RAD® POLX-14P/S
point of load DC/DC converters

The RAD® POLX-14P and RAD® POLX-14S converters are fully integrated building blocks for today’s digital space electronic modules.

They minimize non-recurring engineering and maximize space and routing channels for other electronic devices on the hosting motherboard module. These products enable efficient processing to meet the onboard requirements of the spacecraft environment.

The RAD-POLX-14P is designed for paralleling two POLs to increase current handling capacity up to 22A. The RAD-POLX-14S is for standalone applications and is physically smaller.

Hardware block diagram

- VIN
- MS
- EN
- SYNC
- PGND
- PORSEL
- SS
- CASE
- ISHRxxx
- VOUT
- RSP
- PG
- FB
- RSN
- PGND
- REF
- DVDD
- 3.1 to 5.5 VDC
- Sync control in or out
- Enable
- Sync frequency in or out
- VIN return
- 3.3 VDC or 5 VDC VIN select
- Soft start
- POL cover
- 0.8 VDC to 85 percent of VIN
- Remote sense+
- Power good
- Adjust output voltage
- Remote sense
- VOUT return
- Reference output voltage
- Internal bias supply
- Current share in or out
- Used on RAD POLX-14P only
- RAD POLX-14 P/S
Key features and benefits

- Converter is housed on eight-layer, two-ounce printed wiring board, minimizing voltage drop to maintain tight output voltage regulation
- Top and bottom thermal paths maximize efficiency for low power and thermal dissipation
- Acceptance test includes full functionality and temperature cycling, allowing worst case analysis and component stress analysis
- Input under-voltage lockout and over-current protection promotes efficient transient response
- Integrated power switches, magnetics, and stable power enables controlled circuitry
- Integrated space class 3a printed wiring board ensures ruggedness and quality construction
- With two paralleled POLs, up to 22A is available to provide support for high-current components

Typical current sharing application using two RAD® POLX-14S POLs

Specifications

Input voltage range: 3.1 to 5.5 VCDC

Output voltage range

0.8 VDC to 85 percent of input voltage up to 10A
0.8 VDC to 75 percent of input voltage up to 14A

Output voltage regulation

Static regulation ≤2 percent

Output voltage ripple

≤40m Vpp or 1 percent of output voltage

Efficiency: Up to 88 percent

Temperature

Operates at -55 to +125 degrees Celsius

Radiation hardness

High rate total ionizing dose: 50 krad (Si)
Enhanced low dose rate sensitivity: 50 krad (Si)
Single event latch up and single event burn out linear energy transfer: 86.4MeV/mg/cm²
Single event transient linear energy transfer: 86.4MeV/mg/cm²
Single event functional interrupt: 43MeV/mg/cm²

Configurations

14 A standalone converter (-14S) – 44 pins
22A two parallel converters (-14P) – each 84 pins
Independent or phased/synchronized operation
Prototype or flight converters

Power dissipation

Standby power: 0.03 watts
Operational power: 0.5 watts to 10 watts at 85 degrees Celsius

Package information

Standalone daughter card (-14S)
44 pins on two sides
1.3 inches x 1.5 inches x 0.35 inches
0.58 ounces

Shareable daughter card (-14P)
84 pins on 4 sides
1.5 inches x 1.5 inches x 0.35 inches
0.59 ounces