100W System-Level Power Reference Design for Automotive Infotainment System

(ACTIVE) PMP10749

Description & Features | Technical Documents | Support & Community | Order Now

View the Important Notice for TI Designs covering authorized use, intellectual property matters and disclaimers.

Key Document

- PMP10749 Test Results (PDF 6708 KB)
  21 Mar 2016 40 views

» View All Technical Documents (6)

PMP10749 100W System-Level Power Reference Design for Automotive Infotainment System Board Image (Top View)

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

Description

PMP10749 is a 100-W system-level SMPS design for a higher-power automotive infotainment system. The design has protections, such as load dump through TVS (ISO pulse testing), as well as reverse voltage (innovative smart diode with very low Iq) protection. Furthermore, all the controllers (boost and dual bucks) are in SYNC for EMI-optimized design.

The design is divided into four major blocks:

1. Protection: Reverse battery protection through efficient smart diode and automotive transient protections through TVS.
2. EMI filter: 14-A common modes choke at front end with a differential filter for conducted EMI suppression.
3. Preboost: Highly efficient synchronous preboost design for 100-W application. The output is maintained at 10 V and when Vin > Vout , the output follows the input and true bypass operation is achieved.
4. Dual buck controller: 2.2-MHz switching for AM band avoidance, as well as small size solution. Supports two outputs: 5 V at 10 A, as well as 3.3 V at 10 A. The syncout of controller is used to sync boost at f/10 frequency.

Features

- 2.2-MHz switching for SYNC buck controller - avoid AM band + smaller size
- Wide Vin support for automotive application
- Cycle-by-cycle current limit and optional hiccup-mode overload protection
- Low-cost and high-efficiency solution for 100-W application
- Smart diode for highly efficient reverse battery protection

TI's Standard Terms and Conditions for Evaluation Modules apply.

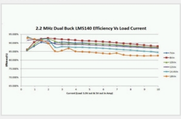
Schematic/Block Diagram

Quickly understand overall system functionality.

Download Schematic

Design Guide

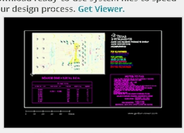
Get results faster with test and simulation data that's been verified.



Download Design Guide

Design Files

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



Download Design Files

Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

Parametrics

	PMP10749.1 (Output Voltage 1)	PMP10749.2 (Output Voltage 2)	PMP10749.3 (Output Voltage 3)
Vin (Min) (V)	4	10	10
Vin (Max) (V)	32	32	32
Vout (Nom) (V)	10	3.3	3.3
Iout (Max) (A)	10	10	10
Output Power (W)	100	33	33
Isolated/Non-Isolated	Non-Isolated	Non-Isolated	Non-Isolated
Input Type	DC	DC	DC
Topology	Boost- Synchronous	Buck- Synchronous	Buck- Synchronous

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
CD74HC4017	High Speed CMOS Logic Decade Counter/Divider with 10 Decoded Outputs	Specialty Logic	Sample & Buy	Not Available
LM5122-Q1	Automotive Grade, 3-65V Wide Vin, Current Mode Synchronous Boost Controller with Multiphase Capabili	Step-Up (Boost)	Sample & Buy	View Design Kits & Evaluation Modules
LM5140-Q1	Wide Vin Dual 2.2MHz low Iq Synchronous Buck Controller	Step-Down (Buck)	Sample & Buy	View Design Kits & Evaluation Modules

Show More

CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
CD74HC4017	SOIC (D) | 16	Download	Download
	PDIP (N) | 16	Download	Download
	SOP (NS) | 16	Download	-
	TSSOP (PW) | 16	Download	Download
LM5140-Q1	VQFNP (RWG) | 40	Download	Download
LM74610-Q1	VSSOP (DGK) | 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.

- read more -

Technical Documents

User guides (1)

Title	Abstract	Type	Size (KB)	Date	Views	TI Recommends
PMP10749 Test Results		PDF	6708	21 Mar 2016	40	✓

Design files (5)

Title	Abstract	Type	Size (KB)	Date	Views
PMP10749 Gerber		ZIP	454	21 Mar 2016	11
PMP10749 Altium		ZIP	1778	21 Mar 2016	22
PMP10749 BOM		PDF	25	21 Mar 2016	17
PMP10749 Block Diagram		PDF	611	21 Mar 2016	28
PMP10749 Schematic		PDF	495	21 Mar 2016	42

Support & Community

TI E2E™ community

TI E2E™ Community

As a member of my.TI you can join the TI E2E™ Community where you can ask questions, share ideas and collaborate with fellow engineers and TI experts

Contents are provided "AS IS" by the respective TI and Community contributors and do not constitute TI specifications. See Terms of use.

Engage in the Community

- Amplifiers
- Broadband RF/IF & Digital Radio
- Clocks & Timers
- Data Converters
- DLP® & MEMS
- Interface
- Logic
- Power Management
- Wireless Connectivity

Wikis

Visit the TI Wiki

Other Support

- TI E2E Community
- Contact Technical Support

Your History

Products You Recently Viewed

- LMX2485211EVAL
- LMK04031BEVAL
- LMK04002BEVAL
- XEVMK2EX
- TMDSEVM437X

TI is a global semiconductor design and manufacturing company. Innovate with 100,000+ analog ICs and embedded processors, along with software, tools and the industry's largest sales/support staff.

© Copyright 1995-2016 Texas Instruments Incorporated. All rights reserved.
Trademarks | Privacy policy | Cookie policy | Terms of use | Terms of sale