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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



LTC4292/LTC4291

4-Port IEEE 802.3bt PoE PSE Controller

FEATURES

- Four PSE Ports
 - Two Power Channels Per Port
- Fully Compliant IEEE 802.3bt Type 3 and 4 PSE
 - Compliant Support for Type 1, 2, 3, and 4 PDs
- Low Power Path Dissipation per Channel
 - 150mΩ Sense Resistance
 - 30mΩ or Lower MOSFET R_{DS(ON)}
- Chipset Provides Electrical Isolation
 - Eliminates Optos and Isolated 3.3V Supply
- Very High Reliability Multipoint PD Detection
 - Connection Check Distinguishes Single-Signature and Dual-Signature PDs
- Continuous, Dedicated Per-Port Power and Current Monitoring
 - Per-Port Power Policing
- 1MHz I²C Compatible Serial Control Interface
- Pin or I²C Programmable PD Power Up to 71.3W
- Available in a 40-Lead 6mm × 6mm (LTC4292) and 24-Lead 4mm × 4mm (LTC4291) QFN Package

APPLICATIONS

- PoE PSE Switches/Routers
- PoE PSE Midspans

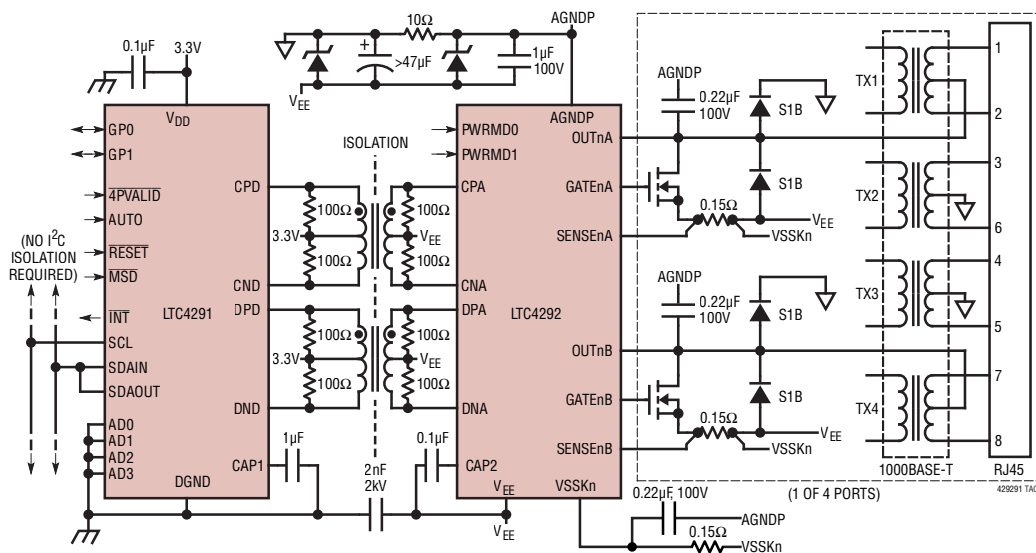
DESCRIPTION

The **LTC[®]4292/LTC4291** chipset is a 4-port power sourcing equipment (PSE) controller designed for use in IEEE 802.3bt Type 3 and 4 compliant Power over Ethernet (PoE) systems. The LTC4292/LTC4291 is designed to power compliant 802.3af, 802.3at, and 802.3bt PDs. The LTC4292/LTC4291 chipset delivers lowest-in-industry heat dissipation by utilizing low-R_{DS(ON)} external MOSFETs and 0.15Ω sense resistance per power channel. A transformer-isolated communication protocol replaces expensive opto-couplers and complex isolated 3.3V supply, resulting in significant BOM cost savings.

Advanced power management features include per-port 14-bit current monitoring, programmable current limit, and versatile fast shut-down of preselected ports. Advanced power management host software is available under a no-cost license. PD detection uses a proprietary multipoint detection mechanism ensuring excellent immunity from false PD identification. Autoclass and 5-event physical classification are supported. The LTC4292/LTC4291 includes an I²C serial interface operable up to 1MHz. The LTC4292/LTC4291 is pin or I²C programmable to negotiate PD delivered power up to 71.3W.

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TYPICAL APPLICATION



LTC4292/LTC4291

ABSOLUTE MAXIMUM RATINGS

(Notes 1, 4)

LTC4292

Supply Voltages

AGNDP – V_{EE} –0.3V to 80V
 VSSK12, VSSK34 (Note 7) ... V_{EE} – 0.3V to V_{EE} + 0.3V

Digital Pins

PWRMD0, PWRMD1 V_{EE} – 0.3V to CAP2 + 0.3V

Analog Pins

SENSEnM, GATEnM, OUTnM V_{EE} – 0.3V to V_{EE} + 80V
 CAP2 (Note 13) V_{EE} – 0.3V to V_{EE} + 5V
 CPA, CNA, DPA, DNA V_{EE} – 0.3V to V_{EE} + 0.3

Operating Ambient Temperature Range

LTC4292I –40°C to 85°C

Junction Temperature (Note 2) 125°C

Storage Temperature Range –65°C to 150°C

(Note 1)

LTC4291

Supply Voltages

V_{DD} – DGND –0.3V to 3.6V

Digital Pins

SCL, SDAIN, SDAOUT, $\overline{\text{INT}}$, $\overline{\text{RESET}}$, $\overline{\text{MSD}}$, ADn, AUTO, 4PVALID, GPn DGND – 0.3V to V_{DD} + 0.3V

Analog Pins

CAP1 (Note 13) –0.3V to DGND + 2V
 CPD, CND, DPD, DND DGND – 0.3V to V_{DD} + 0.3V

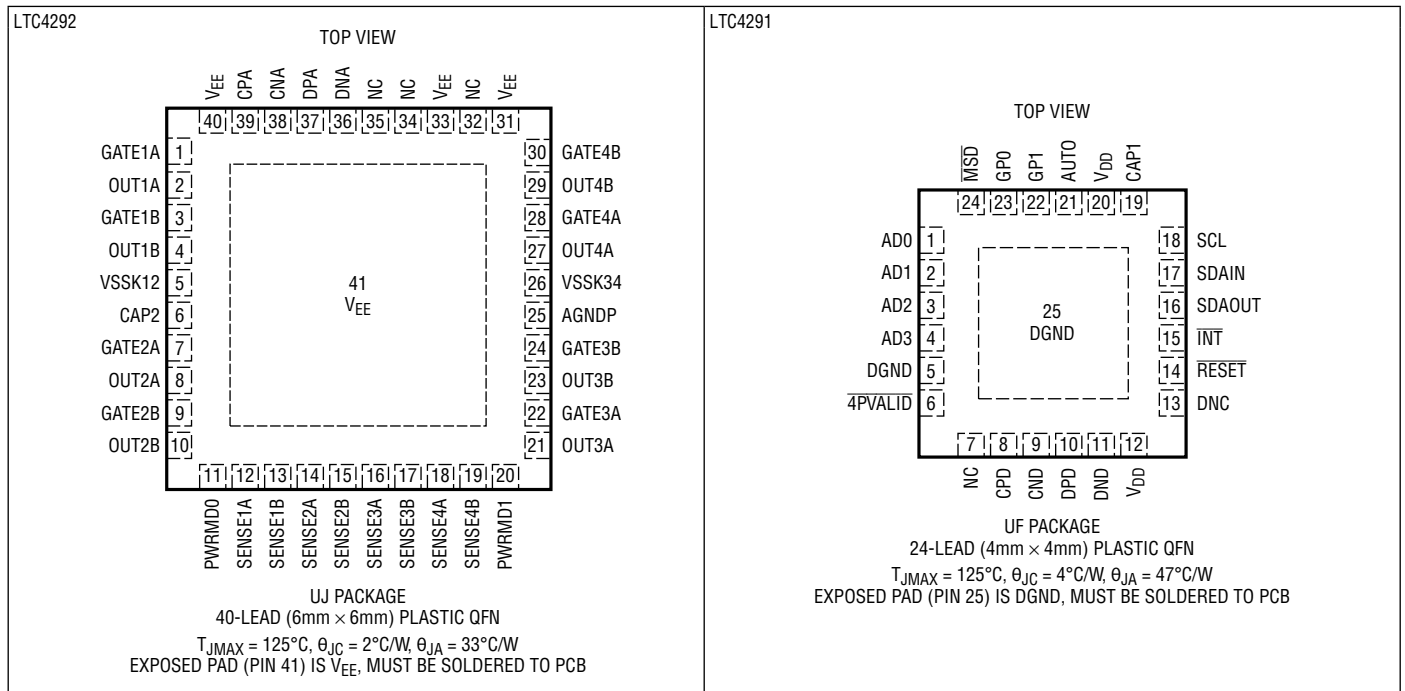
Operating Ambient Temperature Range

LTC4291I –40°C to 85°C

Junction Temperature (Note 2) 125°C

Storage Temperature Range –65°C to 150°C

PIN CONFIGURATION



ORDER INFORMATION <http://www.linear.com/product/LTC4292#orderinfo>

LEAD FREE FINISH	TAPE AND REEL	PART MARKING	PACKAGE DESCRIPTION	TEMPERATURE RANGE
LTC4291IUF#PBF	LTC4291IUF#TRPBF	4291	24-Lead (4mm × 4mm) Plastic QFN	–40°C to 85°C
LTC4292IUJ#PBF	LTC4292IUJ#TRPBF	LTC4292UJ	40-Lead (6mm × 6mm) Plastic QFN	–40°C to 85°C

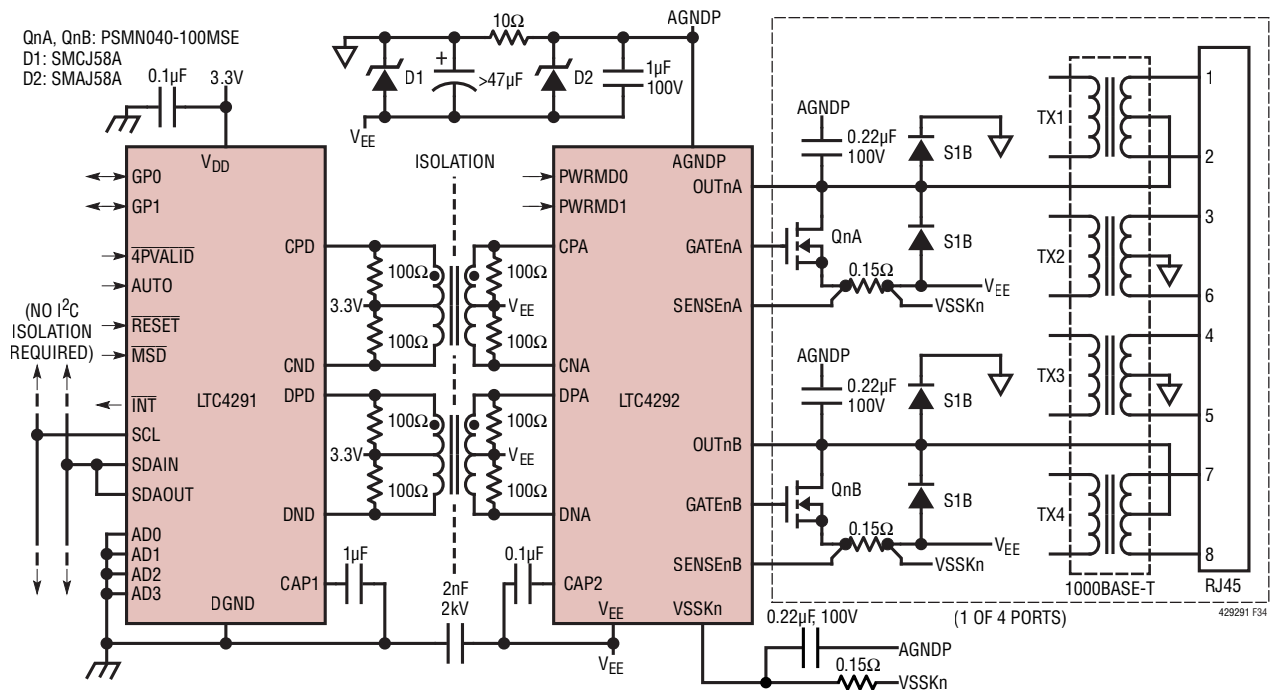
Consult ADI Marketing for parts specified with wider operating temperature ranges.

For more information on lead free part marking, go to: <http://www.linear.com/leadfree/>

For more information on tape and reel specifications, go to: <http://www.linear.com/tapeandreeel/>. Some packages are available in 500 unit reels through designated sales channels with #TRMPBF suffix.

TYPICAL APPLICATION

Figure 34. IEEE 802.3bt Type 3 or Type 4 PSE, Alternative A (MDI-X) and Alternative B(S), 1000BASE-T, 1 of 4 Ports Shown



RELATED PARTS

PART NUMBER	DESCRIPTION	COMMENTS
LT4294	LTPoE++/PoE+/PoE PD Controller	External Switch, IEEE 802.3bt Support Configurable Class
LT4295	IEEE 802.3bt PD with Forward/Flyback Switching Regulator Controller	External Switch, IEEE 802.3bt Support, Configurable Class, Forward or No-Opto Flyback Operation, Frequency, PG/SG Delays, Soft-Start, and Aux Support as Low as 9V, Including Housekeeping Buck, Slope Compensation
LTC4257-1	IEEE 802.3af PD Interface Controller	Internal 100V, 400mA Switch, Dual Current Limit, Programmable Class
LTC4263	Single IEEE 802.3af PSE Controller	Internal FET Switch
LTC4265	IEEE 802.3at PD Interface Controller	Internal 100V, 1A Switch, 2-Event Classification Recognition
LTC4266	Quad IEEE 802.3at PoE PSE Controller	With Programmable I_{CUT}/I_{LIM} , 2-Event Classification, and Port Current and Voltage Monitoring
LTC4267	IEEE 802.3af PD Interface with Integrated Switching Regulator	Internal 100V, 400mA Switch, Dual Inrush Current, Programmable Class
LTC4269-1	IEEE 802.3at PD Interface with Integrated Flyback Switching Regulator	2-Event Classification, Programmable Class, Synchronous No-Opto Flyback Controller, 50kHz to 250kHz, Aux Support
LTC4269-2	IEEE 802.3at PD Interface with Integrated Forward Switching Regulator	2-Event Classification, Programmable Class, Synchronous Forward Controller, 100kHz to 500kHz, Aux Support
LTC4270/LTC4271	12-Port PoE/PoE+/LTPoE++® PSE Controller	Transformer Isolation, Supports Type 1, Type 2 and LTPoE++ PDs
LTC4278	IEEE 802.3at PD Interface with Integrated Flyback Switching Regulator	2-Event Classification, Programmable Class, Synchronous No-Opto Flyback Controller, 50kHz to 250kHz, 12V Aux Support
LTC4279	Single PoE/PoE+/LTPoE++ PSE Controller	Supports IEEE 802.3af, IEEE 802.3at, LTPoE++ and Proprietary PDs
LTC4290/LTC4271	8-Port PoE/PoE+/LTPoE++ PSE Controller	Transformer Isolation, Supports IEEE 802.3af, IEEE 802.3at and LTPoE++ PDs