220V-400VDC Input, 5V/100W Active Clamp Forward

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Description

This reference design generates an isolated 5V/100W output from a high voltage DC input. This design is intended to operate from the output of a PFC front end regulator. The UCC2897A IC is used to control an active clamp forward converter. Self-driven synchronous rectifiers allow for 91% efficiency. An accurate current limit is provided by directly sensing the output current. A clock pulse output is also provided for synchronizing with other converters.

Features

- 220V-400VDC to 5V/20A Output (100W)
- 91% efficiency
- Output Current Sensing
- Features UCC2897A Controller along with TI NexFET Synchronous Rectifiers
- Active Clamp Forward Topology
- Reduced conduction losses and die area of the synchronous rectifiers

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

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Schematic/Block Diagram

Quickly understand overall system functionality.

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Test Data

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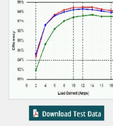

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Design Files

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

	PMP7413
Vin (Max) (v)	400
Vin (Min) (v)	220
Vout (Nom) (v)	5
Iout (Max) (A)	20
Output Power	100
Isolated/Non-Isolated	Isolated
Input Type	DC
Topology	Forward- Active Clamp Forward- Synchronous

TI Devices (5)

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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
SN74AHCT74	Dual Positive-Edge-Triggered D-Type Flip-Flops With Clear and	Flip-Flops/Latch/Register	Sample & Buy	Not Available

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CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
CSD17501Q5A	VSONP (DQG) | 8	Download	-
SN74AHCT74	SOIC (D) | 14	Download	Download
	SSOP (DB) | 14	Download	-
	TVSOP (DGV) | 14	Download	-
	PDIP (N) | 14	Download	-
	SOP (NS) | 14	Download	-
	TSSOP (PW) | 14	Download	Download
	VQFN (RGY) | 14	Download	-
TL103WA	SOIC (D) | 8	Download	Download
TL431A	SOT (DBV) | 3	Download	Download
	TO-92 (LP) | 3	Download	Download
	SIP (PK) | 3	Download	-
	SOT (DBV) | 5	Download	Download
	SOT (DCK) | 6	Download	Download
	SOIC (D) | 8	Download	Download
	PDIP (P) | 8	Download	Download
	SOP (PS) | 8	Download	-
	TSSOP (PW) | 8	Download	-
UCC2897A	TSSOP (PW) | 20	Download	Download
	VQFN (RGP) | 20	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.

- read more -

Technical Documents

User Guides (1)

Title	Abstract	Type	Size (KB)	Date	Views
PMP7413 Test Results		PDF	2503	27 Jun 2012	54

Design Files (4)

Title	Abstract	Type	Size (KB)	Date	Views
PMP7413 PCB		PDF	361	27 Jun 2012	40
PMP7413 Gerber		ZIP	218	27 Jun 2012	29
PMP7413 BOM		PDF	83	27 Jun 2012	58
PMP7413 Schematic		PDF	174	27 Jun 2012	140

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