

TSP776xx:

Fast-Transient-Response 500-mA Low Dropout Voltage Regulators

Product Feature Sheet

Features

- Controlled baseline
 - One assembly/test site, one fabrication site
- Extended temperature performance of -40°C to 125°C
- Enhanced diminishing manufacturing sources (DMS) support
- Enhanced product change notification
- Qualification pedigree[†]
- Open drain power good
- 500-mA low-dropout voltage regulator
- Available in 1.5 V, 1.8 V, 2.5 V, 2.8 V, 3.3 V fixed output and adjustable versions
- Dropout voltage to 169 mV (Typ) at 500 mA (TPS77633)
- Ultralow 85 μA typical quiescent current fast transient response
- 2% tolerance over specified conditions for fixed-output versions
- 20-pin TSSOP PowerPAD™ (PWP) package thermal shutdown protection

[†] Component qualification in accordance with JEDEC and industry standards to ensure reliable operation over an extended temperature range. This includes, but is not limited to, Highly Accelerated Stress Test (HAST) or biased 85/85, temperature cycle, autoclave or unbiased HAST, electromigration, bond intermetallic life, and mold compound life. Such qualification testing should not be viewed as justifying use of this component beyond specified performance and environmental limits.

Packaging

- The TPS776xx family is available in a 20 pin TSSOP package.

Device Overview

The TPS776xx devices are designed to have a fast transient response and be stable with a 10- μF low ESR capacitor. This combination provides high performance at a reasonable cost.

Because the PMOS device behaves as a low-value resistor, the dropout voltage is very low (typically 169 mV at an output current of 500 mA for the TPS77633) and is directly proportional to the output current. Additionally, since the PMOS pass element is a voltage-driven device, the quiescent current is very low and independent of output loading (typically 85 μA over the full range of output current, 0 mA to 500 mA). These two key specifications yield a significant improvement in operating life for battery powered systems. This LDO family also features a sleep mode; applying a TTL high signal to EN (enable) shuts down the regulator, reducing the quiescent current to 1 μA at $T_j = 25^{\circ}\text{C}$.

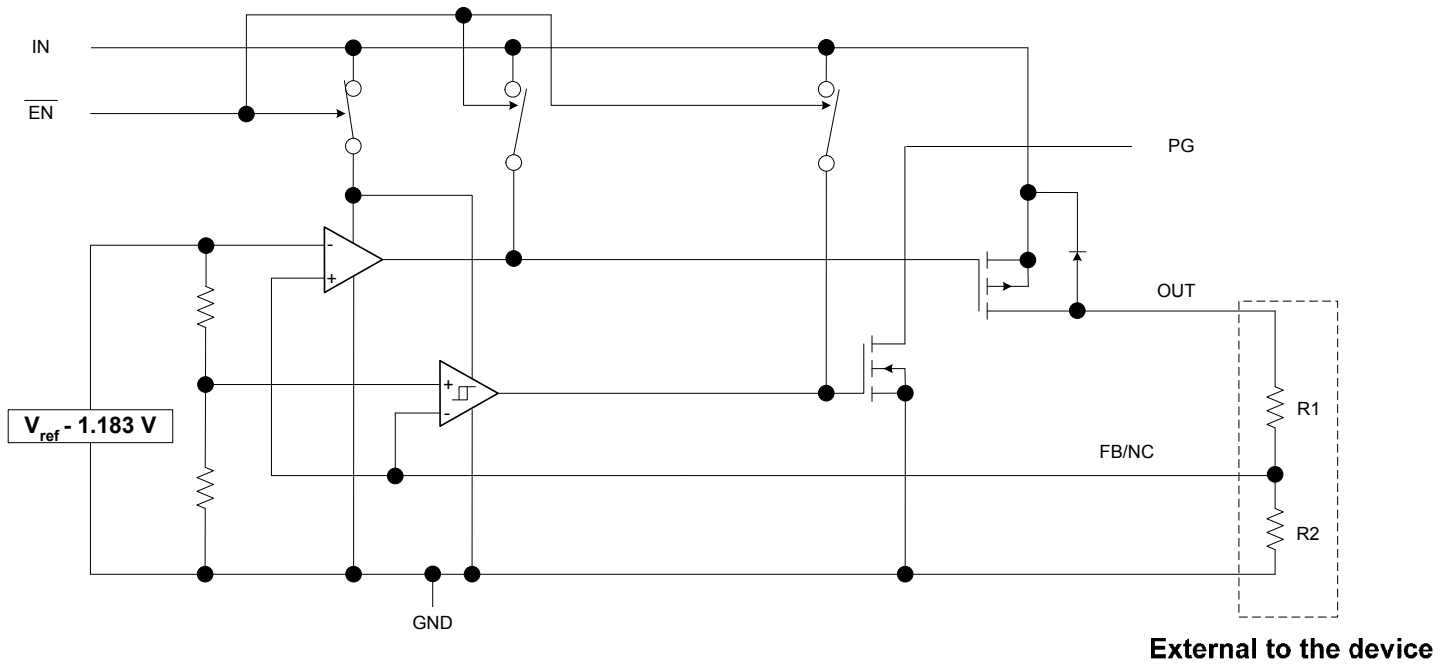
Power good (PG) of the TPS776xx is an active high output, which can be used to implement a power-on reset or a low-battery indicator. The TPS776xx are offered in 1.5-V, 1.8-V, 2.5-V, 2.8 V, and 3.3-V fixed-voltage versions and in an adjustable version (programmable over the range of 1.2 V to 5.5 V for TPS77601 option). Output voltage tolerance is specified as a maximum of 2% over line, load, and temperature ranges. The TPS776xx family is available in 20 pin TSSOP package.

Absolute Maximum Ratings:

Input Voltage Range	-0.3 V to 13.5 V
Voltage Range at EN	-0.3 V to 16.5 V
Maximum PG Voltage	16.5 V
Peak Output Current	Internally Limited
Output Voltage, V_o (OUT, FB)	7 V
Operating Virtual Junction Temperature Range, T_j	-40°C to 125°C
Storage Temperature Range, T_{stg}	-65°C to 150°C
ESD Rating, HMB	2.0 W

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Functional Block Diagram - Adjustable Version



Functional Block Diagram - Fixed Version

