

Applications

- Graphics Processors
- Intelligent Point-of-Load (POL) power regulation

Features

- Multiphase power conversion
 - 1- to 4-phase operation
- 100 kHz to 2 MHz switching frequency
- Internal high precision voltage reference
 - $\pm 12.4\text{mV}$ voltage setpoint accuracy
- Startup and maximum voltages set through external resistor
- 2-bit VID input for additional voltage control
- Driver detect prior to soft-start disables unpopulated phases
- Autonomous or user controlled phase dropping based on current balance and 12V supply faults
- Supports up to three 12V supplies with phase mapping
- 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-bus 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
 - Per Phase and Total Output Current
 - Current balance
 - Auxiliary 12V supply (both fault and return reported)
 - Multiple Internal and External Temperature Limits
- Configurable latched fault or autonomous recovery shutdown
- Single +3.3V supply operation
- RoHS compliant 48-lead MLF plastic package

Packaging & Part Number

Part Number	Ambient	Package
PX3544BDSG	0 to 85°C	48-lead 7mm x 7mm MLF

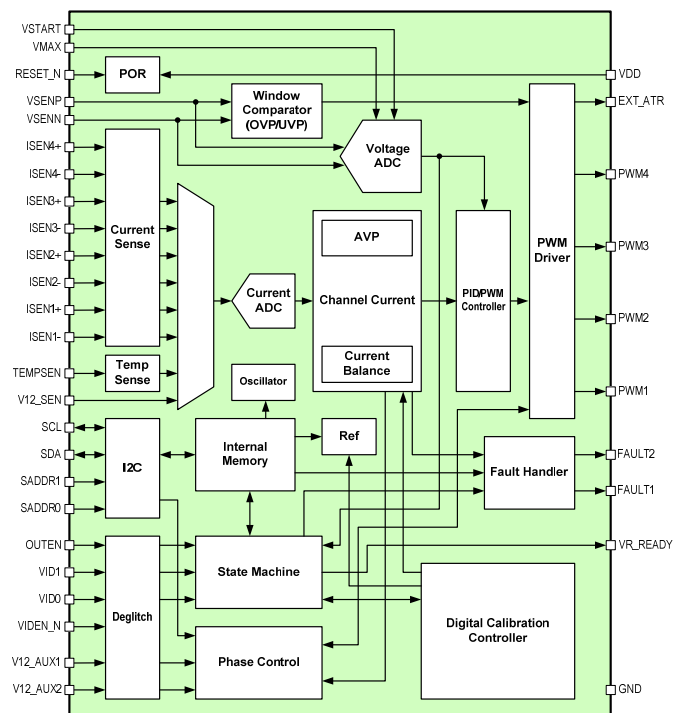
Description

The PX3544 Graphics Processor Digital Multiphase Controller provides core power for today's high current graphic processors by driving up to four 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 four phases, each capable of up to 2 MHz operation, the PX3544 can be used to build DC-DC converters that provide up to 130A with excellent efficiency, low ripple, and the lowest component count.

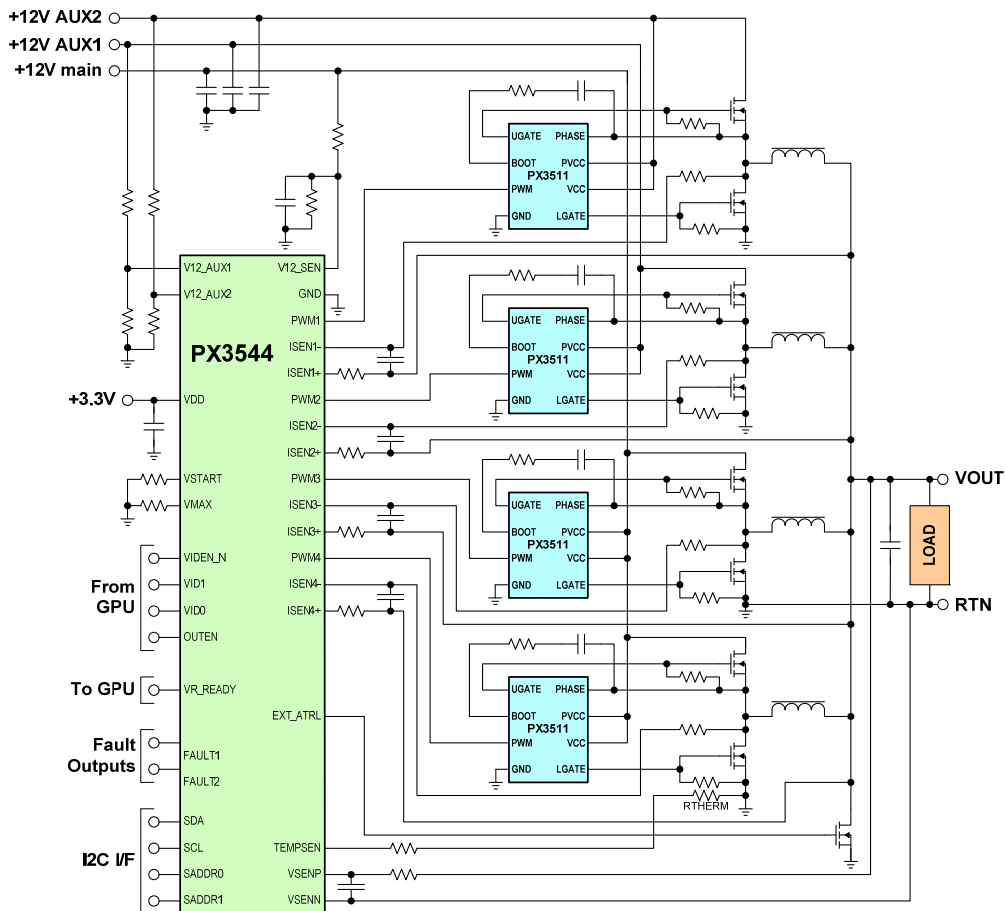
The PX3544 utilizes digital technology to implement all control functions, providing the ultimate in flexibility and stability. The PX3544 incorporates an industry standard I²C-bus serial interface for control and monitoring. Through the serial interface, the power supply designer can quickly optimize designs and monitor system performance. The interface allows the PX3544 to provide digitized information for real time system monitoring and control.

The PX3544 provides intelligent phase detection capability allowing the system to operate under the condition of up to 2 (of 3) missing 12V supplies. Autonomous phase control circuitry will drop phases due to current balance or 12V faults and add phases when the 12V supply returns. An I²C based user phase control mode is also provided.

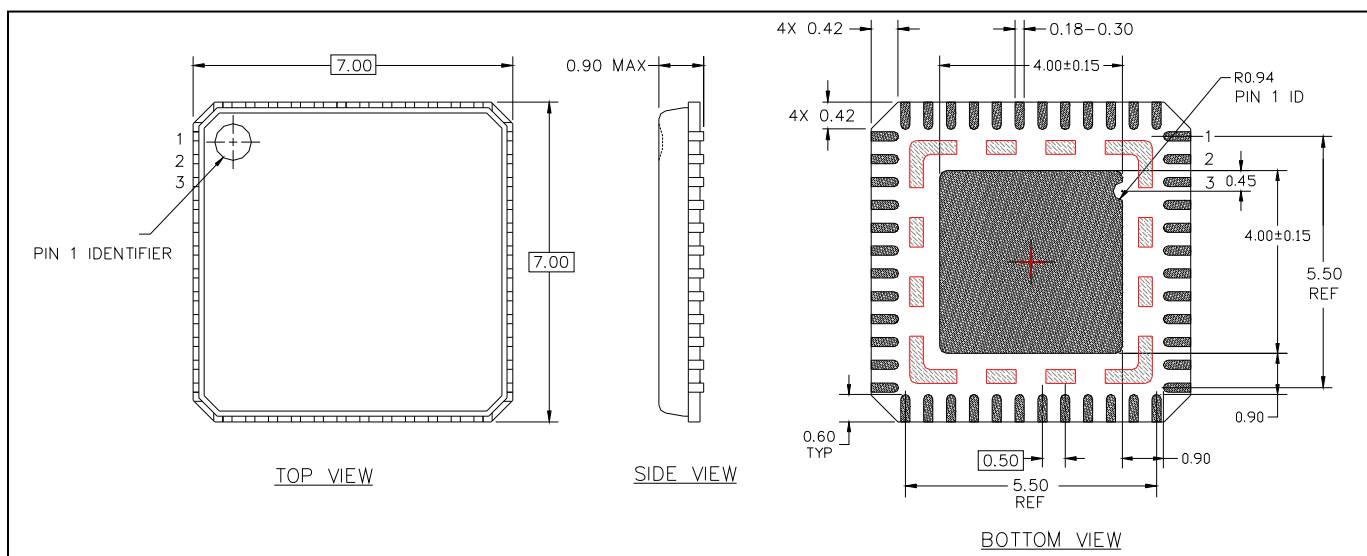
Block Diagram



4-Phase Reference Design with DCR Current Sense



Physical Characteristics (48-lead MLF)



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