Class 4 PoE High Efficiency Active Clamp Forward Converter (3.3V) Reference Design

(ACTIVE) PMP10288

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Key Document

- PMP10288 Test Results (PDF 938 KB)
  23 Jun 2015

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PMP10288 Class 4 PoE High Efficiency Active Clamp Forward Converter (3.3V) Reference Design Board Image

Fully assembled board (shown above) developed for testing and performance validation only, not available for sale.

Description

The PMP10288 reference design is a Power Over Ethernet (POE) active clamp forward converter. It features the TPS23754, which is a combination of a POE Powered Device (PD) controller and PWM controller. CSD17501Q5A FETs are used for high efficiency synchronous rectification. The input accepts standard Type 2 POE voltage of 42.5VDC-57VDC or a 36VDC-57VDC auxiliary voltage. The output power is an isolated 3.3VDC at 6.5A with PoE input or 3.3VDC at 7.2A with auxiliary input.

Features

- Integrated PD and PWM controller
- Power Conversion Efficiency of 90% at full load
- Low gate charge MOSFETs for high efficiency synchronous rectification
- Auxiliary power input available
- Test report includes efficiency, ripple, load step, turn-on response, loop stability, and thermal plot

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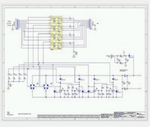
Schematic/Block Diagram

Quickly understand overall system functionality.



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Design Guide

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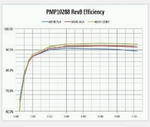

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Design Files

Download ready-to-use system files to speed your design process. Get Viewer.

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Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

Parametrics

	PMP10288
Vin (Min) (V)	36
Vin (Max) (V)	57
Vout (Nom) (V)	3.3
Iout (Max) (A)	7.2
Output Power	23.76
Isolated/Non-Isolated	Isolated
Input Type	DC
Topology	Forward- Active Clamp POE

TI Devices (3)

Order samples, get tools and find more information on the TI products in this reference design.

Part Number	Name	Product Family	Sample & Buy	Design Kits & Evaluation Modules
CSD17501Q5A	30V, N-Channel NexFET™ Power MOSFET with 20 Volt Vgs	Power MOSFET	Sample & Buy	View Design Kits & Evaluation Modules
TLV431A	Low Voltage Adjustable Precision Shunt Regulator	Voltage Reference	Sample & Buy	Not Available
TPS23754	High Power/High Efficiency PoE Interface and DC/DC Controller	Power Over Ethernet (PoE)/LAN Solutions	Sample & Buy	View Design Kits & Evaluation Modules

CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
CSD17501Q5A	VSONP (DQJ) | 8	Download	-
TLV431A	SOT (DBZ) | 3	Download	Download
	TO-92 (LP) | 3	Download	Download
	SIP (PK) | 3	Download	-
	SOT (DBV) | 5	Download	Download
	SOT (DCK) | 6	Download	-
	SOIC (D) | 8	Download	Download
TPS23754	HTSSOP (PWP) | 20	Download	Download

Texas Instruments and Accelerated Designs Inc. have collaborated together to provide TI customers with schematic symbols and PCB layout footprints for TI products.

Step 1: Download and install the Ultra Librarian software ZIP: 62MB

Step 2: Download the Symbol and Footprint .bxl file.

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Technical Documents

User guides (1)

Title	Abstract	Type	Size (KB)	Date	Views	TI Recommends
PMP10288 Test Results		PDF	938	23 Jun 2015	0	✓

Design files (3)

Title	Abstract	Type	Size (KB)	Date	Views
PMP10288 Gerber		ZIP	239	23 Jun 2015	0
PMP10288 BOM		PDF	107	23 Jun 2015	0
PMP10288 Schematic		PDF	522	23 Jun 2015	0

Applications

- Power Over Ethernet (PoE)

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