

DLPA3085 PMIC and High-Current LED Driver IC

1 Features

- High-efficiency, high-current RGB LED driver
- Drivers for external buck FETs up to 16A
- Drivers for external RGB switches
- 10-bit programmable current per channel
- Inputs for selecting color-sequential RGB LEDs
- Generation of DMD high voltage supplies
- Two high-efficiency buck converters to generate the DLPC843x and DMD supply
- One high-efficiency, 8-bit programmable buck converter for fan driver application or general power supply. General purpose buck2 (PWR6) is currently supported.
- Two LDOs supplying auxiliary voltages
- Analog MUX for measuring internal and external nodes such as a thermistor and reference levels
- Monitoring/protections: thermal shutdown, hot die, and undervoltage lockout (UVLO)

2 Applications

- [Portable DLP® Pico™ projectors](#)

3 Description

The DLPA3085 is a highly integrated power management IC optimized for DLP® Pico™ Projector systems. The DLPA3085 supports LED projectors up to 16A per LED and up to 32A for series LEDs, enabled by an integrated high efficiency buck controller. Additionally, the drivers control the RGB switches, supporting the sequencing of R, G, and B LEDs. The DLPA3085 contains five buck converters, two of which are dedicated for DLPC low voltage supplies. Another dedicated regulating supply generates the three timing-critical DC supplies for the DMD: VBIAS, VRST, and VOFS.

The DLPA3085 contains several auxiliary blocks which can be used in a flexible way. This enables a tailor-made Pico Projector system. One 8-bit programmable buck converter can be used, for instance, to drive an RGB projector FAN or to make auxiliary supply line. General purpose buck2 (PWR6) is currently supported. Two LDOs can be used for a lower-current supply, up to 200mA. These LDOs are predefined to 2.5V and 3.3V.

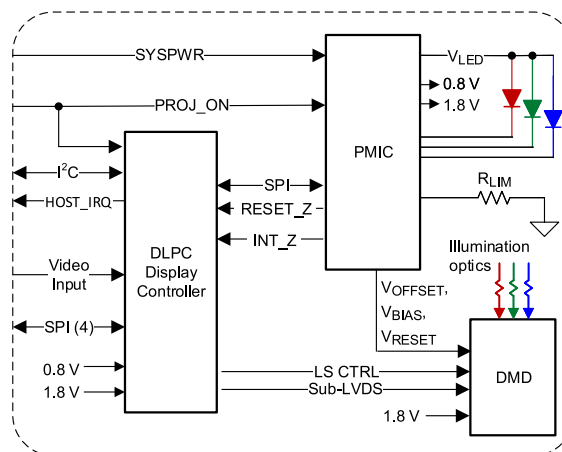
Through the SPI, all blocks of the DLPA3085 can be addressed. Features included are the generation of the system reset, power sequencing, input signals for sequentially selecting the active LED, IC self-protections, and an analog MUX for routing analog information to an external ADC.

ADVANCE INFORMATION

Device Information

PART NUMBER	PACKAGE	PACKAGE SIZE
DLPA3085 ⁽¹⁾	HTQFP (100)	14.00mm × 14.00mm

(1) For more information, see the *Mechanical, Packaging, and Orderable* addendum.



Typical Simplified System

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ADVANCE INFORMATION

4 Device and Documentation Support

4.1 Third-Party Products Disclaimer

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4.2 Device Support

4.2.1 Device Nomenclature

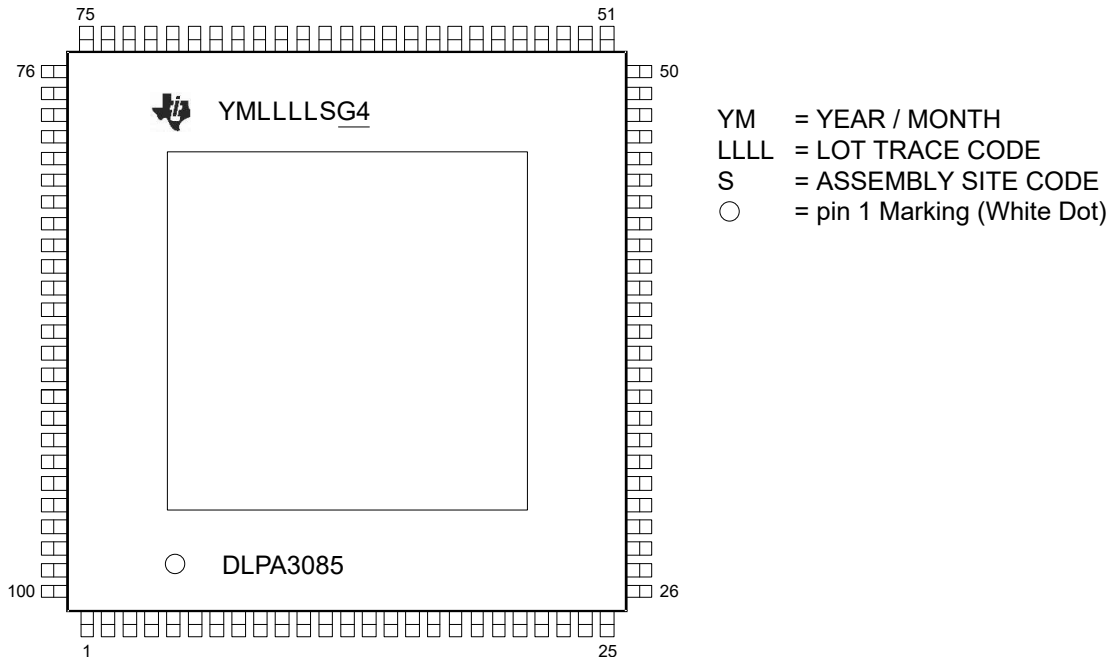


Figure 4-1. Package Marking DLPA3085 (Top View)

4.3 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](https://www.ti.com). Click on *Notifications* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

4.4 Support Resources

[TI E2E™ support forums](#) are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

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4.5 Trademarks

Pico™ is a trademark of Texas Instruments.
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 DLP® is a registered trademark of Texas Instruments.
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4.6 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

4.7 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

5 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

DATE	REVISION	NOTES
June 2024	*	Initial Release

6 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.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
XDLPA3085PFD	ACTIVE	HTQFP	PFD	100	90	TBD	Call TI	Call TI	0 to 70		Samples

(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.

OBSELETE: TI has discontinued the production of the device.

(2) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(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.

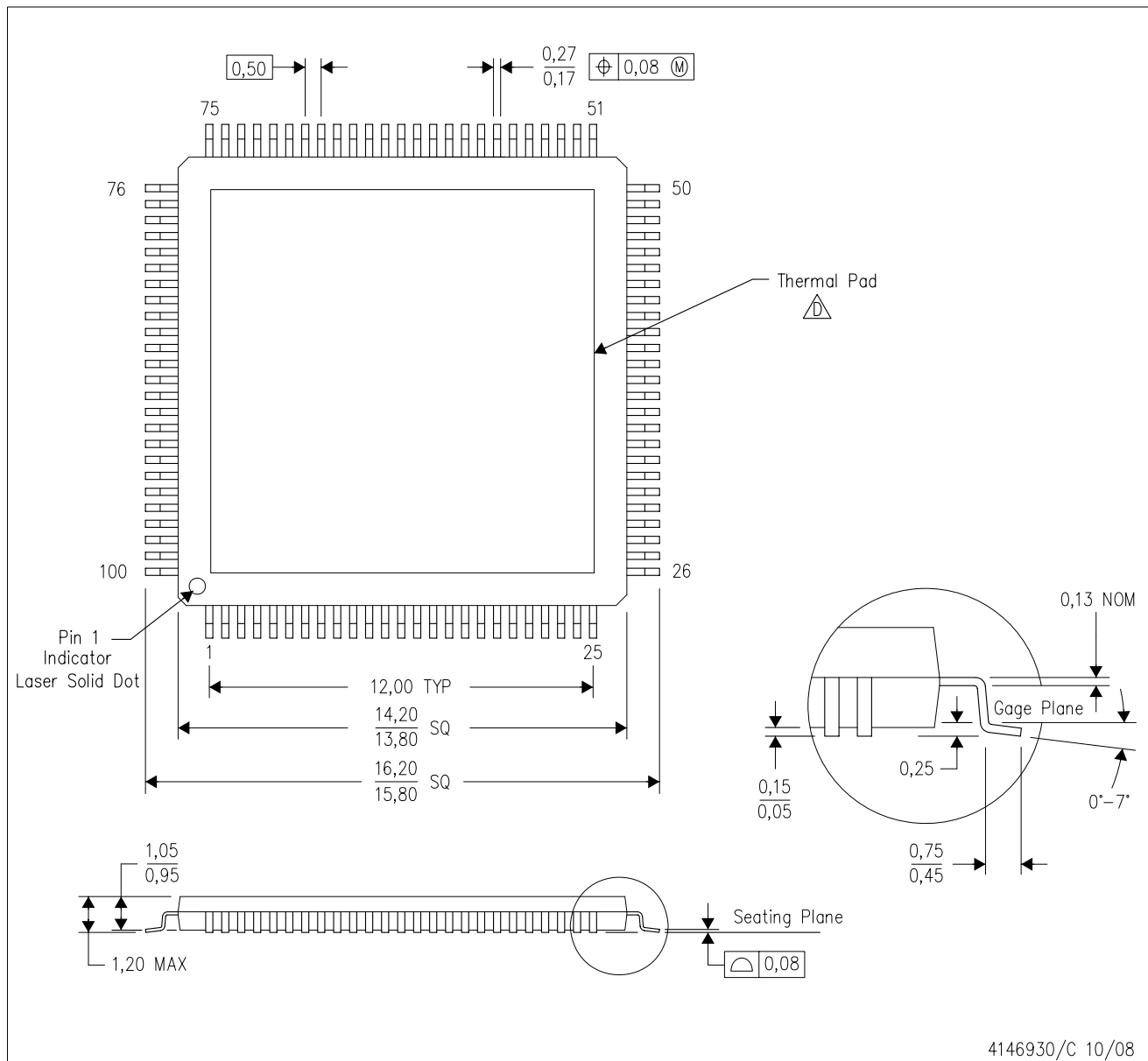
(6) Lead finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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MECHANICAL DATA

PFD (S-PQFP-G100) PowerPAD™ PLASTIC QUAD FLATPACK (DIE DOWN)



- 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. Body dimensions do not include mold flash or protrusion.
 - △ This package is designed to be attached directly to an external heatsink. Refer to Technical Brief, PowerPAD Thermally Enhanced Package, Texas Instruments Literature No. SLMA002 for information regarding recommended board layout. This document is available at www.ti.com <<http://www.ti.com>>. See the product data sheet for details regarding the exposed thermal pad dimensions.
 - E. Falls within JEDEC MS-026

PowerPAD is a trademark of Texas Instruments.

THERMAL PAD MECHANICAL DATA

PFD (S-PQFP-G100)

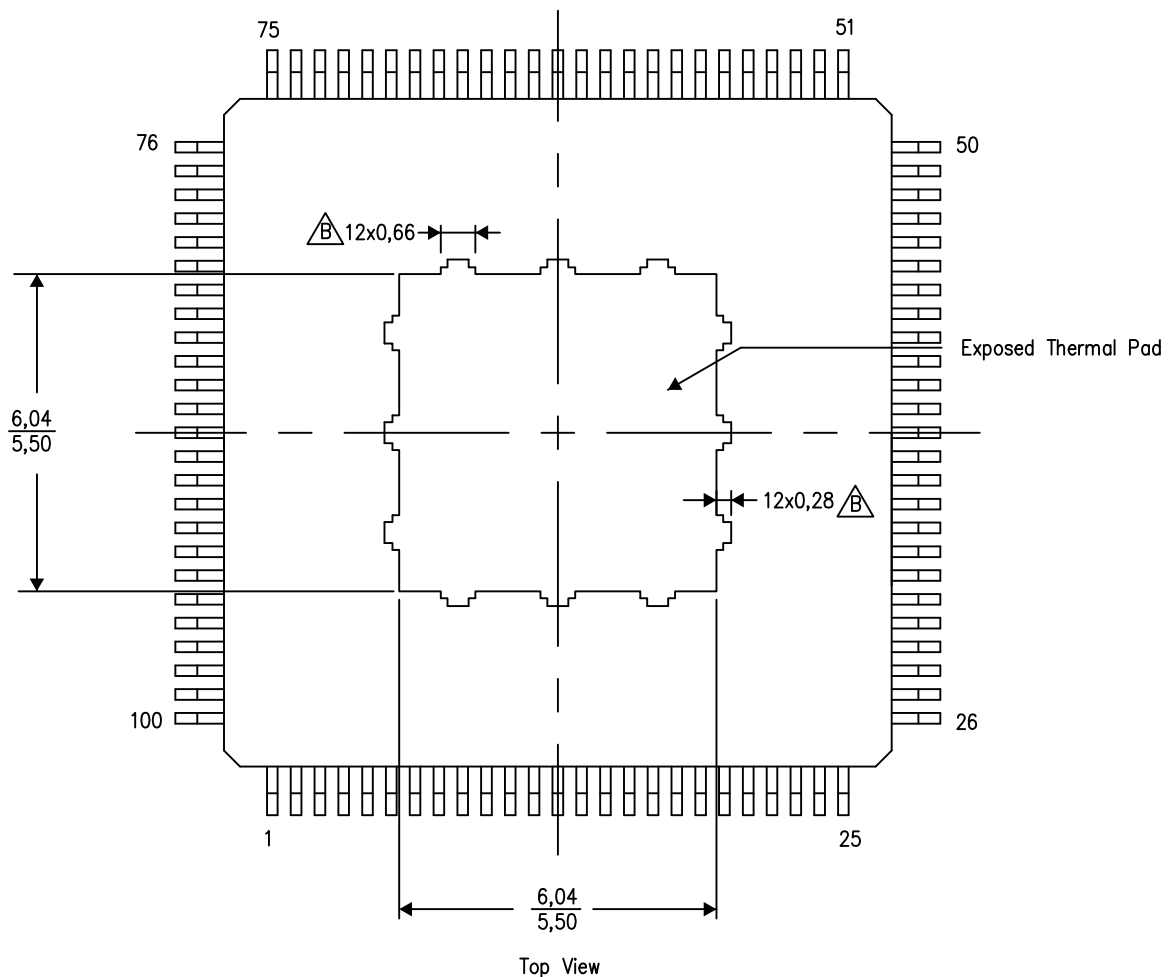
PowerPAD™ PLASTIC QUAD FLATPACK

THERMAL INFORMATION

This PowerPAD™ package incorporates an exposed thermal pad that is designed to be attached directly to an external heatsink. This design optimizes the heat transfer from the integrated circuit (IC).

For additional information on the PowerPAD package and how to take advantage of its heat dissipating abilities, refer to Technical Brief, PowerPAD Thermally Enhanced Package, Texas Instruments Literature No. SLMA002 and Application Brief, PowerPAD Made Easy, Texas Instruments Literature No. SLMA004. Both documents are available at www.ti.com.


The exposed thermal pad dimensions for this package are shown in the following illustration.



Exposed Thermal Pad Dimensions

4211595-3/B 06/14

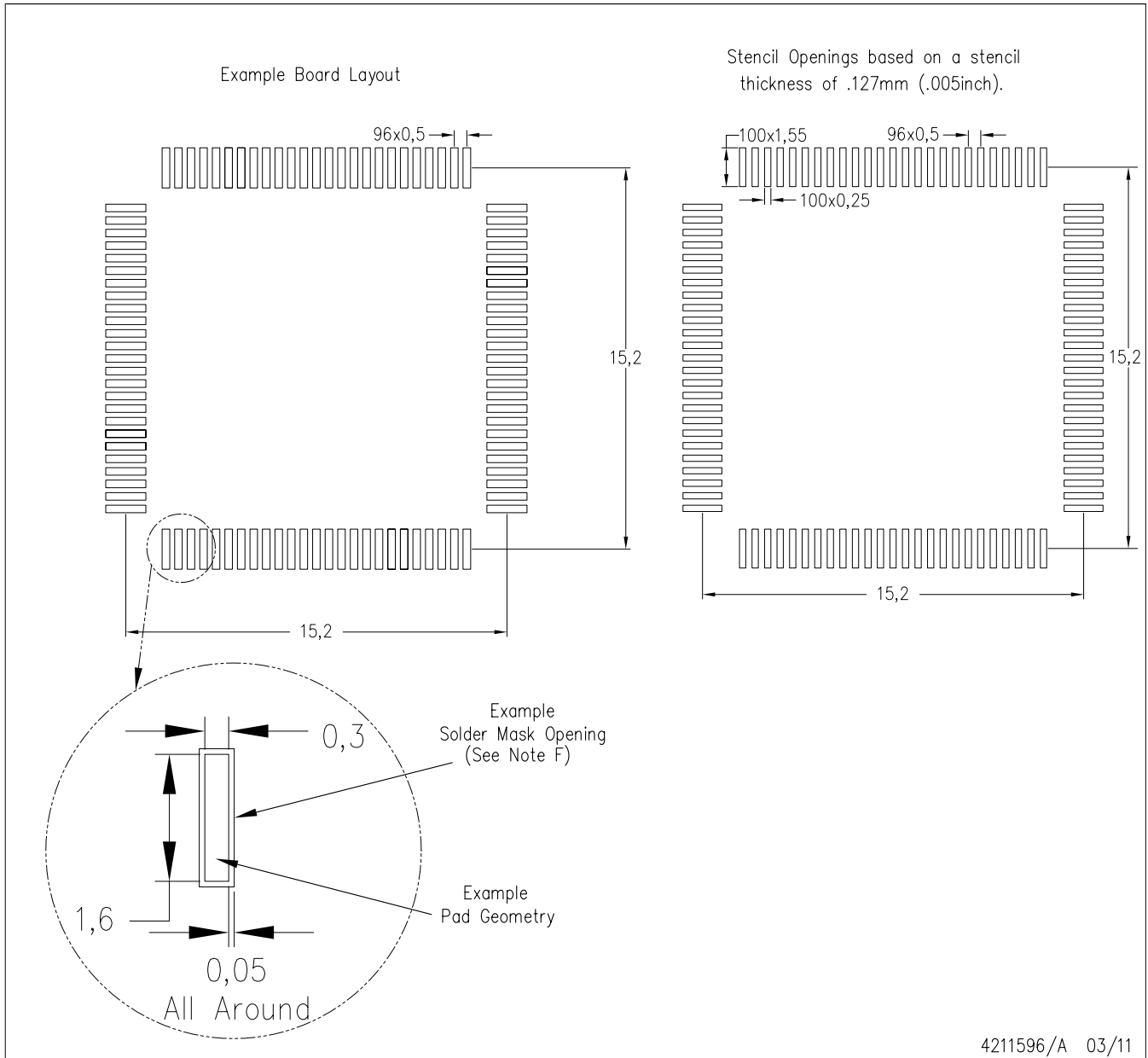
NOTE: A. All linear dimensions are in millimeters

 Tie strap features may not be present.

PowerPAD is a trademark of Texas Instruments

PFD (S-PQFP-G100)

PowerPAD™ PLASTIC QUAD FLATPACK



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Example stencil design based on a 50% volumetric metal load solder paste. Refer to IPC-7525 for other stencil recommendations.
 - D. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

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