



DUAL PROCESSOR SUPERVISORS

FEATURES

- Dual Supervisory Circuits for DSP- and Processor-Based Systems
- Power-On Reset Generator with Fixed Delay Time of 200ms; no External Capacitor Needed
- Watchdog Timer Retriggeres the $\overline{\text{RESET}}$ Output at $\text{SENSEn} \geq V_{IT+}$
- Temperature-Compensated Voltage Reference
- Maximum Supply Current of 40 μA
- Supply Voltage Range: 2.7V to 6V
- Defined $\overline{\text{RESET}}$ Output From $V_{DD} \geq 1.1\text{V}$
- MSOP-8 and SO-8 Packages
- Temperature Range: -40°C to $+85^{\circ}\text{C}$

APPLICATIONS

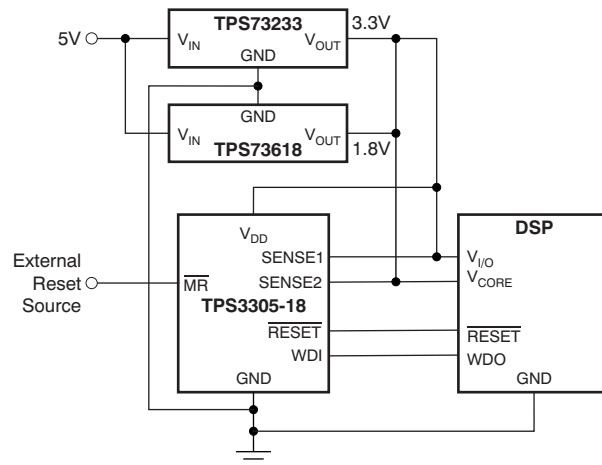
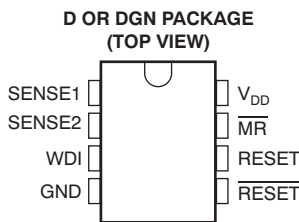
- Processor Supply Monitoring
- Industrial Equipment
- Automotive Systems
- Portable/Battery-Powered Equipment
- Wireless Communication Systems
- Notebook/Desktop Computers

DESCRIPTION

The TPS3305 family is a series of micropower supply voltage supervisors designed for circuit initialization. Its dual monitor topology is well-suited to use in DSP and processor-based systems, which often require two supply voltages, core and I/O.

$\overline{\text{RESET}}$ is asserted when the voltage at either SENSEn pin falls below its threshold voltage, V_{IT} . When both SENSEn pins are again above their respective threshold voltages, $\overline{\text{RESET}}$ is held low for the factory-programmed delay time (200ms typ). $\overline{\text{RESET}}$ is also asserted if the watchdog input (WDI) is not toggled for more than 1.6s typ.

The TPS3305-xx devices are available in either 8-pin MSOP or SO packages, and are specified for operation over a temperature range of -40°C to $+85^{\circ}\text{C}$.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

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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.

ORDERING INFORMATION⁽¹⁾

| DEVICE | NOMINAL SUPERVISED VOLTAGE | | THRESHOLD VOLTAGE (TYP) | |
|------------|----------------------------|--------|-------------------------|--------|
| | SENSE1 | SENSE2 | SENSE1 | SENSE2 |
| TPS3305-18 | 3.3 V | 1.8 V | 2.93 V | 1.68 V |
| TPS3305-25 | 3.3 V | 2.5 V | 2.93 V | 2.25 V |
| TPS3305-33 | 5.0 V | 3.3 V | 4.55 V | 2.93 V |

(1) For the most current specifications and package information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.

ABSOLUTE MAXIMUM RATINGS⁽¹⁾⁽²⁾

Over operating junction temperature range (unless otherwise noted).

| | UNIT |
|--|---|
| Supply voltage range, V_{DD} | -0.3V to +7V |
| V_{MR} , V_{WDI} | -0.3V to $V_{DD} + 0.3V$ |
| Input voltage at SENSE1 and SENSE2, V_I | $(V_{DD} + 0.3)V_{IT} / 1.25V$ |
| V_{RESET} , $V_{\overline{RESET}}$ | -0.3V to +7V |
| Maximum low output current, I_{OL} | 5mA |
| Maximum high output current, I_{OH} | -5mA |
| Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{DD}$) | $\pm 20mA$ |
| Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{DD}$) | $\pm 20mA$ |
| Continuous total power dissipation | See Dissipation Ratings Table |
| Operating junction temperature range, T_J | -40°C to +85°C |
| Storage temperature range, T_{stg} | -65°C to +150°C |
| Soldering temperature | +260°C |

(1) Stresses beyond those listed under *absolute maximum ratings* may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under *recommended operating conditions* is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

(2) All voltage values are with respect to GND.

DISSIPATION RATINGS TABLE

| PACKAGE | $T_A \leq +25^\circ C$ POWER RATING | DERATING FACTOR ABOVE $T_A = +25^\circ C$ | $T_A = +70^\circ C$ POWER RATING | $T_A = +85^\circ C$ POWER RATING |
|---------|--|--|-------------------------------------|-------------------------------------|
| DGN | 2.14W | 17.1mW/°C | 1.37W | 1.11W |
| D | 725mW | 5.8mW/°C | 464mW | 377mW |

ELECTRICAL CHARACTERISTICS

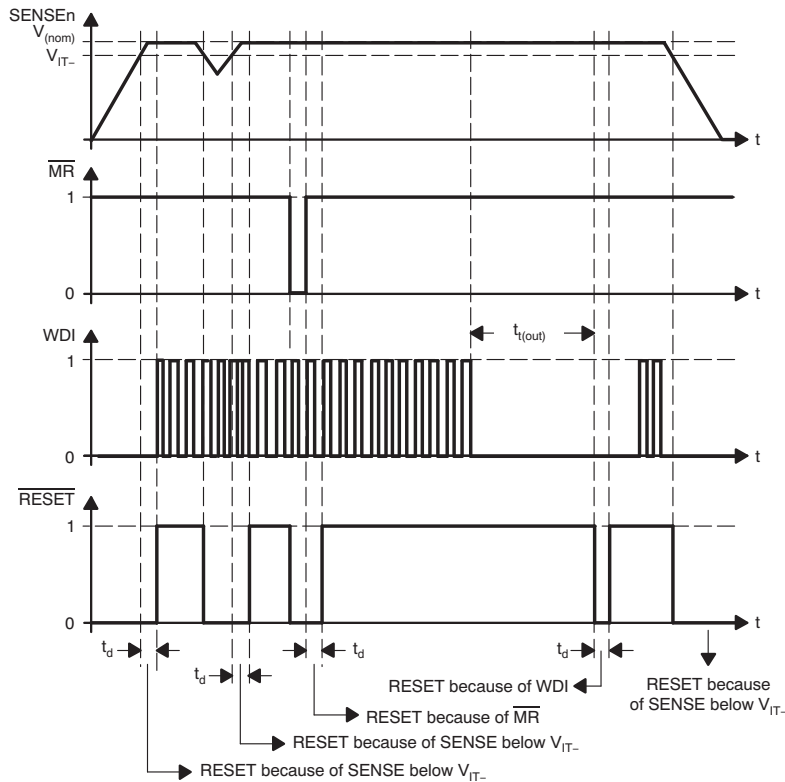
Over operating junction temperature range (unless otherwise noted).

| PARAMETER | | TEST CONDITIONS | TPS3305-xx | | | UNIT | | |
|---------------------------------------|--|--|--|------|------|------|------|---|
| | | | MIN | TYP | MAX | | | |
| V _{DD} | Input supply range | | 2.7 | | 6.0 | V | | |
| T _J | Operating junction temperature range | | -40 | | +85 | °C | | |
| V _{OH} | High-level output voltage | V _{DD} = 2.7V to 6V, I _{OH} = -20μA | V _{DD} - 0.2V | | | V | | |
| | | V _{DD} = 3.3V, I _{OH} = -2mA | V _{DD} - 0.4V | | | V | | |
| | | V _{DD} = 6V, I _{OH} = -3mA | V _{DD} - 0.4V | | | V | | |
| V _{OL} | Low-level output voltage | V _{DD} = 2.7V to 6V, I _{OL} = 20μA | 0.2 | | | V | | |
| | | V _{DD} = 3.3V, I _{OL} = 2mA | 0.4 | | | V | | |
| | | V _{DD} = 6V, I _{OL} = 3mA | 0.4 | | | V | | |
| Power-up reset voltage ⁽¹⁾ | | V _{DD} ≥ 1.1V, I _{OL} = 20μA | 0.4 | | | V | | |
| V _{IT-} | Negative-going input threshold voltage ⁽²⁾ | V _{DD} = 2.7V to 6V, T _A = 0°C to +85°C | VSENSE1, VSENSE2 | 1.64 | 1.68 | 1.72 | V | |
| | | | | 2.20 | 2.25 | 2.30 | V | |
| | | | | 2.86 | 2.93 | 3.0 | V | |
| | | | | 4.46 | 4.55 | 4.64 | V | |
| | | VSENSE1, VSENSE2 | V _{DD} = 2.7V to 6V, T _A = -40°C to +85°C | | 1.64 | 1.68 | 1.73 | V |
| | | | | | 2.20 | 2.25 | 2.32 | V |
| | | | | | 2.86 | 2.93 | 3.02 | V |
| | | | | | 4.46 | 4.55 | 4.67 | V |
| V _{hys} | Hysteresis at VSENSEn input | V _{IT-} = 1.68V | 15 | | | mV | | |
| | | V _{IT-} = 2.25V | 20 | | | mV | | |
| | | V _{IT-} = 2.93V | 30 | | | mV | | |
| | | V _{IT-} = 4.55V | 40 | | | mV | | |
| I _{H(AV)} | Average high-level input current | WDI | WDI = V _{DD} = 6V Time average (dc = 88%) | | 100 | 150 | μA | |
| I _{L(AV)} | Average low-level input current | WDI | WDI = 0V, V _{DD} = 6V Time average (dc = 12%) | | -15 | -20 | μA | |
| V _{IH} | High-level input voltage at \overline{MR} and WDI | | 0.7 x V _{DD} | | | V | | |
| V _{IL} | Low-level input voltage at \overline{MR} and WDI | | 0.3 x V _{DD} | | | V | | |
| Δt / ΔV | Input transition rise and fall rate at \overline{MR} | | 50 | | | ns/V | | |
| I _H | High-level input current | WDI | WDI = V _{DD} = 6V | | 120 | 170 | μA | |
| | | \overline{MR} | $\overline{MR} = 0.7 \times V_{DD}$, V _{DD} = 6V | | -130 | -180 | μA | |
| | | SENSE1 | VSENSE1 = V _{DD} = 6V | | 5 | 8 | μA | |
| | | SENSE2 | VSENSE2 = V _{DD} = 6V | | 6 | 9 | μA | |
| I _L | Low-level input current | WDI | WDI = 0V, V _{DD} = 6V | | -120 | -170 | μA | |
| | | \overline{MR} | $\overline{MR} = 0V$, V _{DD} = 6V | | -430 | -600 | μA | |
| | | SENSEn | VSENSE1,2 = 0V | | -1 | 1 | μA | |
| I _{DD} | Supply current | | 40 | | | μA | | |
| C _I | Input capacitance | V _I = 0V to V _{DD} | 10 | | | pF | | |

(1) The lowest supply voltage at which **RESET** becomes active. t_r, V_{DD} ≥ 15 μs/V.

(2) To ensure best stability of the threshold voltage, a bypass capacitor (0.1 μF ceramic) should be placed close to the supply terminals.

TIMING DIAGRAM



TIMING REQUIREMENTS

At $V_{DD} = 2.7V$ to $6V$, $R_L = 1M\Omega$, $C_L = 50pF$, and $T_J = +25^\circ C$.

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------|-------------|---|-----|-----|-----|---------|
| t_w | Pulse width | $V_{SENSEnL} = V_{IT-} - 0.2V$, $V_{SENSEnH} = V_{IT+} + 0.2V$ | 6 | | | μs |
| | | $V_{IH} = 0.7 \times V_{DD}$, $V_{IL} = 0.3 \times V_{DD}$ | 100 | | | ns |
| | | | 100 | | | ns |

SWITCHING CHARACTERISTICS

At $V_{DD} = 2.7V$ to $6V$, $R_L = 1M\Omega$, $C_L = 50pF$, and $T_J = +25^\circ C$.

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|--------------|--|--|-----|-----|-----|---------|
| $t_{t(out)}$ | Watchdog time-out | $V_{I(SENSEn)} \geq V_{IT+} + 0.2V$, $\overline{MR} \geq 0.7 \times V_{DD}$ See Timing Diagram | 1.1 | 1.6 | 2.3 | s |
| t_d | Delay time | $V_{I(SENSEn)} \geq V_{IT+} + 0.2V$, $\overline{MR} \geq 0.7 \times V_{DD}$ See Timing Diagram | 140 | 200 | 280 | ms |
| t_{PHL} | Propagation (delay) time, high-to-low level output | \overline{MR} to \overline{RESET} , \overline{MR} to RESET $V_{I(SENSEn)} \geq V_{IT+} + 0.2V$, $V_{IH} = 0.7 \times V_{DD}$, $V_{IL} = 0.3 \times V_{DD}$ | | 200 | 500 | ns |
| t_{PLH} | Propagation (delay) time, low-to-high level output | \overline{MR} to \overline{RESET} , \overline{MR} to RESET $V_{I(SENSEn)} \geq V_{IT+} + 0.2V$, $V_{IH} = 0.7 \times V_{DD}$, $V_{IL} = 0.3 \times V_{DD}$ | | 200 | 500 | ns |
| t_{PHL} | Propagation (delay) time, high-to-low level output | \overline{SENSEn} to \overline{RESET} , \overline{SENSEn} to RESET $V_{IH} = V_{IT+} + 0.2V$, $V_{IL} = V_{IT-} - 0.2V$, $\overline{MR} \geq 0.7 \times V_{DD}$ | | 1 | 5 | μs |
| t_{PLH} | Propagation (delay) time, low-to-high level output | \overline{SENSEn} to \overline{RESET} , \overline{SENSEn} to RESET $V_{IH} = V_{IT+} + 0.2V$, $V_{IL} = V_{IT-} - 0.2V$, $\overline{MR} \geq 0.7 \times V_{DD}$ | | 1 | 5 | μs |

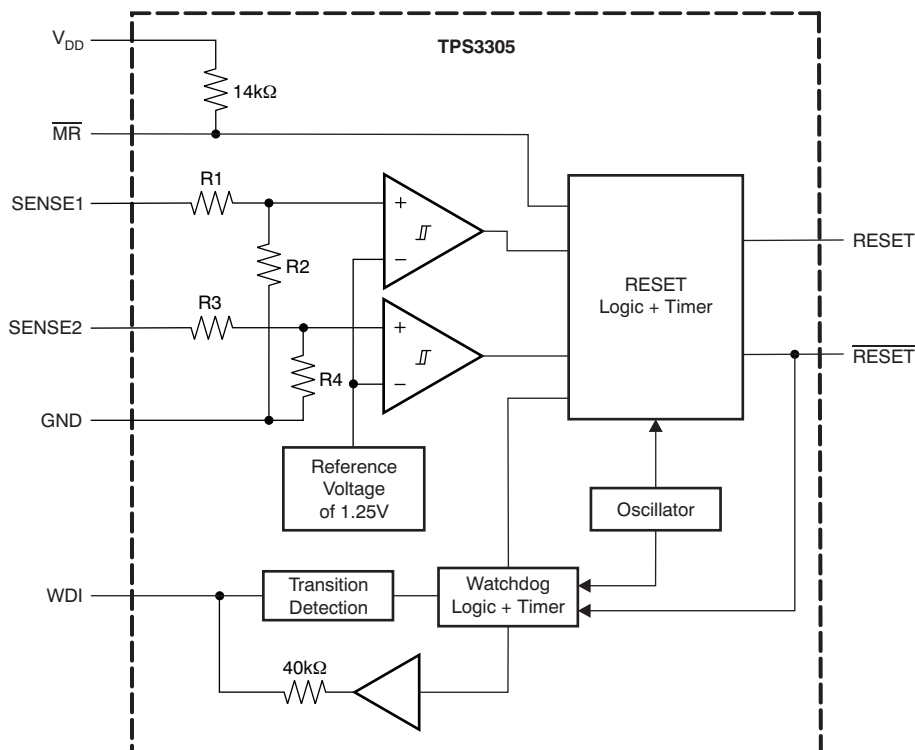
DEVICE INFORMATION

FUNCTION/TRUTH TABLE⁽¹⁾

| MR | SENSE1 > V _{IT1} | SENSE2 > V _{IT2} | RESET | RESET |
|----|---------------------------|---------------------------|-------|-------|
| L | X | X | L | H |
| H | 0 | 0 | L | H |
| H | 0 | 1 | L | H |
| H | 1 | 0 | L | H |
| H | 1 | 1 | H | L |

(1) X = Don't care

FUNCTIONAL BLOCK DIAGRAM



TERMINAL FUNCTIONS

| TERMINAL | | DESCRIPTION |
|-----------------|-----|--------------------------|
| NAME | NO. | |
| GND | 4 | Ground |
| MR | 7 | Manual reset |
| RESET | 5 | Active-low reset output |
| RESET | 6 | Active-high reset output |
| SENSE1 | 1 | Sense voltage input 1 |
| SENSE2 | 2 | Sense voltage input 2 |
| WDI | 3 | Watchdog timer input |
| V _{DD} | 8 | Supply voltage |

TYPICAL CHARACTERISTICS

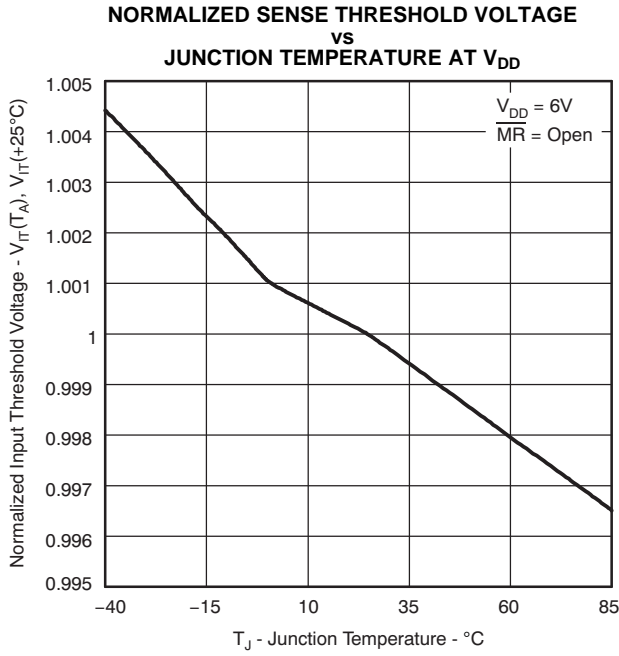


Figure 1.

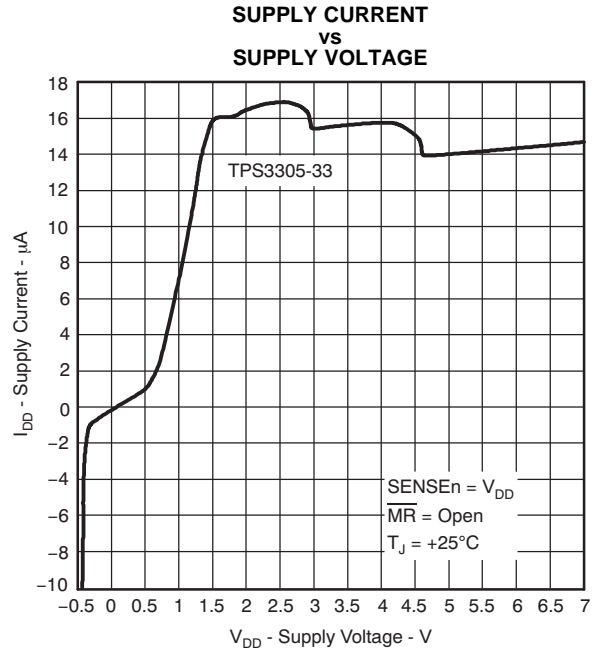


Figure 2.

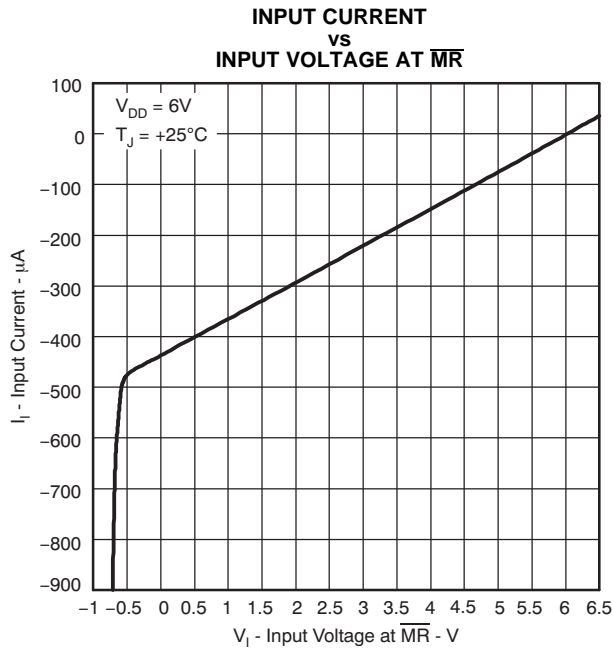


Figure 3.

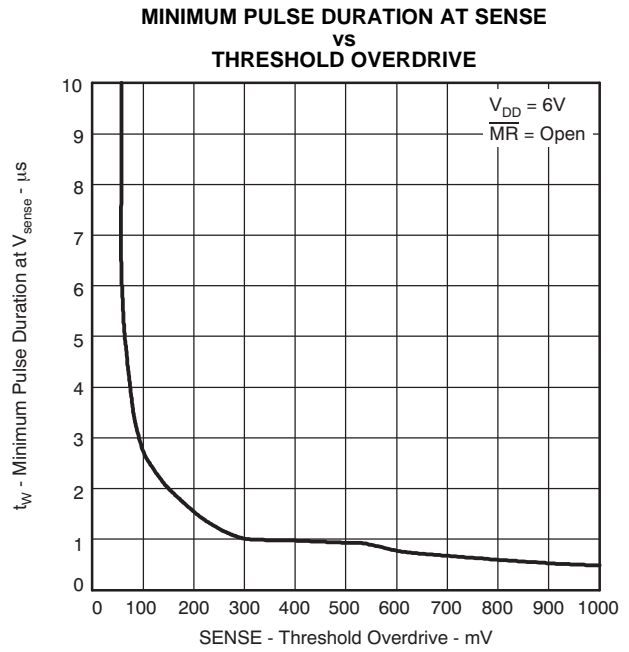
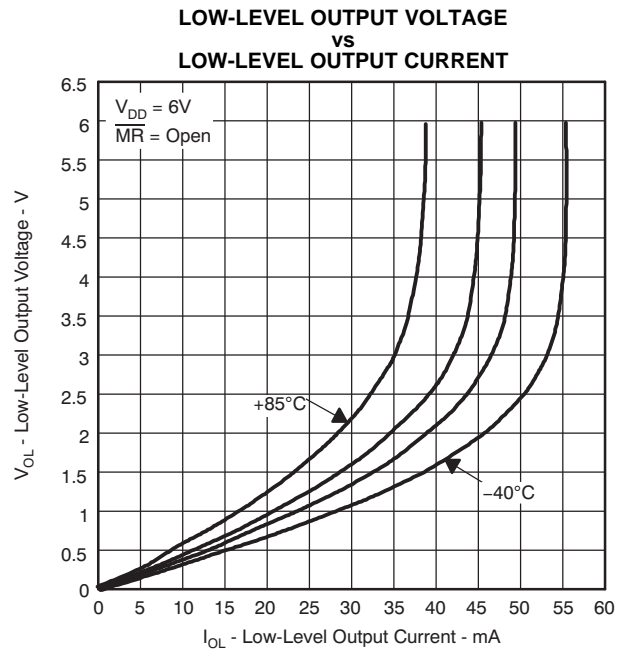
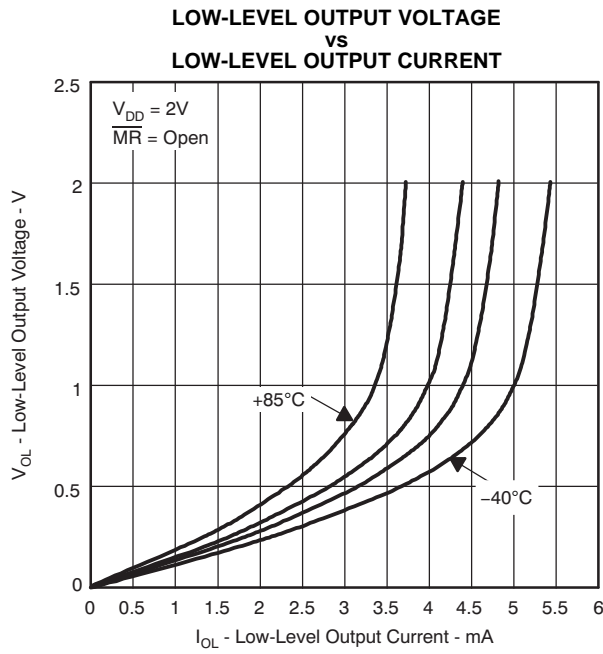
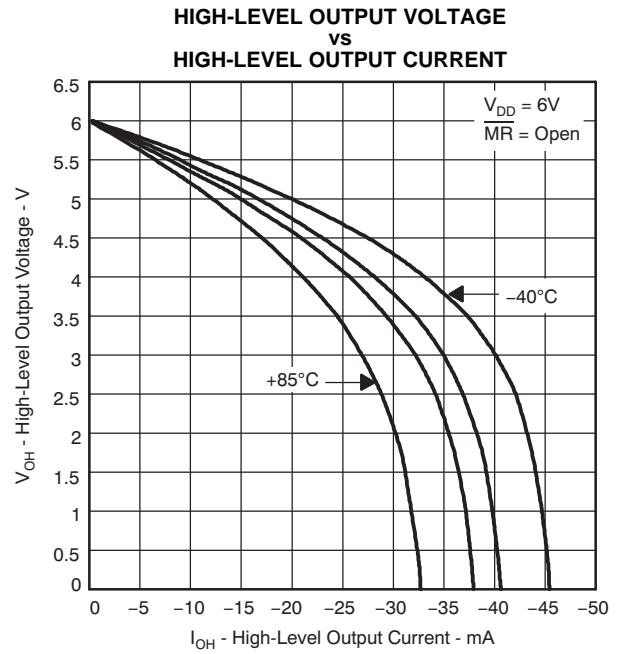
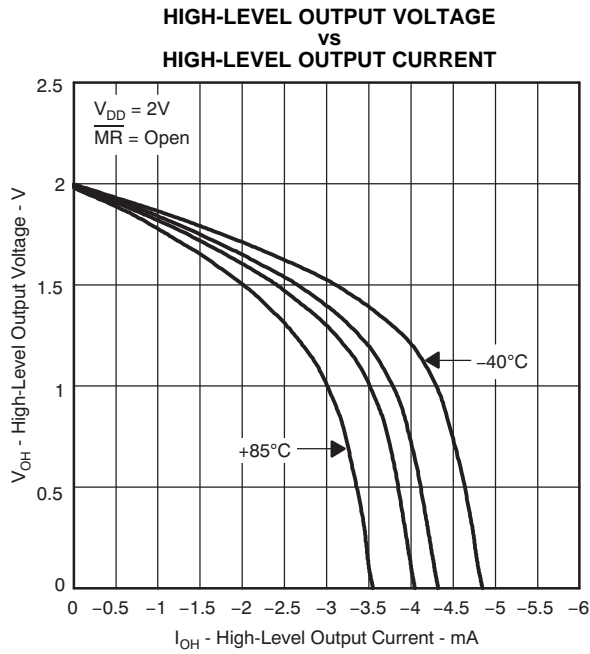


Figure 4.

TYPICAL CHARACTERISTICS (continued)



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 |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|--------------------------------------|----------------------|--------------|-------------------------|-------------------------|
| TPS3305-18D | ACTIVE | SOIC | D | 8 | 75 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30518 | Samples |
| TPS3305-18DG4 | ACTIVE | SOIC | D | 8 | 75 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30518 | Samples |
| TPS3305-18DGN | ACTIVE | HVSSOP | DGN | 8 | 80 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAM | Samples |
| TPS3305-18DGN4 | ACTIVE | HVSSOP | DGN | 8 | 80 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAM | Samples |
| TPS3305-18DGNR | ACTIVE | HVSSOP | DGN | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAM | Samples |
| TPS3305-18DGNRG4 | ACTIVE | HVSSOP | DGN | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAM | Samples |
| TPS3305-18DR | ACTIVE | SOIC | D | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30518 | Samples |
| TPS3305-18DRG4 | ACTIVE | SOIC | D | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30518 | Samples |
| TPS3305-25D | ACTIVE | SOIC | D | 8 | 75 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30525 | Samples |
| TPS3305-25DGN | ACTIVE | HVSSOP | DGN | 8 | 80 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAN | Samples |
| TPS3305-25DGNR | ACTIVE | HVSSOP | DGN | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAN | Samples |
| TPS3305-25DR | ACTIVE | SOIC | D | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30525 | Samples |
| TPS3305-33D | ACTIVE | SOIC | D | 8 | 75 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30533 | Samples |
| TPS3305-33DG4 | ACTIVE | SOIC | D | 8 | 75 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30533 | Samples |
| TPS3305-33DGN | ACTIVE | HVSSOP | DGN | 8 | 80 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAO | Samples |
| TPS3305-33DGN4 | ACTIVE | HVSSOP | DGN | 8 | 80 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAO | Samples |
| TPS3305-33DGNR | ACTIVE | HVSSOP | DGN | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAO | Samples |
| TPS3305-33DGNRG4 | ACTIVE | HVSSOP | DGN | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | AAO | Samples |
| TPS3305-33DR | ACTIVE | SOIC | D | 8 | 2500 | RoHS & Green | NIPDAU | Level-1-260C-UNLIM | -40 to 85 | 30533 | 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.

OBSOLETE: 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 ≤ 1000 ppm threshold. Antimony trioxide based flame retardants must also meet the ≤ 1000 ppm 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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TAPE AND REEL INFORMATION

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

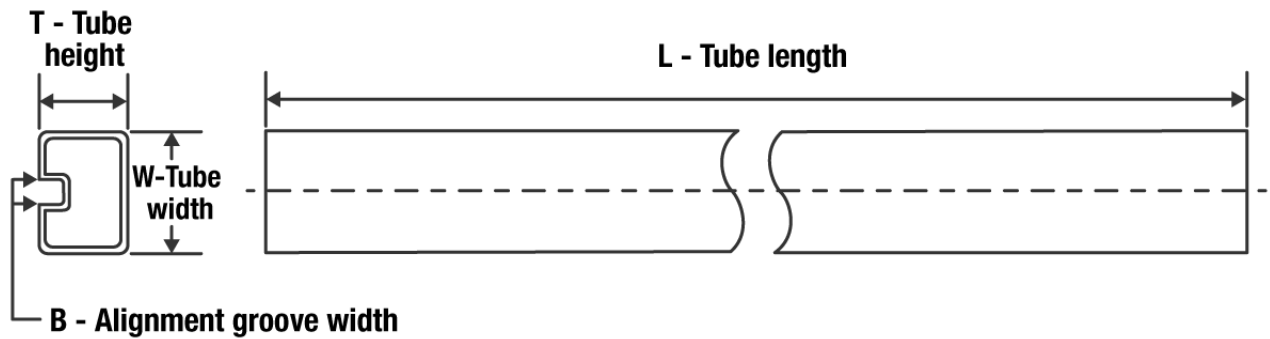

*All dimensions are nominal

| 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 |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| TPS3305-18DGNR | HVSSOP | DGN | 8 | 2500 | 330.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| TPS3305-18DR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |
| TPS3305-25DGNR | HVSSOP | DGN | 8 | 2500 | 330.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| TPS3305-25DR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |
| TPS3305-33DGNR | HVSSOP | DGN | 8 | 2500 | 330.0 | 12.4 | 5.3 | 3.4 | 1.4 | 8.0 | 12.0 | Q1 |
| TPS3305-33DR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |

TAPE AND REEL BOX DIMENSIONS


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| TPS3305-18DGNR | HVSSOP | DGN | 8 | 2500 | 358.0 | 335.0 | 35.0 |
| TPS3305-18DR | SOIC | D | 8 | 2500 | 350.0 | 350.0 | 43.0 |
| TPS3305-25DGNR | HVSSOP | DGN | 8 | 2500 | 358.0 | 335.0 | 35.0 |
| TPS3305-25DR | SOIC | D | 8 | 2500 | 350.0 | 350.0 | 43.0 |
| TPS3305-33DGNR | HVSSOP | DGN | 8 | 2500 | 358.0 | 335.0 | 35.0 |
| TPS3305-33DR | SOIC | D | 8 | 2500 | 350.0 | 350.0 | 43.0 |

TUBE


*All dimensions are nominal

| Device | Package Name | Package Type | Pins | SPQ | L (mm) | W (mm) | T (μm) | B (mm) |
|---------------|--------------|--------------|------|-----|--------|--------|--------|--------|
| TPS3305-18D | D | SOIC | 8 | 75 | 505.46 | 6.76 | 3810 | 4 |
| TPS3305-18DG4 | D | SOIC | 8 | 75 | 505.46 | 6.76 | 3810 | 4 |
| TPS3305-25D | D | SOIC | 8 | 75 | 505.46 | 6.76 | 3810 | 4 |
| TPS3305-33D | D | SOIC | 8 | 75 | 505.46 | 6.76 | 3810 | 4 |
| TPS3305-33DG4 | D | SOIC | 8 | 75 | 505.46 | 6.76 | 3810 | 4 |

GENERIC PACKAGE VIEW

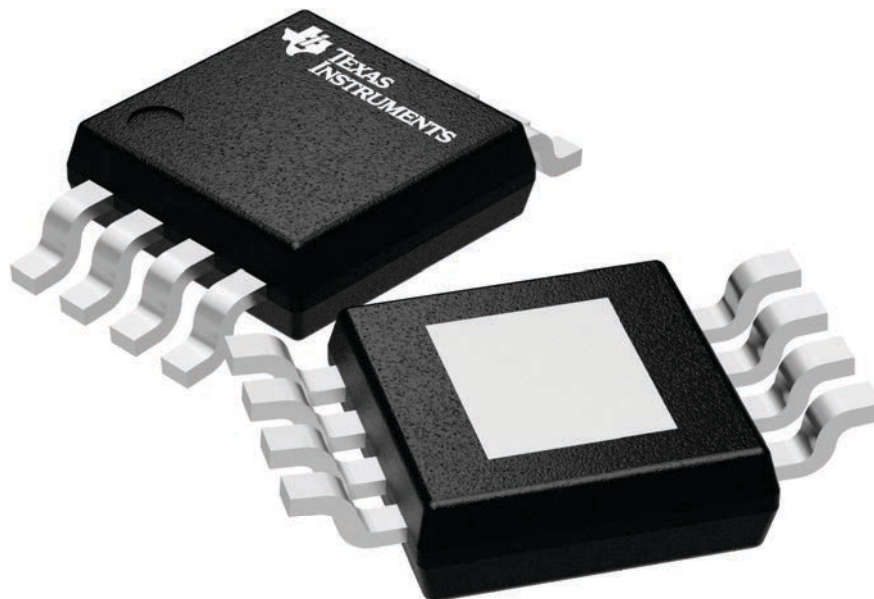
DGN 8

PowerPAD VSSOP - 1.1 mm max height

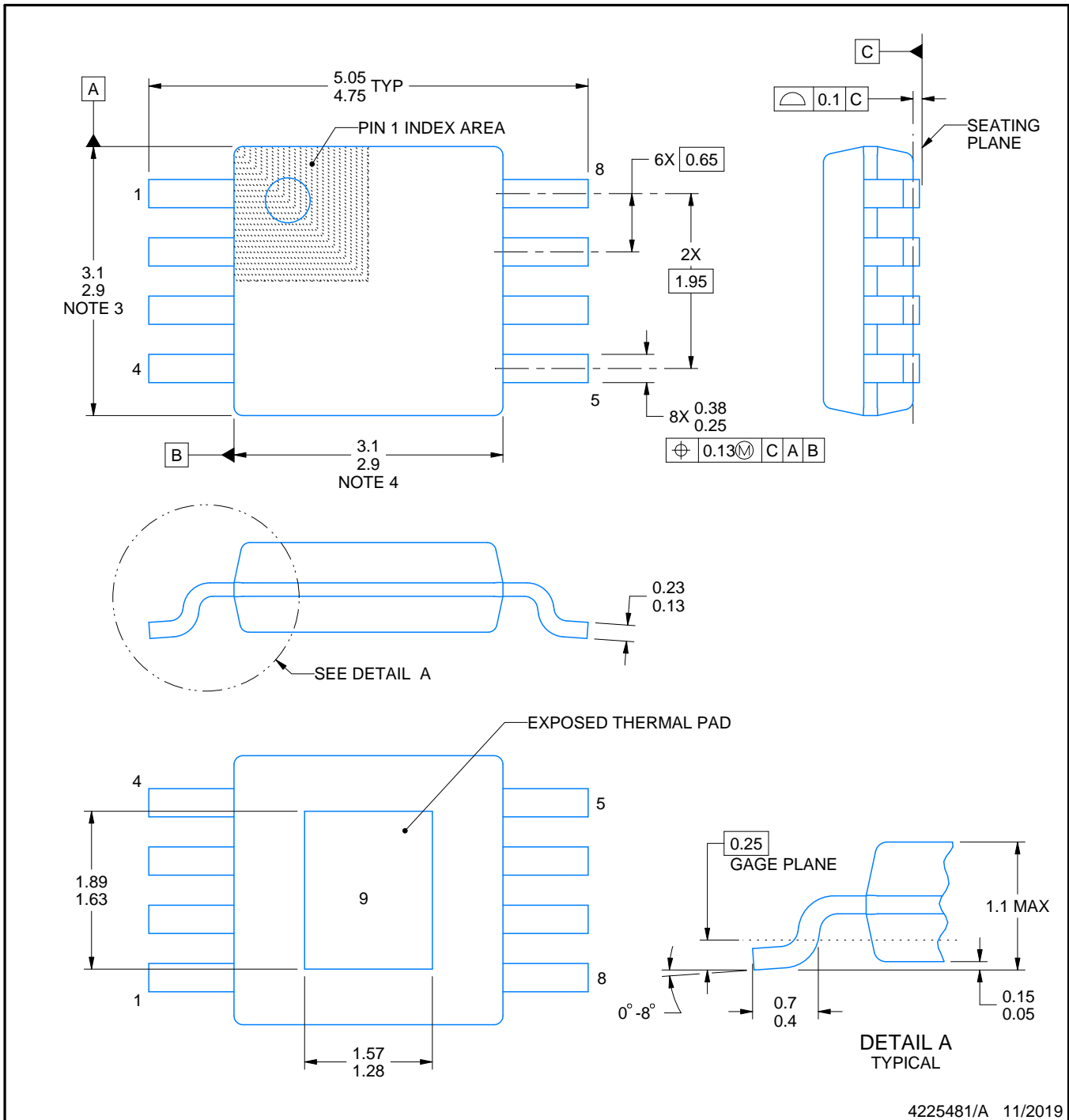
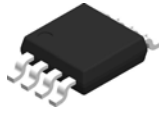
3 x 3, 0.65 mm pitch

SMALL OUTLINE PACKAGE

This image is a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.



4225482/A



4225481/A 11/2019

NOTES:

PowerPAD is a trademark of Texas Instruments.

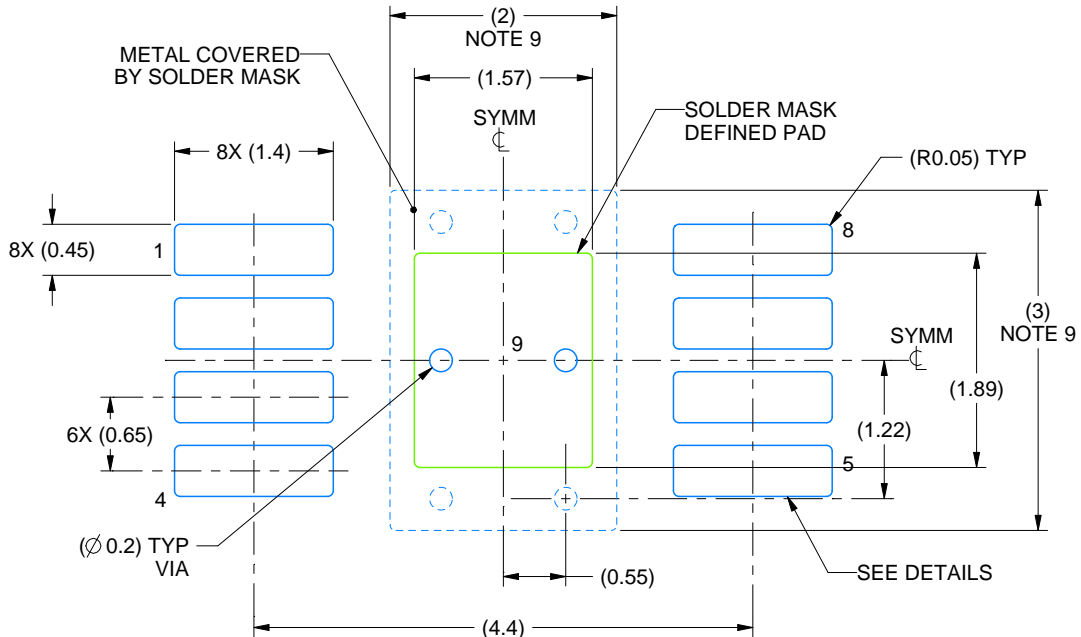
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-187.

EXAMPLE BOARD LAYOUT

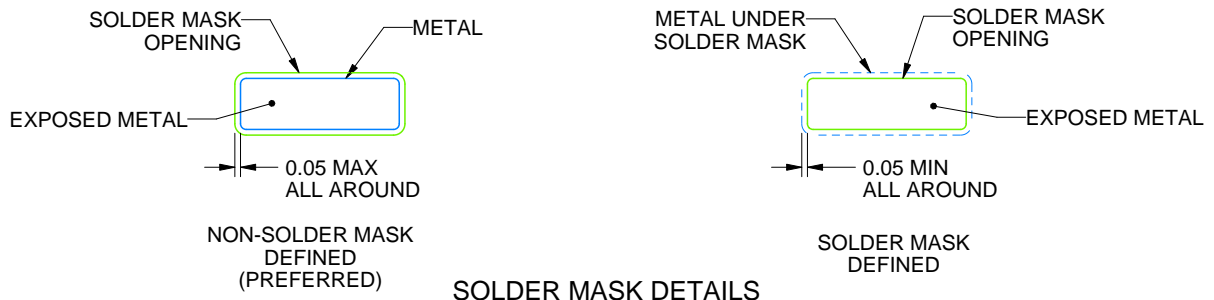
DGN0008D

PowerPAD™ VSSOP - 1.1 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 15X



SOLDER MASK DETAILS

4225481/A 11/2019

NOTES: (continued)

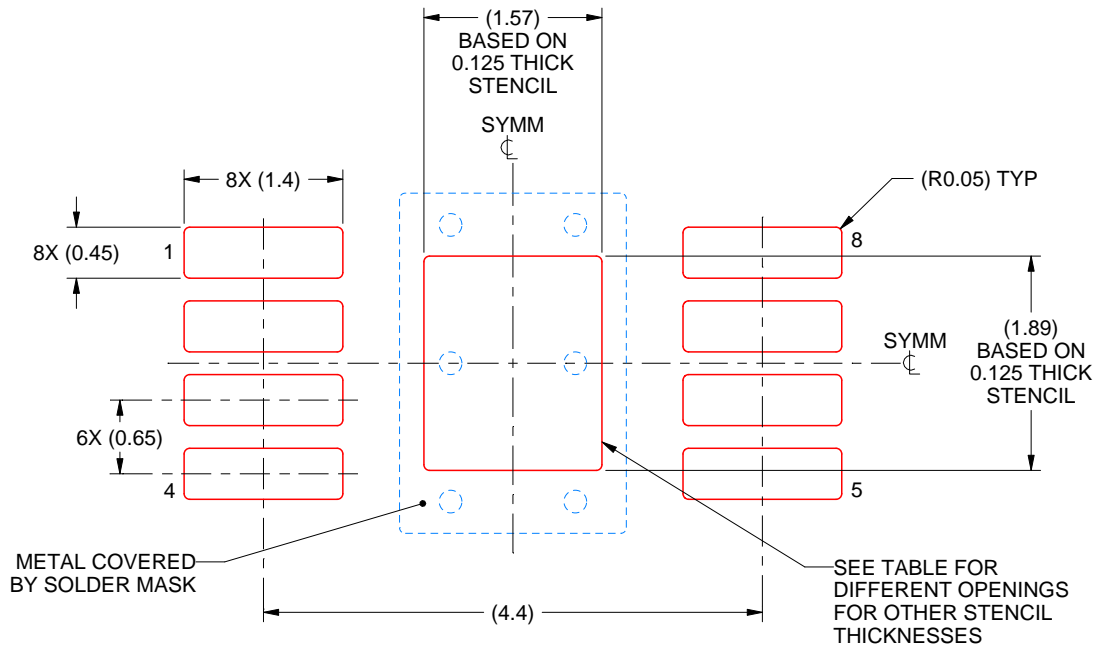
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.
8. Vias are optional depending on application, refer to device data sheet. If any vias are implemented, refer to their locations shown on this view. It is recommended that vias under paste be filled, plugged or tented.
9. Size of metal pad may vary due to creepage requirement.

EXAMPLE STENCIL DESIGN

DGN0008D

PowerPAD™ VSSOP - 1.1 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE
EXPOSED PAD 9:
100% PRINTED SOLDER COVERAGE BY AREA
SCALE: 15X

| STENCIL THICKNESS | SOLDER STENCIL OPENING |
|-------------------|------------------------|
| 0.1 | 1.76 X 2.11 |
| 0.125 | 1.57 X 1.89 (SHOWN) |
| 0.15 | 1.43 X 1.73 |
| 0.175 | 1.33 X 1.60 |

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NOTES: (continued)

10. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
11. Board assembly site may have different recommendations for stencil design.



D0008A

PACKAGE OUTLINE

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



4214825/C 02/2019

NOTES:

1. Linear dimensions are in inches [millimeters]. Dimensions in parenthesis are for reference only. Controlling dimensions are in inches. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 [0.15] per side.
4. This dimension does not include interlead flash.
5. Reference JEDEC registration MS-012, variation AA.

EXAMPLE BOARD LAYOUT

D0008A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:8X



SOLDER MASK DETAILS

4214825/C 02/2019

NOTES: (continued)

- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

D0008A

SOIC - 1.75 mm max height

SMALL OUTLINE INTEGRATED CIRCUIT



SOLDER PASTE EXAMPLE
BASED ON .005 INCH [0.125 MM] THICK STENCIL
SCALE:8X

4214825/C 02/2019

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

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