Primarion® PX3535
Digital Multiphase Controller

Product Brief

Applications

- Core power regulation for Intel® and AMD® µprocessors
- Intelligent point-of-load (POL) power regulation

Features

- Multiphase power conversion
  - 1- to 6-phase operation
- 100 KHz to 2 MHz switching frequency
- Supports Intel® VR 10.x, AMD®, and custom VID codes
- Internal high precision voltage reference
  - ± 10mV voltage setpoint accuracy
- Precision digital current sense calibration
- Precise digital current balancing with programmable offsets for thermal balancing
- Digitally programmable loadline and loop compensation
- Differential voltage sense
- Digital temperature sensor compensation
- Active Transient Response (ATR) enables meeting transient requirements with reduced output capacitance
- I^2C-bus interface for monitoring, control and configuration
- Internal non-volatile memory (NVM) to store custom configurations with four programmable Active Voltage Positioning (AVP) system configurations
- Extensive fault detection capability with two user configurable output fault pins
  - Input Under-voltage
  - Output Under-/Over-voltage
  - High Side Short
  - Per Phase and Total Output Current
  - Multiple Internal and External Temperature Limits
  - NVM Configuration
  - Calibration Range and Time-Out
- Configurable latched fault or autonomous recovery shutdown
- Single +3.3V supply operation
- RoHS compliant 48-lead LQFP plastic package

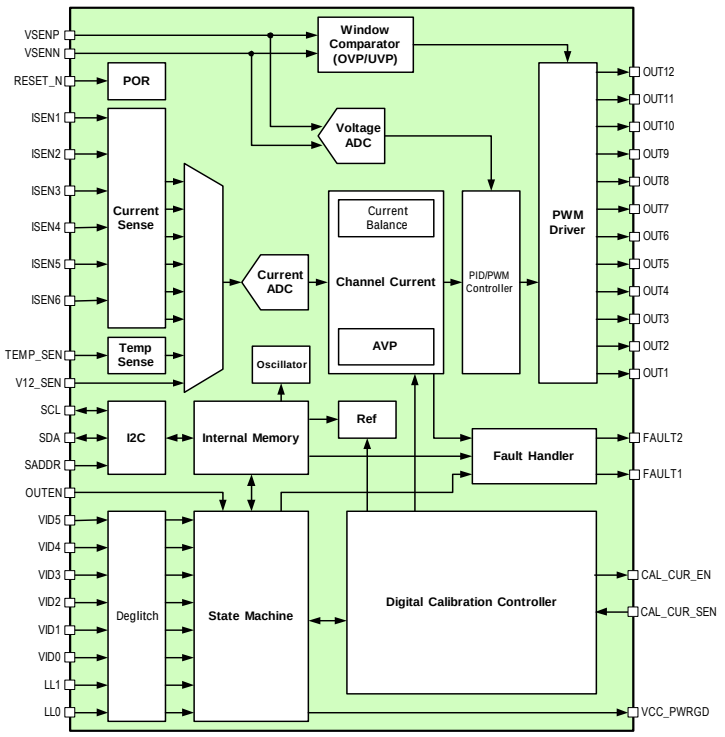
Description

Processors that operate above a GHz require fast, intelligent power systems. The Primarion® PX3535 Digital Multiphase Controller provides high-bandwidth frequency response, noise immunity, and active transient performance algorithms that only digital architecture can provide.

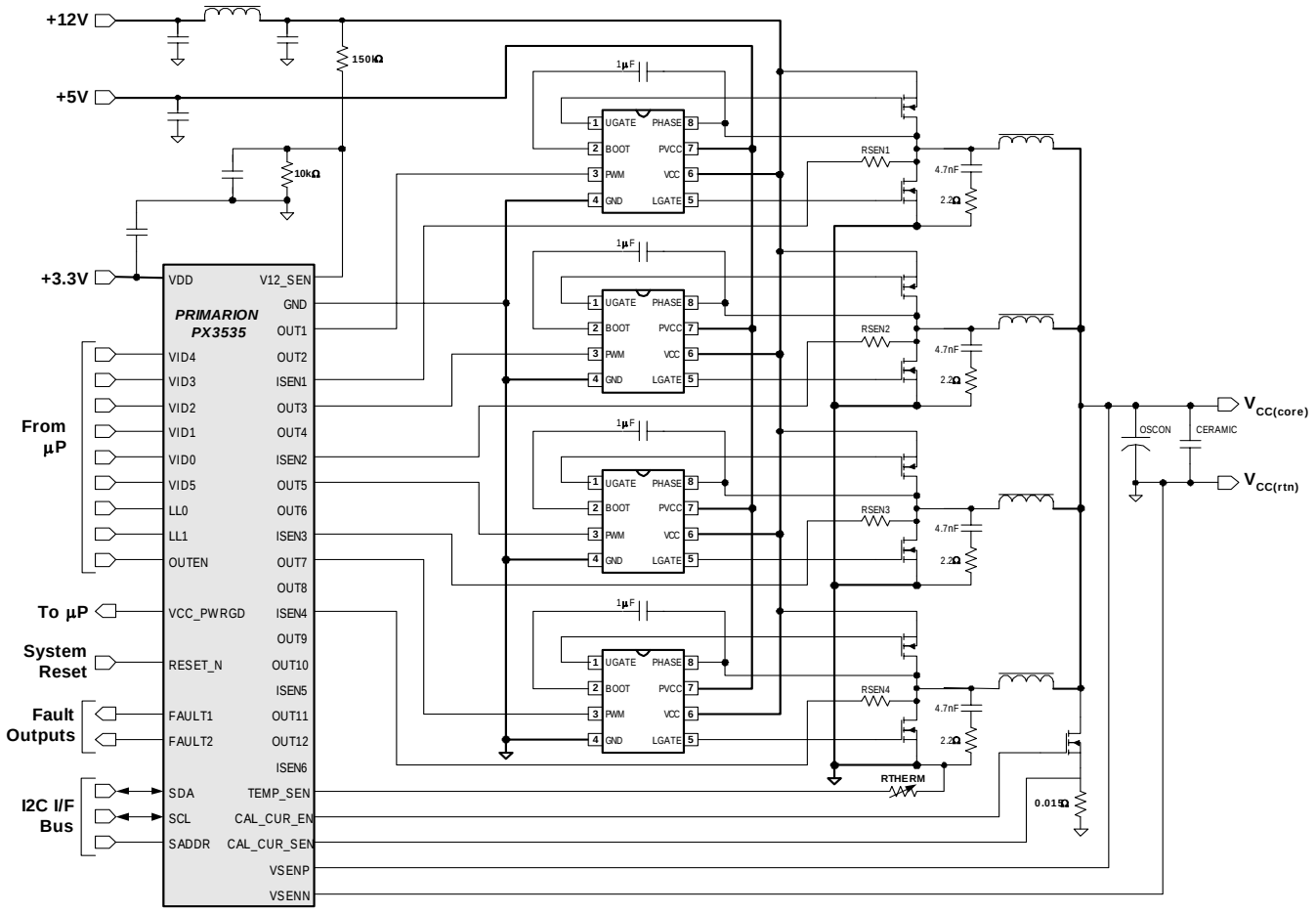
The PX3535 provides core power for today's high current microprocessors by driving from one to six synchronous-rectified buck-converter channels in parallel. Interleaved timing of the channels results in a higher ripple frequency, reducing input and output ripple. With up to six phases, each capable of up to 2 MHz operation, the PX3535 can be used to build DC-DC converters that provide up to 200A with excellent efficiency, low ripple, and the lowest component count.

The PX3535 utilizes digital technology to implement all control functions, providing the ultimate in flexibility and stability. The PX3535 incorporates an industry standard I^2C-bus serial interface for control and monitoring. Through the serial interface, the power supply designer can quickly optimize designs and monitor system performance. The interface allows the PX3535 to provide digitized information for real time system monitoring and control.

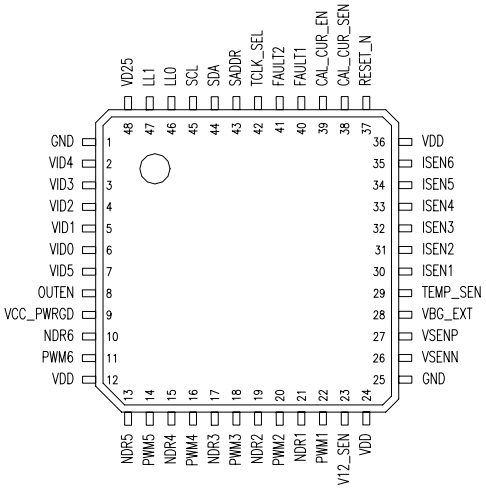
Block Diagram

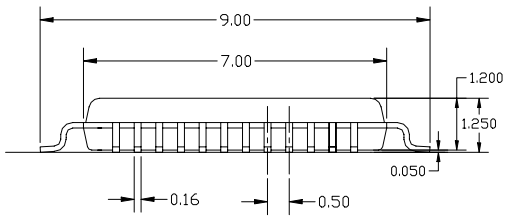


4-Phase Reference Design



Physical Characteristics (48-pin LQFP)





Notes:
1. All dimensions are in mm

Printed in the USA/1002/PDF/TK/PS

2780 Skypark Drive, Suite 100, Torrance, CA 90505 1-310-602-5500 Fax 1-310-602-5559 • www.primarion.com