## PMP9444 Ultrascale Kintex FPGA Power Reference Design

### Revision History

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### Design Description

The design is intended for use in automotive applications. It includes components such as power rails and control systems. The power rails are designed to provide stable power to various sections of the system. The control systems ensure proper operation under different conditions.

### Components

- **TPS54028 + 2x CS55375**: 2-phase Sync Buck Controller
- **LM231510**: 1A Power Module
- **LM231506**: 6A Power Module
- **LM231503**: 1A Power Module
- **LM231505**: 1A Power Module

### Design Constraints

- The design must comply with ISO26262 requirements for automotive use.
- All components must be certified as compliant with automotive standards.
- The design must be scalable to accommodate future requirements.

### Power Distribution

- **+3.3V**: Power rail for critical components.
- **+12V**: Power rail for high current components.

### Safety Considerations

- The design includes failsafe mechanisms to ensure safety in case of component failure.
- The design is intended for use in systems where reliability is critical.

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VCCbram_trim

PMBus header

Sequencer/system Monitor #1

Connect to GND near one of the DVSs pins

AGND to PGND strap at only 1 point

http://www.ti.com

Engineer:  
Drawn By:  

Project Title:  

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Clearance/Buffer/Driver

- 5.5V
- 3.3V
- 1.8V
- 1.0V

GND

5V

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GND
PH pins should be connected to a copper island under the device for thermal relief. DO NOT connect any external component or net to this pin.

DO NOT connect AGNDs on this page to a common system AGND

Engineer: Sami Sirhan

Drawn By: Sami Sirhan

Contact: http://www.ti.com/support

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MGTAVTT: 1.2V @ 2A

- VIN = 2.87V, Rin = 0.1Ω
- Sets: VOUT = 1.2V, fSW = 480kHz

MGTAVTT 0A-2A => CS = 0V - 2.015V

G = 201.5, Rg = 499
VCCAUX: 1.8V @ 3A

PH pins should be connected to a copper island under the device for thermal relief. DO NOT connect any external component or net to this pin.

DO NOT connect AGNDs on this page to a common system AGND

AGND is FGND Strap at ONLY 1 point
To GPIO1 on UCD90120A-2

AGND to PGND Strap at ONLY 1 point

AGND to PGND Strap at ONLY 1 point

VCC1V8: 1.8V @ 2A

Radj = 1.13k,
Rrt/clk = 324k
Sets:
VOUT = 1.8V
fSW = 480kHz

NO Variations

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DE2

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PH pins should be connected to a copper island under the device for thermal relief. **DO NOT connect any external component or net to this pin.**

AGND to PGND Strap at ONLY 1 point

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DPH pins should be connected to a copper island under the device for thermal relief. DO NOT connect any external component or net to this pin.

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**UTIL_3p3V: 3.3V @ 1A**

- **Texas**: R43, Rin = 158k
- **Set**: VOUT = 3.3V
- **fSW**: 630kHz

- **R43**: 158k
- **R45**: 6.3k
- **R41**: 1%
- **R40**: 4.7k
- **C60**: 68µF
- **C61**: 47µF
- **C62**: 12.1k
- **C63**: 100pF
- **C64**: 5.1V
- **D1**: BZT52C5V1T-7

- **VIN**: +3.3V/1A

- **AGND** to **PGND** Strap at ONLY 1 point

*PH pins should be connected to a copper island under the device for thermal relief. DO NOT connect any external component or net to this pin.

*DO NOT connect AGNDs on this page to a common system AGND*
**UTIL_5V: 5V @ 1A**

- **Vin** should be connected to a copper island under the device for thermal relief. DO NOT connect any external component or net to this pin.
- **AGND** to **PGND** strap at only 1 point.

**Components:**
- **R125**: 49.9Ω, 1%
- **R126**: TP65
- **R127**: 105kΩ
- **C201**: 47µF, 16V
- **C202**: 47µF, 6.3V
- **C203**: 68.1kΩ
- **C204**: 47µF, 6.3V
- **C205**: 47µF, 16V
- **C206**: 100pF
- **D2**: BZT52C5V1T-7
- **VIN**: 5V
- **VADJ**: 5V
- **SENSE+**: 5V
- **U21**: LMZ31503RUQ
- **NT10**: 100pF
- **PVIN**: 5V
- **PVIN**: 5V
- **PVIN**: 5V
- **VIN**: 5V
- **PH**: 5V
- **PH**: 5V
- **PH**: 5V
- **PH**: 5V
- **DNC**: 5V
- **VO**: 5V
- **VO**: 5V
- **VO**: 5V
- **VO**: 5V
- **DNC**: 5V
- **DNC**: 5V
- **DNC**: 5V
- **DNC**: 5V
- **PWRGD**: 5V
- **AGND12**: 5V
- **RT/CLK**: 5V
- **PGND**: 5V
- **PGND**: 5V
- **PGND**: 5V
- **PVIN**: 5V
- **PVIN**: 5V
- **VIN**: 5V
- **VADJ**: 5V
- **AGND**: 5V
- **PH**: 5V
- **VO**: 5V

**Notes:**
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- AGND to PGND strap at only 1 point.
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