5V@2.1A USB Charger Automotive Reference Design

(ACTIVE) PMP10282

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Key Document

- PMP10282 Test Results (PDF 1576 KB)
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PMP10282 5V@2.1A USB Charger Automotive Reference Design Board Image

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

Description

This USB 3.0 charger provides 5V @ 2.1A over an automotive input range of 8V - 40V. It uses the integrated FET TPS54340 PWM Buck controller and implements cable voltage droop compensation. A TPS2546 charging port controller provides data line switching plus an integrated FET with dual current protection thresholds.

Features

- 8 to 40V (12V nominal) input voltage and 5V/2.1A output with TPS54340
- Programmable voltage droop
- Supports both USB 2.0 and 3.0 power switch requirements
- This reference design has been lab tested and is supported with design files and an application note

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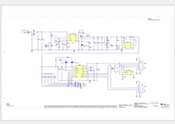
Schematic/Block Diagram

Quickly understand overall system functionality.



Download Schematic

Design Guide

Get results faster with test and simulation data that's been verified.

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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

	PMP10282
Vin (Min) (V)	8
Vin (Max) (V)	40
Vout (Nom) (V)	5
Iout (Max) (A)	2.1
Output Power (W)	10.5
Isolated/Non-isolated	Non-isolated
Input Type	DC
Topology	Buck- Non Sync

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
INA213	26-V, Bi-Directional, Zero-Drift, High Accuracy, Low-/High-Side, Voltage Out Current Shunt Monitor	Current Sense Amplifiers	Sample & Buy	View Design Kits & Evaluation Modules
TPD2E001	Low-Capacitance 2-Channel +/-15 kV ESD-Protection Array for High-Speed Data Interfaces	ESD Protection Diodes	Sample & Buy	View Design Kits & Evaluation Modules
TPS2546	USB Charging Port Controller and Power Switch	USB Power and Charging Port Controllers	Sample & Buy	View Design Kits & Evaluation Modules

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CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
INA213	SOT (DCK) | 6	Download	Download
	UQFN (RSW) | 10	Download	-
TPD2E001	SOP (DZD) | 4	Download	-
	SOT (DRL) | 5	Download	Download
	WSON (DRS) | 6	Download	-
	USON (DRY) | 6	Download	Download
TPS2546	WQFN (RTE) | 16	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
PMP10282 Test Results		PDF	1576	30 Nov 2015	44	✓

Design files (5)

Title	Abstract	Type	Size (KB)	Date	Views
PMP10282 Gerber		ZIP	249	30 Nov 2015	12
PMP10282 CAD Files		ZIP	13917	30 Nov 2015	21
PMP10282 Assembly Drawing		PDF	80	30 Nov 2015	13
PMP10282 BOM		PDF	99	30 Nov 2015	21
PMP10282 Schematic		PDF	131	30 Nov 2015	66

Related Tools & Software

Reference Designs (1)

Name	Part Number	Tool Type
Dual-Port Automotive USB Charger Reference Design	PMP7390	TI Designs

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