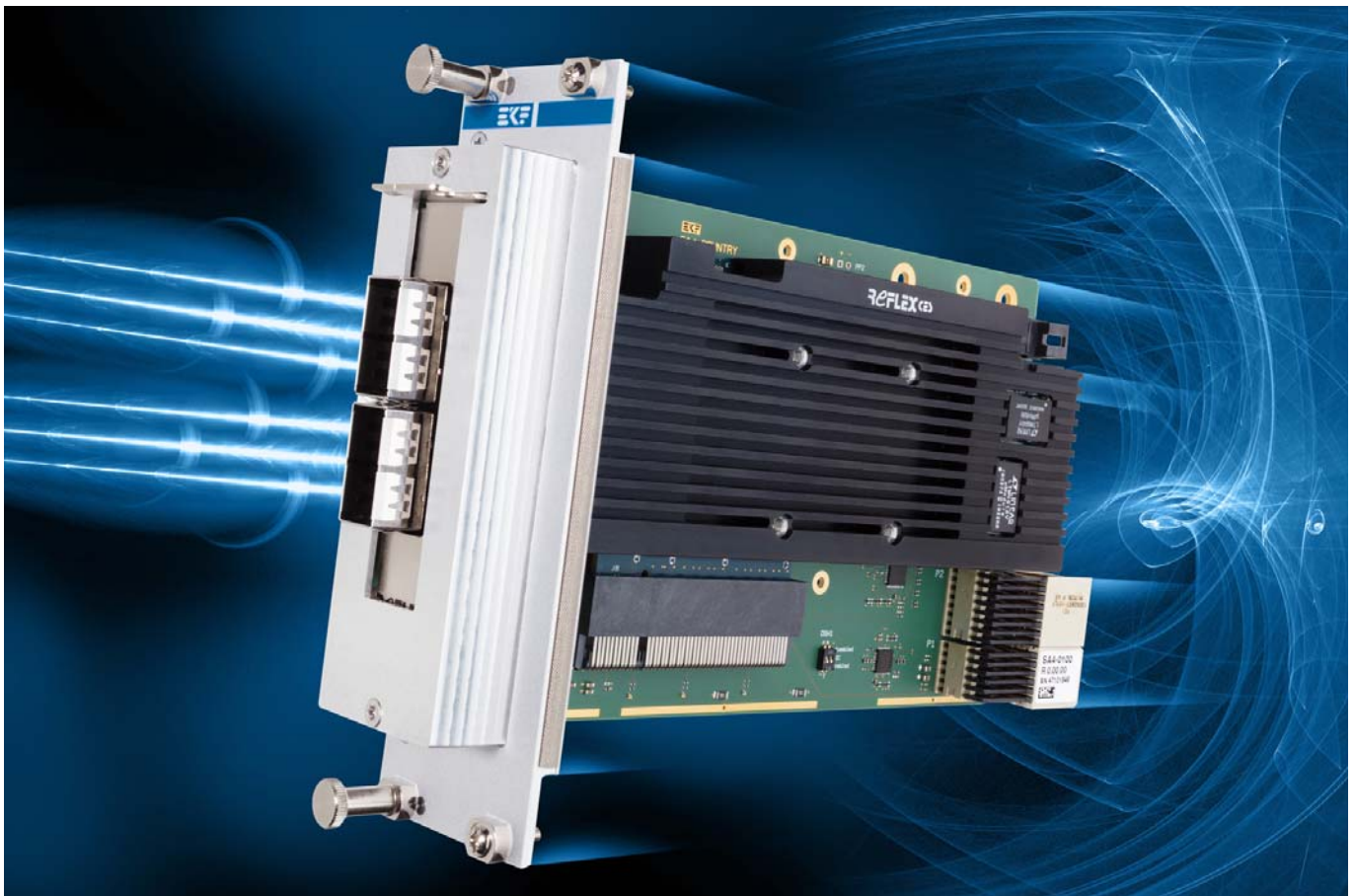
Document No. 8661 • 29 August 2018



## General

*The SA4-COUNTRY is a peripheral slot board for PICMG® CompactPCI® Serial systems and acts as carrier for low profile PCI Express® Card. The SA4-COUNTRY is provided with a PCI Express® x8 connector (option x4, x1) and accommodates a PCIe® card with maximum dimensions of up to 176mm (length) x 68.9mm (height). Covered by a metallic shell, the PCI Express® Card protrudes slightly from the front panel, for optimum board space utilization.*

The SA4-COUNTRY is equipped with the backplane connectors P1/P2 for support of up to eight PCI Express® lanes when inserted into a CompactPCI® Serial fat pipe slot. For the x1 or x4 options, only P1 is required. For optimum signal integrity, PCI Express® Gen3 redrivers are provided on-board, and also a clock buffer. As an option, a 50mm axial fan can be mounted at the SA4-COUNTRY bottom side, for a forced air flow under a demanding PCIe® card.



SA4-COUNTRY & Sample PCI Express® Card w. Intel Altera Arria 10 FPGA

## Feature Summary

### *General*

- ▶ PICMG® CompactPCI® Serial standard (CPCI-S.0)
- ▶ Single size Eurocard 3U 8HP 100x160mm<sup>2</sup>, assembly extension through front panel (metal cap 13.5mm)
- ▶ Actual front panel width may vary depending on customers special needs for system integration and the particular PCI Express® Card in use
- ▶ Suitable for CompactPCI® Serial peripheral slot (PCI Express® enabled)
- ▶ CompactPCI® Serial fat pipe slot PCIe x8 or at least peripheral slot PCIe x4 recommended
- ▶ CompactPCI® Serial backplane connectors P1 & P2 for PCI Express® x8
- ▶ CompactPCI® Serial backplane connector P1 for PCI Express® x4

### *PCI Express® Card*

- ▶ Carrier board for limited size (short profile) PCI Express® Card
- ▶ Maximum card dimensions 176.0mm x 68.9mm
- ▶ Die cast hood on the SA4-COUNTRY front panel covers PCI Express® Card bracket
- ▶ Up to 70W power support via PCI Express® Card connector (+3.3V/3A, +12V/5A)
- ▶ *PCI Express® connector x1 (SA4-0100-COUNTRY)*
- ▶ *PCI Express® connector x4 (SA4-0400-COUNTRY)*
- ▶ PCI Express® connector x8 (SA4-0800-COUNTRY)
- ▶ PCI Express® Gen3 clock buffer on-board
- ▶ PCI Express® Gen3 redrivers on-board
- ▶ Opening in the SA4-COUNTRY PCB for a 50mm Papst axial fan (optional bottom side mounting), for forced rear side airflow under the PCI Express® Card (heat dissipation enhancement)

### *Applications*

- ▶ Easy system integration of special functions not yet available as CompactPCI® Serial board
- ▶ System integration of proprietary hardware
- ▶ Integration of 3<sup>rd</sup> party IP e.g. FPGA based solutions with proprietary software
- ▶ Rapid solution for prototyping systems and small volume applications

## Feature Summary

*Compliance Tested*

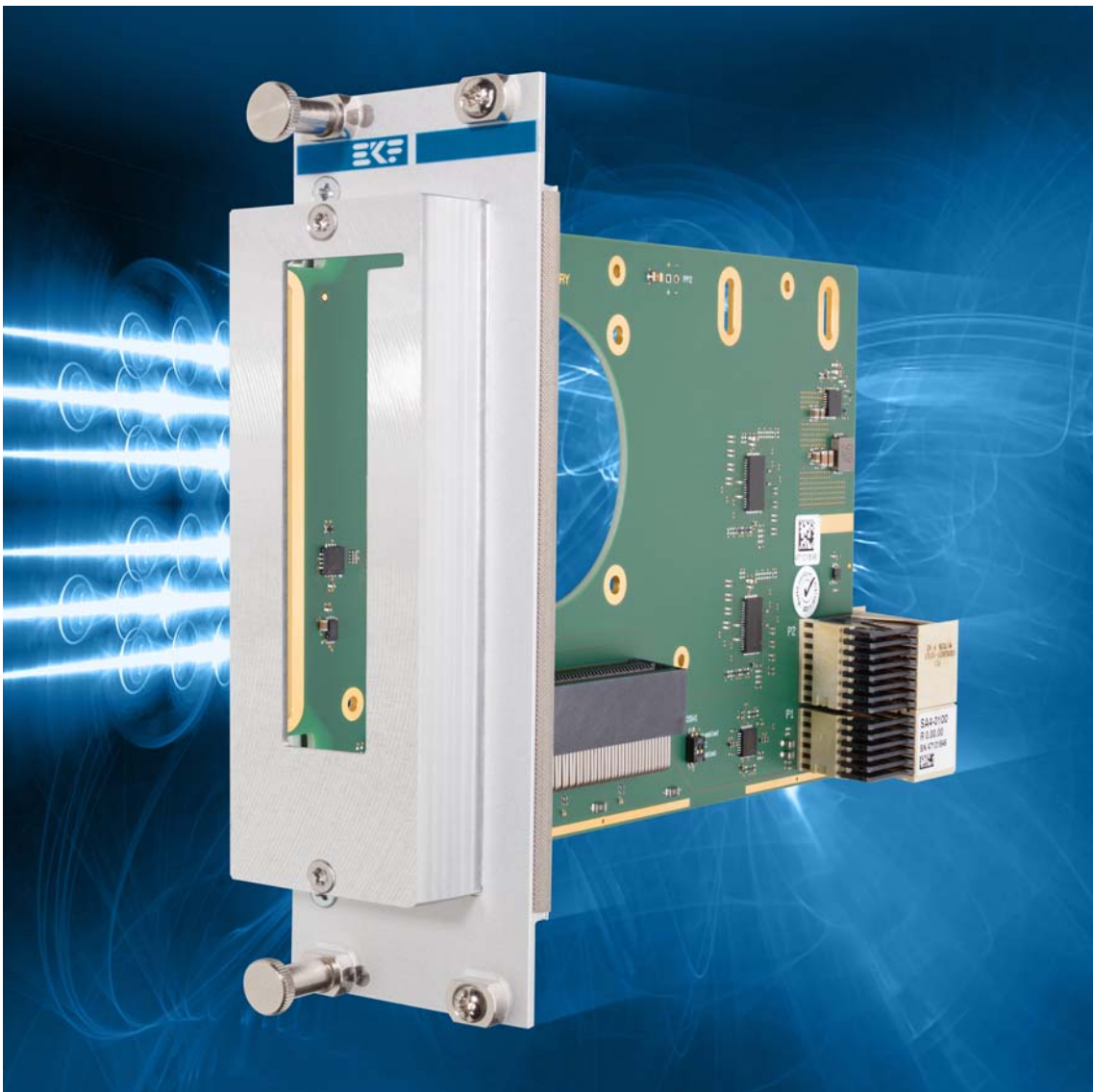
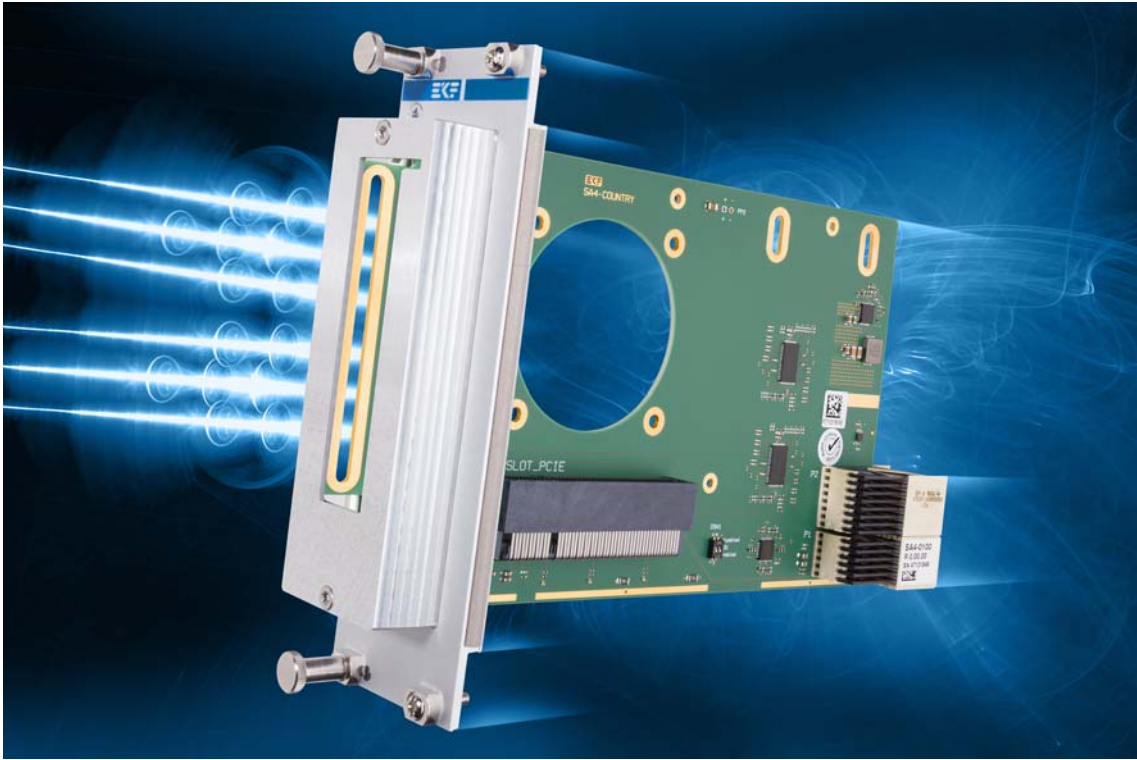
- ▶ Bittware • Intel Altera Arria 10 FPGA
- ▶ Nallatech • Intel Altera Arria 10 FPGA
- ▶ Reflex CES • Intel Altera Arria 10 FPGA
- ▶ Projected: Reflex CES • Intel Altera Arria 5 FPGA

*Regulatory*

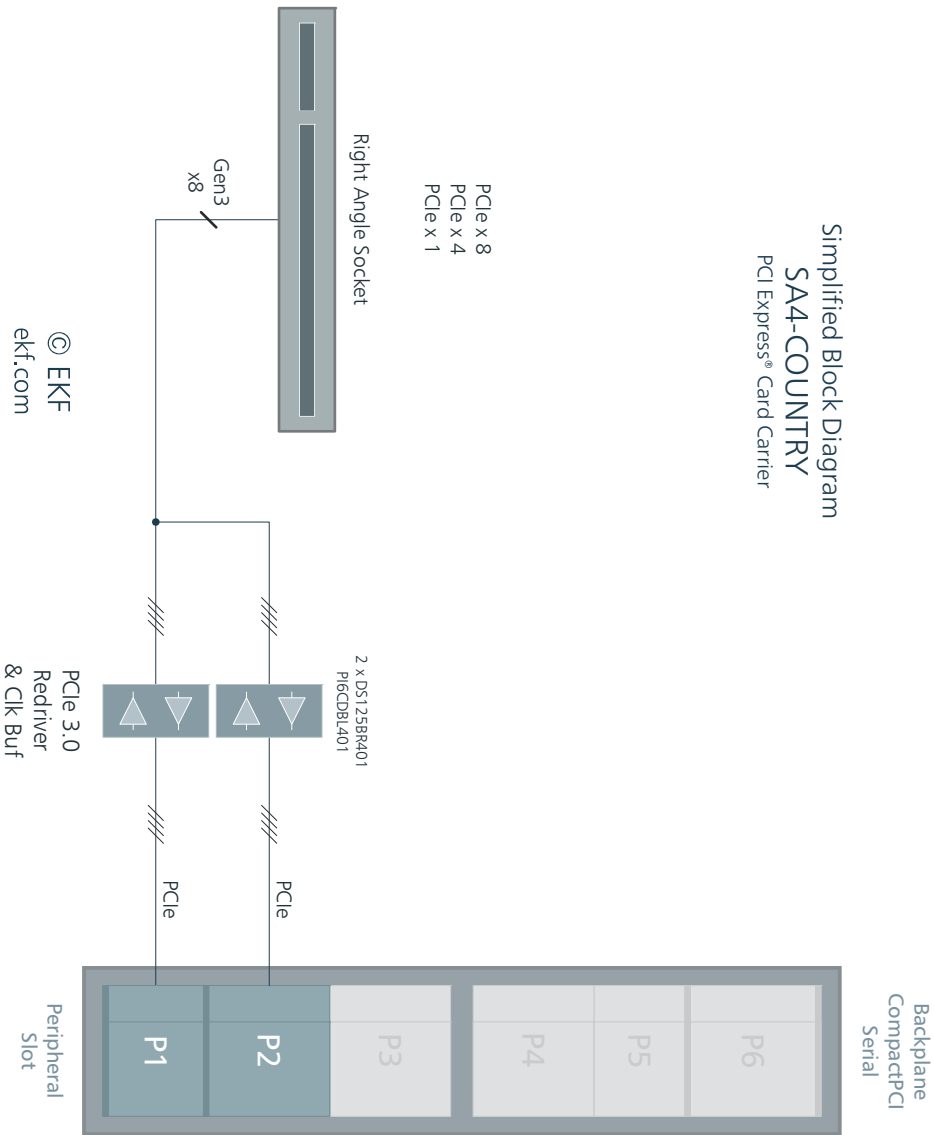
- ▶ Designed & manufactured in Germany
- ▶ Certified quality management according to ISO 9001
- ▶ Long term availability
- ▶ Rugged solution (coating, sealing, underfilling on request)
- ▶ RoHS compliant
- ▶ Operation temperature 0°C to +70°C (commercial temperature range)
- ▶ Operation temperature -40°C to +85°C (industrial temperature range) on request
- ▶ 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 91.9 years
- ▶ EC Regulations EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)

all items are subject to change w/o further notice

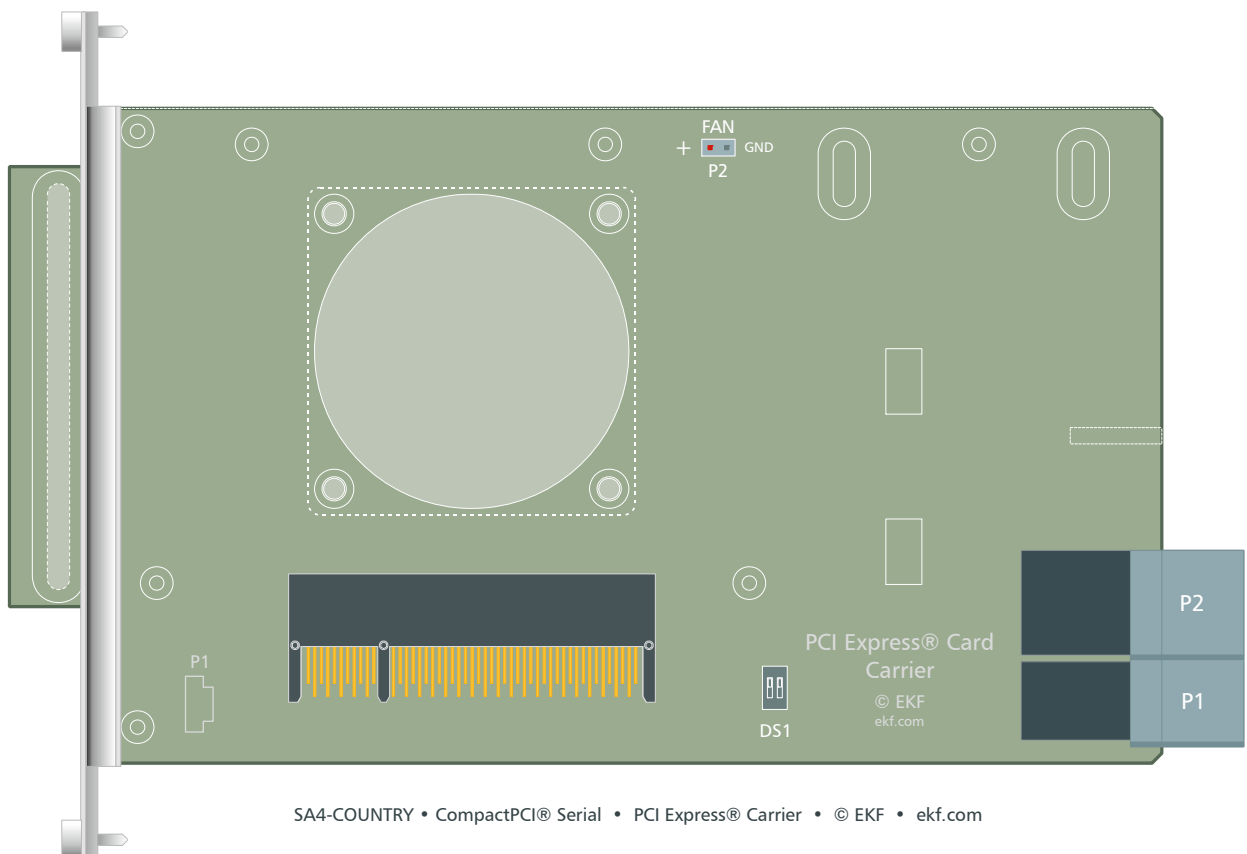
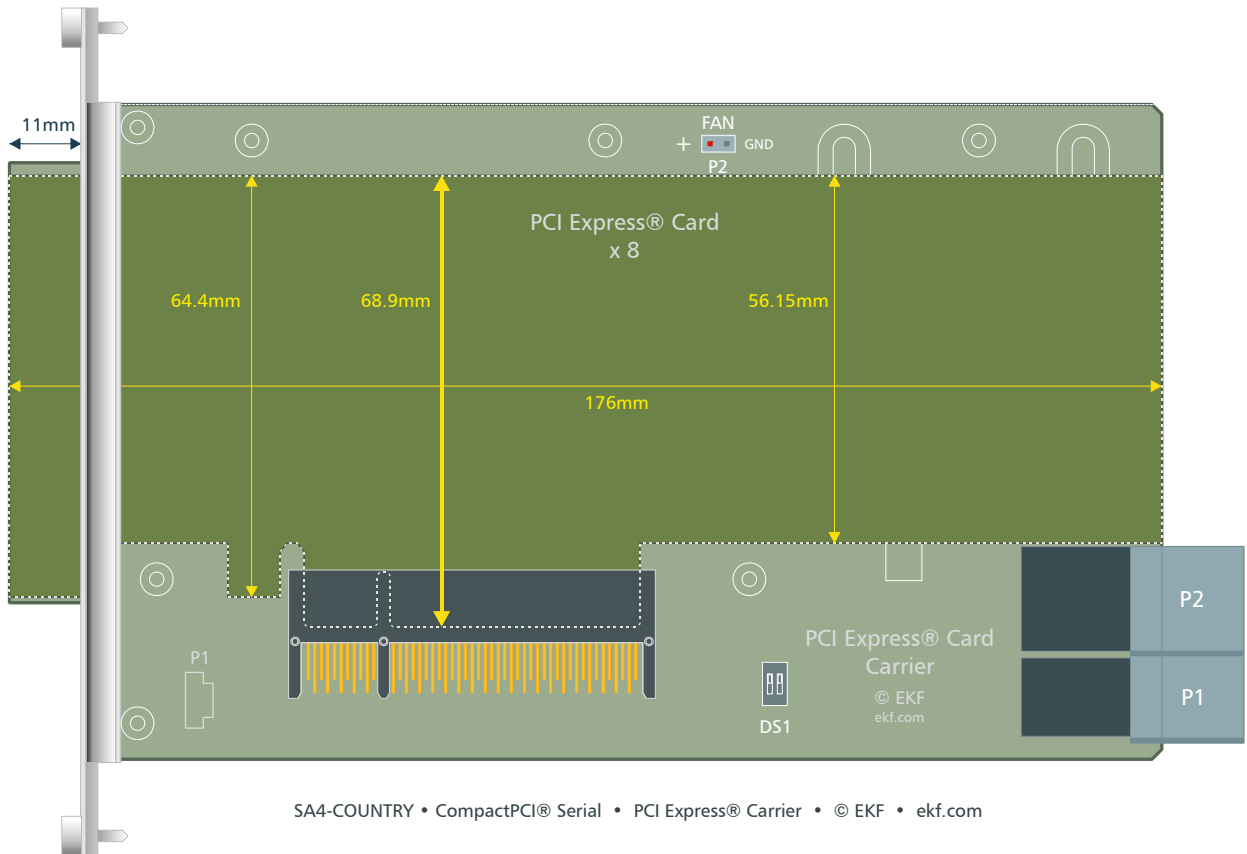




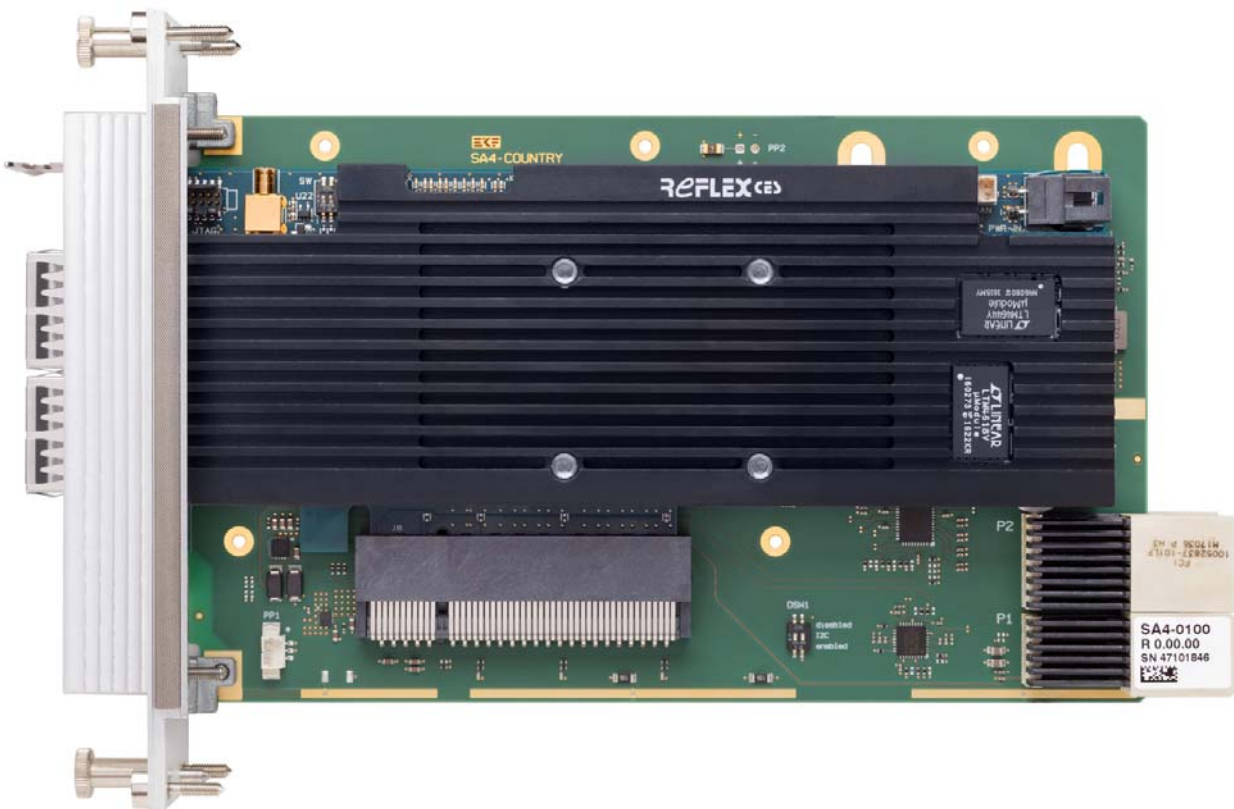
### Block Diagram



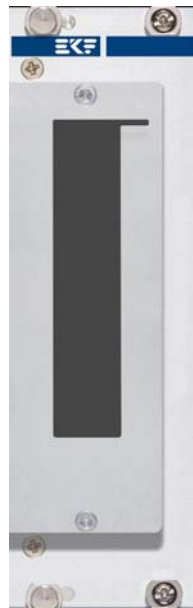
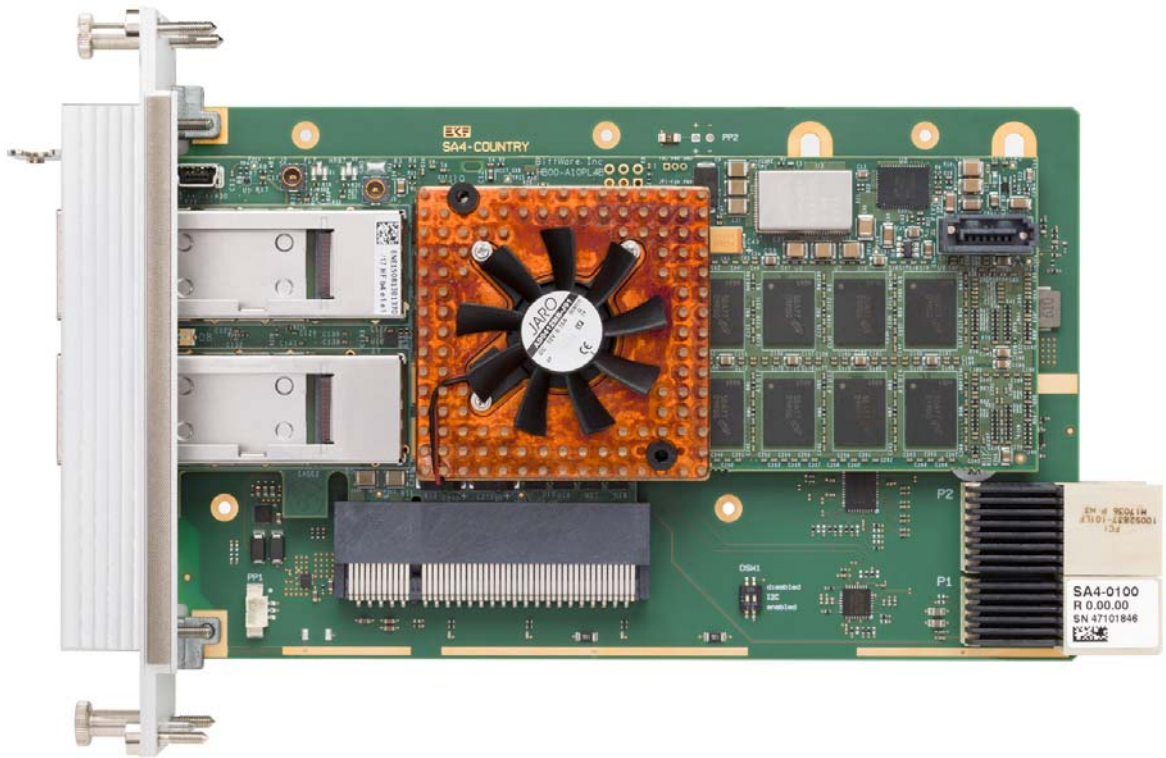
### Component Orientation



front shell not shown







### Front Panel



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SA4-COUNTRY

## PCI Express® Connector

The SA4-COUNTRY is provided with a right angled edge card connector for PCI Express® Cards. Dependent of the PCIe card to be hosted, this connector can be sized either x1, x4 or x8 lanes (link width). A PCIe card with a link width of x1 or x4 would also fit into the x8 connector (SA4-0800), and a PCIe card with a link width of x1 will fit also into the x4 connector (SA4-0400). For optimum ruggedness however it is recommended to chose that SA4-COUNTRY carrier card connector version which mates 1:1 the PCIe card capability.

PCIe Connector x1 (SA4-0100-COUNTRY)			
Part #255.1.1.036.2			
B		A	
B1	+12V	PRSNT1#	A1
2	+12V	+12V	2
3	+12V	+12V	3
4	GND	GND	4
5	SCL	TCK (PD)	5
6	SDA	TDI (PU)	6
7	GND	TDO (NC)	7
8	+3.3V	TMS (PU)	8
9	TRST# (PD)	+3.3V	9
10	+3.3V (3.3V <sub>AUX</sub> )	+3.3V	10
11	WAKE#	RST#	11
B12	RSVD	GND	A12
13	GND	REFCLK+	13
14	PE_TX00+	REFCLK-	14
15	PE_TX00-	GND	15
16	GND	PE_RX00+	16
17	PRSNT2#	PE_RX00-	17
18	GND	GND	18

PCI Express® connector x1  
pin assignment common with x4 & x8 connectors

+3.3V is sourced from an on-board regulator. According to the PE card specification, the current should not exceed 3A. +12V is a switched power rail, for up to 5.0A. Both power rails can be disabled by the on-board I2C circuitry.

PCIe Connector x4 (SA4-0400-COUNTRY)			
Part #255.1.1.064.2			
B		A	
B19	PE_TX01+	RSVD	A19
20	PE_TX01-	GND	20
21	GND	PE_RX01+	21
22	GND	PE_RX01-	22
23	PE_TX02+	GND	23
24	PE_TX02-	GND	24
25	GND	PE_RX02+	25
26	GND	PE_RX02-	26
27	PE_TX03+	GND	27
28	PE_TX03-	GND	28
29	GND	PE_RX03+	29
30	RSVD	PE_RX03-	30
31	PRSNT2#	GND	31
32	GND	RSVD	32

PCI Express® connector x4 • pin assignment common with x8 connector

PCIe Connector x8 (SA4-0800-COUNTRY)			
Part #255.1.1.098.2			
B		A	
B33	PE_TX04+	RSVD	A33
34	PE_TX04-	GND	34
35	GND	PE_RX04+	35
36	GND	PE_RX04-	36
37	PE_TX05+	GND	37
38	PE_TX05-	GND	38
39	GND	PE_RX05+	39
40	GND	PE_RX05-	40
41	PE_TX06+	GND	41
42	PE_TX06-	GND	42
43	GND	PE_RX06+	43
44	GND	PE_RX06-	44
45	PE_TX07+	GND	45
46	PE_TX07-	GND	46
47	GND	PE_RX07+	47
48	PRSNT2#	PE_RX07-	48
49	GND	GND	49

## CompactPCI® Serial Backplane Connectors P1/P2

P1 CompactPCI® Serial Peripheral Slot Backplane Connector												
EKF Part #250.3.1206.20.02 • 72 pos. 12x6, 14mm Width												
P1	A	B	C	D	E	F	G	H	I	J	K	L
6	GND	PE TX02+	PE TX02-	GND	PE RX02+	PE RX02-	GND	PE TX03+	PE TX03-	GND	PE RX03+	PE RX03-
5	PE TX00+	PE TX00-	GND	PE RX00+	PE RX00-	GND	PE TX01+	PE TX01-	GND	PE RX01+	PE RX01-	GND
4	GND	<i>USB2+</i>	<i>USB2-</i>	GND	PE CLK+	PE CLK-	GND	<i>SATA TX+</i>	<i>SATA TX-</i>	GND	<i>SATA RX+</i>	<i>SATA RX-</i>
3	<i>USB3 TX+</i>	<i>USB3 TX-</i>	GA0	<i>USB3 RX+</i>	<i>USB3 RX-</i>	GA1	<i>SATA SDI</i>	<i>SATA SDO</i>	GA2	<i>SATA SCL</i>	<i>SATA SL</i>	GA3
2	GND	I2C SCL	I2C SDA	GND	RSV	RSV	GND	RST#	WAKE#	GND	PE EN#	SYS EN#
1	+12V	STBY	GND	+12V	+12V	GND	+12V	+12V	GND	+12V	+12V	GND

pin positions printed white: not connected



## P2 CompactPCI® Serial Peripheral Slot Backplane Connector

EKF Part #250.3.1208.20.00 • 96 pos. 12x8, 16mm Width

P2	A	B	C	D	E	F	G	H	I	J	K	L
8	GND			GND			GND			GND		
7			GND			GND			GND			GND
6	GND			GND			GND			GND		
5			GND			GND			GND			GND
4	GND			GND			GND			GND		
3			GND			GND			GND			GND
2	GND	PE TX06+	PE TX06-	GND	PE RX06+	PE RX06-	GND	PE TX07+	PE TX07-	GND	PE RX07+	PE RX07-
1	PE TX04+	PE TX04-	GND	PE RX04+	PE RX04-	GND	PE TX05+	PE TX05-	GND	PE RX05+	PE RX05-	GND

## Ordering Information

For popular SA4-COUNTRY SKUs please refer to  
[www.ekf.com/liste/liste\\_21.html#SA4](http://www.ekf.com/liste/liste_21.html#SA4)

Please note:

SA4-COUNTRY photos shown here for application illustration may be populated with a 3<sup>rd</sup> party PCI Express® card, which is not scope of delivery.

## Related Links to EKF CompactPCI® Serial PCI Express® Carrier Cards

SA1-FUSION	<a href="http://www.ekf.com/s/sa1/sa1.html">www.ekf.com/s/sa1/sa1.html</a>
SA4-COUNTRY	<a href="http://www.ekf.com/s/sa4/sa4.html">www.ekf.com/s/sa4/sa4.html</a>

## Related Documents CompactPCI® Serial

Basics / Overview CompactPCI® Serial	<a href="http://www.ekf.com/s/smart_solution.pdf">www.ekf.com/s/smart_solution.pdf</a>
CompactPCI® Serial Home	<a href="http://www.ekf.com/s/serial.html">www.ekf.com/s/serial.html</a>

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