



## ULTRA-SMALL SUPPLY VOLTAGE SUPERVISORS

 Check for Samples: [TPS3800-xx](#), [TPS3801-xx](#), [TPS3802-xx](#)

### FEATURES

- Small, 5-Pin SC-70 (SOT-323) Package
- Supply Current of 9  $\mu$ A
- Power-On Reset Generator With Fixed Delay Time
  - TPS3800 = 100 ms
  - TPS3801 = 200 ms
  - TPS3802 = 400 ms
- Precision Supply Voltage Monitor 1.8 V, 2.5 V, 2.7 V, 3 V, 3.3 V, 5 V, and Adjustable
- Manual Reset Input (Except TPS3801-01)
- Temperature Range:  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$

### APPLICATIONS

- Applications Using DSPs, Microcontrollers, or Microprocessors
- Wireless Communication Systems
- Portable/Battery-Powered Equipment
- Programmable Controls
- Intelligent Instruments
- Industrial Equipment
- Notebook/Desktop Computers
- Automotive Systems

### DESCRIPTION

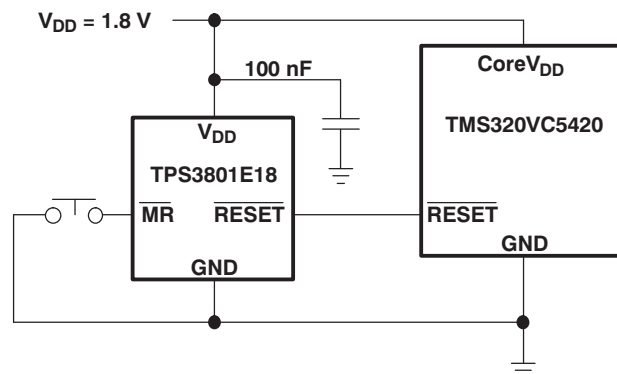
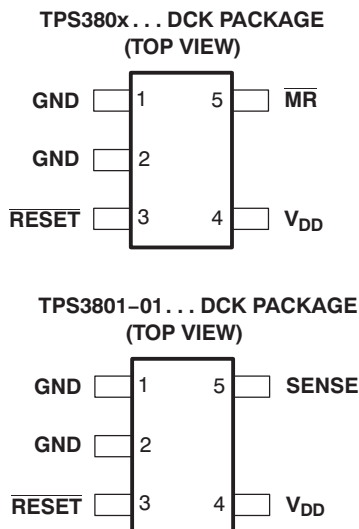
The TPS380x family of supervisory circuits monitor supply voltages to provide circuit initialization and timing supervision, primarily for DSPs and other processor-based systems.

These devices assert a push-pull  $\overline{\text{RESET}}$  signal when the SENSE (adjustable version) or  $V_{\text{DD}}$  (fixed version) drops below a preset threshold. The  $\overline{\text{RESET}}$  output remains asserted for the factory programmed delay time after the SENSE or  $V_{\text{DD}}$  return above its threshold.

The TPS380x devices, except the TPS3801-01, incorporate a manual reset input ( $\overline{\text{MR}}$ ). A low level at  $\overline{\text{MR}}$  causes  $\overline{\text{RESET}}$  to become active.

The TPS380x uses a precision reference to achieve an overall threshold accuracy of 2%–2.5%. These devices are available in a 5-pin SC-70 package, which is only about half the size of a 5-pin SOT-23 package.

The TPS380x devices are fully specified over a temperature range of  $-40^{\circ}\text{C}$  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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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.

### AVAILABLE OPTIONS<sup>(1)</sup>

| T <sub>A</sub> | DEVICE NAME   | THRESHOLD VOLTAGE                      | TYP DELAY TIME | MARKING |
|----------------|---------------|----------------------------------------|----------------|---------|
| -40°C to 85°C  | TPS3801-01DCK | Adjustable (V <sub>ref</sub> = 1.14 V) | 200 ms         | ARF     |
|                | TPS3801E18DCK | 1.71 V                                 | 200 ms         | ARE     |
|                | TPS3801J25DCK | 2.25 V                                 | 200 ms         | NJA     |
|                | TPS3800G27DCK | 2.5 V                                  | 95 ms          | ARI     |
|                | TPS3801L30DCK | 2.64 V                                 | 200 ms         | NPA     |
|                | TPS3801K33DCK | 2.93 V                                 | 200 ms         | NWA     |
|                | TPS3802L30DCK | 2.64 V                                 | 380 ms         | ASA     |
|                | TPS3802K33DCK | 2.93 V                                 | 380 ms         | ARK     |
|                | TPS3801T50DCK | 4.00 V                                 | 25 ms          | AVI     |
|                | TPS3801I50DCK | 4.55 V                                 | 200 ms         | NSA     |

(1) For the most current package and ordering information, see the Package Option Addendum at the end of this data sheet, or refer to our web site at [www.ti.com](http://www.ti.com).

### ABSOLUTE MAXIMUM RATINGS<sup>(1) (2)</sup>

Over operating free-air temperature range (unless otherwise noted).

|                                                                                                 | UNIT                              |
|-------------------------------------------------------------------------------------------------|-----------------------------------|
| Supply voltage, V <sub>DD</sub>                                                                 | 7 V                               |
| SENSE                                                                                           | -0.3 V to 5 V                     |
| All other pins                                                                                  | -0.3 V to 7 V                     |
| $\overline{MR}$                                                                                 | -0.3 V to V <sub>DD</sub> + 0.3 V |
| $\overline{RESET}$                                                                              | -0.3 V to V <sub>DD</sub> + 0.3 V |
| Maximum low-output current, I <sub>OL</sub>                                                     | 5 mA                              |
| Maximum high-output current, I <sub>OH</sub>                                                    | -5 mA                             |
| Input-clamp current, I <sub>IK</sub> (V <sub>I</sub> < 0 or V <sub>I</sub> > V <sub>DD</sub> )  | ±20 mA                            |
| Output-clamp current, I <sub>OK</sub> (V <sub>O</sub> < 0 or V <sub>O</sub> > V <sub>DD</sub> ) | ±20 mA                            |
| Operating junction temperature range, T <sub>J</sub> <sup>(3)</sup>                             | -40°C to +85°C                    |
| Storage temperature range, T <sub>stg</sub>                                                     | -65°C to +150°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. For reliable operation, the device should not be operated at 7 V for more than t = 1000h continuously.

(3) Due to the low dissipation power of this device, it is assumed that T<sub>J</sub> = T<sub>A</sub>.

### RECOMMENDED OPERATING CONDITIONS

|                                                                | MIN                                                        | MAX                   | UNIT |   |
|----------------------------------------------------------------|------------------------------------------------------------|-----------------------|------|---|
| Supply voltage, V <sub>DD</sub>                                | TPS3801J25, TPS3801L30, TPS3801K33, TPS3801I50, TPS3801T50 | 2                     | 6    | V |
|                                                                | All other devices                                          | 1.6                   | 4    |   |
| SENSE                                                          | 0                                                          | See <sup>(1)</sup>    | V    |   |
| Input voltage, V <sub>I</sub>                                  | 0                                                          | V <sub>DD</sub> + 0.3 | V    |   |
| High-level input voltage, V <sub>IH</sub>                      | 0.7 × V <sub>DD</sub>                                      | V <sub>DD</sub> + 0.3 | V    |   |
| Low-level input voltage, V <sub>IL</sub>                       |                                                            | 0.3 × V <sub>DD</sub> | V    |   |
| Input transition rise and fall rate at $\overline{MR}$ , Δt/ΔV |                                                            | 100                   | ns/V |   |
| Pull-up resistor value, $\overline{RESET}$                     | V <sub>Pull-up</sub><br>50μA                               |                       | Ω    |   |
| Operating free-air temperature range, T <sub>A</sub>           | -40                                                        | +85                   | °C   |   |

(1) Maximum = V<sub>DD</sub> + 0.3 or 4.5 V, whichever is greater.

## ELECTRICAL CHARACTERISTICS

 Over  $-40^{\circ}\text{C}$  to  $+85^{\circ}\text{C}$  free-air temperature range (unless otherwise noted).

| PARAMETER                                                             | TEST CONDITIONS                                                        | TPS3800-xx, TPS3801-xx,<br>TPS3802-xx                                   |       |      | UNIT          |   |
|-----------------------------------------------------------------------|------------------------------------------------------------------------|-------------------------------------------------------------------------|-------|------|---------------|---|
|                                                                       |                                                                        | MIN                                                                     | TYP   | MAX  |               |   |
| $V_{OH}$ High-level output voltage ( $\overline{\text{RESET}}$ )      | $V_{DD} = 1.6\text{ V to }6\text{ V}$ , $I_{OH} = -500\ \mu\text{A}$   | $V_{DD} - 0.2$                                                          |       |      | V             |   |
|                                                                       | $V_{DD} = 3.3\text{ V}$ , $I_{OH} = -2\text{ mA}$                      | $V_{DD} - 0.4$                                                          |       |      |               |   |
|                                                                       | $V_{DD} = 6\text{ V}$ , $I_{OH} = -4\text{ mA}$ <sup>(1)</sup>         | $V_{DD} - 0.4$                                                          |       |      |               |   |
| $V_{OL}$ Low-level output voltage ( $\overline{\text{RESET}}$ )       | $V_{DD} = 1.6\text{ V to }6\text{ V}$ , $I_{OL} = 500\ \mu\text{A}$    | 0.2                                                                     |       |      | V             |   |
|                                                                       | $V_{DD} = 3.3\text{ V}$ , $I_{OL} = 2\text{ mA}$                       | 0.4                                                                     |       |      |               |   |
|                                                                       | $V_{DD} = 6\text{ V}$ , $I_{OL} = 4\text{ mA}$ <sup>(1)</sup>          | 0.4                                                                     |       |      |               |   |
| Power-up reset voltage <sup>(2)</sup>                                 | $V_{DD} \geq 1.1\text{ V}$ , $I_{OL} = 50\ \mu\text{A}$                | 0.2                                                                     |       |      | V             |   |
| $V_{IT-}$ Negative-going input threshold voltage <sup>(3)</sup>       | TPS380x-01                                                             | $T_A = -40^{\circ}\text{C to }85^{\circ}\text{C}$                       | 1.117 | 1.14 | 1.163         | V |
|                                                                       | TPS380xE18                                                             |                                                                         | 1.67  | 1.71 | 1.75          |   |
|                                                                       | TPS380xJ25                                                             |                                                                         | 2.2   | 2.25 | 2.3           |   |
|                                                                       | TPS380xG27                                                             |                                                                         | 2.45  | 2.5  | 2.55          |   |
|                                                                       | TPS380xL30                                                             |                                                                         | 2.58  | 2.64 | 2.7           |   |
|                                                                       | TPS380xK33                                                             |                                                                         | 2.87  | 2.93 | 2.99          |   |
|                                                                       | TPS380xI50                                                             |                                                                         | 4.45  | 4.55 | 4.65          |   |
|                                                                       | TPS380xT50                                                             |                                                                         | 3.92  | 4    | 4.08          |   |
| $V_{hys}$ Threshold hysteresis                                        | TPS380x-01                                                             |                                                                         | 15    |      | mV            |   |
|                                                                       | TPS380xx18                                                             |                                                                         | 25    |      |               |   |
|                                                                       | TPS380xx25                                                             |                                                                         | 30    |      |               |   |
|                                                                       | TPS380xx27                                                             |                                                                         | 35    |      |               |   |
|                                                                       | TPS380xx30                                                             |                                                                         | 35    |      |               |   |
|                                                                       | TPS380xx33                                                             |                                                                         | 40    |      |               |   |
|                                                                       | TPS380xx50                                                             |                                                                         | 60    |      |               |   |
| $I_{IH}$ High-level input current ( $\overline{\text{MR}}$ )          | $\overline{\text{MR}} = 0.7 \times V_{DD}$ , $V_{DD} = 6\text{ V}$     | -40                                                                     | -60   | -100 | $\mu\text{A}$ |   |
| $I_{IL}$ Low-level input current ( $\overline{\text{MR}}$ )           | $\overline{\text{MR}} = 0\text{ V}$ , $V_{DD} = 6\text{ V}$            | -130                                                                    | -200  | -340 | $\mu\text{A}$ |   |
| $I_I$ Input current (SENSE)                                           |                                                                        | -25                                                                     |       | 25   | nA            |   |
| $I_{DD}$ Supply current                                               | TPS3801J25,<br>TPS3801L30,<br>TPS3801K33,<br>TPS3801I50,<br>TPS3801T50 | $V_{DD} = 2\text{ V}$ , $\overline{\text{MR}}$ and output unconnected   | 9     | 12   | $\mu\text{A}$ |   |
|                                                                       |                                                                        | $V_{DD} = 6\text{ V}$ , $\overline{\text{MR}}$ and output unconnected   | 20    | 25   |               |   |
|                                                                       | TPS3801-01                                                             | $V_{DD} = 1.6\text{ V}$ , SENSE = 0 V to $V_{DD}$ , output unconnected  | 7     | 10   |               |   |
|                                                                       |                                                                        | $V_{DD} = 4\text{ V}$ , SENSE = 0 V to $V_{DD}$ , output unconnected    | 9     | 12   |               |   |
|                                                                       | TPS3801E18,<br>TPS3800G27,<br>TPS3802K33,<br>TPS3802L30                | $V_{DD} = 1.6\text{ V}$ , $\overline{\text{MR}}$ and output unconnected | 8     | 11   |               |   |
| $V_{DD} = 4\text{ V}$ , $\overline{\text{MR}}$ and output unconnected |                                                                        | 13                                                                      | 18    |      |               |   |
| $C_i$ Input capacitance                                               | $V_I = 0\text{ V to }V_{DD}$                                           | 5                                                                       |       |      | pF            |   |

(1) Only valid for the TPS3801J25, TPS3801L30, TPS3801K33, TPS3801I50, and TPS3801T50.

 (2) The lowest supply voltage at which  $\overline{\text{RESET}}$  becomes active.  $t_r$ ,  $V_{DD} \geq 15\ \mu\text{s/V}$ .

 (3) To ensure the best stability of the threshold voltage, a bypass capacitor (0.1- $\mu\text{F}$  ceramic) should be placed near the supply terminals.

## TIMING REQUIREMENTS

at  $R_L = 1\text{ M}\Omega$ ,  $C_L = 50\text{ pF}$ ,  $T_A = +25^\circ\text{C}$

| PARAMETER |             | TEST CONDITIONS           | MIN                                                                                                | TYP | MAX | UNIT |               |
|-----------|-------------|---------------------------|----------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| $t_w$     | Pulse width | at SENSE                  | $V_{DD} = 1.6\text{ V}$ , $V_{IH} = 1.1 \times V_{IT-}$ , $V_{IL} = 0.9 \times V_{IT-}$            |     |     | 1    | $\mu\text{s}$ |
|           |             | at $V_{DD}$               | $V_{DD} = V_{IT-} + 0.2\text{ V}$ , $V_{DD} = V_{IT-} - 0.2\text{ V}$                              |     |     | 3    |               |
|           |             | at $\overline{\text{MR}}$ | $V_{DD} \geq V_{IT-} + 0.2\text{ V}$ , $V_{IL} = 0.3 \times V_{DD}$ , $V_{IH} = 0.7 \times V_{DD}$ |     |     | 100  | ns            |

## SWITCHING CHARACTERISTICS

at  $R_L = 1\text{ M}\Omega$ ,  $C_L = 50\text{ pF}$ ,  $T_A = +25^\circ\text{C}$

| PARAMETER |                                                    | TEST CONDITIONS                                           | MIN                                                                                                      | TYP | MAX | UNIT |               |
|-----------|----------------------------------------------------|-----------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----|-----|------|---------------|
| $t_d$     | $\overline{\text{RESET}}$ recovery delay time      | TPS3801T50                                                | 15                                                                                                       | 25  | 35  | ms   |               |
|           |                                                    | TPS3800                                                   | 60                                                                                                       | 95  | 140 |      |               |
|           |                                                    | TPS3801                                                   | 120                                                                                                      | 200 | 280 |      |               |
|           |                                                    | TPS3802                                                   | 240                                                                                                      | 380 | 560 |      |               |
| $t_{PHL}$ | Propagation (delay) time, high-to-low-level output | $\overline{\text{MR}}$ to $\overline{\text{RESET}}$ delay | $V_{DD} \geq V_{IT-} + 0.2\text{ V}$ ,<br>$V_{IL} = 0.3 \times V_{DD}$ ,<br>$V_{IH} = 0.7 \times V_{DD}$ |     |     | 15   | ns            |
|           |                                                    | $V_{DD}$ to $\overline{\text{RESET}}$ delay               | $V_{IL} = V_{IT-} - 0.2\text{ V}$ ,<br>$V_{IH} = V_{IT-} + 0.2\text{ V}$                                 |     |     | 1    | $\mu\text{s}$ |
|           |                                                    | SENSE to $\overline{\text{RESET}}$                        | $V_{IL} = V_{IT-} - 0.2\text{ V}$ ,<br>$V_{IH} = V_{IT-} + 0.2\text{ V}$                                 |     |     | 1    | $\mu\text{s}$ |

## TIMING DIAGRAM



NOTE:  $\overline{\text{RESET}}$  should not be forced high during the power-up sequence (until  $V_{DD} > 1.1\text{ V}$ ).

FUNCTIONAL BLOCK DIAGRAMS

FUNCTION/TRUTH TABLE, TPS380x

| MR | $V_{DD} > V_{IT}$ | RESET |
|----|-------------------|-------|
| L  | 0                 | L     |
| L  | 1                 | L     |
| H  | 0                 | L     |
| H  | 1                 | H     |

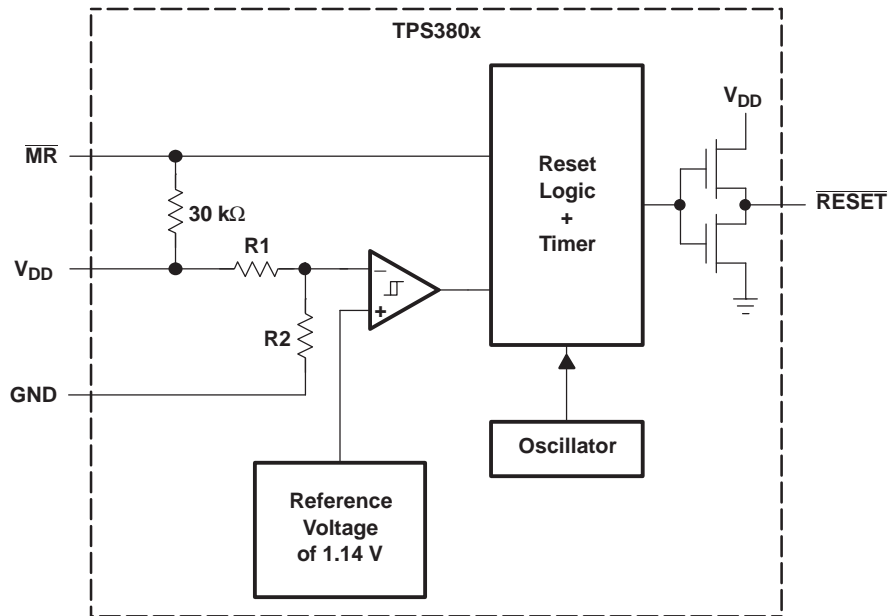


Figure 1.



Figure 2.

TYPICAL CHARACTERISTICS

LOW-LEVEL OUTPUT VOLTAGE  
 vs  
 LOW-LEVEL OUTPUT CURRENT

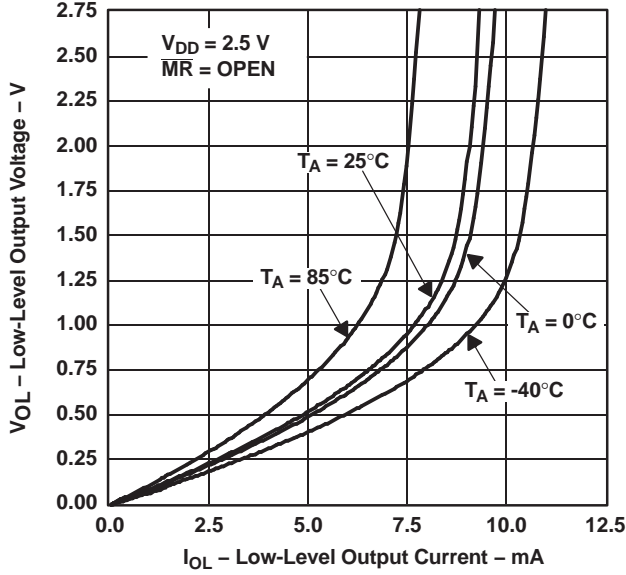


Figure 3.

SUPPLY CURRENT  
 vs  
 SUPPLY VOLTAGE

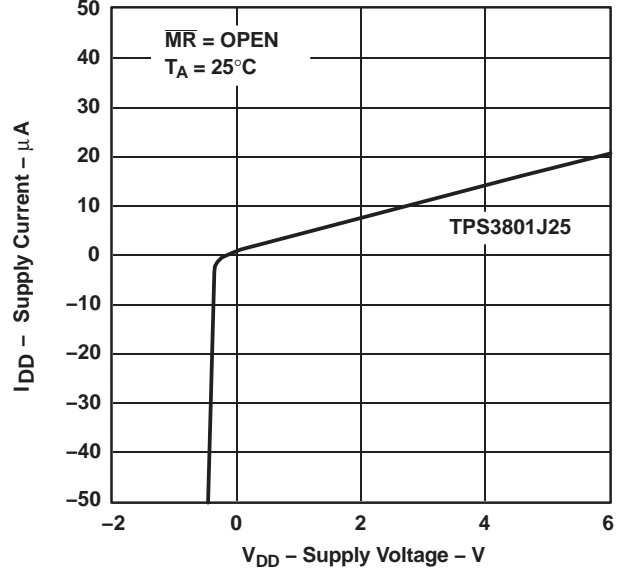


Figure 4.

HIGH-LEVEL OUTPUT VOLTAGE  
 vs  
 HIGH-LEVEL OUTPUT CURRENT

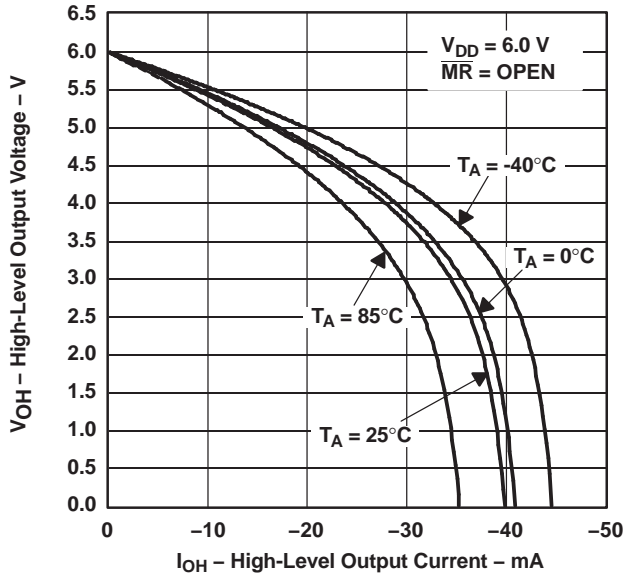


Figure 5.

HIGH-LEVEL OUTPUT VOLTAGE  
 vs  
 HIGH-LEVEL OUTPUT CURRENT

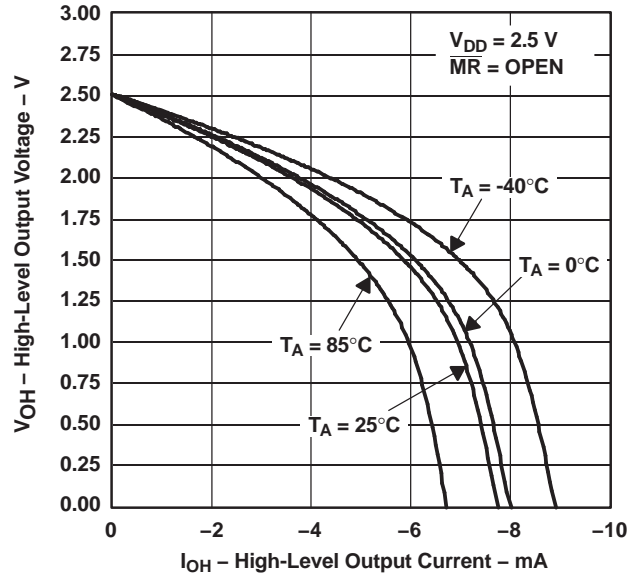
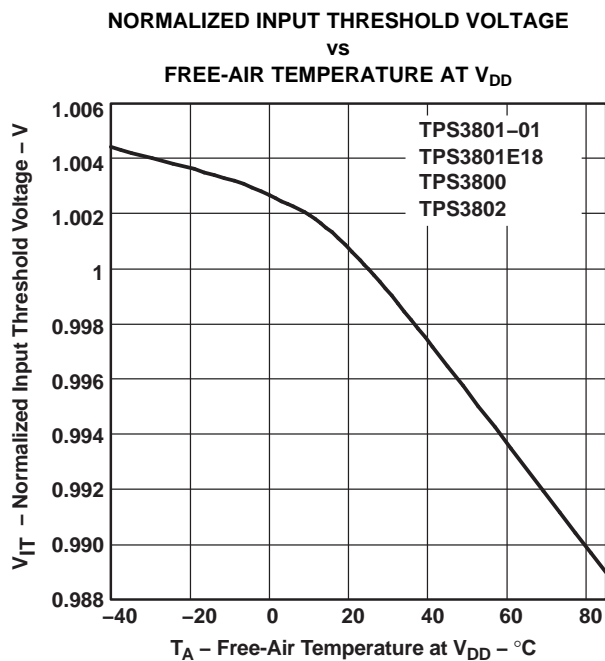
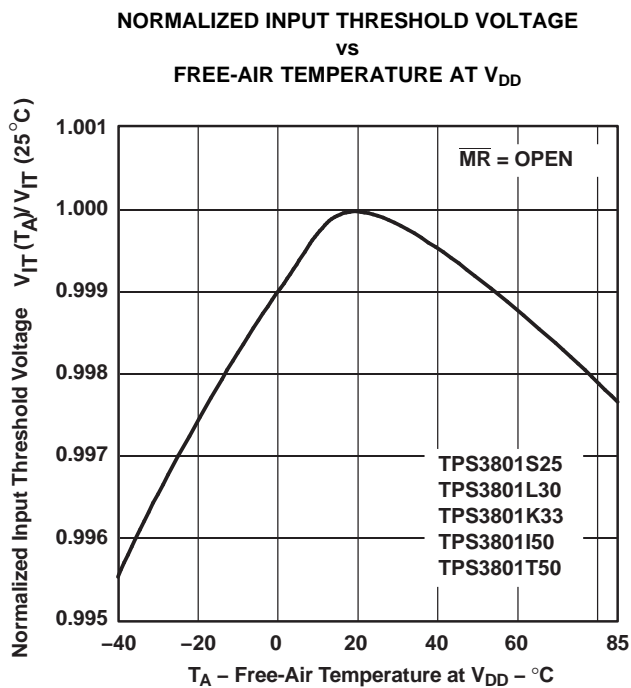
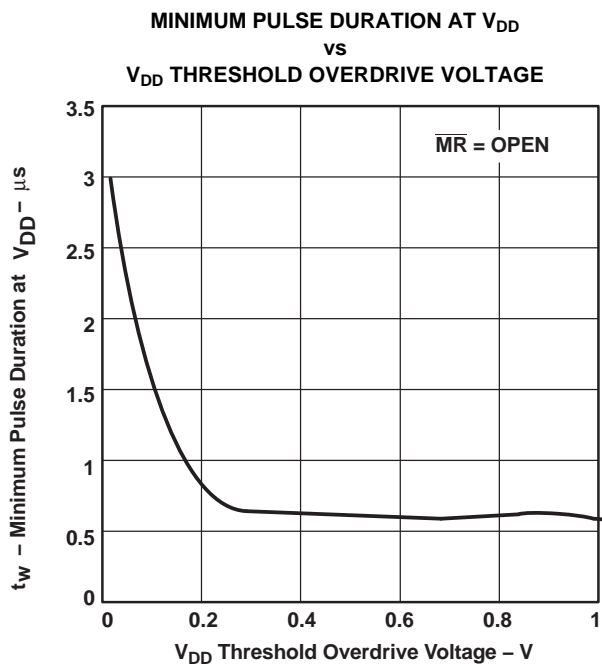
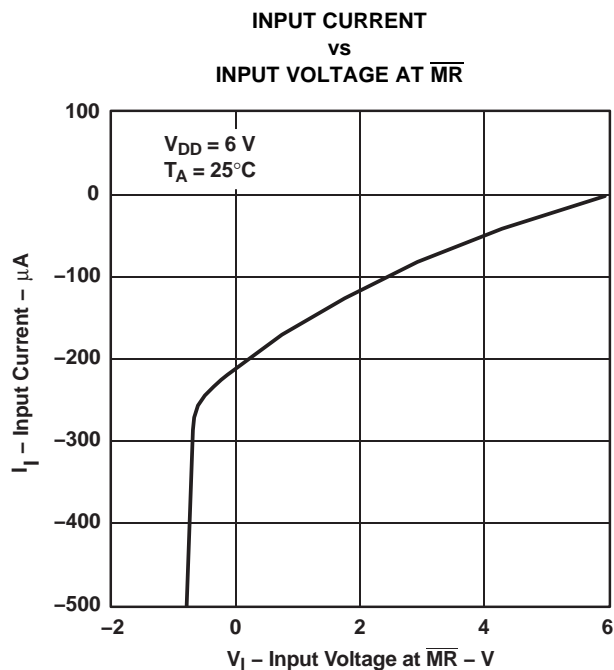


Figure 6.

TYPICAL CHARACTERISTICS (continued)



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**Changes from Revision D (December 2006) to Revision E**

**Page**

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- Added Pull-up resistor value,  $\overline{\text{RESET}}$  to the Recommended Operating Conditions Table ..... [2](#)
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**PACKAGING INFORMATION**

| Orderable Device | Status<br>(1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan<br>(2) | Lead finish/<br>Ball material<br>(6) | MSL Peak Temp<br>(3) | Op Temp (°C) | Device Marking<br>(4/5) | Samples                 |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|--------------------------------------|----------------------|--------------|-------------------------|-------------------------|
| TPS3800G27DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | ARI                     | <a href="#">Samples</a> |
| TPS3801-01DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | ARF                     | <a href="#">Samples</a> |
| TPS3801E18DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | ARE                     | <a href="#">Samples</a> |
| TPS3801I50DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | NSA                     | <a href="#">Samples</a> |
| TPS3801J25DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | NJA                     | <a href="#">Samples</a> |
| TPS3801K33DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | NWA                     | <a href="#">Samples</a> |
| TPS3801L30DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | NPA                     | <a href="#">Samples</a> |
| TPS3801T50DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | AVI                     | <a href="#">Samples</a> |
| TPS3802K33DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | ARK                     | <a href="#">Samples</a> |
| TPS3802L30DCKR   | ACTIVE        | SC70         | DCK             | 5    | 3000        | RoHS & Green    | NIPDAU                               | Level-1-260C-UNLIM   | -40 to 85    | ASA                     | <a href="#">Samples</a> |

(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 <=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.

<sup>(5)</sup> 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.

<sup>(6)</sup> 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**

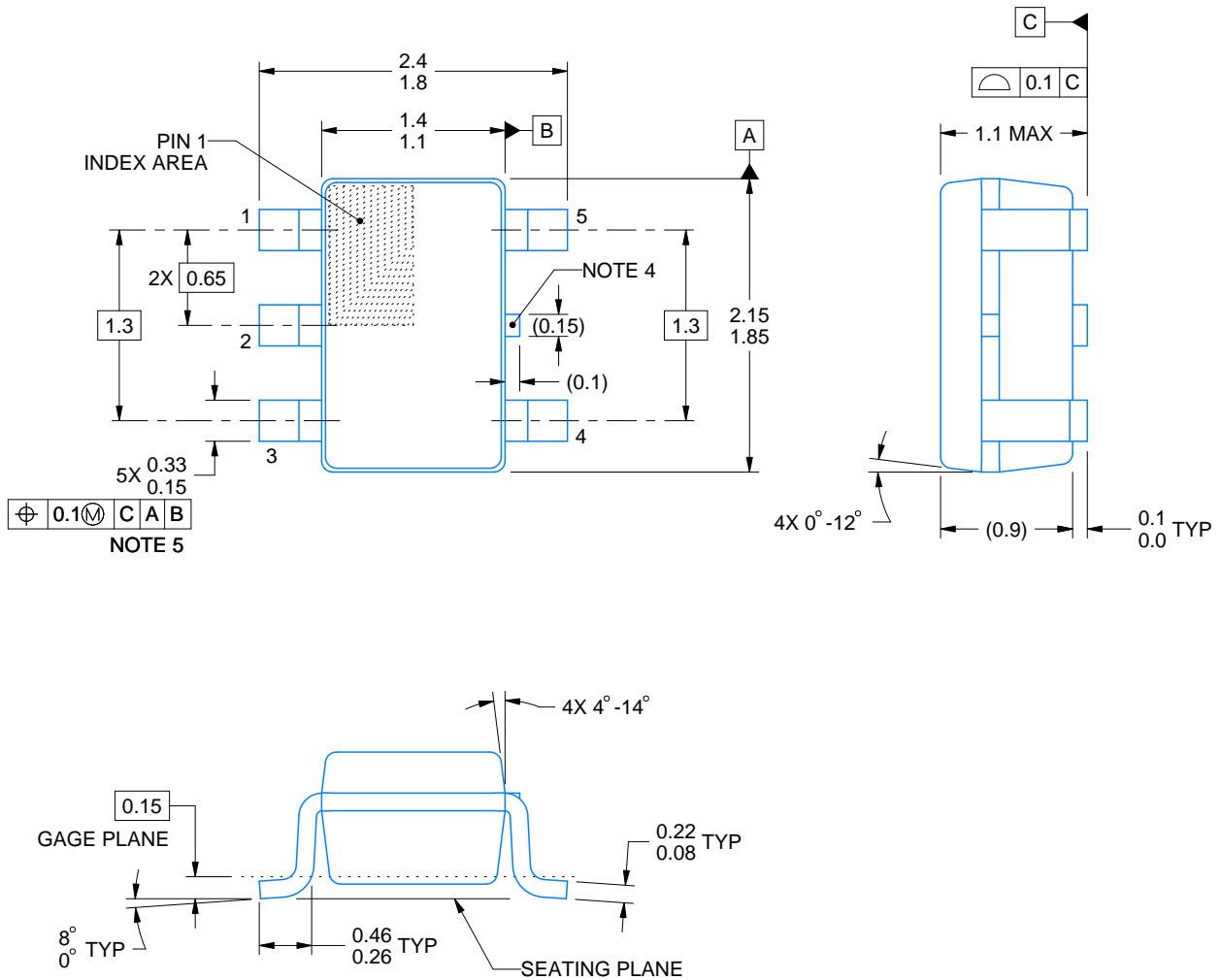

\*All dimensions are nominal

| 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 |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| TPS3800G27DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801-01DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801E18DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801I50DCKR | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.41    | 2.41    | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801J25DCKR | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.41    | 2.41    | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801K33DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801L30DCKR | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.41    | 2.41    | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801T50DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3801T50DCKR | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.41    | 2.41    | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3802K33DCKR | SC70         | DCK             | 5    | 3000 | 178.0              | 9.0                | 2.4     | 2.5     | 1.2     | 4.0     | 8.0    | Q3            |
| TPS3802L30DCKR | SC70         | DCK             | 5    | 3000 | 180.0              | 8.4                | 2.41    | 2.41    | 1.2     | 4.0     | 8.0    | Q3            |

**TAPE AND REEL BOX DIMENSIONS**


\*All dimensions are nominal

| Device         | Package Type | Package Drawing | Pins | SPQ  | Length (mm) | Width (mm) | Height (mm) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| TPS3800G27DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| TPS3801-01DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| TPS3801E18DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| TPS3801I50DCKR | SC70         | DCK             | 5    | 3000 | 183.0       | 183.0      | 20.0        |
| TPS3801J25DCKR | SC70         | DCK             | 5    | 3000 | 183.0       | 183.0      | 20.0        |
| TPS3801K33DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| TPS3801L30DCKR | SC70         | DCK             | 5    | 3000 | 183.0       | 183.0      | 20.0        |
| TPS3801T50DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| TPS3801T50DCKR | SC70         | DCK             | 5    | 3000 | 183.0       | 183.0      | 20.0        |
| TPS3802K33DCKR | SC70         | DCK             | 5    | 3000 | 180.0       | 180.0      | 18.0        |
| TPS3802L30DCKR | SC70         | DCK             | 5    | 3000 | 183.0       | 183.0      | 20.0        |



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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. Reference JEDEC MO-203.
4. Support pin may differ or may not be present.
5. Lead width does not comply with JEDEC.
6. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25mm per side

# EXAMPLE BOARD LAYOUT

DCK0005A

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE:18X



SOLDER MASK DETAILS

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NOTES: (continued)

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

# EXAMPLE STENCIL DESIGN

DCK0005A

SOT - 1.1 max height

SMALL OUTLINE TRANSISTOR



SOLDER PASTE EXAMPLE  
BASED ON 0.125 THICK STENCIL  
SCALE: 18X

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NOTES: (continued)

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

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