Product Information

EA4-COUNTRY • CompactPCI® Express • PCI Express® Card Adapter

General

The EA4-COUNTRY is a peripheral slot board for PICMG® CompactPCI® Express systems and acts as adapter/carrier for a low profile PCI Express® Card. The EA4-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 hood, the PCI Express® Card protrudes with its bracket from the EA4-COUNTRY front panel, for optimum board space utilization.

The EA4-COUNTRY complies with the PICMG® EXP.0 specification and is also suitable for PXI Express™ systems. For best performance, the EA4-COUNTRY should be inserted into a CompactPCI® Express peripheral slot type 1 or 2, with a link width of PCIe® x8 on the backplane connector XP3. As power path for the PCI Express® card, the EA4-COUNTRY is equipped in addition with the backplane power connector XP1, as defined for CompactPCI® Express type 1 peripheral slots.

EA4-0800-COUNTRY

Feature Summary

General

- PICMG® CompactPCI® Express standard (EXP.0)
- Carrier card for a low profile PCI Express® Card
- Suitable also for PXI Express™ systems
- Single size Eurocard 3U 8HP 100x160mm^2, assembly extension through front panel (metal cap)
- Suitable for CompactPCI® Express peripheral slot type 1 or type 2
- Suitable also for PXI Express™ peripheral slot
- CompactPCI® Express XJ3/XP3 connector/slot with PCIe® x8 link width recommended
- CompactPCI® Express XP1/XJ1 equipped slot recommended for power (type 1)
- Option on-board auxiliary power connector allows operation also in a CompactPCI® Express type 2 peripheral slot and PXI Express™ peripheral slot
- Backplane connector XJ4 with F2 key for CompactPCI® Express & PXI Express™ systems
- PCIe® x8 upstream Gen3 8.0Gbps via redriver supported
- Actual link size and transfer speed as result of link training (depends on PCI Express® card and CompactPCI® Express backplane capabilities)

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 EA4-COUNTRY front panel covers PCI Express® card bracket
- Up to 75W power support via PCI Express® card connector (+3.3V/3A, +12V/5.5A)
- Power derived either from backplane XJ1/XP1, or as an option from an on-board connector
- PCI Express® connector x8 (EA4-0800-COUNTRY), option x4, x1
- PCI Express® connector x16 (modified x8) (EA4-1600-COUNTRY)
- PCI Express® Gen3 clock buffer and PCI Express® Gen3 redrivers for optimum signal integrity
- Opening in the EA4-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)

Feature Summary

Applications

- Easy system integration of special functions not available as CompactPCI® Express board
- System integration of proprietary hard- and software e.g. FPGA based PCI Express® cards
- Rapid solution for prototyping systems and small to medium volume applications

Compliance Tested

- Bittware • Intel Altera Arria 10 FPGA
- Nallatech • Intel Altera Arria 10 FPGA
- NVIDIA • QUADRO P1000 GPU
- Reflex CES • Intel Altera Arria 10 FPGA • Xilinx Virtex Ultrascale+ VU9P FPGA

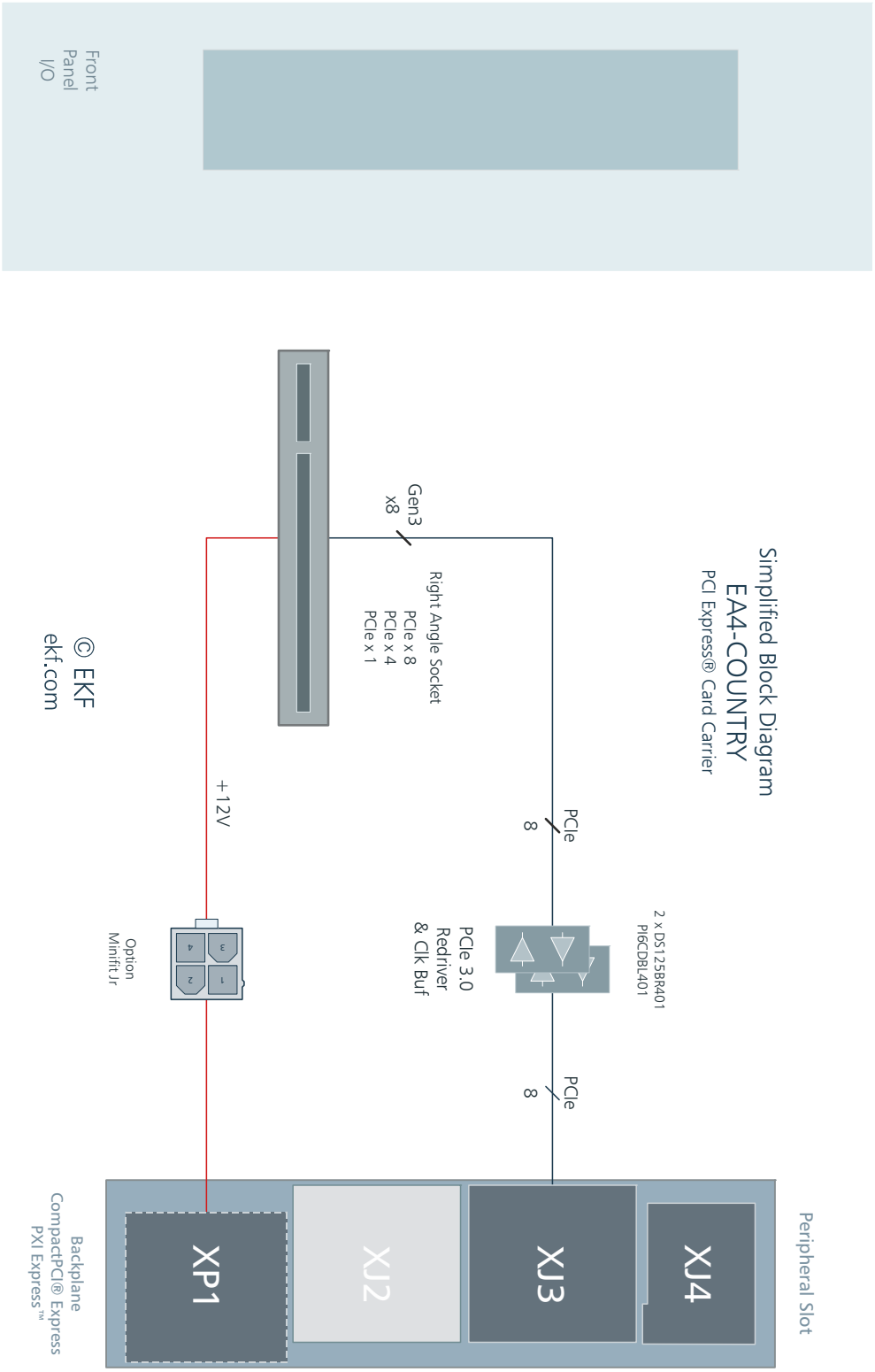
Regulatory

- 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 -40°C to +85°C (industrial temperature range)
- 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 79.8 years
- EC Regulations EN55022, EN55024, EN60950-1 (UL60950-1/IEC60950-1)

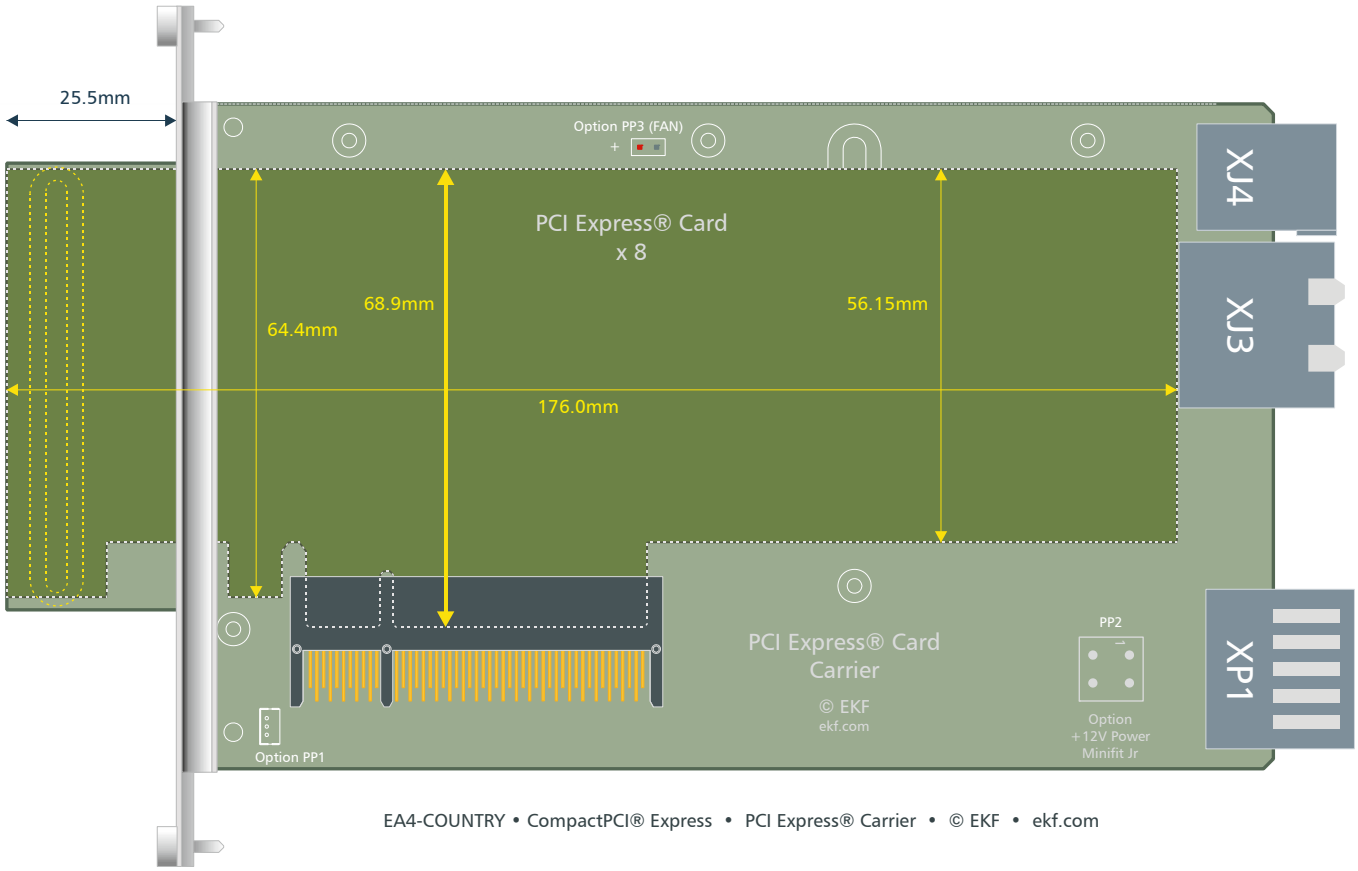
all items are subject to change w/o further notice

EA4-1600-COUNTRY w. NVIDIA QUADRO GPU Board

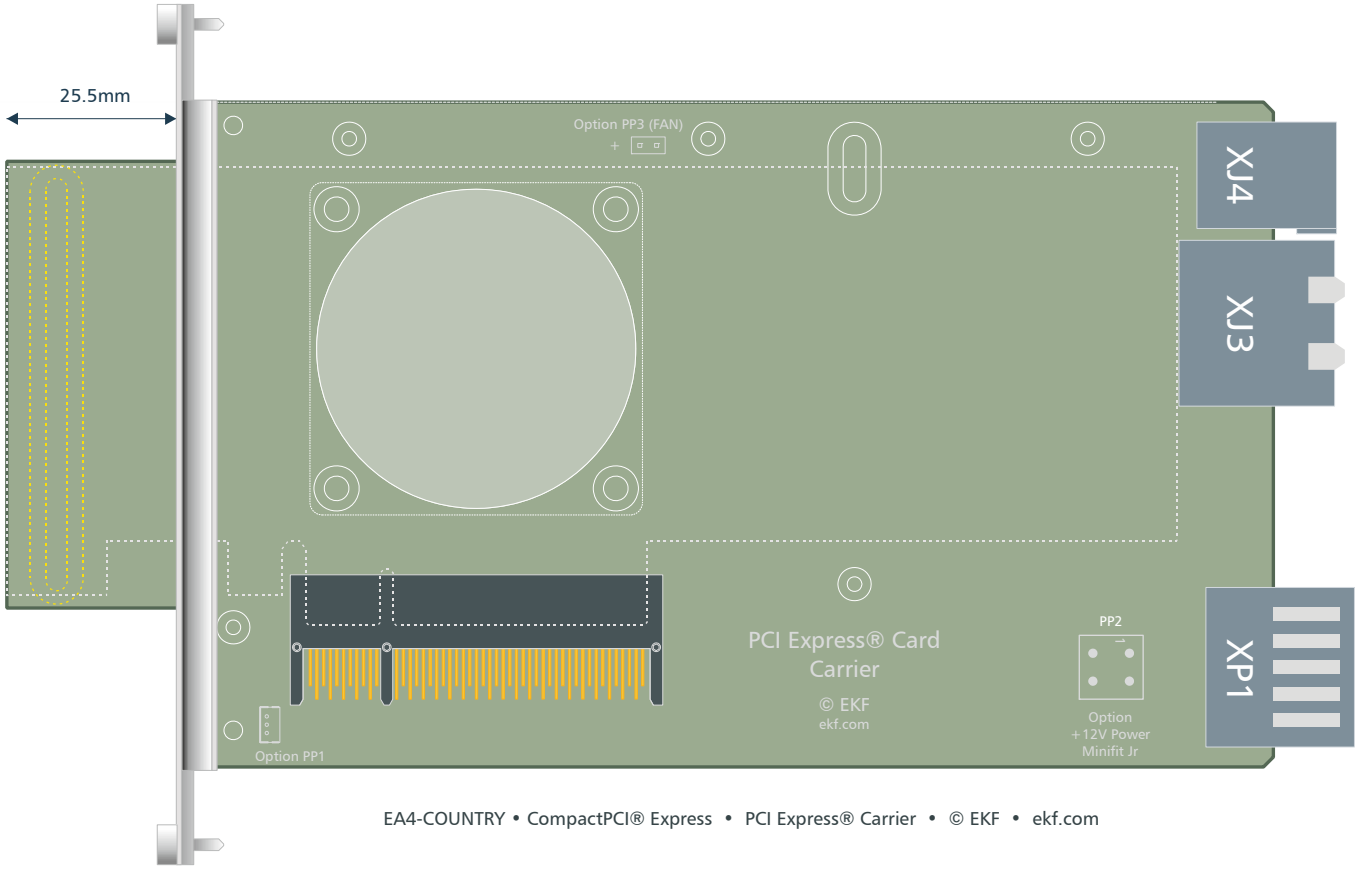
Block Diagram



Component Orientation

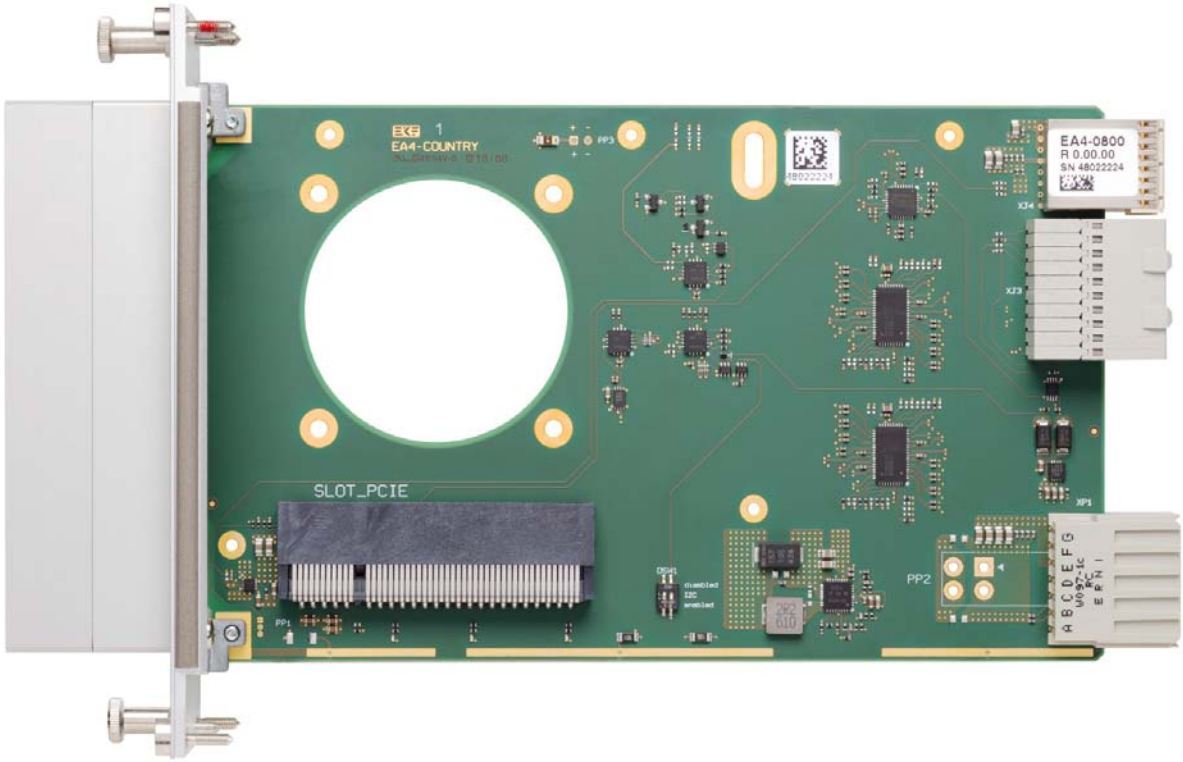


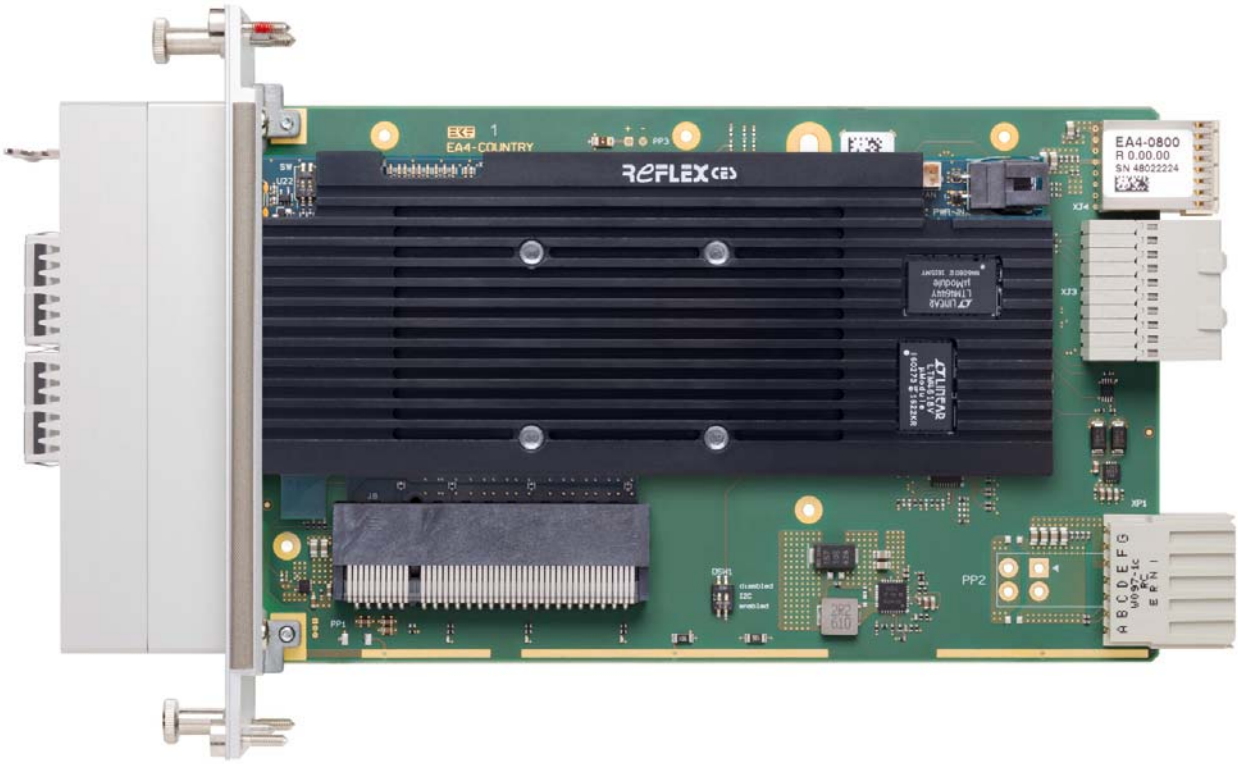
EA4-COUNTRY • CompactPCI® Express • PCI Express® Carrier • © EKF • ekf.com



EA4-COUNTRY • CompactPCI® Express • PCI Express® Carrier • © EKF • ekf.com

front hood not shown


EA4-COUNTRY
EA4-0800
R 0.00.00
SLOT_PCIE
PP2


EA4-COUNTRY
EA4-0800
R 0.00.00
REFLEX CES
PP2

Front Panel

EA4-COUNTRY

PCI Express® Connector

The EA4-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 PCI Express® card with a link width of x1 or x4 would also fit into the x8 connector (EA4-0800), and a PCIe card with a link width of x1 will fit also into the x4 connector (EA4-0400). For optimum ruggedness however it is recommended to chose that EA4-COUNTRY carrier card connector version which mates 1:1 the PCI Express® card capability.

PCIe Connector x1 (EA4-0100-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 *($3.3V_{AUX}$)*	+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

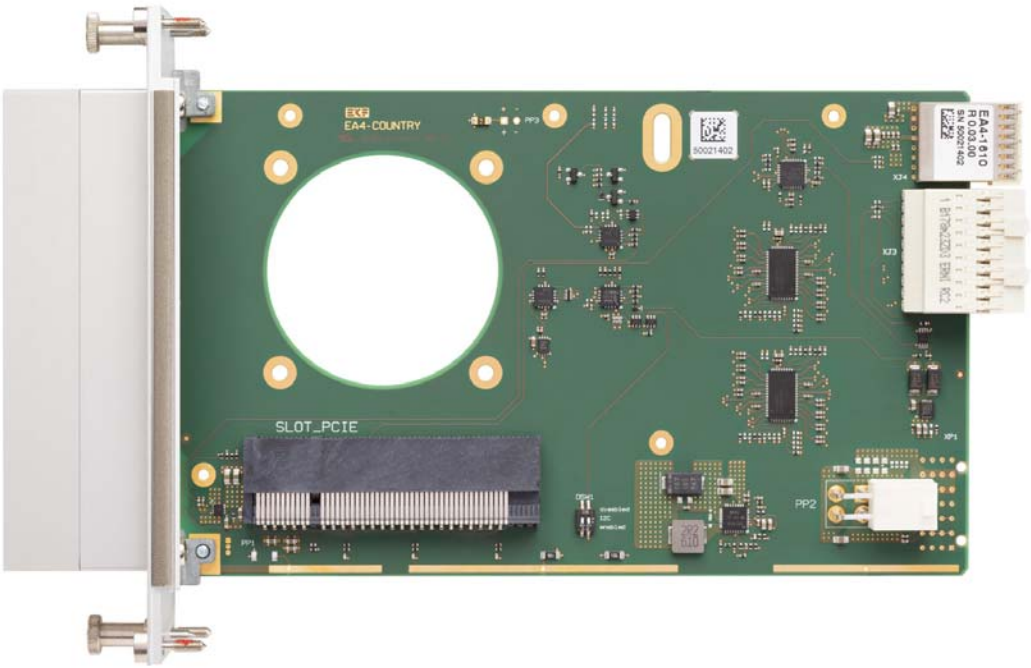
+3.3V is sourced from an on-board regulator, attached to +12V. According to the PE card specification, the current should not exceed 3.3V/3A. +12V (at the PCIe connector) is a switched power rail, for up to 5.5A. Both power rails +3.3V and +12V can be disabled by the on-board I2C circuitry. *The entire power required for the PCI Express® card will be derived either from the EA4-COUNTRY backplane connector XP1 (CompactPCI® Express type 1 slot), or must be supplied via the EA4-COUNTRY on-board ATX auxiliary power connector PP2 (ordering option).*

PCIe Connector x4 (EA4-0400-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 (EA4-0800-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

For PCI Express® cards with a x16 edge finger (EA4-1600-COUNTRY), a x16 PCIe® connector is stuffed which has been mechanically cut at ~6cm width, beyond the x8 connector contacts. This allows a x16 PCI Express® card to be accommodated, while leaving the edge fingers 50 to 82 unconnected. The PCI Express® link training therefore will result in a x8 connection, which is also the maximum native link width of a CompactPCI® Express 2-link backplane.



EA4-1600-COUNTRY w. Virtex Ultrascale+ VU9P FPGA Board

CompactPCI® Express Backplane Connectors

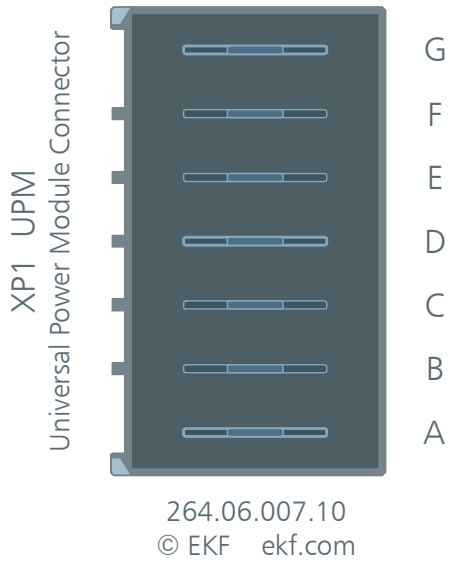
The EA4-COUNTRY is equipped with two connectors XJ3 and XJ4, which are mandatory for CompactPCI® Express peripheral type1 and type 2 cards (and PXI Express™ peripheral slots), and the optional power connector XP1, which is specified only for type 1 CompactPCI® Express peripheral cards.

XP1

Universal Power Module (UPM) Connector EKF Part #264.06.007.10	
XP1	Power Rail
G	GND
F	+12V
E	+12V
D	GND
C	*+5V*
B	+3.3V
A	GND

pin positions printed grey are not connected

XP1 will be provided as power source for the PCI Express® card, and mates the XJ1 connector on a CompactPCI® Express peripheral type 1 backplane slot. Each UPM blade contact is rated at 15A, more than sufficient for the 75W rated PCI Express® card connector. As an alternate to XP1, for use of the EA4-COUNTRY in a CompactPCI® Express type 2 slot (or PXI Express™ peripheral or hybrid slot, which all may not provide the XJ1 connector), consider the auxiliary on-board connector PP2 (Minifit Jr) as the PCI Express® card power feeding - so please check your needs before ordering. +5V and +3.3V from the XP1 connector are not in use on the EA4-COUNTRY due to on-board switching regulators. *+12V sourcing via either XP1 or the optional on-board ATX aux power connector is mandatory!*

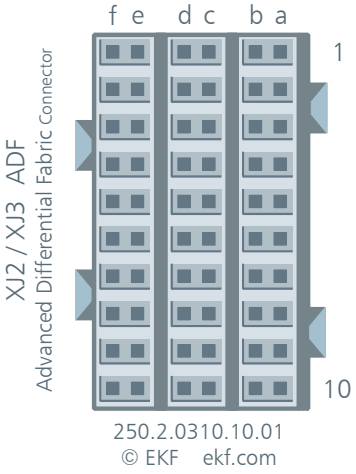


Please note that +12V is also required on the XJ4 connector.

XJ3

Advanced Differential Fabric (ADF) Connector • EKF Part #250.2.0310.10.01						
XJ3	A	B	C	D	E	F
1	RSV *PXIe_CLK100+*	RSV *PXIe_CLK100-*	RSV *PXIe_SYNC100+*	RSV *PXIe_SYNC100-*	RSV *PXIe_DSTARC+*	RSV *PXIe_DSTARC-*
2	PRSNT#	PWREN#	RSV *PCIe_DSTARB+*	RSV *PCIe_DSTARB-*	RSV *PCIe_DSTARA+*	RSV *PCIe_DSTARA-*
3	SMB_DAT	SMB_CLK	RSV	RSV	RSV	RSV
4	MPWRGD	PERST#	RSV	RSV	1REFCLK+	1REFCLK-
5	1PETP0	1PETN0	1PERP0	1PERN0	1PETP1	1PETN1
6	1PETP2	1PETN2	1PERP2	1PERN2	1PERP1	1PERN1
7	1PETP3	1PETN3	1PERP3	1PERN3	1PETP4	1PETN4
8	1PETP5	1PETN5	1PERP5	1PERN5	1PERP4	1PERN4
9	1PETP6	1PETN6	1PERP6	1PERN6	1PETP7	1PETN7
10	RSV	RSV	RSV	RSV	1PERP7	1PERN7

all signals printed grey are NC • *all signal names printed italic are specified for PXI Express™*
all differential pair shield pins ab(1-10), cd(1-10) and ef(1-10) are tied to GND



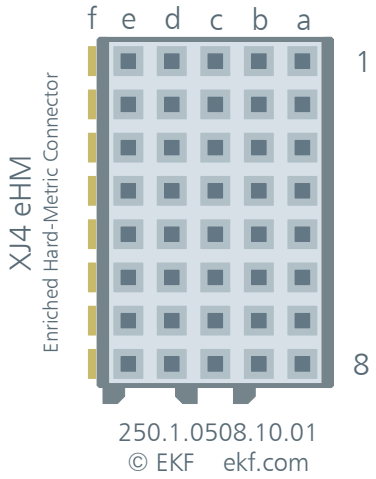
XJ4

Enriched Hard-Metric (eHM) Connector • EKF Part #250.1.0508.10.02					
XJ4	A	B	C	D	E
1	GA4 1)	GA3 1)	GA2	GA1	GA0
2	+5V_AUX 2)	GND	SYSEN#	WAKE#	ALERT#
3	+12V 2)	+12V 2)	GND	GND	GND
4	GND	GND	3.3V	3.3V	3.3V
5	I/O *PXI_TRIG3*	I/O *PXI_TRIG4*	I/O *PXI_TRIG5*	GND *PXI_GND*	I/O *PXI_TRIG6*
6	I/O *PXI_TRIG2*	GND *PXI_GND*	ATNLED	I/O *PXI_STAR*	I/O *PXI_CLK10*
7	I/O *PXI_TRIG1*	I/O *PXI_TRIG0*	ATNSW#	GND *PXI_GND*	I/O *PXI_TRIG7*
8	I/O *PXI_RSV*	GND *PXI_GND*	I/O *PXI_RSV*	I/O *PXI_LBL6*	I/O *PXI_LBR6*

all signals printed grey are NC • *all signal names printed italic are specified for PXI Express™*

1) either backplane signal GA3/GA4 ≠ 0 (backplane slot >8) will disable the internal I^2C circuitry

2) in use for I^2C circuitry, main +12V power required via either XP1 backplane connector or optional ATX auxiliary connector



The XJ4 connector is mechanically coded either for pure usage with CompactPCI® Express (F1 key) or PXI Express™ (F2 key). By default, the F2 connector is populated, since it can be inserted into both types of backplane connectors XP4. Illustrated above is the F1 keyed connector.

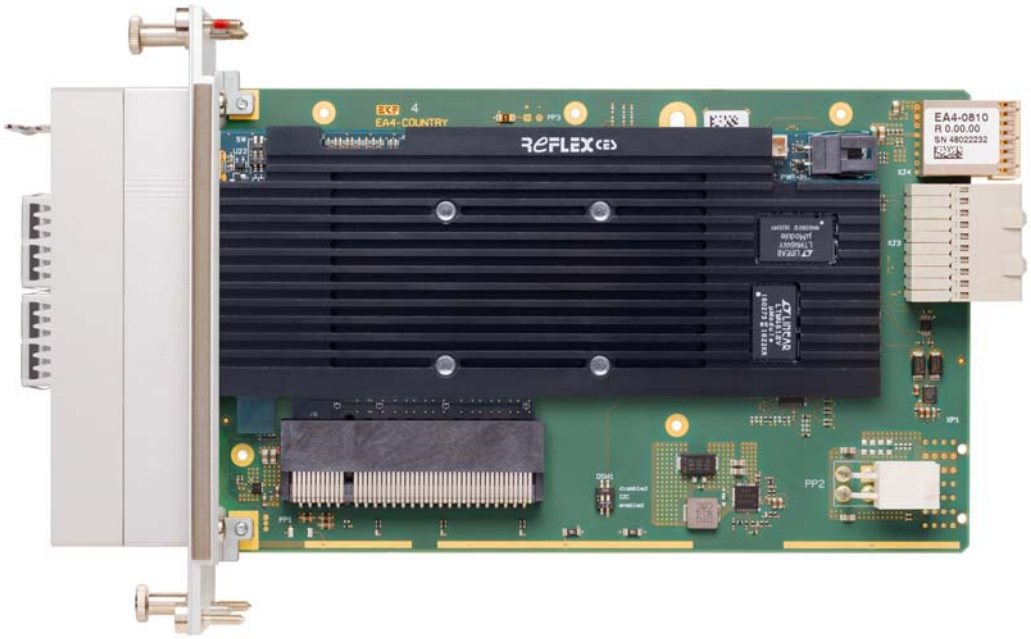
Option 4.20mm Power Connector +12V (ATX Aux Power)

The EA4-COUNTRY carrier card derives +12V power (as required for the PCI Express® card) either from the XP1 backplane connector, or as an alternate from the on-board ATX auxiliary power connector PP2. Available as an option, this is a 2x2 pin 4.2mm pitch dual row wire to board vertical or horizontal header, for attachment of a suitable cable assembly between power supply and the EA4-COUNTRY.

Please note: +12V sourcing via either XP1 or the ATX aux power connector is mandatory!

4.20mm Connector 2x2 Dual Row Part #264.02.104.00				
	GND	1	2	GND
	+12V	3	4	+12V

Each connector pin is rated at 8A. Mating cable connectors are available e.g. from Molex, under the Mini-Fit® Jr.™ brand. A suitable housing would be e.g. the Molex part #0039013042, to be used with crimp terminals e.g. Molex part #0039000060 (18-24 AWG). Other manufacturers for 4.20mm style connectors are e.g. WE and TE. Since ATX specification 2.03 many ATX power supplies have a suitable +12V auxiliary power cable harness.



EA4-0810-COUNTRY • 4.2mm Power Connector +12V

Ordering Information
For popular EA4-COUNTRY SKUs please refer to www.ekf.com/liste/liste_23.html#EA4

Please note:
EA4-COUNTRY photos shown here for application illustration may be populated with a 3rd party PCI Express® card, which is not scope of delivery.

Related Links to EKF CompactPCI® Serial PCI Express® Carrier Cards	
SA1-FUSION	www.ekf.com/e/sa1/sa1.html
SA4-COUNTRY	www.ekf.com/s/sa4/sa4.html

Related Documents CompactPCI® Serial	
Basics / Overview CompactPCI® Serial	www.ekf.com/s/smart_solution.pdf
CompactPCI® Serial Home	www.ekf.com/s/serial.html

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