

# 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<sub>DS(ON)</sub>**
- **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 I<sup>2</sup>C Compatible Serial Control Interface**
- **Pin or I<sup>2</sup>C 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

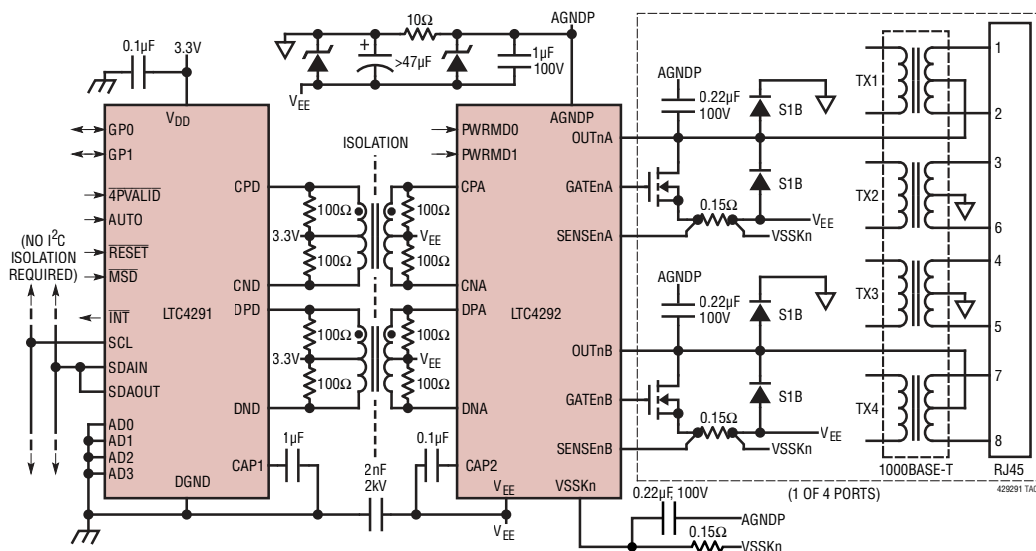
### DESCRIPTION

The **LTC<sup>®</sup>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<sub>DS(ON)</sub> 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 I<sup>2</sup>C serial interface operable up to 1MHz. The LTC4292/LTC4291 is pin or I<sup>2</sup>C 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<sub>EE</sub> ..... –0.3V to 80V  
 VSSK12, VSSK34 (Note 7) ... V<sub>EE</sub> – 0.3V to V<sub>EE</sub> + 0.3V

Digital Pins

PWRMD0, PWRMD1 ..... V<sub>EE</sub> – 0.3V to CAP2 + 0.3V

Analog Pins

SENSEnM, GATEnM, OUTnM V<sub>EE</sub> – 0.3V to V<sub>EE</sub> + 80V  
 CAP2 (Note 13) ..... V<sub>EE</sub> – 0.3V to V<sub>EE</sub> + 5V  
 CPA, CNA, DPA, DNA ..... V<sub>EE</sub> – 0.3V to V<sub>EE</sub> + 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<sub>DD</sub> – DGND ..... –0.3V to 3.6V

Digital Pins

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

Analog Pins

CAP1 (Note 13) ..... –0.3V to DGND + 2V  
 CPD, CND, DPD, DND ..... DGND – 0.3V to V<sub>DD</sub> + 0.3V

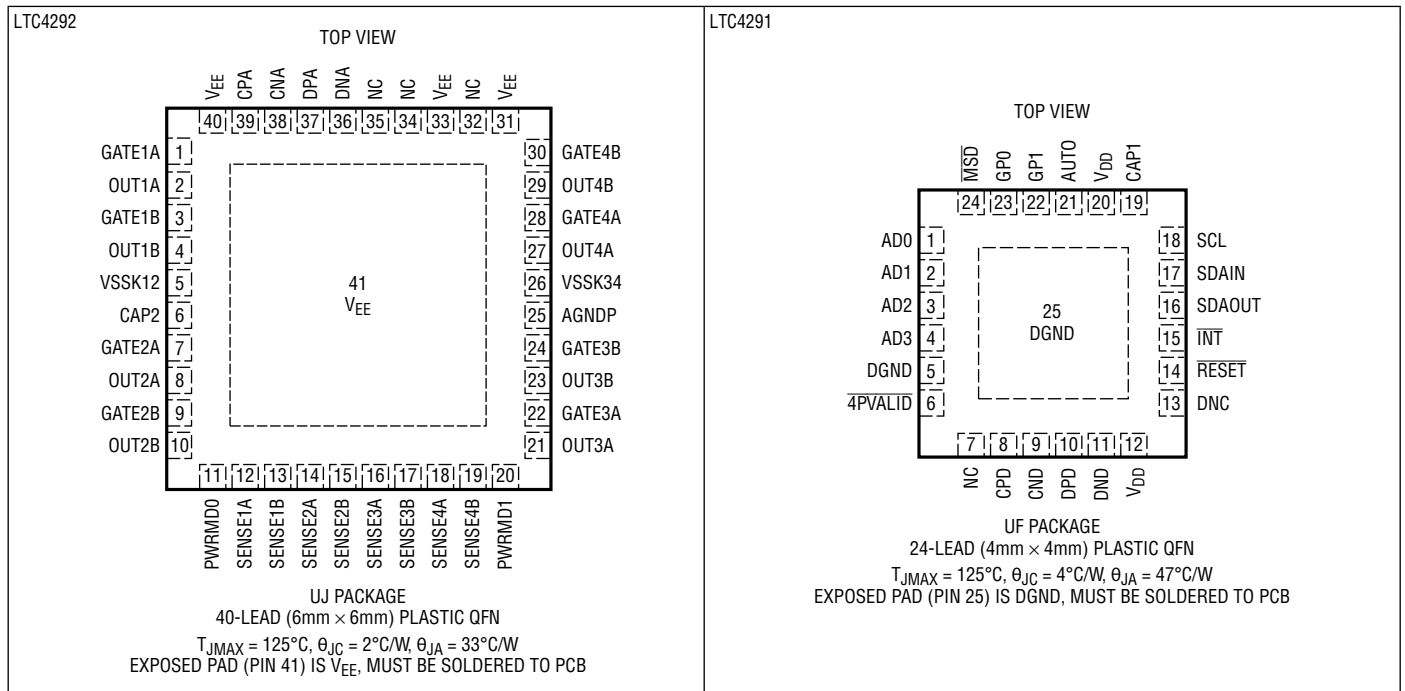
Operating Ambient Temperature Range

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

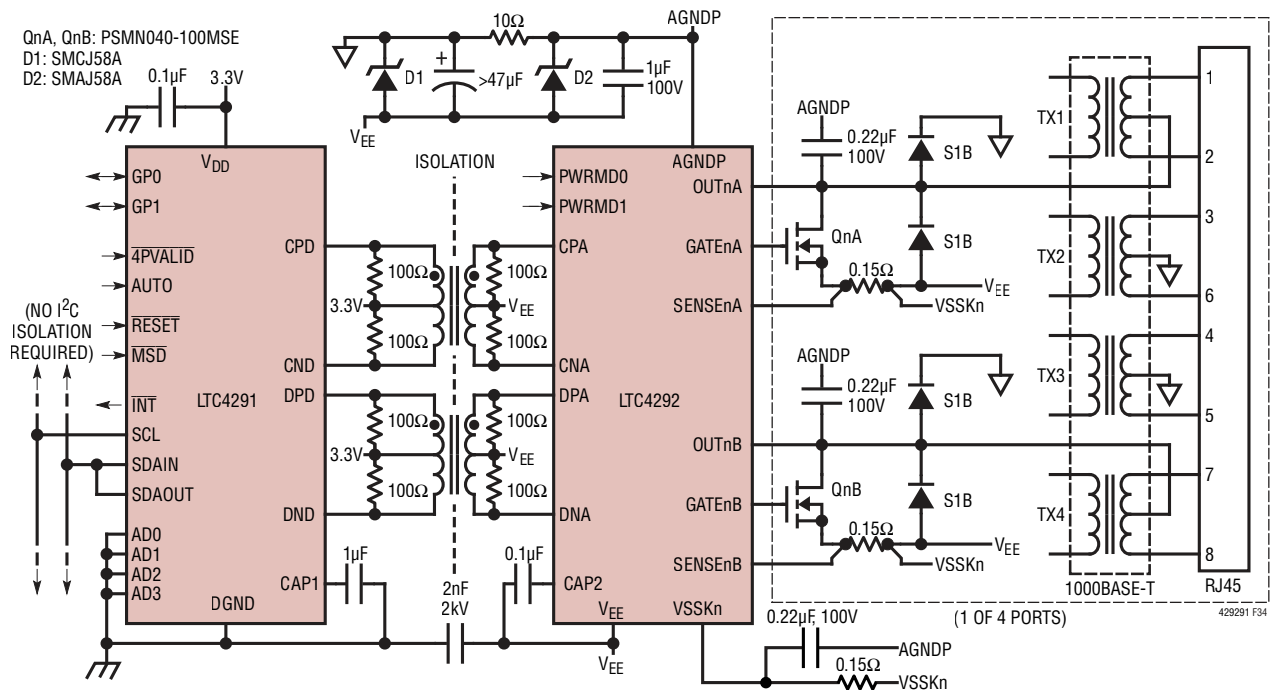
Consult ADI Marketing for parts specified with wider operating temperature ranges.

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/tapeandreel/>. 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
<a href="#">LT4294</a>	LTPoE++/PoE+/PoE PD Controller	External Switch, IEEE 802.3bt Support Configurable Class
<a href="#">LT4295</a>	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
<a href="#">LTC4257-1</a>	IEEE 802.3af PD Interface Controller	Internal 100V, 400mA Switch, Dual Current Limit, Programmable Class
<a href="#">LTC4263</a>	Single IEEE 802.3af PSE Controller	Internal FET Switch
<a href="#">LTC4265</a>	IEEE 802.3at PD Interface Controller	Internal 100V, 1A Switch, 2-Event Classification Recognition
<a href="#">LTC4266</a>	Quad IEEE 802.3at PoE PSE Controller	With Programmable $I_{CUT}/I_{LIM}$ , 2-Event Classification, and Port Current and Voltage Monitoring
<a href="#">LTC4267</a>	IEEE 802.3af PD Interface with Integrated Switching Regulator	Internal 100V, 400mA Switch, Dual Inrush Current, Programmable Class
<a href="#">LTC4269-1</a>	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
<a href="#">LTC4269-2</a>	IEEE 802.3at PD Interface with Integrated Forward Switching Regulator	2-Event Classification, Programmable Class, Synchronous Forward Controller, 100kHz to 500kHz, Aux Support
<a href="#">LTC4270/LTC4271</a>	12-Port PoE/PoE+/LTPoE++® PSE Controller	Transformer Isolation, Supports Type 1, Type 2 and LTPoE++ PDs
<a href="#">LTC4278</a>	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
<a href="#">LTC4279</a>	Single PoE/PoE+/LTPoE++ PSE Controller	Supports IEEE 802.3af, IEEE 802.3at, LTPoE++ and Proprietary PDs
<a href="#">LTC4290/LTC4271</a>	8-Port PoE/PoE+/LTPoE++ PSE Controller	Transformer Isolation, Supports IEEE 802.3af, IEEE 802.3at and LTPoE++ PDs