USB-C DFP, 20V/3A Out, Universal AC Input Reference Design

(ACTIVE) PMP11451

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Key Document

- PMP11451 Test Results (PDF 8126 KB)
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PMP11451 USB-C DFP, 20V/3A Out, Universal AC Input Reference Design Board (Top View)

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

Description

This power reference design provides up to 20 V/60 W over USB-C from a universal AC input range of 85 to 265 VAC. The UCC24636 synchronous rectifier driver allows this design to provide 91% average efficiency. A daughter card provides the PD port control over the USB-C output connector.

Features

- 91% average efficiency
- Standby (no load) power consumption is less than 40 mW
- Conducted emissions are below Class B levels
- Compact form factor 60 mm x 60 mm x 25 mm (2.35 in x 2.35 in x 1 in)

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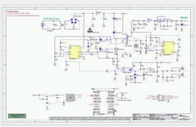
Schematic/Block Diagram

Quickly understand overall system functionality.



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Design Guide

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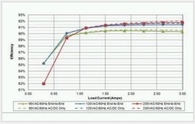

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Design Files

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Bill of Materials (BOM)

Find the complete list of components in this reference design.

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Parametrics

	PMP11451.1 (Output Voltage 1)
Vin (Min) (V)	85
Vin (Max) (V)	265
Vout (Nom) (V)	20
Iout (Max) (A)	3
Output Power (W)	60
Isolated/Non-Isolated	Isolated
Input Type	AC
Topology	Flyback- Quasi Resonant

TI Devices (4)

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
CSD17578Q3A	CSD17578Q3A 30 V N-Channel NexFET™ Power MOSFET	Power MOSFET	Sample & Buy	Not Available
TL431A	Adjustable Precision Shunt Regulator	Voltage Reference	Sample & Buy	Not Available
UCC24636	Synchronous Rectifier Controller With Ultra-Low Standby Current	Offline and Isolated DC/DC Controllers and Converters	Sample & Buy	View Design Kits & Evaluation Modules

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CAD/CAE symbols

Part #	Package | Pins	CAD File [.bxl]	STEP Model [.stp]
TL431A	SOT (DBZ) | 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	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 free download.

Step 2: Download the Symbol and Footprint from the CAD.bxl file table.

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Technical Documents

User guides (1)

Title	Abstract	Type	Size (KB)	Date	Views	TI Recommends
PMP11451 Test Results		PDF	8126	23 Feb 2016	57	✓

Design files (4)

Title	Abstract	Type	Size (KB)	Date	Views
PMP11451 3D Assembly Drawing		PDF	867	23 Feb 2016	21
PMP11451 Assembly Drawing		PDF	136	23 Feb 2016	19
PMP11451 BOM		PDF	106	23 Feb 2016	48
PMP11451 Schematic		PDF	157	23 Feb 2016	95

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