

# Altera® Stratix® V FPGA Power Solution (PMP9365)



## System Description

The PMP9365 reference design provides all the power supply rails necessary to power Altera's Stratix® V family of FPGAs. This design uses several LMZ3 series modules, LDOs, and a DDR termination regulator to provide all the necessary rails to power the FPGA. It also features two LM3880's for flexible power up and power down sequencing. This design uses a 12V input.

## Featured Applications

- FPGA

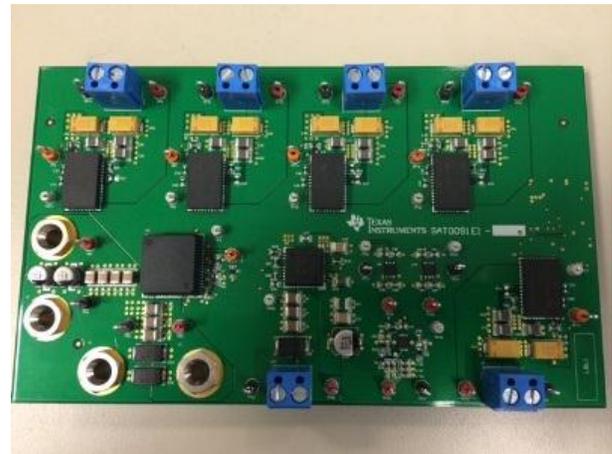
## Design Resources

- Block Diagram and Schematic
- Test Data
- Gerber Files
- Design Files
- Bill of Materials

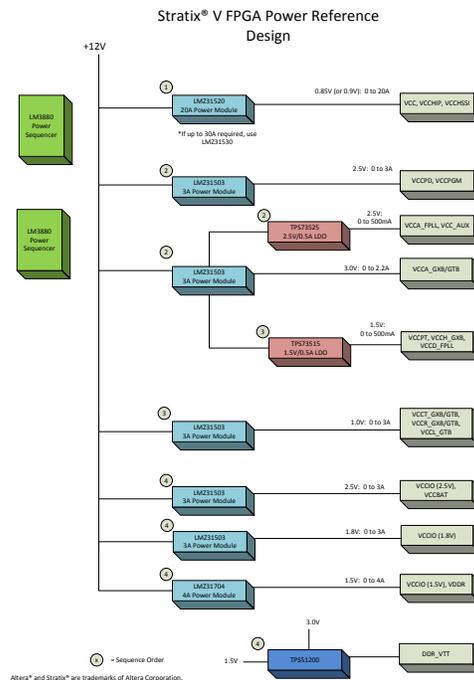
## Design Features

- Design optimized to support a 12V Input Voltage
- Provides all the power supply rails needed to power an Altera® Stratix® V FPGA
- Power-up and power-down sequencing
- Supports DDR3 memory device
- Module design for ease of use

## Design Photo



## Block Diagram



### Jump start system design and speed time to market

Comprehensive designs include schematics or block diagrams, BOMs, design files and test reports by experts with deep system and product knowledge. Designs span TI's portfolio of analog, embedded processor and connectivity products and supports a board range of applications including industrial, automotive, medical, consumer, and more. To explore the designs, go to <http://www.ti.com/tidesigns>

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### Associated Part Numbers

<u>Part Number</u>	<u>Part Description</u>
LMZ31520	Simple switcher power module that combines a 20A DC/DC converter with power MOSFETs, a shielded inductor, and passives. Its input can range from 3 to 14.5V.
LMZ31503	Simple switcher power module that combines a 3A DC/DC converter with power MOSFETs, a shielded inductor, and passives. Its input can range from 4.5 to 14.5V.
LM3880	Power sequencer that can control power up and power down of multiple power supplies using a precision enable pin and three output flags.
TPS73525	Single output 500mA LDO with high PSRR, low noise, fast start-up, low quiescent current, fixed (2.5V), and excellent AC performance.
TPS73515	Single output 500mA LDO with high PSRR, low noise, fast start-up, low quiescent current, fixed (1.5V), and excellent AC performance.
LMZ31704	Simple switcher power module that combines a 4A DC/DC converter with power MOSFETs, a shielded inductor, and passives. Its input can range from 2.95 to 17V.
TPS51200	Sink/Source DDR termination regulator with VTTREF buffered reference for DDR2/3/4/3L. Designed for low input voltage, low-cost, low-noise, and space considerate systems.

### Design Considerations:

The design goal is to provide a full solution to power an Altera Stratix V FPGA; including core, transceiver, auxiliary, and I/O power. The design must also provide power up and power down sequencing and accept a 12V input.

### Power Supplies –

LMX3x series simple switcher modules were used to provide the remaining power supply rails for this system. These modules feature integrated inductors for ease of design and require minimal external components. These power supply rails were designed to keep output ripple at a minimum and DC & AC errors <3%. For the lower current rails, fixed output LDOs were used to provide <500mA.

### Power Up and Down Sequencing –

Two LM3880 power sequencers are cascaded together to provide power up and down sequencing for all of the rails needed to power the FPGA.



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