

TPS65037x-Q1 Automotive Camera PMIC

1 Features

- Qualified for automotive applications
- AEC-Q100 qualified with following results:
 - Device operates from 4V to 18V input supply
 - Input supply 36V tolerant
 - Device temperature grade 1: -40°C to +125°C
- Functional Safety -Compliant targeted
 - Developed for functional safety applications
 - Documentation to aid ISO26262 and IEC61508 system design available upon product release
 - Systematic capability and hardware integrity up to ASIL-B targeted
 - Under/overvoltage monitors with Built-In Self-Test
 - Temperature warning and thermal shutdown
- Mid-VIN step-down converter BUCK1
 - V_{IN} range from 4V to 18V
 - V_{OUT} range from 3V to 5V
 - Output current up to 1.5A for normal operation
 - Output current up to 2.5A for heater mode (limited temperature and VSYS)
 - 2.2MHz switching frequency
- Two Low-VIN step-down converters BUCK2, BUCK3:
 - V_{IN} range from 2.5V to 5.5V
 - V_{OUT} range from 0.8V to 1.8V
 - Output current 2A for BUCK2, 1A for BUCK3
 - 2.2MHz or 4.4MHz switching frequency
- One low dropout (LDO) regulator:
 - V_{IN} range from 2.5V to 5.5V
 - V_{OUT} range from 1.2V to 3.3V
 - Up to 300mA output current
 - Low noise and high PSRR
- 3mm × 2.5mm 18-pin WQFN-HR with wettable flanks

2 Applications

- Automotive camera modules
 - Surround view camera modules
 - Rear View Camera modules
 - Power over coax (POC) camera modules
 - E-mirror camera modules

3 Description

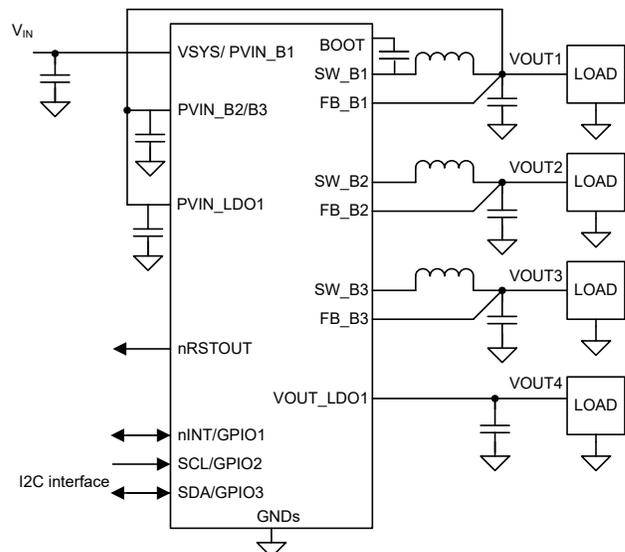
The TPS65037x-Q1 device is a highly integrated power management IC for automotive camera modules. This device combines three step-down converters and one low-dropout (LDO) regulator. The BUCK1 step-down converter operating input voltage range is up to 18V. The device can tolerate input voltage up to 36V (not recommended for a prolonged time period). All converters operate in a forced fixed-frequency PWM mode and support optional Spread-Spectrum Modulation (SSM) for EMI reduction. The LDO can supply 300mA and operate with an input voltage range from 2.5V to 5.5V. The TPS65037x-Q1 supports I2C control interface with interrupt pin or, alternatively, three GPIOs.

The TPS65037x-Q1 is available in a 18-pin WQFN-HR package (3mm × 2.5mm).

Device Information

PART NUMBER	PACKAGE ⁽¹⁾	BODY SIZE (NOM)
TPS65037(1)-Q1	WQFN (18)	3mm × 2.5mm

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

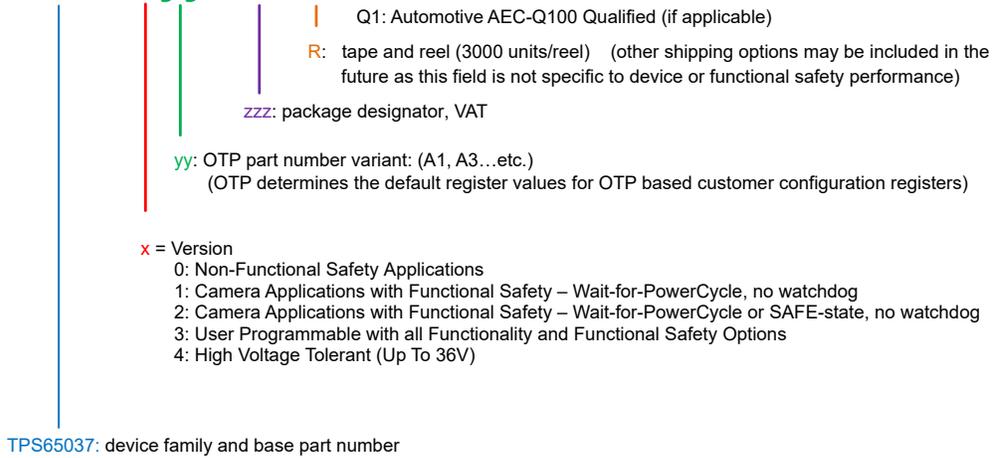


TPS65037x-Q1 Application Circuit



The specific orderable part numbers supported are as follows :

TPS65037xyyzzzRQ1



ADVANCE INFORMATION

4 Device and Documentation Support

4.1 Device Support

4.1.1 Third-Party Products Disclaimer

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4.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on 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.

4.3 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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4.4 Trademarks

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4.5 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.

4.6 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
January 2026	*	Advance Information

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.

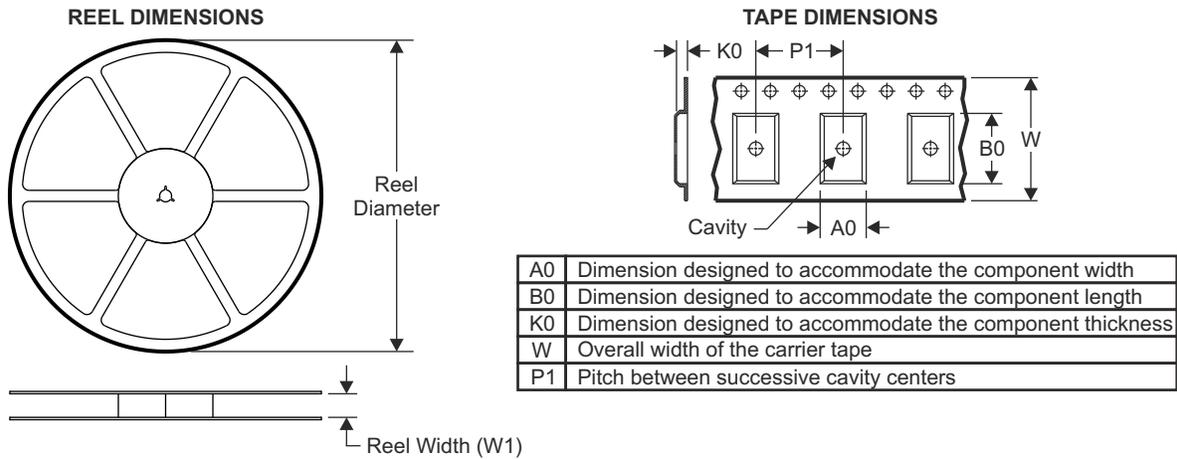
6.1 Package Option Addendum

Packaging Information

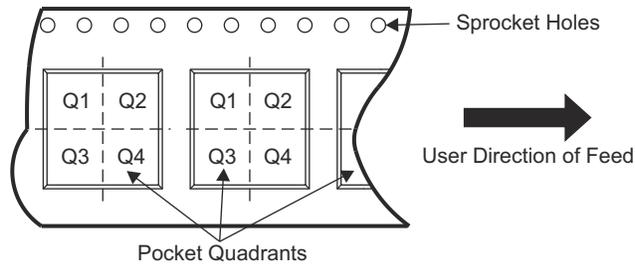
Orderable Device (Preview)	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish ⁽⁴⁾	MSL Peak Temp ⁽³⁾	Op Temp (°C)	Device Marking ^{(5) (6)}
PTPS6503720FVATRQ1	PRE_PROD	WQFN-HR	VAT	18	3000	RoHS & Green	Sn	Level2-260C	-40°C to 125°C	PO037X

- (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.
PRE_PROD Unannounced device, not in production, not available for mass market, nor on the web, samples not available.
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) 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.
- (5) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device
- (6) 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.
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6.2 Tape and Reel Information



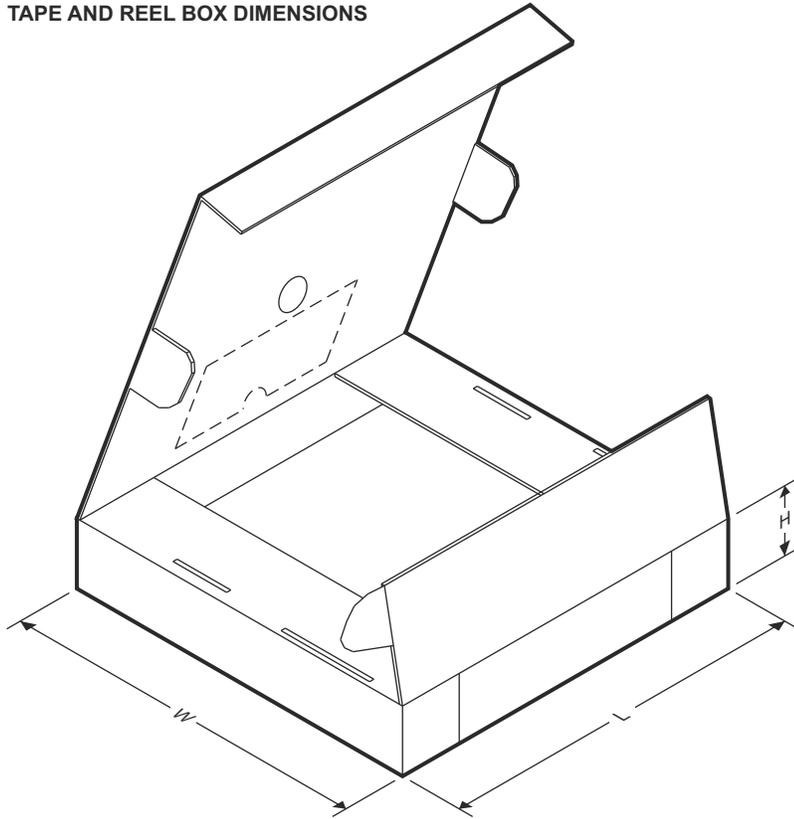
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
PTPS6503720FVATRQ1	WQFN-HR	VAT	18	3000	330.0	12.4	2.8	3.3	1.1	8.0	12	Q2

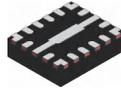
ADVANCE INFORMATION

TAPE AND REEL BOX DIMENSIONS



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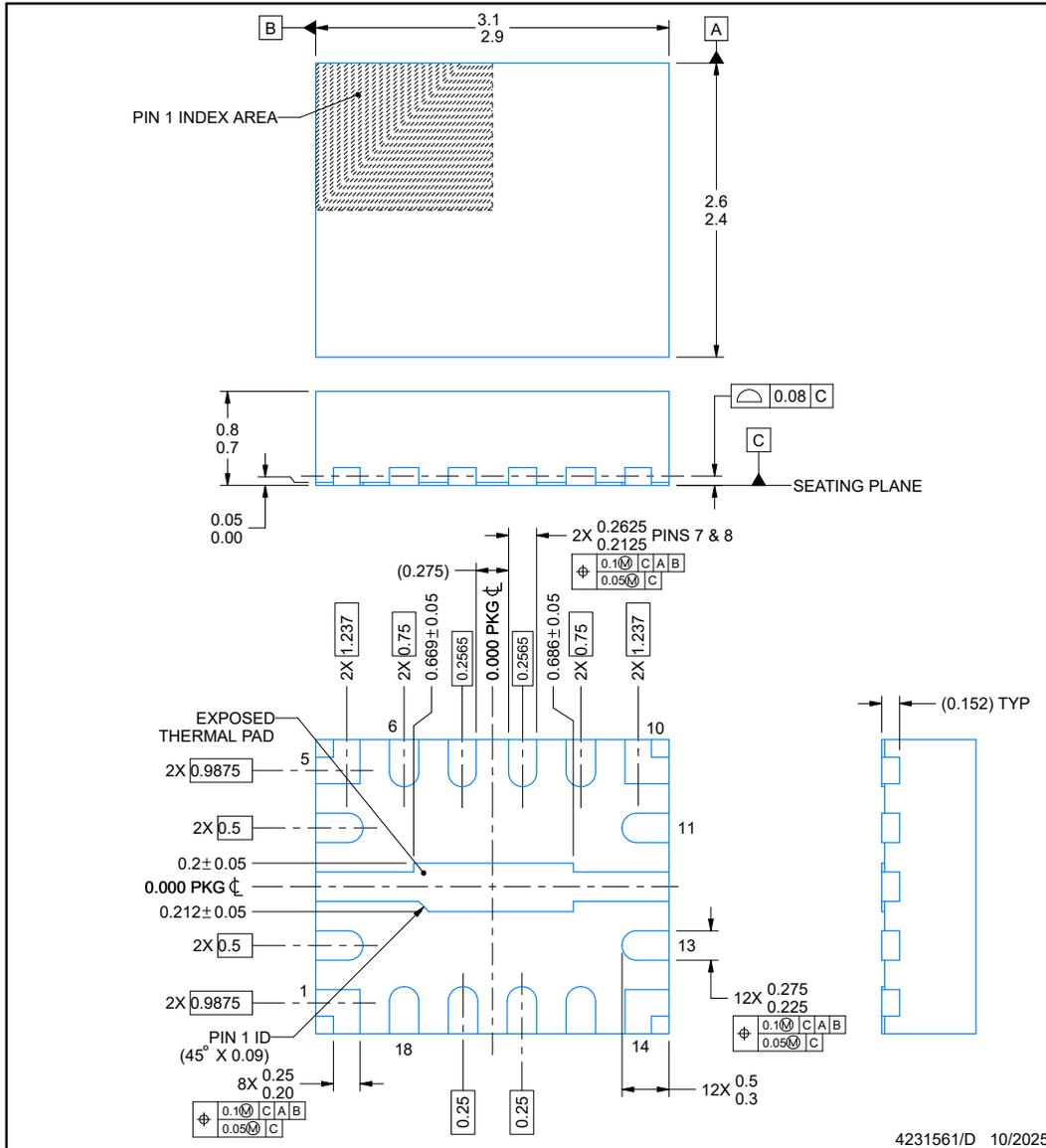
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
PTPS6503720FVATRQ1	WQFN-HR	VAT	18	3000	210.0	185.0	35.0



VAT0018A

PACKAGE OUTLINE
WQFN-HR - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES:

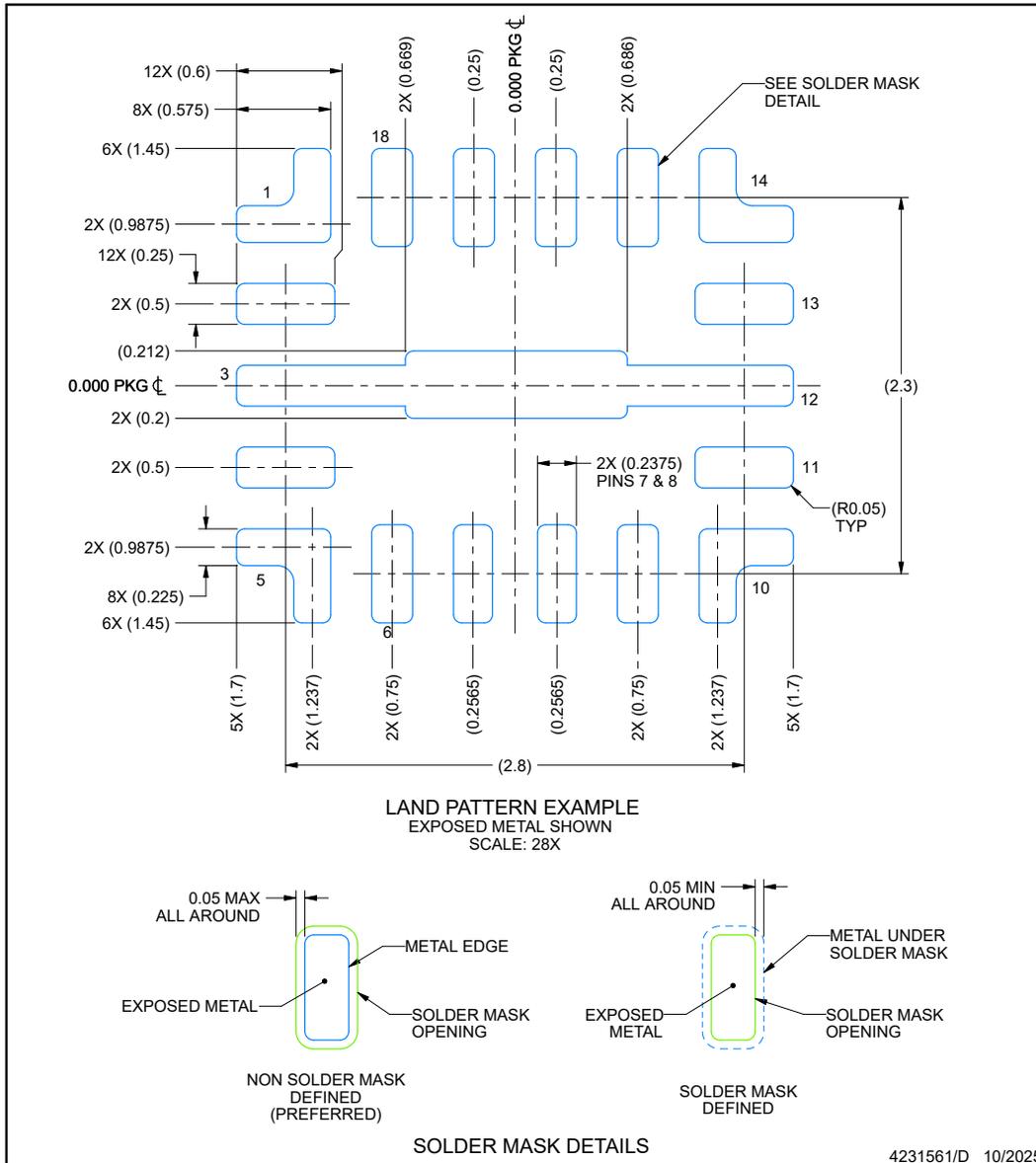
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.

EXAMPLE BOARD LAYOUT

VAT0018A

WQFN-HR - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

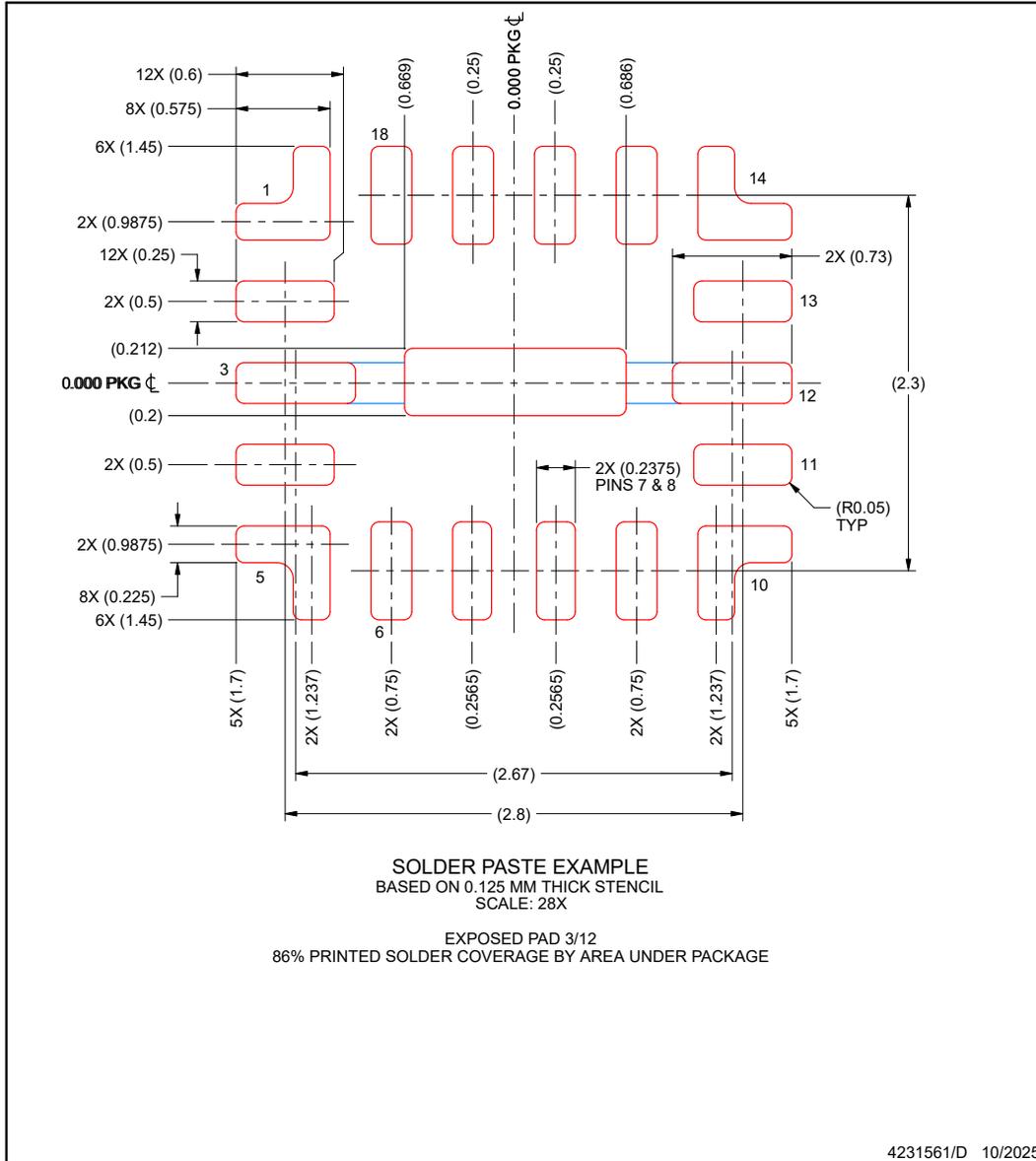
- This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
- Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.

EXAMPLE STENCIL DESIGN

VAT0018A

WQFN-HR - 0.8 mm max height

PLASTIC QUAD FLATPACK - NO LEAD



NOTES: (continued)

6. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.

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