TEXAS INSTRUMENTS

DLPA2005

DLPS047 – AUGUST 2014

DLPA2005 Power Management and LED Driver IC for DLP® Pico™ Projectors

1 Features

- High Efficiency RGB LED Driver With Buck-Boost Dc-to-Dc Converter, DMD Supplies, DPP Core Supply, 1.8-V Load Switch, and Measurement System in a Small Chip-Scale Package
- Three Low-Impedance (30 mΩ Typical at 27°C) MOSFET Switches for Channel Selection
- Independent, 10-Bit Current Control per Channel
- 2.4-A Max LED Current for DLPA2005 Embedded Applications
- DMD Regulators
  - Requires Only a Single Inductor
  - VOFS: 10 V
  - VBIAS: 18 V
  - VRST: –14 V
  - Passive Discharge to GND When Disabled
- DPP 1.1-V Core Supply
  - Synchronous Step-Down Converter With Integrated Switching FETs
  - Supports up to 600-mA Output Current
- VLED Buck Boost Converter
  - Power Save Mode at Light Load Current
- Low-Impedance Load Switch
  - VIN Range from 1.8 to 3.6 V
  - Supports up to 200 mA of Current
  - Passive Discharge to GND When Disabled
- DMD Reset Signal Generation and Power Supply Sequencing
- 33-MHz Serial Peripheral Interface (SPI)
- Multiplexer for Measuring Analog Signals
  - Battery Voltage
  - LED Voltage, LED Current
  - Light Sensor (for White Point Correction)
  - Internal Reference Voltage
  - External (Thermistor) Temperature Sensor
- Monitoring and Protection Circuits
  - Hot Die Warning and Thermal Shut Down
  - Low-Battery Warning
  - Programmable Battery Undervoltage Lockout (UVLO)
  - Load Switch UVLO
  - Overcurrent and Undervoltage Protection
- DLPA2005 QFN Package
  - 48-Pin 0.4-mm Pitch
  - Die Size: 6.0 mm x 6.0 mm ± 0.15 mm

2 Applications

- DLP® Pico™ Projector

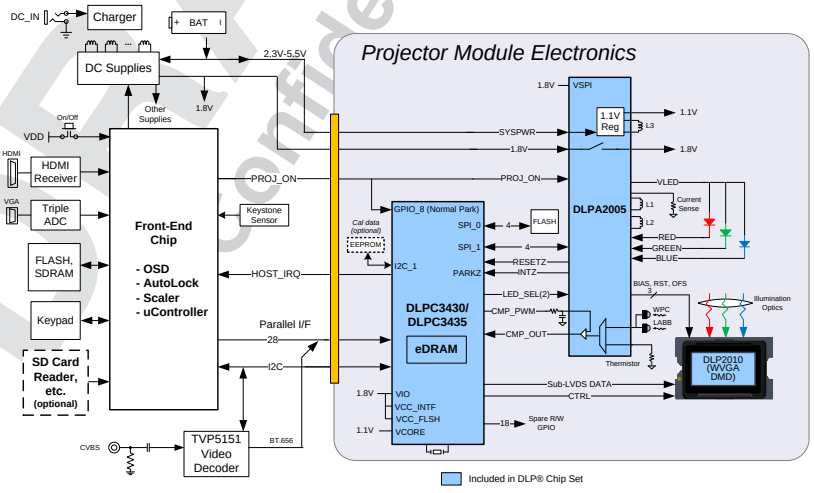
3 Description

DLPA2005 is a dedicated PMIC/RGB LED driver for the DLP2010 (.2 WVGA) DMD and the DLPC3430 or DLPC3435 controller. For reliable operation of the DLP2010 DMD, it is mandatory to use the DLPA2000 or DLPA2005 device with the DLP2010 DMD.

Device Information[1]

PART NUMBER	PACKAGE	BODY SIZE (NOM)
DLPA2005	QFN (48)	6.00 mm x 6.00 mm ± 0.150 mm

(1) For all available packages, see the orderable addendum at the end of the data sheet.



4 Device and Documentation Support

4.1 Trademarks

Pico is a trademark of Texas Instruments.
DLP is a registered trademark of Texas Instruments.

4.2 Electrostatic Discharge Caution

These devices have limited built-in ESD protection. The leads should be shorted together or the device placed in conductive foam during storage or handling to prevent electrostatic damage to the MOS gates.

4.3 Glossary

SLYZ022 — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

5 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
DLPA2005ERSLR	PREVIEW	VQFN	RSL	48	3000	TBD	Call TI	Call TI			

(1) The marketing status values are defined as follows:
ACTIVE: Product device recommended for new designs.
LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.
NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.
PREVIEW: Device has been announced but is not in production. Samples may or may not be available.
OBSOLETE: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been defined.
Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.
Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.
Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

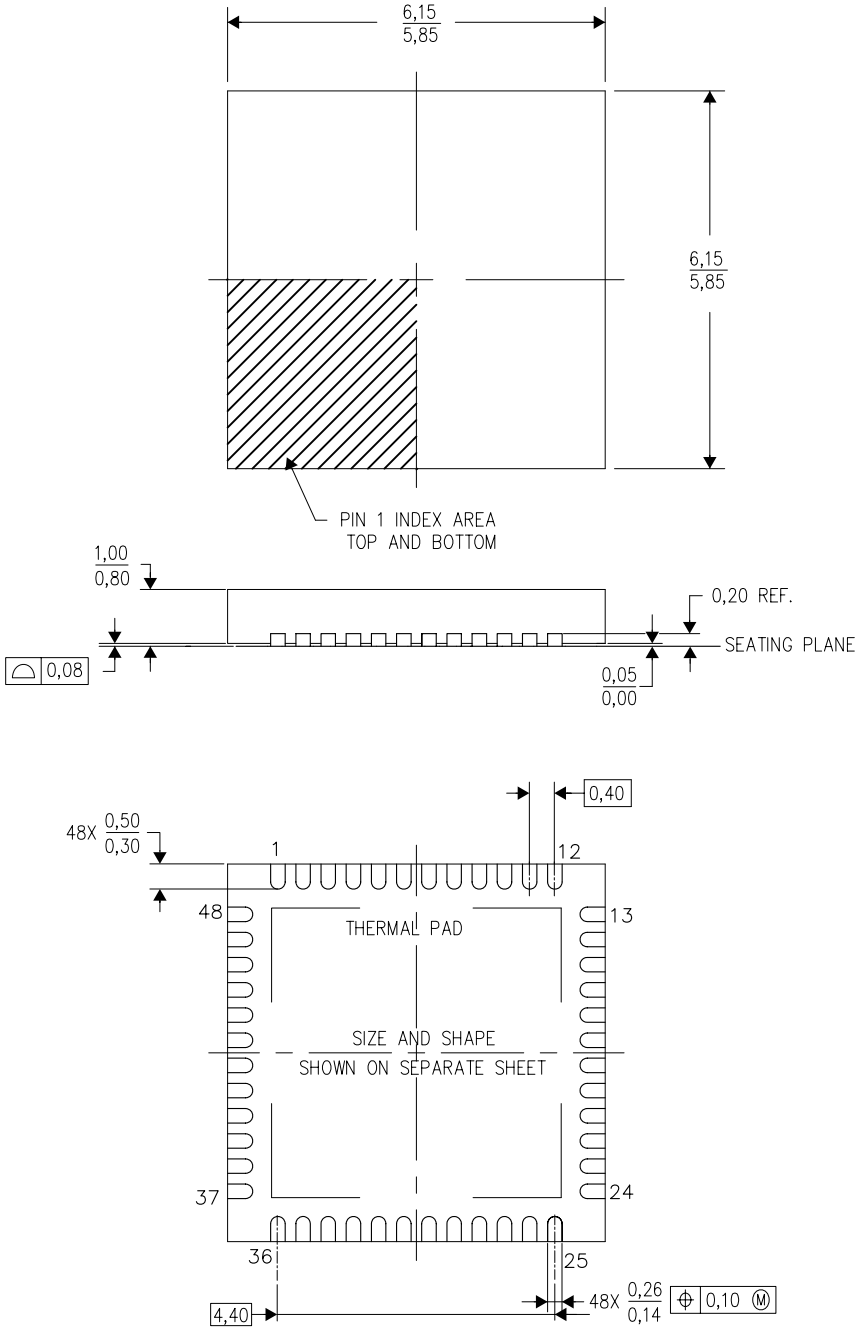
(3) MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

(6) Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

RSL (S–PVQFN–N48) PLASTIC QUAD FLATPACK NO–LEAD



NOTES:
A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. Quad Flatpack, No–leads (QFN) package configuration.
D. The package thermal pad must be soldered to the board for thermal and mechanical performance.
E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.

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