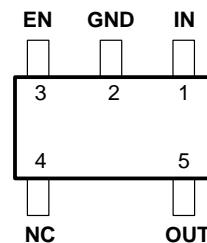


- 100-mA Low-Dropout Regulator
- Fixed Output Voltage Options: 5 V, 3.8 V, 3.3 V, 3.2 V, and 3 V
- Dropout Typically 170 mV at 100-mA
- Thermal Protection
- Less Than 1 μ A Quiescent Current in Shutdown
- -40°C to 125°C Operating Junction Temperature Range
- 5-Pin SOT-23 (DBV) Package
- ESD Protection Verified to 1.5 KV Human Body Model (HBM) per MIL-STD-883C

DBV PACKAGE
(TOP VIEW)



NC – No internal connection

description

The TPS761xx is a 100 mA, low dropout (LDO) voltage regulator designed specifically for battery-powered applications. A proprietary BiCMOS fabrication process allows the TPS761xx to provide outstanding performance in all specifications critical to battery-powered operation.

The TPS761xx is available in a space-saving SOT-23 (DBV) package and operates over a junction temperature range of -40°C to 125°C .

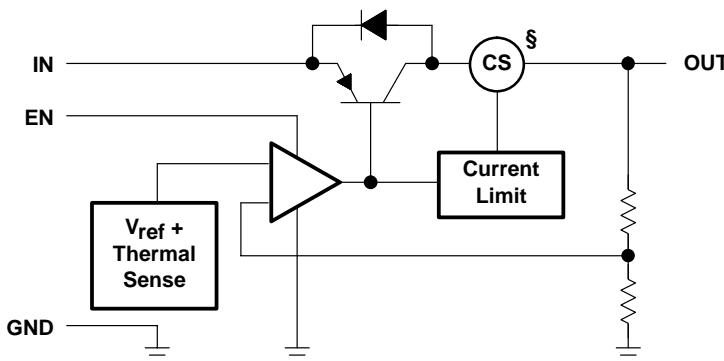
AVAILABLE OPTIONS

| T _J | VOLTAGE | PACKAGE | PART NUMBER | | SYMBOL |
|--|---------|-----------------|----------------|---------------|--------|
| -40°C to 125°C | 3 V | SOT-23 (DBV) | TPS76130DBVRT† | TPS76130DBVT‡ | PAEI |
| | 3.2 V | | TPS76132DBVRT† | TPS76132DBVT‡ | PAFI |
| | 3.3 V | | TPS76133DBVRT† | TPS76133DBVT‡ | PAII |
| | 3.8 V | | TPS76138DBVRT† | TPS76138DBVT‡ | PAKI |
| | 5 V | | TPS76150DBVRT† | TPS76150DBVT‡ | PALI |

† The DBVR passive indicates tape and reel of 3000 parts.

‡ The DBVT passive indicates tape and reel of 250 parts.

functional block diagram



§ Current sense



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.

TPS76130, TPS76132, TPS76133, TPS76138, TPS76150 LOW-POWER 100-mA LOW-DROPOUT LINEAR REGULATORS

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Terminal Functions

| TERMINAL NAME | NO. | I/O | DESCRIPTION |
|---------------|-----|-----|--------------------------|
| EN | 3 | I | Enable input |
| GND | 2 | | Ground |
| IN | 1 | I | Input voltage |
| NC | 4 | | No connection |
| OUT | 5 | O | Regulated output voltage |

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

| | |
|---|------------------------------|
| Input voltage range, V_I (see Note 1) | –0.3 V to 16 V |
| Voltage range at EN | –0.3 V to $V_I + 0.3$ V |
| Peak output current | internally limited |
| Continuous total dissipation | See Dissipation Rating Table |
| Operating junction temperature range, T_J | –40°C to 150°C |
| Storage temperature range, T_{stg} | –65°C to 150°C |
| ESD rating, HBM | 1.5 kV |

[†] 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.

NOTE 1: All voltages are with respect to device GND pin.

DISSIPATION RATING TABLE

| BOARD | PACKAGE | $R_{\theta JC}$ | $R_{\theta JA}$ | DERATING FACTOR ABOVE $T_A = 25^\circ C$ | $T_A \leq 25^\circ C$ POWER RATING | $T_A = 70^\circ C$ POWER RATING | $T_A = 85^\circ C$ POWER RATING |
|---------------------|---------|-----------------|-----------------|---|---------------------------------------|------------------------------------|------------------------------------|
| Low K [‡] | DBV | 65.8 °C/W | 259 °C/W | 3.9 mW/°C | 386 mW | 212 mW | 154 mW |
| High K [§] | DBV | 65.8 °C/W | 180 °C/W | 5.6 mW/°C | 555 mW | 305 mW | 222 mW |

[‡] The JEDEC Low K (1s) board design used to derive this data was a 3 inch x 3 inch, two layer board with 2 ounce copper traces on top of the board.

[§] The JEDEC High K (2s2p) board design used to derive this data was a 3 inch x 3 inch, multilayer board with 1 ounce internal power and ground planes and 2 ounce copper traces on top and bottom of the board.

recommended operating conditions

| | | MIN | NOM | MAX | UNIT |
|---------------------------------------|----------|------|-----|-----|------|
| Input voltage, V_I | TPS76130 | 3.35 | 16 | | V |
| | TPS76132 | 3.58 | 16 | | |
| | TPS76133 | 3.68 | 16 | | |
| | TPS76138 | 4.18 | 16 | | |
| | TPS76150 | 5.38 | 16 | | |
| Continuous output current, I_O | | 0 | 100 | | mA |
| Operating junction temperature, T_J | | –40 | 125 | | °C |

TPS76130, TPS76132, TPS76133, TPS76138, TPS76150
LOW-POWER 100-mA LOW-DROPOUT LINEAR REGULATORS

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**electrical characteristics over recommended operating free-air temperature range,
 $V_I = V_{O(\text{typ})} + 1 \text{ V}$, $I_O = 1 \text{ mA}$, $EN = V_I$, $C_O = 4.7 \mu\text{F}$ (unless otherwise noted)**

| PARAMETER | | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|---------------------------------|----------------------|---|------|------|------|------------------|
| V_O | Output voltage | $T_J = 25^\circ\text{C}$ | 2.96 | 3 | 3.04 | V |
| | | $T_J = 25^\circ\text{C}$, $1 \text{ mA} < I_O < 100 \text{ mA}$ | 2.9 | | 3.04 | |
| | | $1 \text{ mA} < I_O < 100 \text{ mA}$ | 2.89 | | 3.07 | |
| | TPS76132 | $T_J = 25^\circ\text{C}$ | 3.16 | 3.2 | 3.24 | V |
| | | $T_J = 25^\circ\text{C}$, $1 \text{ mA} < I_O < 100 \text{ mA}$ | 3.11 | | 3.24 | |
| | | $1 \text{ mA} < I_O < 100 \text{ mA}$ | 3.08 | | 3.3 | |
| | TPS76133 | $T_J = 25^\circ\text{C}$ | 3.26 | 3.3 | 3.34 | V |
| | | $T_J = 25^\circ\text{C}$, $1 \text{ mA} < I_O < 100 \text{ mA}$ | 3.21 | | 3.34 | |
| | | $1 \text{ mA} < I_O < 100 \text{ mA}$ | 3.18 | | 3.4 | |
| | TPS76138 | $T_J = 25^\circ\text{C}$ | 3.76 | 3.8 | 3.84 | V |
| | | $T_J = 25^\circ\text{C}$, $1 \text{ mA} < I_O < 100 \text{ mA}$ | 3.71 | | 3.84 | |
| | | $1 \text{ mA} < I_O < 100 \text{ mA}$ | 3.68 | | 3.9 | |
| | TPS76150 | $T_J = 25^\circ\text{C}$ | 4.95 | 5 | 5.05 | V |
| | | $T_J = 25^\circ\text{C}$, $1 \text{ mA} < I_O < 100 \text{ mA}$ | 4.88 | | 5.05 | |
| | | $1 \text{ mA} < I_O < 100 \text{ mA}$ | 4.86 | | 5.1 | |
| $I_I(\text{standby})$ | Standby current | $EN = 0 \text{ V}$ | | | 1 | μA |
| Quiescent current (GND current) | | $I_O = 0 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 90 | 115 | | μA |
| | | $I_O = 0 \text{ mA}$ | | | 130 | |
| | | $I_O = 1 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 100 | 130 | | |
| | | $I_O = 1 \text{ mA}$ | | | 170 | |
| | | $I_O = 10 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 190 | 220 | | |
| | | $I_O = 10 \text{ mA}$ | | | 260 | |
| | | $I_O = 50 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 850 | 1100 | | |
| | | $I_O = 50 \text{ mA}$ | | | 1200 | |
| | | $I_O = 100 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 2600 | 3600 | | |
| | | $I_O = 100 \text{ mA}$ | | | 4000 | |
| Input regulation | TPS76130 | $4 \text{ V} < V_I < 16$, $I_O = 1 \text{ mA}$ | 3 | 10 | | mV |
| | TPS76132 | $4.2 \text{ V} < V_I < 16$, $I_O = 1 \text{ mA}$ | 3 | 10 | | |
| | TPS76133 | $4.3 \text{ V} < V_I < 16$, $I_O = 1 \text{ mA}$ | 3 | 10 | | |
| | TPS76138 | $4.8 \text{ V} < V_I < 16$, $I_O = 1 \text{ mA}$ | 3 | 10 | | |
| | TPS76150 | $6 \text{ V} < V_I < 16$, $I_O = 1 \text{ mA}$ | 3 | 10 | | |
| V_n | Output noise voltage | $BW = 300 \text{ Hz to } 50 \text{ kHz}$ $C_O = 10 \mu\text{F}$, $T_J = 25^\circ\text{C}$ | | | 190 | μVrms |
| | Ripple rejection | $f = 1 \text{ kHz}$, $C_O = 10 \mu\text{F}$, $T_J = 25^\circ\text{C}$ | | | 63 | dB |

TPS76130, TPS76132, TPS76133, TPS76138, TPS76150 LOW-POWER 100-mA LOW-DROPOUT LINEAR REGULATORS

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**electrical characteristics over recommended operating free-air temperature range,
 $V_I = V_O(\text{typ}) + 1 \text{ V}$, $I_O = 1 \text{ mA}$, $\text{EN} = V_I$, $C_O = 4.7 \mu\text{F}$ (unless otherwise noted) (continued)**

| PARAMETER | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------------------------------|---|-----|-----|-----|---------------|
| Dropout voltage | $I_O = 0 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 1 | 3 | | mV |
| | $I_O = 0 \text{ mA}$ | | 5 | | |
| | $I_O = 1 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 7 | 10 | | |
| | $I_O = 1 \text{ mA}$ | | 15 | | |
| | $I_O = 10 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 40 | 60 | | |
| | $I_O = 10 \text{ mA}$ | | 90 | | |
| | $I_O = 50 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 120 | 150 | | |
| | $I_O = 50 \text{ mA}$ | | 180 | | |
| | $I_O = 100 \text{ mA}$, $T_J = 25^\circ\text{C}$ | 170 | 240 | | |
| | $I_O = 100 \text{ mA}$ | | 280 | | |
| Peak output current/current limit | | 100 | 125 | 135 | mA |
| High level enable input | | 2 | | | V |
| Low level enable input | | | | 0.8 | V |
| I_I Input current (EN) | EN = 0 V | -1 | 0 | 1 | μA |
| | EN = V_I | | 2.5 | 5 | |

TYPICAL CHARACTERISTICS

Table of Graphs

| | | FIGURE |
|----------------|-------------------------|-------------------------|
| V_O | Output voltage | vs Output current |
| | | vs Free-air temperature |
| Ground current | | vs Free-air temperature |
| Output noise | | vs Frequency |
| Z_O | Output impedance | vs Frequency |
| V_{DO} | Dropout voltage | vs Free-air temperature |
| | Line transient response | |
| | Load transient response | |

TYPICAL CHARACTERISTICS

TPS76130
OUTPUT VOLTAGE
vs
OUTPUT CURRENT

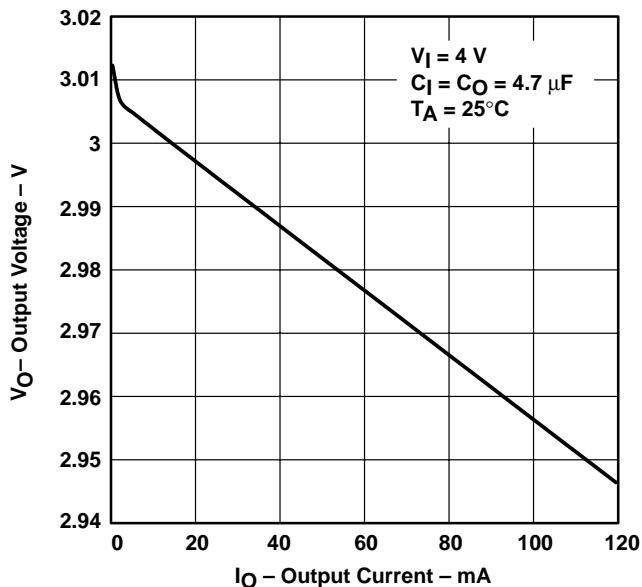


Figure 1

TPS76133
OUTPUT VOLTAGE
vs
OUTPUT CURRENT

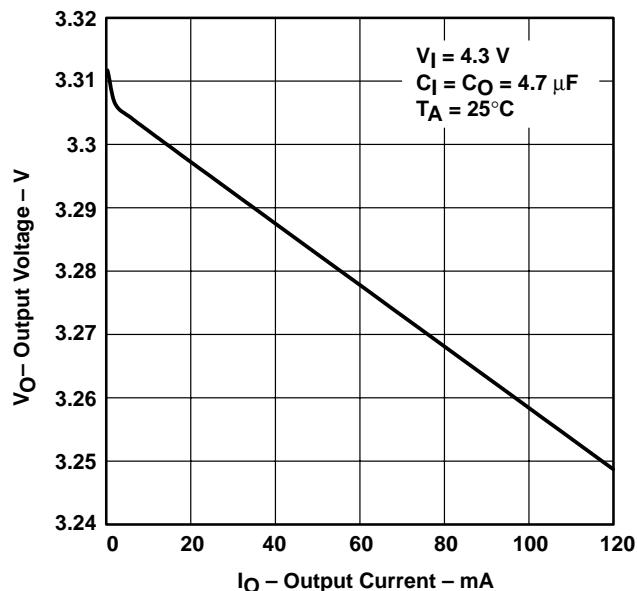


Figure 2

TPS76150
OUTPUT VOLTAGE
vs
OUTPUT CURRENT

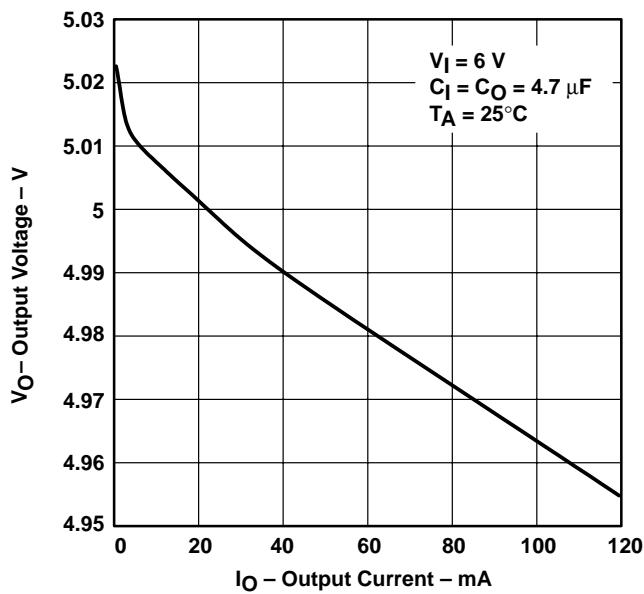


Figure 3

TPS76130
OUTPUT VOLTAGE
vs
FREE-AIR TEMPERATURE

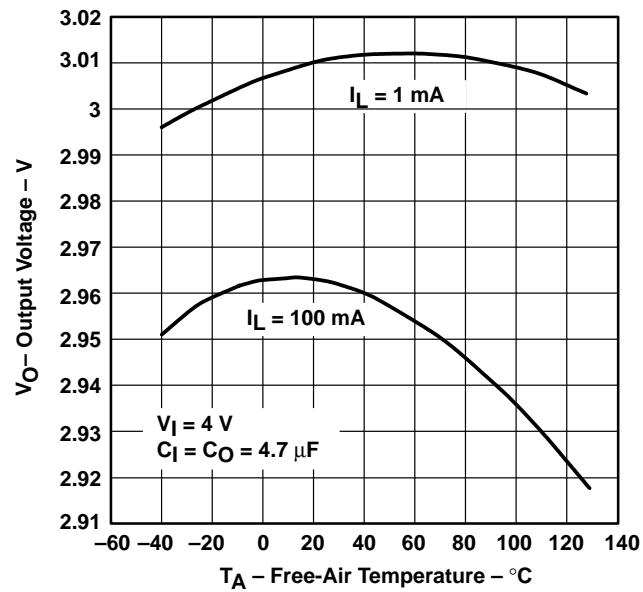


Figure 4

TPS76130, TPS76132, TPS76133, TPS76138, TPS76150 LOW-POWER 100-mA LOW-DROPOUT LINEAR REGULATORS

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TYPICAL CHARACTERISTICS

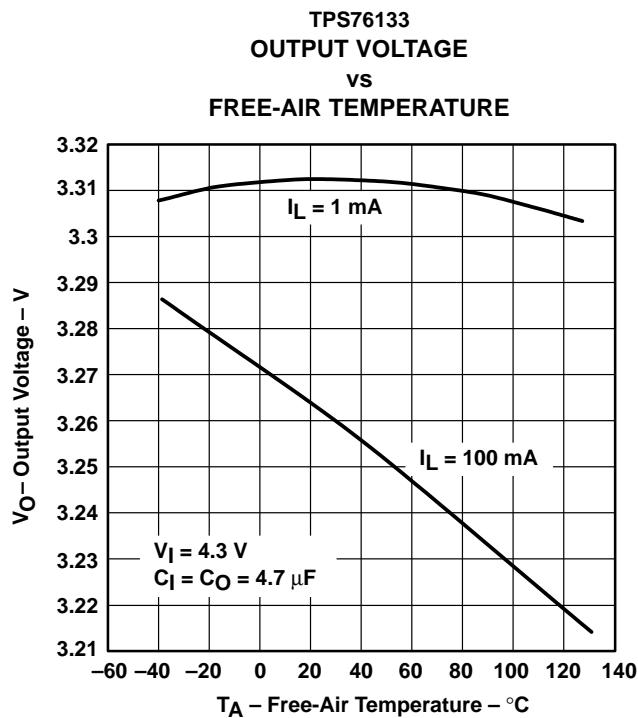


Figure 5

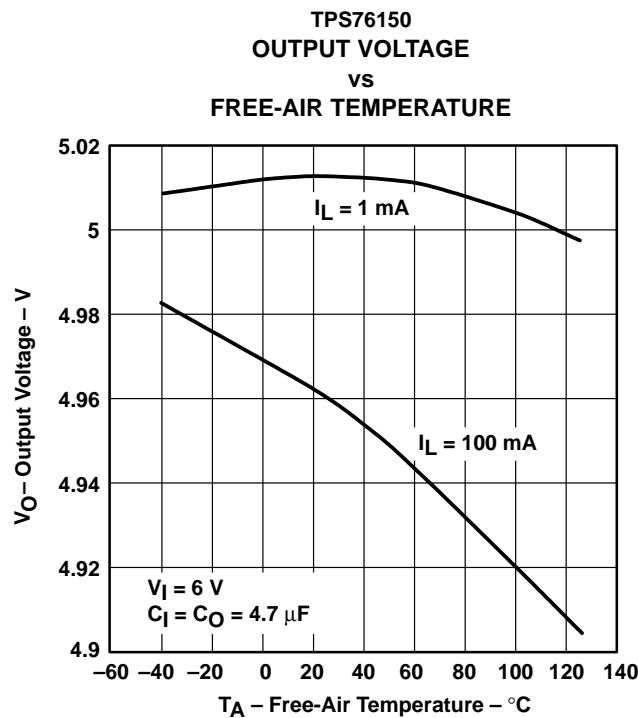


Figure 6

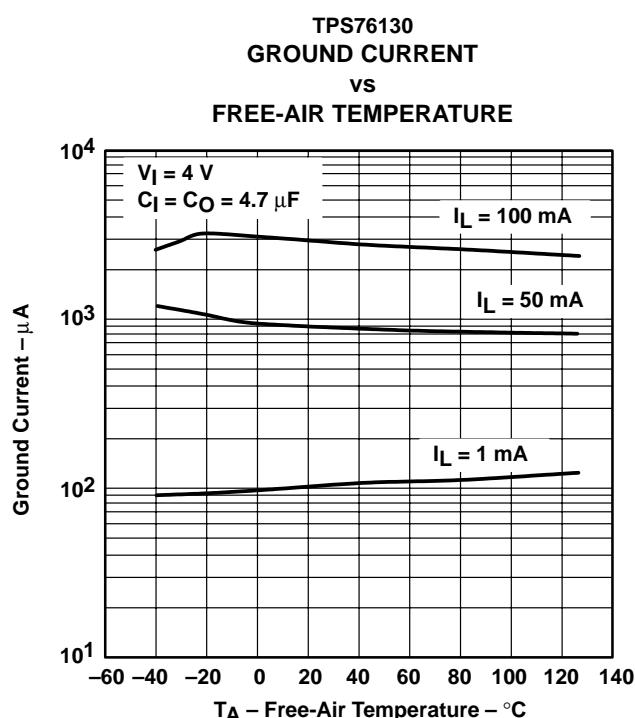


Figure 7

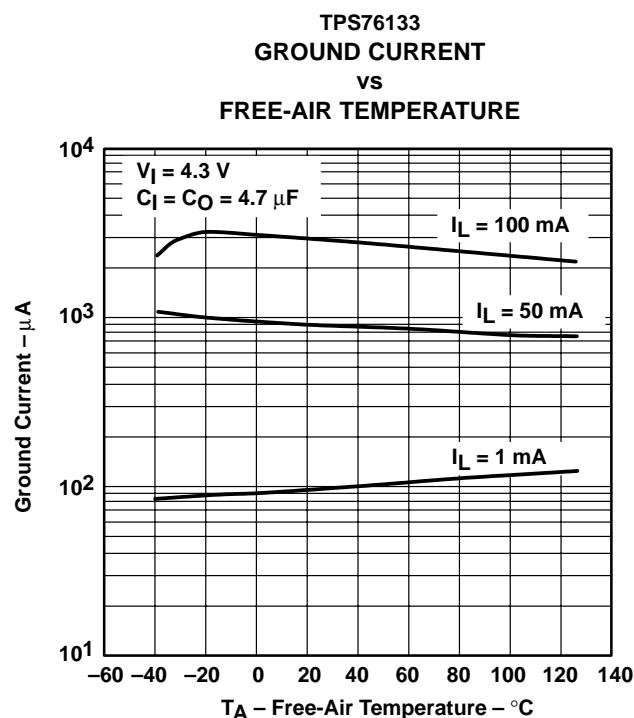


Figure 8

TYPICAL CHARACTERISTICS

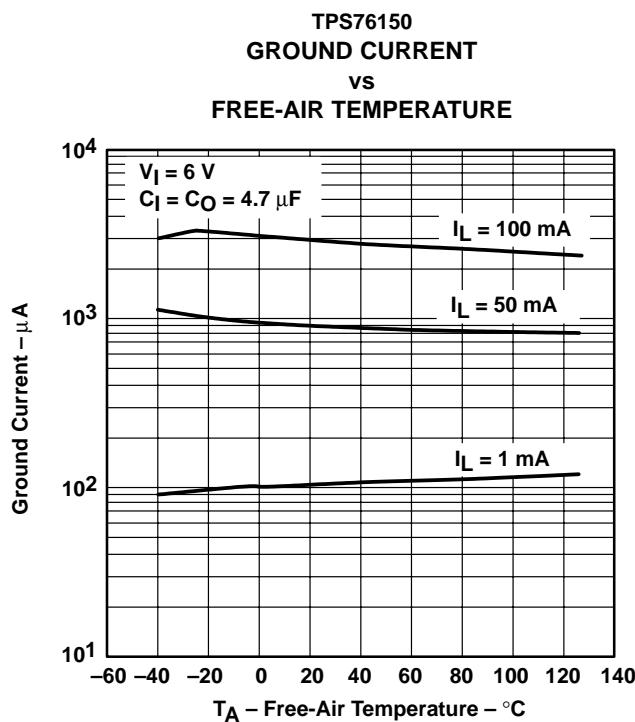


Figure 9

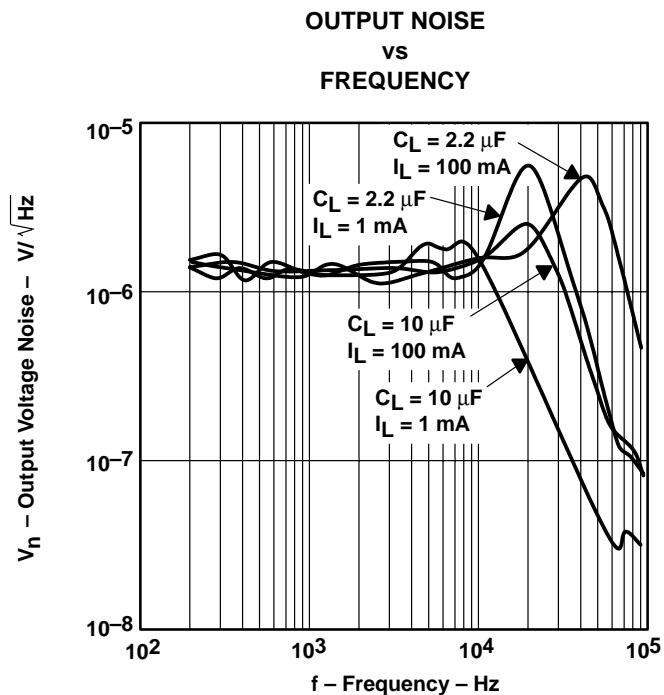


Figure 10

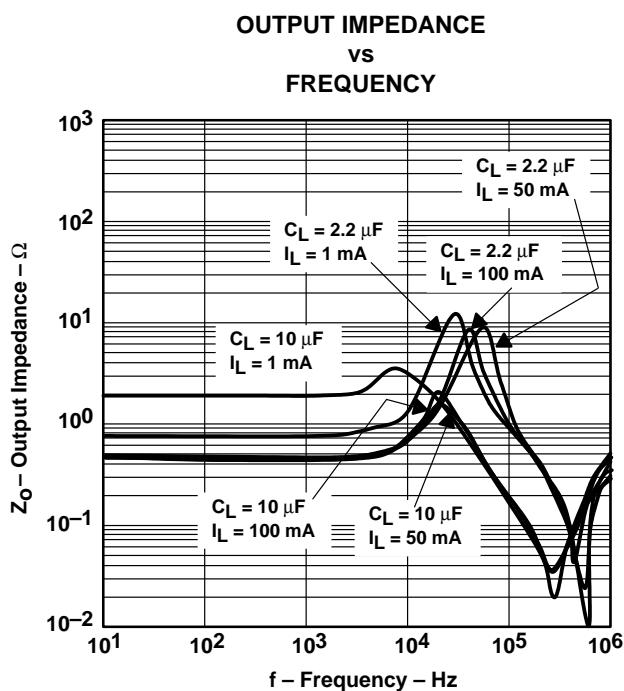


Figure 11

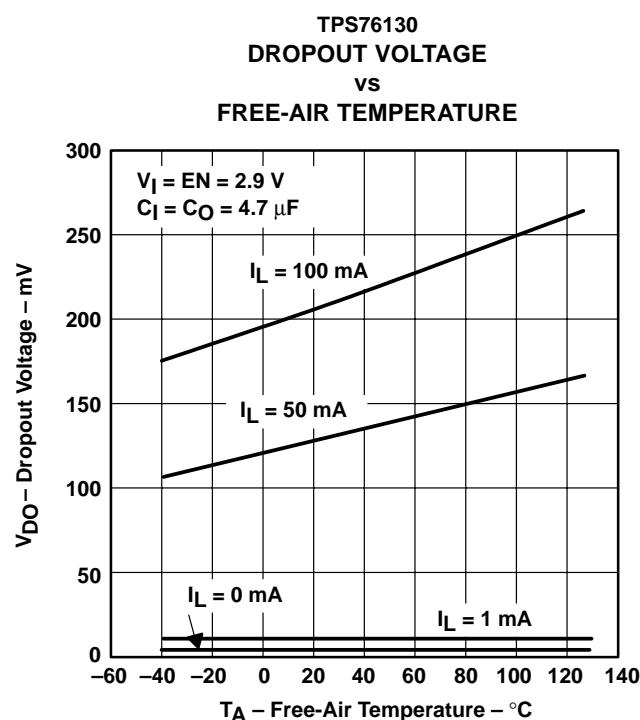


Figure 12

TPS76130, TPS76132, TPS76133, TPS76138, TPS76150 LOW-POWER 100-mA LOW-DROPOUT LINEAR REGULATORS

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TYPICAL CHARACTERISTICS

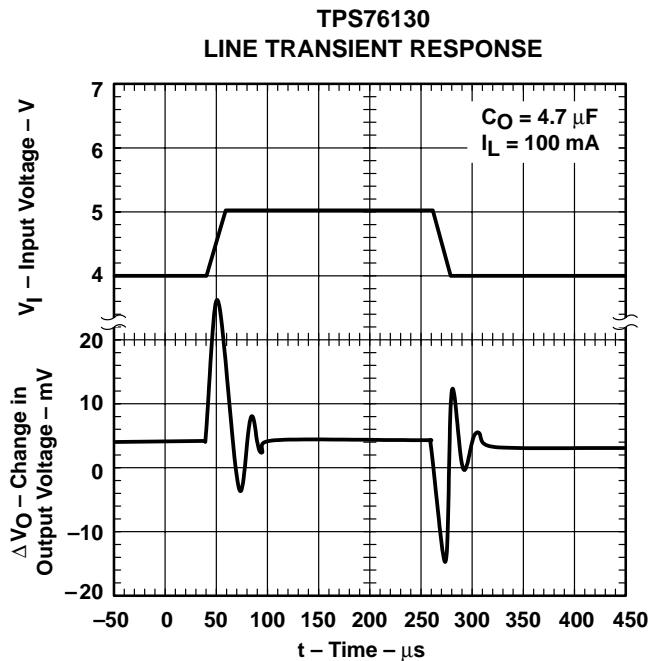


Figure 13

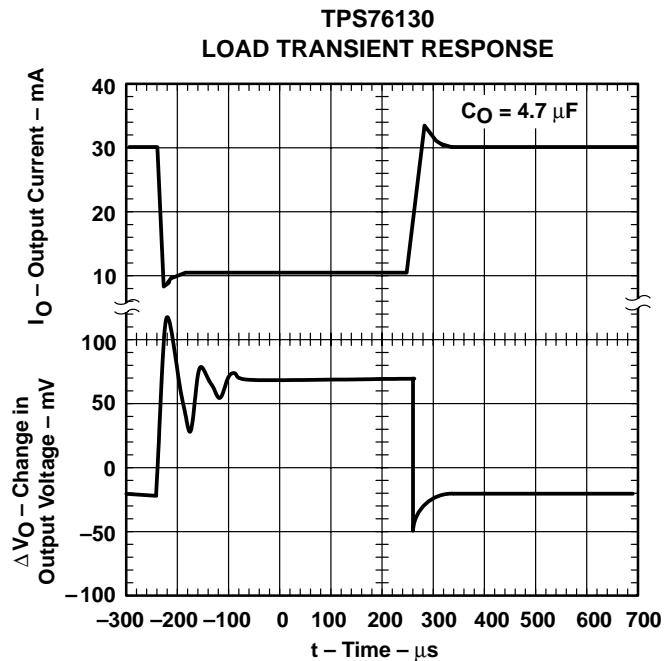


Figure 14

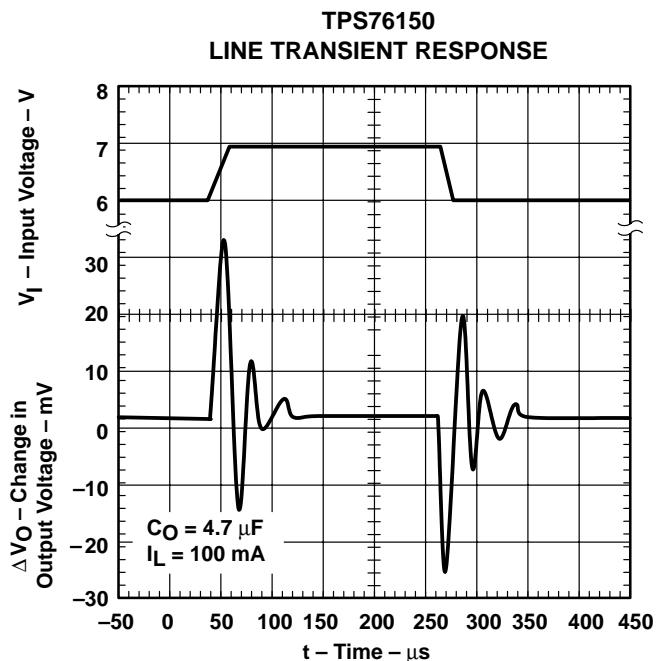


Figure 15

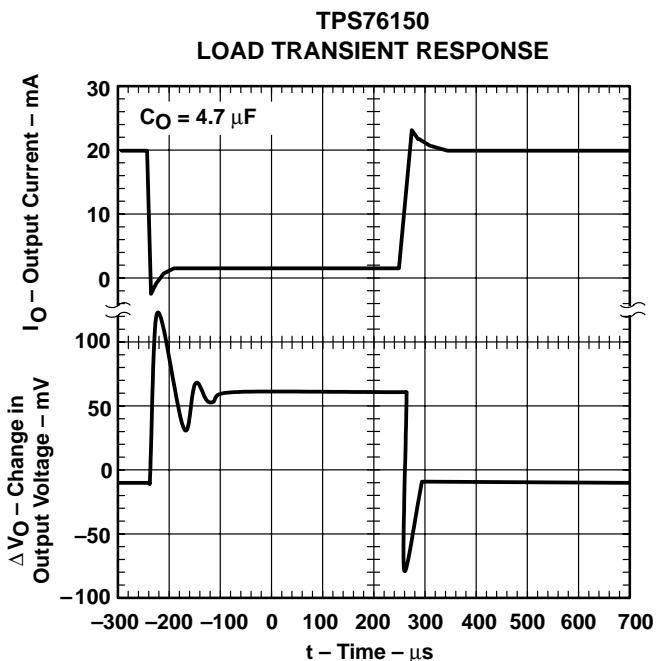


Figure 16

APPLICATION INFORMATION

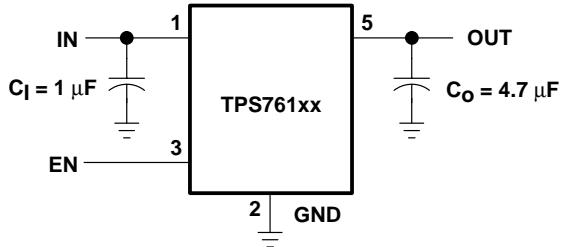


Figure 17. TPS761xx Typical Application

over current protection

The over current protection circuit forces the TPS761xx into a constant current output mode when the load is excessive or the output is shorted to ground. Normal operation resumes when the fault condition is removed.

NOTE:

An overload or short circuit may also activate the over temperature protection if the fault condition persists.

over temperature protection

The thermal protection system shuts the TPS761xx down when the junction temperature exceeds 160°C. The device recovers and operates normally when the temperature drops below 150°C.

input capacitor

A 1- μ F or larger ceramic decoupling capacitor with short leads connected between IN and GND is recommended. The decoupling capacitor may be omitted if there is a 1 μ F or larger electrolytic capacitor connected between IN and GND and located reasonably close to the TPS761xx. However, the small ceramic device is desirable even when the larger capacitor is present, if there is a lot of high frequency noise present in the system.

output capacitor

Like all low dropout regulators, the TPS761xx requires an output capacitor connected between OUT and GND to stabilize the internal control loop. The minimum recommended capacitance value is 4.7 μ F and the ESR (equivalent series resistance) must be between 0.1 Ω and 10 Ω . Solid tantalum electrolytic, aluminum electrolytic, and multilayer ceramic capacitors are all suitable, provided they meet the requirements described above. Most of the commercially available 4.7- μ F surface-mount solid-tantalum capacitors, including devices from Sprague, Kemet, and Nichicon, meet the ESR requirements stated above. Multilayer ceramic capacitors should have minimum values of 4.7 μ F over the full operating temperature range of the equipment.

enable (EN)

A logic zero on the enable input shuts the TPS761xx off and reduces the supply current to less than 1 μ A. Pulling the enable input high causes normal operation to resume. If the enable feature is not used, EN should be connected to IN to keep the regulator on all of the time. The EN input must not be left floating.

reverse current path

The power transistor used in the TPS761xx has an inherent diode connected between IN and OUT as shown in the functional block diagram. This diode conducts current from the OUT terminal to the IN terminal whenever IN is lower than OUT by a diode drop. This condition does not damage the TPS761xx provided the current is limited to 150 mA.

PACKAGING INFORMATION

| Orderable part number | Status (1) | Material type (2) | Package Pins | Package qty Carrier | RoHS (3) | Lead finish/ Ball material (4) | MSL rating/ Peak reflow (5) | Op temp (°C) | Part marking (6) |
|------------------------------|---------------|----------------------|------------------|-----------------------|-------------|--------------------------------------|-----------------------------------|--------------|---------------------|
| TPS76130DBVR | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAEI |
| TPS76130DBVR.A | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAEI |
| TPS76130DBVT | Active | Production | SOT-23 (DBV) 5 | 250 SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAEI |
| TPS76130DBVT.A | Active | Production | SOT-23 (DBV) 5 | 250 SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAEI |
| TPS76132DBVR | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAFI |
| TPS76132DBVR.A | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAFI |
| TPS76132DBVT | Active | Production | SOT-23 (DBV) 5 | 250 SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAFI |
| TPS76132DBVT.A | Active | Production | SOT-23 (DBV) 5 | 250 SMALL T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAFI |
| TPS76133DBVR | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAII |
| TPS76133DBVR.A | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PAII |
| TPS76133DBVT | Obsolete | Production | SOT-23 (DBV) 5 | - | - | Call TI | Call TI | -40 to 125 | PAII |
| TPS76138DBVR | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU SN | Level-1-260C-UNLIM | -40 to 125 | PAKI |
| TPS76138DBVR.A | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | SN | Level-1-260C-UNLIM | -40 to 125 | PAKI |
| TPS76138DBVT | Active | Production | SOT-23 (DBV) 5 | 250 SMALL T&R | Yes | NIPDAU SN | Level-1-260C-UNLIM | -40 to 125 | PAKI |
| TPS76138DBVT.A | Active | Production | SOT-23 (DBV) 5 | 250 SMALL T&R | Yes | SN | Level-1-260C-UNLIM | -40 to 125 | PAKI |
| TPS76150DBVR | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PALI |
| TPS76150DBVR.A | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PALI |
| TPS76150DBVRG4 | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PALI |
| TPS76150DBVRG4.A | Active | Production | SOT-23 (DBV) 5 | 3000 LARGE T&R | Yes | NIPDAU | Level-1-260C-UNLIM | -40 to 125 | PALI |
| TPS76150DBVT | Obsolete | Production | SOT-23 (DBV) 5 | - | - | Call TI | Call TI | -40 to 125 | PALI |

⁽¹⁾ **Status:** For more details on status, see our [product life cycle](#).

⁽²⁾ **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

⁽³⁾ **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

⁽⁴⁾ **Lead finish/Ball material:** Parts 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.

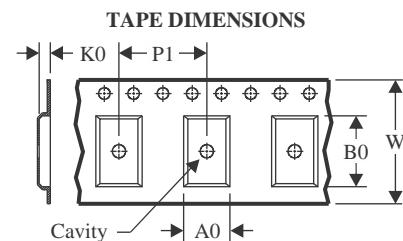
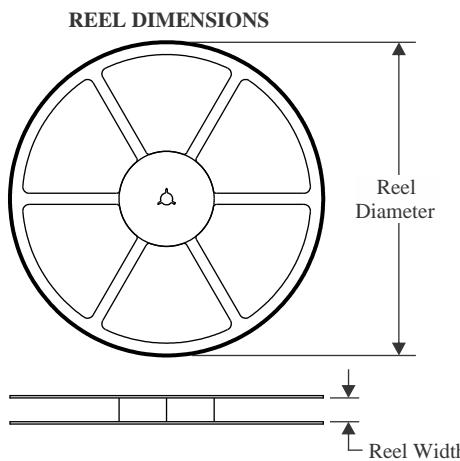
⁽⁵⁾ **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

⁽⁶⁾ **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

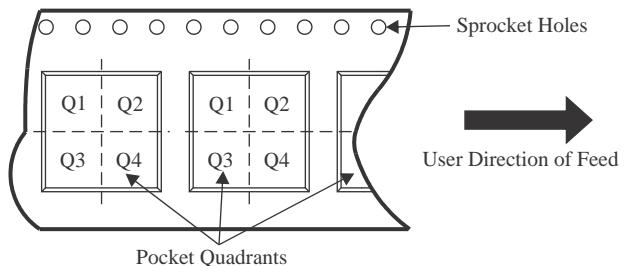
Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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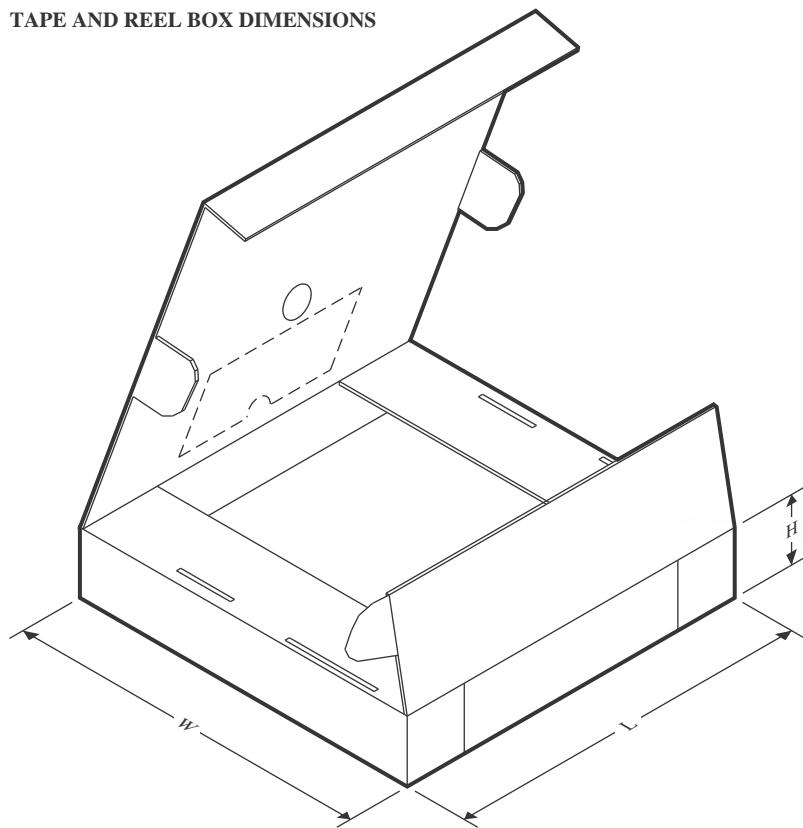
TAPE AND REEL INFORMATION


| | |
|----|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

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 |
|----------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| TPS76130DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 9.0 | 3.15 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76130DBVT | SOT-23 | DBV | 5 | 250 | 180.0 | 9.0 | 3.15 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76132DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 9.0 | 3.15 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76132DBVT | SOT-23 | DBV | 5 | 250 | 180.0 | 9.0 | 3.15 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76133DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 9.0 | 3.15 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76138DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 8.4 | 3.2 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76138DBVT | SOT-23 | DBV | 5 | 250 | 180.0 | 8.4 | 3.2 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76150DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 8.4 | 3.2 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76150DBVR | SOT-23 | DBV | 5 | 3000 | 180.0 | 8.4 | 3.2 | 3.2 | 1.4 | 4.0 | 8.0 | Q3 |
| TPS76150DBVRG4 | SOT-23 | DBV | 5 | 3000 | 180.0 | 8.4 | 3.2 | 3.2 | 1.4 | 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) |
|----------------|--------------|-----------------|------|------|-------------|------------|-------------|
| TPS76130DBVR | SOT-23 | DBV | 5 | 3000 | 182.0 | 182.0 | 20.0 |
| TPS76130DBVT | SOT-23 | DBV | 5 | 250 | 182.0 | 182.0 | 20.0 |
| TPS76132DBVR | SOT-23 | DBV | 5 | 3000 | 182.0 | 182.0 | 20.0 |
| TPS76132DBVT | SOT-23 | DBV | 5 | 250 | 182.0 | 182.0 | 20.0 |
| TPS76133DBVR | SOT-23 | DBV | 5 | 3000 | 182.0 | 182.0 | 20.0 |
| TPS76138DBVR | SOT-23 | DBV | 5 | 3000 | 210.0 | 185.0 | 35.0 |
| TPS76138DBVT | SOT-23 | DBV | 5 | 250 | 210.0 | 185.0 | 35.0 |
| TPS76150DBVR | SOT-23 | DBV | 5 | 3000 | 210.0 | 185.0 | 35.0 |
| TPS76150DBVR | SOT-23 | DBV | 5 | 3000 | 210.0 | 185.0 | 35.0 |
| TPS76150DBVRG4 | SOT-23 | DBV | 5 | 3000 | 210.0 | 185.0 | 35.0 |

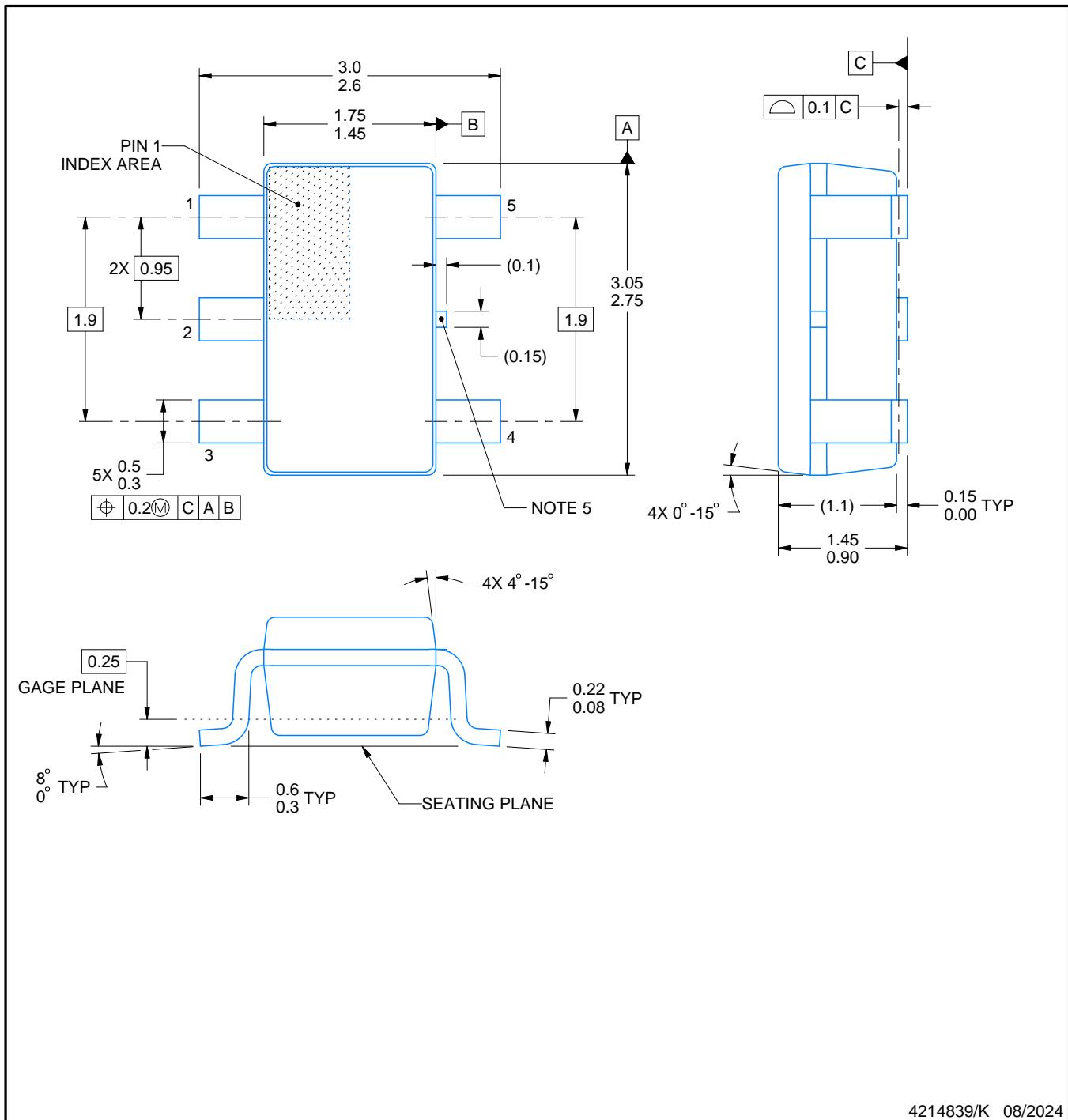
PACKAGE OUTLINE

DBV0005A



SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



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NOTES:

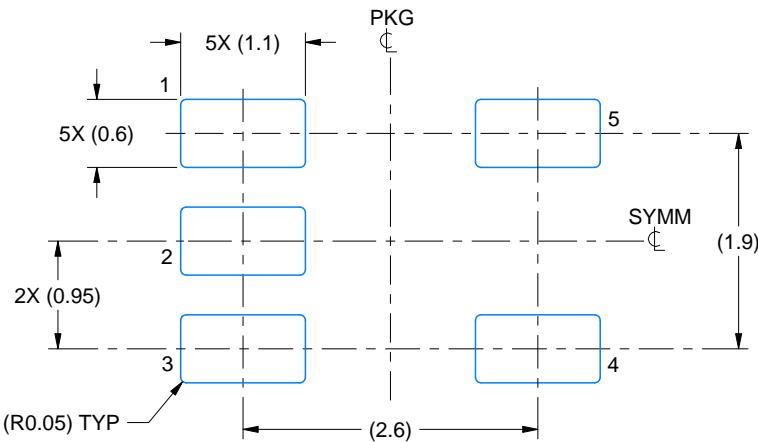
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. Reference JEDEC MO-178.
4. Body dimensions do not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.25 mm per side.
5. Support pin may differ or may not be present.

EXAMPLE BOARD LAYOUT

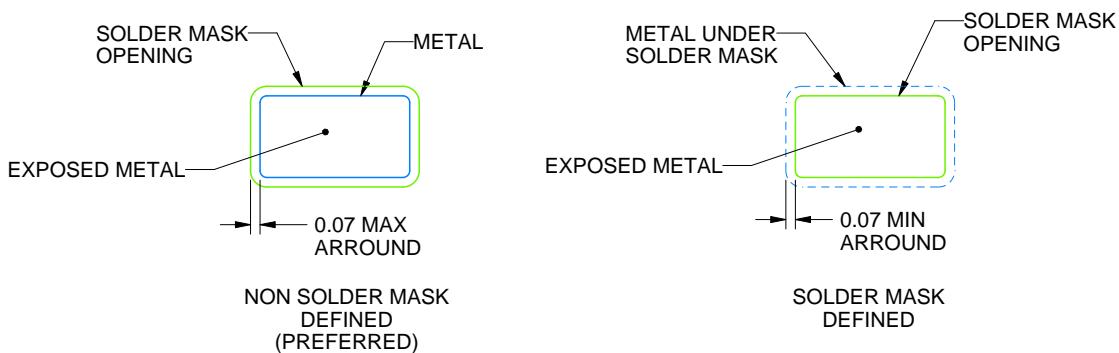
DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE:15X



SOLDER MASK DETAILS

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NOTES: (continued)

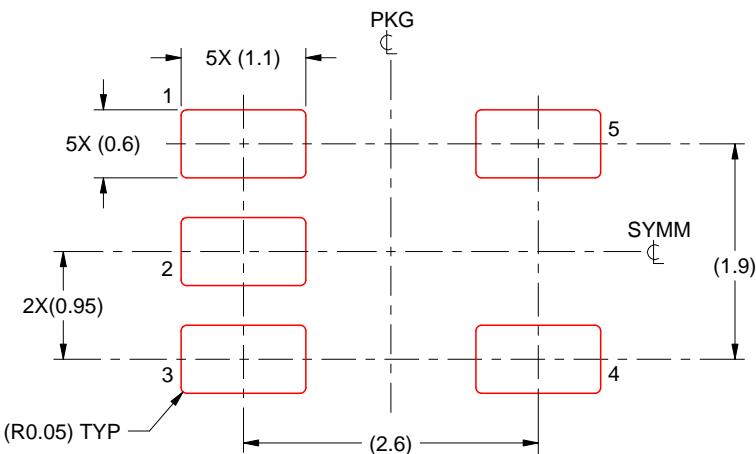
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DBV0005A

SOT-23 - 1.45 mm max height

SMALL OUTLINE TRANSISTOR



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:15X

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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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