

## TPS382x Voltage Monitor With Watchdog Timer

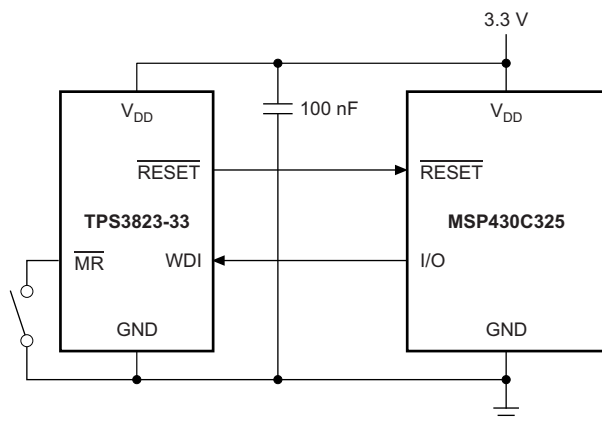
### 1 Features

- Power-On reset generator with fixed delay time of 200 ms (TPS3823/4/5/8) or 25 ms (TPS3820)
- Manual reset input (TPS3820/3/5/8)
- Reset output available in active-low (TPS3820/3/4/5), active-high (TPS3824/5), and open drain (TPS3828)
- Supply voltage supervision range: 2.5 V, 3 V, 3.3 V, 5 V
- Watchdog timer (TPS3820/3/4/8)
- Supply current of 15  $\mu$ A (Typical)
- 5-Pin SOT-23 package
- Temperature range:  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  ( $-40^{\circ}\text{C}$  to  $125^{\circ}\text{C}$  for TPS3823A-33)

### 2 Applications

- [DSPs, microcontrollers, or microprocessors](#)
- [Industrial equipment](#)
- [Programmable controls](#)
- [Automotive systems](#)
- [Portable and battery-powered equipment](#)
- [Intelligent instruments](#)
- [Wireless communications systems](#)
- [Notebook and desktop computers](#)

#### Typical Application Schematic



### 3 Description

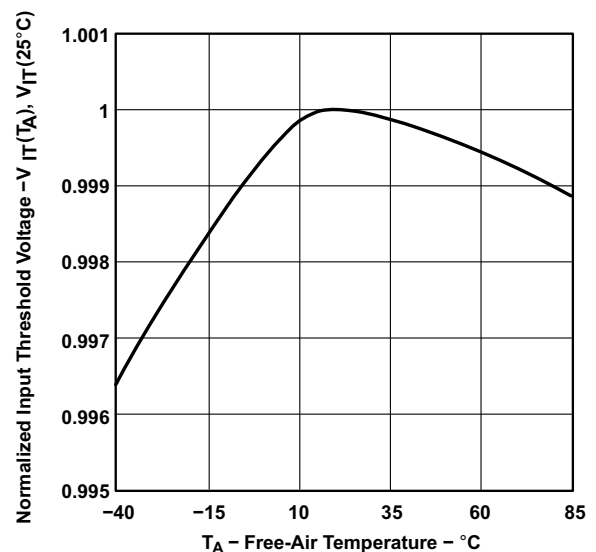
The TPS382x family of supervisors provide circuit initialization and timing supervision, primarily for DSP and processor-based systems. During power on,  $\overline{\text{RESET}}$  asserts when the supply voltage  $V_{\text{DD}}$  becomes greater than 1.1 V. Thereafter, the supply voltage supervisor monitors  $V_{\text{DD}}$  and keeps  $\overline{\text{RESET}}$  active low as long as  $V_{\text{DD}}$  remains less than the threshold voltage,  $V_{\text{IT-}}$ . An internal timer delays the return of the output to the inactive state (high) to ensure proper system reset. The delay time,  $t_{\text{d}}$ , starts after  $V_{\text{DD}}$  has risen above the threshold voltage ( $V_{\text{IT-}} + V_{\text{HYS}}$ ). When the supply voltage drops below the threshold voltage  $V_{\text{IT-}}$ , the output becomes active (low) again. No external components are required. All the devices of this family have a fixed-sense threshold voltage,  $V_{\text{IT-}}$ , set by an internal voltage divider. The TPS382x family also offers watchdog time out options of 200 ms (TPS3820) and 1.6 s (TPS3823/4/8).

#### Device Information<sup>(1)</sup>

PART NUMBER	PACKAGE	BODY SIZE (NOM)
TPS382x	SOT-23 (5)	2.90 mm x 1.60 mm

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

#### Normalized Input Threshold Voltage vs Free-Air Temperature



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## 4 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

<b>Changes from Revision L (January 2018) to Revision M</b>	<b>Page</b>
• Added Operating free-air, $T_A$ for TPS3823A-33 only .....	5
• Added Electrical Characteristics for TPS3823A-33 only Table .....	7
• Added new typical performance curves figure 9 through 26 .....	10

<b>Changes from Revision K (November 2015) to Revision L</b>	<b>Page</b>
• Changed the $\overline{\text{RESET}}$ columns for the TPS3824 and TPS3828 devices.....	4
• Removed 'Open-drain' from the RESET column for the TPS3828 device.....	4
• Changed text in the $\overline{\text{MR}}$ pin description from: RESET to: $\overline{\text{RESET}}$ .....	4

<b>Changes from Revision J (April 2013) to Revision K</b>	<b>Page</b>
• Added <i>ESD Ratings</i> table, <i>Feature Description</i> section, <i>Device Functional Modes</i> , <i>Application and Implementation</i> section, <i>Power Supply Recommendations</i> section, <i>Layout</i> section, <i>Device and Documentation Support</i> section, and <i>Mechanical, Packaging, and Orderable Information</i> section .....	1
• Changed front-page figure.....	1
• Changed <i>Pin Configuration and Functions</i> section; updated table format.....	4
• Changed "free-air temperature" to "junction temperature" in <i>Absolute Maximum Ratings</i> condition statement .....	5
• Deleted <i>Soldering temperature</i> specification from <i>Absolute Maximum Ratings</i> table.....	5
• Changed <i>clamp current</i> to <i>current</i> specifications in <i>Absolute Maximum Ratings</i> table .....	5
• Changed Removed $V_I$ from <i>Absolute Maximum Ratings</i> table .....	5
• Changed Removed $V_{\text{SENSE}}$ from <i>Recommended Operating Conditions</i> table.....	5
• Changed free-air temperature to junction temperature in <i>Electrical Characteristics</i> condition statement.....	6
• Changed " $T_A$ " to " $T_J$ " in <i>Timing Requirements</i> condition statement .....	7
• Changed " $T_A$ " to " $T_J$ " in <i>Switching Characteristics</i> condition statement .....	7

• Added footnote (3) to <i>Functional Block Diagram</i> .....	14
• Changed part number shown in <a href="#">Figure 27</a> .....	16
• Changed <a href="#">Figure 29</a> .....	18

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**Changes from Revision I (February 2013) to Revision J**
**Page**

• Added <i>TPS382xA-33</i> to second $\overline{\text{RESET}}$ row of $V_{OH}$ parameter in <i>Electrical Characteristics</i> table .....	6
• Added <i>TPS382xA-33</i> to third $\overline{\text{RESET}}$ row of $V_{OL}$ parameter in <i>Electrical Characteristics</i> table .....	6
• Corrected typo in $V_{OL}$ $\overline{\text{RESET}}$ parameter test conditions .....	6
• Added <i>TPS382xA-33</i> to third and seventh rows of $V_{IT-}$ parameter in <i>Electrical Characteristics</i> table .....	6
• Added <i>TPS382xA-33</i> to third row of $V_{hys}$ parameter in <i>Electrical Characteristics</i> table .....	6
• Added <i>TPS382xA-33</i> to third row of $I_{OS}$ parameter in <i>Electrical Characteristics</i> table .....	7
• Added <i>TPS3823A</i> to second row of $t_{out}$ parameter in <i>Switching Characteristics</i> table .....	7
• Added <i>TPS3823A</i> to second row of $t_d$ parameter in <i>Switching Characteristics</i> table .....	7
• Added <i>TPS3823A</i> to first row of $t_{PHL}$ parameter in <i>Switching Characteristics</i> table .....	8

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**Changes from Revision H (July 2012) to Revision I**
**Page**

• Added last row of <i>Terminal Functions</i> table to Package Information table .....	4
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