Automotive eCall Power Supply Reference Design with High Intermediate Voltage

TIDesigns

(ACTIVE) PMP9768

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Description

This reference design includes a complete power management solution for a standalone emergency call (eCall) system in an automotive environment. The circuit is supplied directly from the car battery rail. It also manages a backup battery to power the eCall system while the car battery rail is not available. It includes power path management which routes the available power rail directly to four DC/DC converters which are supplying the required functional blocks of the eCall system. The solution is optimized to operate at maximum efficiency while powered from the backup battery.

Automotive eCall Power Supply Reference Design with High Intermediate Voltage

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

Features

- Complete power solution for an automotive eCall system
- Operating input voltage range up to 40V
- Provides supply voltage for all required eCall functional blocks
- Up to 87% total efficiency while operating at backup power
- Up to 84% total efficiency in standby at backup power
- All DC/DC converters used can operate at switching frequencies above 2MHz

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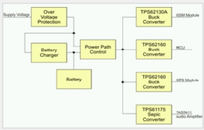
Schematic/Block Diagram

Quickly understand overall system functionality.



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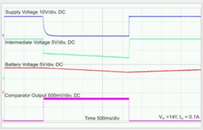

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Design Files

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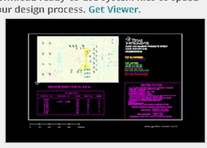

Download Design Files

Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

Parametrics

	PMP9768.1 (Output Voltage 1)	PMP9768.2 (Output Voltage 2)	PMP9768.3 (Output Voltage 3)	PMP9768.4 (Output Volt
Vin (Min) (V)	5	5	5	5
Vin (Max) (V)	40	40	40	40
Vout (Nom) (V)	3.8	1.8	5	9
Iout (Max) (A)	2	1	1	1
Output Power (W)	7.6	1.8	5	9
Isolated/Non-Isolated	Non-Isolated	Non-Isolated	Non-Isolated	Non-Isolated
Input Type	DC	DC	DC	DC
Topology	Buck- Integrated Switch	Buck- Integrated Switch	Buck- Integrated Switch	Sepic- Integ

TI Devices (7)

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
CSD25402Q3A	P-Channel NexFET Power MOSFET	Power MOSFET	Sample & Buy	Not Available
TAS5421-Q1	22-W Mono Automotive Digital Audio Amplifier With Load Dump and I2C Diagnostics	Audio	Sample & Buy	View Design Kits & Evaluation Modules
TL331-Q1	Automotive Catalog Single Differential Comparator	Amplifiers and Linear	Sample & Buy	Not Available

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CAD/CAE symbols

Part #	Package | Pins	CAD File (.bxl)	STEP Model (.stp)
TL331-Q1	SOT (DBV) | 5	Download	Download
TLVH431A-Q1	SOT (DBV) | 5	Download	Download
TPS62130A-Q1	VQFN (RGT) | 16	Download	Download
TPS62160-Q1	WSON (DSG) | 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
PMP9768 Test Results		PDF	273	22 Feb 2016	127

Design files (4)

Title	Abstract	Type	Size (KB)	Date	Views
PMP9768 Gerber		ZIP	162	22 Feb 2016	24
PMP9768 PCB		PDF	698	22 Feb 2016	41
PMP9768 BOM		PDF	94	22 Feb 2016	78
PMP9768 Schematic		PDF	795	22 Feb 2016	214

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