AC-mains LED Lighting with DALI DMX512 & Power Line Communications Reference Design

(ACTIVE) TIDM-AC-LED-COM

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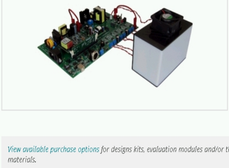

Description

Ideal for outdoor, entertainment, and industrial lighting applications, this LED Lighting design provides high power and high efficiency illumination with built-in communications networking. The lighting unit consists of a 250W universal AC-input LED driver power supply and a demonstrational six-string LED lamp. Driving the LEDs with great power efficiency and electrical utilization, the LED driver power supply operates at greater than 90% power efficiency with 0.99 power factor (PF). Furthermore, to support system-networked lighting and remote connectivity, this power supply includes support for common lighting communications standards including Digital Addressable Lighting Interface (DALI), DMX512, and Power Line Communications (PLC).

Features

- *Suitable worldwide for high-illumination and dimmable LED applications, the LED driver power supply supports universal AC input and up to 250W LED loads.*
- *System-ready LED driver power supply consists of AC rectification with single phase boost-mode power factor correction (PFC), a half-bridge LLC Resonant DC/DC converter, and independent LED dimming stages.*
- *Wide LED dimming spectrum with power-efficient operation mode possible by digitally controlled, load-reactive, LED driver power supply.*
- *System-networked lighting and remote connectivity support provided through integrated lighting communications protocols, including DALI, DMX512, and power line communications (PLC).*
- *High-efficiency LED driver power supply operation, precise LED dimming control, and robust communications networking made possible by the C2000™ Piccolo™ TMS320F28027 microcontroller.*
- *LED lighting reference platform is available for purchase and includes hardware platform, software examples and libraries, graphical user interface (GUI), technical application notes, and step-by-step theory-based user guides.*

View available purchase options for designs kits, evaluation modules and/or the bill of materials.

$699.00(USD)

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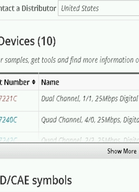
NOTE: Software for this board is located inside the controlSUITE™ software package. Download controlSUITE at ti.com/controlsuite. Once installed, navigate to "Solar Micro Inverter Development Kit" under the Development Tools -> Solar section.

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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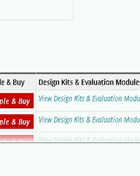
Source Files

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



Download Source Files

Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

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Part Number	Buy from Texas Instruments or Third Party	Buy from Authorized Distributor	Status
TMDSIACLEDCOMKIT: C2000 Piccolo MCU AC LED Lighting & Communications Kit	$699.00(USD) In Stock Typically Ships in 1 to 3 Business Days Buy from TI	Pricing may vary. Buy from distributor	ACTIVE

Contact a Distributor: United States Go

TI Devices (10)

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
ISO7221C	Dual Channel, 1/1, 25Mbps Digital Isolator	Isolator	Sample & Buy	View Design Kits & Evaluation Modules
ISO7240C	Quad Channel, 4/0, 25Mbps, Digital Isolator	Isolator	Sample & Buy	View Design Kits & Evaluation Modules
ISO7242C	Quad Channel, 3/1, 25Mbps, Digital Isolator	Isolator	Sample & Buy	View Design Kits & Evaluation Modules

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CAD/CAE symbols

Part #	Package | Pins	CAD File [.bxl]	STEP Model [.stp]
ISO7221C	SOIC (D) | 8	Download	Download
	SOP (DUB) | 8	Download	-
ISO7240C	SOIC (DW) | 16	Download	Download
ISO7242C	SOIC (DW) | 16	Download	Download
MAX3221	SSOP (DB) | 16	Download	-
	TSSOP (PW) | 16	Download	Download
OPA376	SOT (DBV) | 5	Download	Download
	SOT (DCK) | 5	Download	Download
	SOIC (D) | 8	Download	Download
TMS320F28035	VQFN (RSH) | 56	Download	-
	TQFP (PAG) | 64	Download	Download
	LQFP (PN) | 80	Download	Download
TPS73033	SOT (DBV) | 5	Download	Download
	DSBGA (YZQ) | 5	Download	-
TPS79533	SOT (DCQ) | 6	Download	-
UCC27324	SOIC (D) | 8	Download	Download
	HVSSOP (DGN) | 8	Download	Download
	WSON (DSD) | 8	Download	-
	PDIP (P) | 8	Download	Download
UCC28810	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.*

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Technical Documents

Application Notes (4)

Title	Abstract	Type	Size (KB)	Date	Views
AC LED Lighting & Communications Hardware Developer's Kit	Read Abstract	PDF	367	29 Jan 2013	162
PLC With the AC LED Lighting & Communications Developer's Kit	Read Abstract	PDF	627	17 Jan 2012	814
DALI Communication on the AC LED Lighting & Communications Developer's Kit	Read Abstract	PDF	241	11 Jan 2012	118
DMX512 Communication on the AC LED Lighting & Communications Developer's Kit	Read Abstract	PDF	1786	07 Jan 2012	240

User Guides (2)

Title	Abstract	Type	Size (KB)	Date	Views
AC LED Lighting & Communications Developer's Kit User's Guide		PDF	1705	01 Dec 2011	78
AC LED Lighting and Communications Quick Start Guide		PDF	677	01 Nov 2011	44

Design Files (4)

Title	Abstract	Type	Size (KB)	Date	Views
AC-mains LED Lighting with DALI, DMX512, and Power Line Comms. Schematic		PDF	587	10 Sep 2014	167
AC-mains LED Lighting with DALI, DMX512, and Power Line Comms. PCB Layout		PDF	538	10 Sep 2014	44
AC-mains LED Lighting with DALI, DMX512, and Power Line Comms. Gerber Files		ZIP	1529	10 Sep 2014	30
AC-mains LED Lighting with DALI, DMX512, and Power Line Comms. BOM		PDF	172	10 Sep 2014	60

Related Tools & Software

Software (1)

Name	Part Number	Software Type
controlSUITE	CONTROLSUITE	Software Libraries

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TI E2E™ community

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