340W Digital Controlled LLC Resonant Half-Bridge DC-to-DC Power Conversion Reference Design

(ACTIVE) TIDA-00512

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340W Digital Controlled LLC Resonant Half-Bridge DC-to-DC Power Conversion Reference Design

Description

This design is a LLC resonant half-bridge DC-DC power converter with digital control using 3138ACC32EVM-149 daughter-card. The daughter-card control functions with preloaded firmware providing the required control functions for a LLC resonant half-bridge converter. The TIDA-00512 (3138ALLCEVM-150) accepts a DC input from 350VDC to 400VDC, and outputs a nominal 12VDC with full load output power of 340W, or full output current of 29A.

As seen at APEC

Features

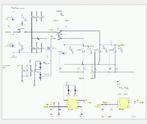
- Synchronous rectification
- Optimal diode emulation and dead time of synchronous rectification
- Cycle-by-cycle current limiting with duty cycle matching
- Automatic mode switching between LLC mode and PWM mode
- Test points to facilitate device and topology evaluation

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

TIs Standard Terms and Conditions for Evaluation Modules apply.

Schematic/Block Diagram

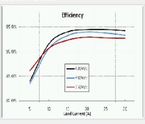
Quickly understand overall system functionality.



Download Schematic

Test Data

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



Download Test Data

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

	TIDA-00512
Vin (Min) (V)	350
Vin (Max) (V)	400
Vout (Nom) (V)	12
Iout (Max) (A)	29
Output Power	348
Isolated/Non-Isolated	Isolated
Input Type	DC
Topology	Half Bridge- LLC

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
OPA376	Precision, Low Noise, Low Iq Operational Amplifier	Operational Amplifier (Op Amp)	Sample & Buy	View Design Kits & Evaluation Modules
SN65C3221	3-V To 5.5-V Multichannel RS-232 Line Driver/Receiver	Interface	Sample & Buy	View Design Kits & Evaluation Modules
TPS2411	N+1 and OR-ing Power Rail Controller	Power Protection, Distribution, Monitoring	Sample & Buy	View Design Kits & Evaluation Modules
UCC27714	High-Speed, 4-A, 600-V High-Side Low-Side Gate Driver	AC/DC and Isolated DC/DC Power Supply	Sample & Buy	Not Available
UCC28600	8-Pin Quasi Resonant Flyback Green Mode Controller	AC/DC and Isolated DC/DC Power Supply	Sample & Buy	View Design Kits & Evaluation Modules
UCD3138A	UCD3138A Highly Integrated Digital Controller for Isolated Power	Digital Power Control Solutions	Sample & Buy	View Design Kits & Evaluation Modules
UCD7138	Low-Side Power MOSFET Driver With Body Diode Conduction Sensing	Digital Power Control Solutions	Sample & Buy	View Design Kits & Evaluation Modules

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CAD/CAE symbols

Part #	Package | Pins	CAD File [.bxl]	STEP Model [.stp]
OPA376	SOT (DBV) | 5	Download	Download
	SOT (DCK) | 5	Download	Download
	SOIC (D) | 8	Download	Download
SN65C3221	SSOP (DB) | 16	Download	-
	SOIC (DW) | 16	Download	-
	TSSOP (PW) | 16	Download	Download
TPS2411	TSSOP (PW) | 14	Download	Download
UCC28600	SOIC (D) | 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 Ultra Librarian software ZIP: 62MB

Step 2: Download the Symbol and Footprint .bxl file.

- read more -

Technical Documents

User guides (1)

Title	Abstract	Type	Size [KB]	Date	Views
TIDA-00512 Test Results		PDF	429	27 Feb 2015	0

Design files (4)

Title	Abstract	Type	Size [KB]	Date	Views
TIDA-00512 Gerber		ZIP	390	27 Feb 2015	0
TIDA-00512 Assembly Drawing		PDF	320	27 Feb 2015	0
TIDA-00512 BOM		PDF	120	27 Feb 2015	0
TIDA-00512 Schematic		PDF	408	27 Feb 2015	0

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