12Vdc Input, 2.1A USB Charger for Smart Phones and Tablets Reference Design

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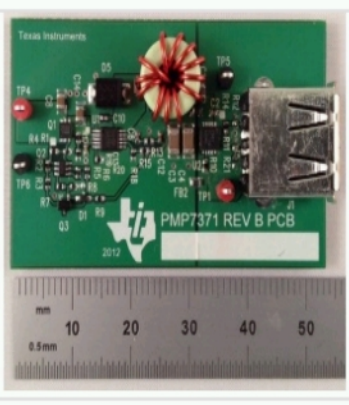
Description

This reference design takes a 12Vdc input (20V max) and generates a 5V/2.1A output for charging smart phone and tablets. The TPS54240 provides a cost effective yet efficient solution for the DC/DC conversion. The TPS2561A provides a precision current limit to protect the device being charged during over load conditions. The CSD25302 provides a gated latch that protects against output over-voltage conditions.



Top view

Features

- Complete USB charging solution
- The TPS54240 provides a low cost yet high efficiency (~90%) DC/DC conversion.
- The TPS2561A provides a precision current limit to protect the device from over load conditions.
- The design implements a latching type output over-voltage protection.

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

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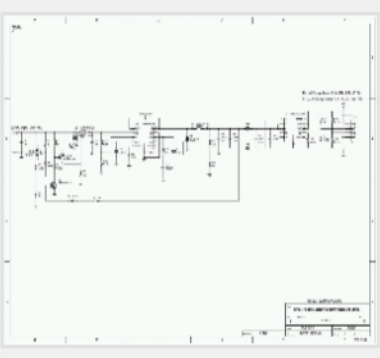
Schematic/Block Diagram

Quickly understand overall system functionality.



Download Schematic

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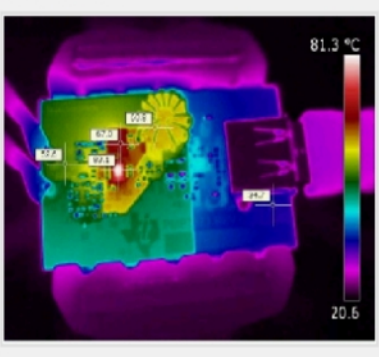

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Design Files

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Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

Parametrics

	PMP7371
Vin (Min) (V)	8
Vin (Max) (V)	20
Vout (Nom) (V)	5
Iout (Max) (A)	2.1
Output Power	10.5
Isolated/Non-Isolated	Non-Isolated
Input Type	DC
Topology	Buck- Non Sync

TI Devices (2)

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Part Number	Name	Product Family	Sample & Buy	Design Kits & Evaluation Modules
TPS2561A	Dual Channel Precision Adjustable Current-Limited Power Switches	USB Power and Charging Port Controllers	Sample & Buy	View Design Kits & Evaluation Modules
TPS54240	3.5V to 42V Input, 2.5A Step-Down Converter with Eco-Mode	Converter (Integrated Switch)	Sample & Buy	View Design Kits & Evaluation Modules

CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
TPS54240	HVSSOP (DGQ) | 10	Download	Download
	VSON (DRC) | 10	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
PMP7371 Test Results		PDF	3413	28 Mar 2012	75

Design Files (4)

Title	Abstract	Type	Size (KB)	Date	Views
PMP7371 Gerber		ZIP	249	17 Mar 2014	76
PMP7371 PCB		PDF	69	28 Mar 2012	99
PMP7371 Schematic		PDF	36	28 Mar 2012	302
PMP7371 BOM		PDF	26	28 Mar 2012	6,071

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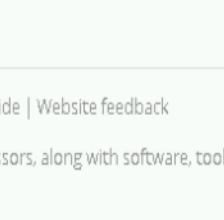

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