



## Applications

- Core power regulation for Intel® and AMD®  $\mu$ processors
- Intelligent point-of-load (POL) power regulation

## Description

The PX3535 digital multiphase controller provides core power for today's high current microprocessors by driving up 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 1.5 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 I2C/SMBus serial interface for control and monitoring. Through the serial interface the power supply designer can quickly optimize designs and monitor telemetry. The interface allows the PX3535 to provide digitized information for real time system monitoring and control.

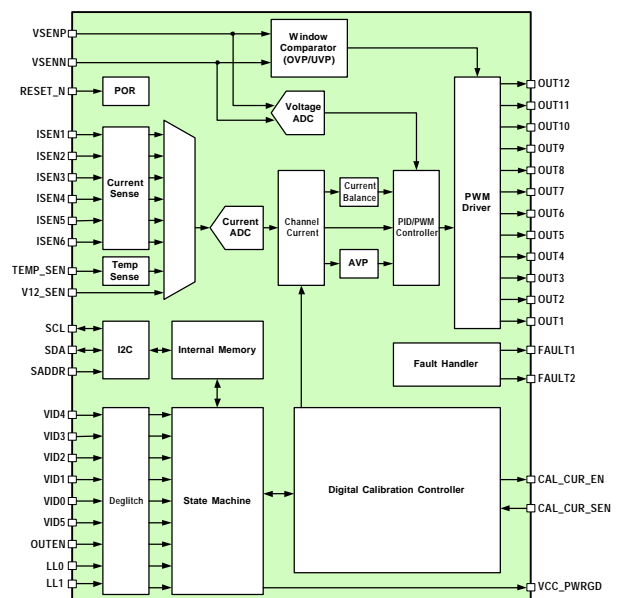
The PX3535 provides superior loadline accuracy through internal calibration that measures and corrects current sense error sources on startup. The PX3535 has programmable current sense temperature compensation that allows the designer to tailor the response for best loadline accuracy over temperature. Superior loadline accuracy reduces component count and solution cost.

To further reduce component count the PX3535 incorporates patented Active Transient Response (ATR) technology, allowing the fastest response to transient events for reduced output capacitance.

The flexibility of the PX3535 allows the power supply designer to implement a wide range of solutions. When used with industry standard power train components, the PX3535 provides the highest performance with lowest component count and cost. When area is at a premium, the PX3535 can be used with the PX3520 integrated power stage to implement the industry's highest density power solutions.

## Features

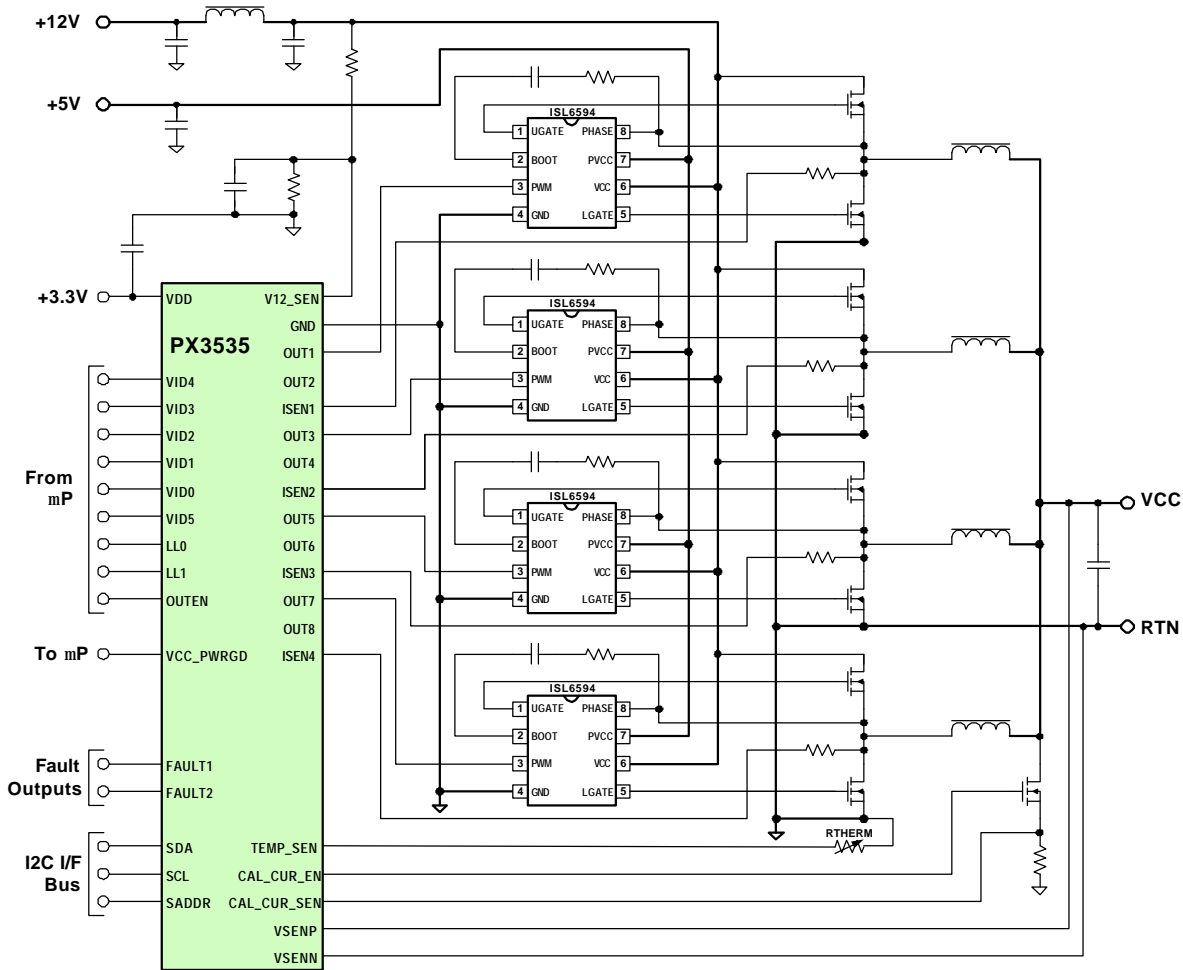
- Multiphase power conversion
  - 2- to 6-phase operation
- 300 kHz to 1.5 MHz switching frequency
- Supports Intel® VR 10.x, AMD®, and custom VID codes
- Internal high precision voltage reference
  - $\pm 5\text{mV}$  voltage setpoint accuracy
- Precision digital current sense calibration
  - $\pm 14\text{mV}$  loadline accuracy
- 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
- I2C/SMBus interface for monitoring, control and configuration
- Internal non-volatile memory (NVM) to store custom 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
- 48-lead LQFP plastic package
- Commercial temperature range of 0°C to 85°C ambient



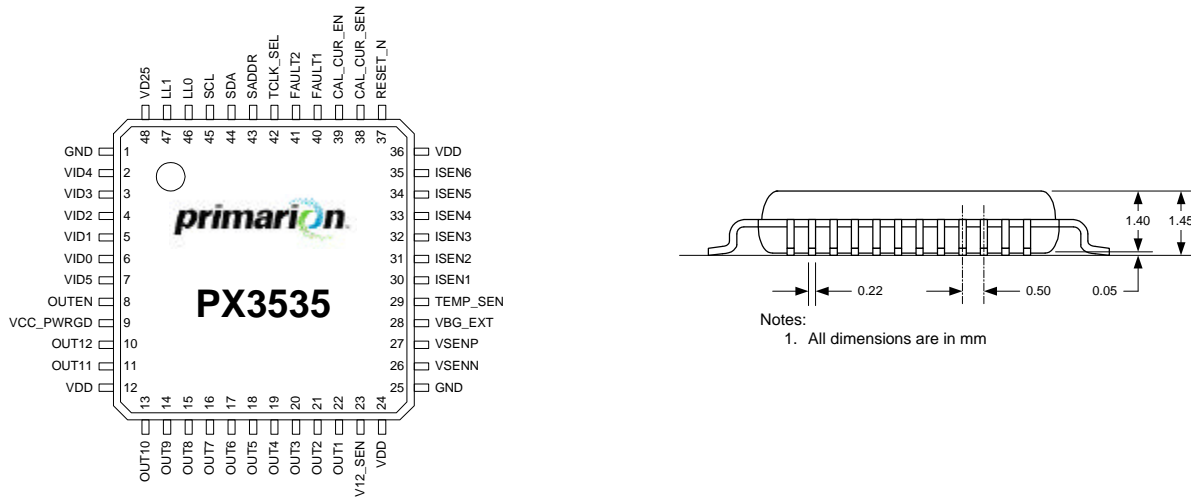
# Primarion® PowerCode™ PX3535 Digital Multiphase Controller

Product Brief

## 4-Phase Reference Design



## Physical Characteristics (48-pin LQFP)



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