

TPS7B4253-Q1 300-mA Low-Dropout Voltage-Tracking LDO

1 Features

- Qualified for Automotive Applications
- AEC-Q100 Qualified With the Following Results:
 - Device Temperature Grade 1: -40°C to 125°C Ambient Operating Temperature Range
 - Device HBM ESD Classification Level 3
 - Device CDM ESD Classification Level C5
- -40 - to 45 -V Wide Input-Voltage Range (Max)
- Output Voltage Adjusts Down to:
 - 1.5 to 40 V (HTSSOP)
 - 2 to 40 V (HSOP)
- 300-mA Output Current Capability
- Very-Low Output Tracking Tolerance, 5 mV (Max)
- 350-mV Low Dropout Voltage when $I_O = 200$ mA
- Separated Tracking and Enable Input
- 40- μA Low Quiescent Current at Light Loads
- Extremely Wide ESR Range.
 - Stable with 10- to 500- μF Ceramic Output Capacitor, ESR 1 m Ω to 20 Ω
- Reverse Polarity Protection
- Overtemperature Protection
- Output Short-Circuit Proof to Ground and Supply
- Available in the Following Packages:
 - 8-Pin HSOP Package
 - 20-Pin HTSSOP Package

2 Applications

- Automotive
- Off-Board Sensor Supply
- High-Precision Voltage Tracking

3 Description

The TPS7B4253-Q1 device is a monolithic integrated low dropout voltage tracker. The device is designed to supply off-board systems in automotive environments such as a sensor in an engine management system. The IC has integrated protection for overload, overtemperature, and reverse-polarity protection. The device also has output short-circuit protection to battery and ground. The device is available in an HSOP-8 and HTSSOP-20 package. The HTSSOP-20 package has an exposed pad that provides extremely low thermal resistance.

Supply voltages up to 45-V input voltage are regulated to a reference voltage applied at the adjust input, ADJ, with high accuracy, and loads up to 300 mA.

In order to reduce the quiescent current to a minimum, the TPS7B4253-Q1 device can be switched to standby mode by setting the adjust and enable inputs, ADJ and EN, to low.

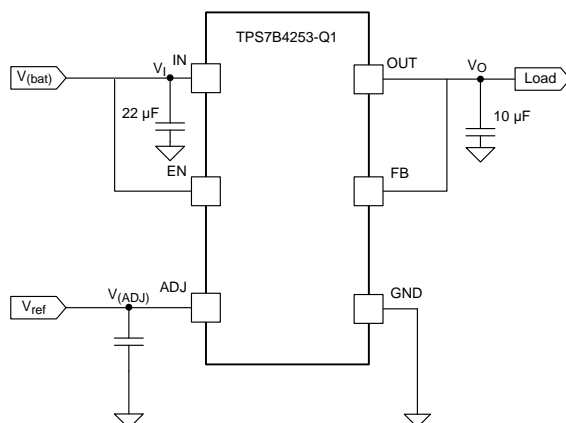
Device Information⁽¹⁾

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS7B4253-Q1	HSOP (8)	4.89 mm x 3.90 mm
	HTSSOP (20)	6.50 mm x 4.40 mm

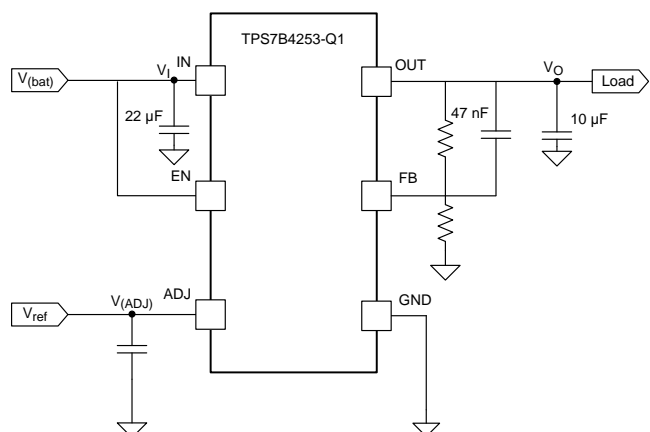
(1) For all available packages, see the orderable addendum at the end of the datasheet.

4 Typical Application Schematic

Output Voltage Equals Reference Voltage



Output Voltage Higher Than Reference Voltage



5 Device and Documentation Support

5.1 Trademarks

All trademarks are the property of their respective owners.

5.2 Electrostatic Discharge Caution



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.

5.3 Glossary

[SLYZ022](#) — *TI Glossary*.

This glossary lists and explains terms, acronyms, and definitions.

6 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
TPS7B4253QDDARQ1	PREVIEW	SO PowerPAD	DDA	8	2500	TBD	Call TI	Call TI	-40 to 125		
TPS7B4253QPWPRQ1	PREVIEW	HTSSOP	PWP	20	2000	TBD	Call TI	Call TI	-40 to 125		

(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) 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) 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/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.

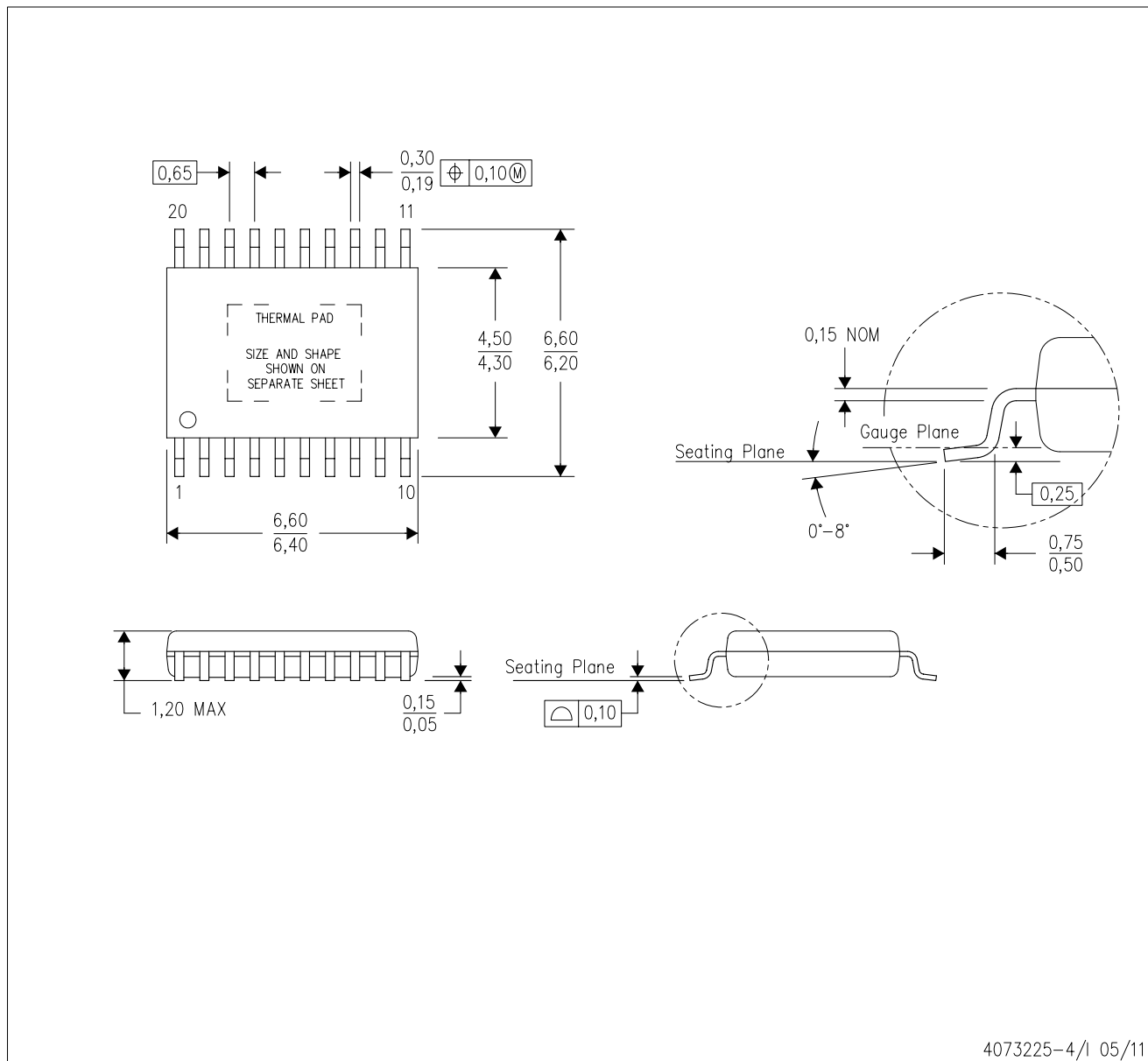
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MECHANICAL DATA

PWP (R-PDSO-G20)

PowerPAD™ PLASTIC SMALL OUTLINE



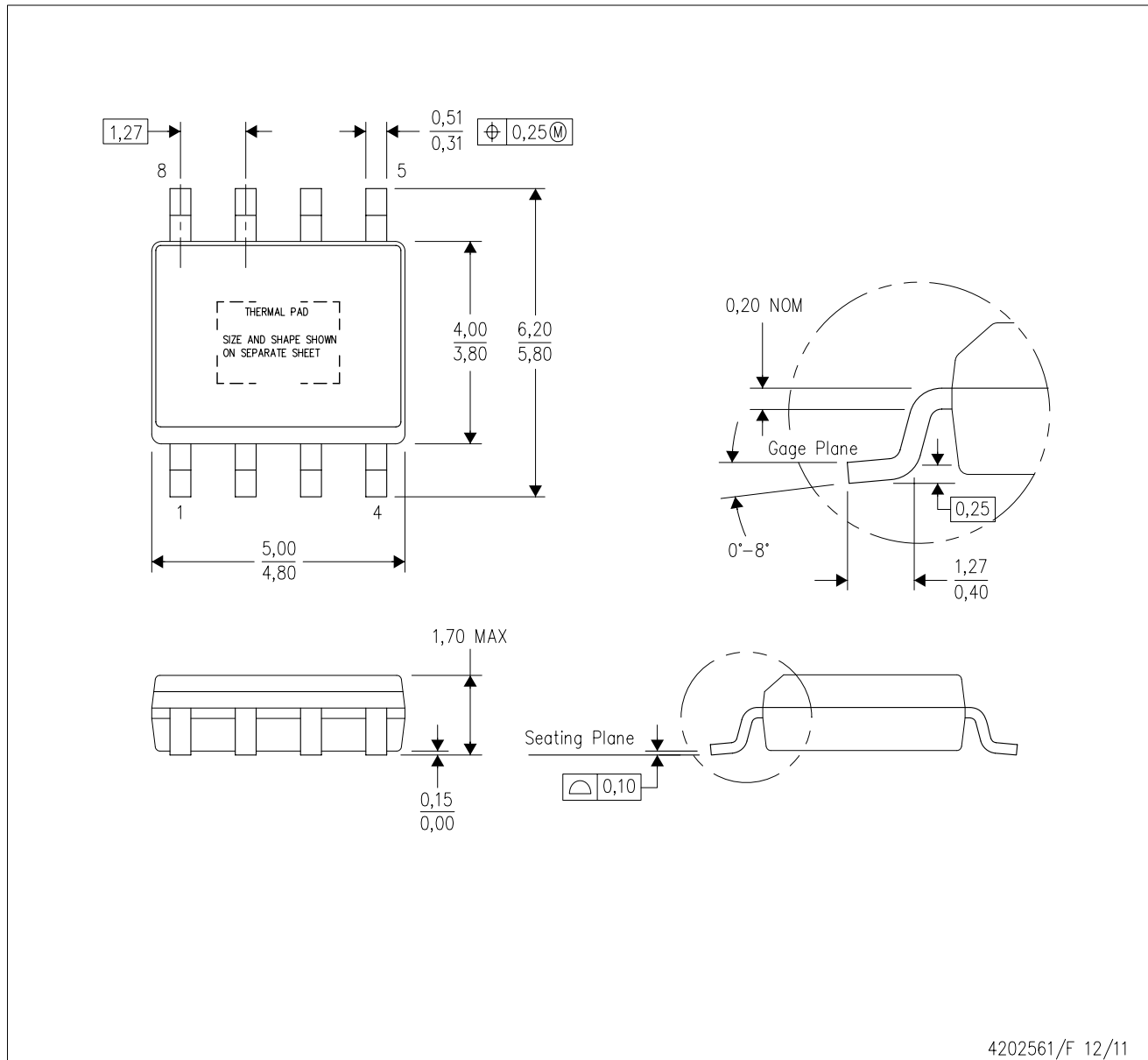
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- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Body dimensions do not include mold flash or protrusions. Mold flash and protrusion shall not exceed 0.15 per side.
 - This package is designed to be soldered to a thermal pad on the board. Refer to Technical Brief, PowerPad Thermally Enhanced Package, Texas Instruments Literature No. SLMA002 for information regarding recommended board layout. This document is available at www.ti.com <<http://www.ti.com>>.
 - See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
 - Falls within JEDEC MO-153

PowerPAD is a trademark of Texas Instruments.

DDA (R-PDSO-G8)

PowerPAD™ PLASTIC SMALL-OUTLINE



4202561/F 12/11

- NOTES:
- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5-1994.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion not to exceed 0,15.
 - D. This package is designed to be soldered to a thermal pad on the board. Refer to Technical Brief, PowerPad Thermally Enhanced Package, Texas Instruments Literature No. SLMA002 for information regarding recommended board layout. This document is available at www.ti.com <<http://www.ti.com>>.
 - E. See the additional figure in the Product Data Sheet for details regarding the exposed thermal pad features and dimensions.
 - F. This package complies to JEDEC MS-012 variation BA

PowerPAD is a trademark of Texas Instruments.

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