

## Powering LMZ3 Devices from a 3.3-V Bus

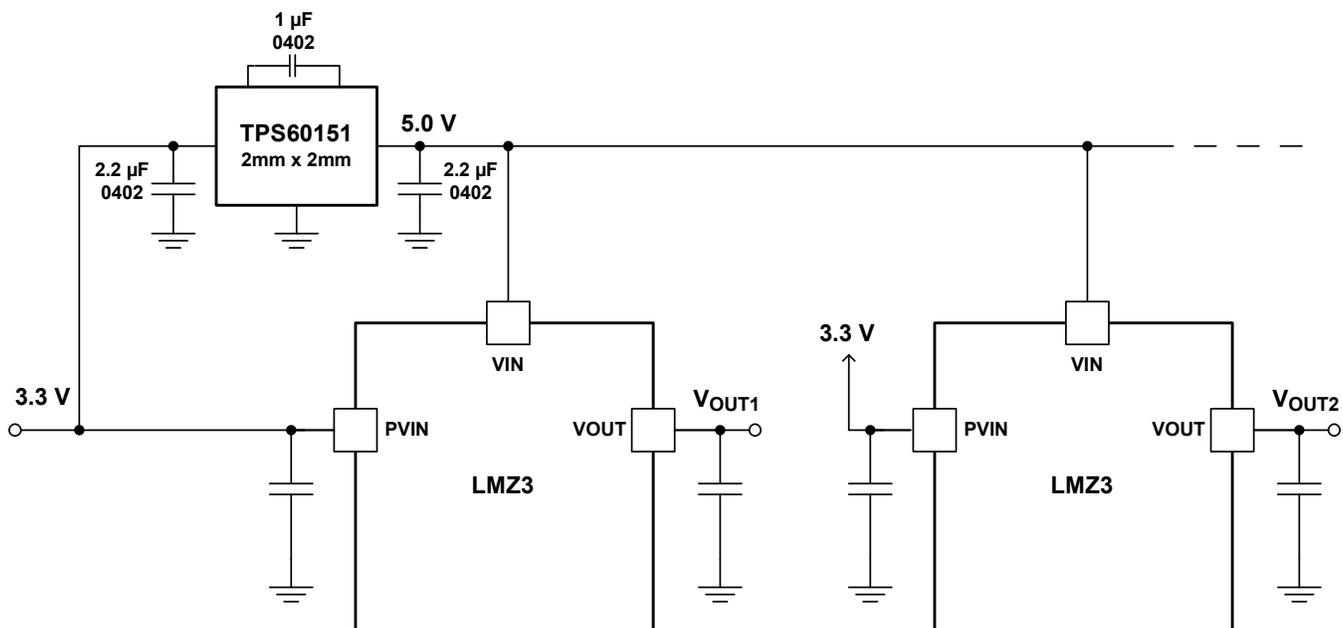
Jason Arrigo

SVA - SimpleSwitcher

As applications with only a 3.3-V rail are becoming more popular, lower input voltage power supplies are required. Many products that can switch lower input voltages still require some higher bias voltage to power the internal circuitry of the power supply. Therefore, the ability to easily produce a higher bias voltage from a 3.3-V rail is becoming more important.

The LMZ3 family of mid-input voltage (4.5 V to 14.5 V) power modules can switch voltages as low as 1.6 V, but require a bias voltage of at least 4.5 V. The mid-input voltage LMZ3 devices have both PVIN and VIN inputs and can operate off of a split rail where PVIN is the input switching voltage and VIN is the input bias voltage. The input switching voltage (PVIN) is the voltage that is converted to a lower output voltage and requires higher current. The input bias voltage (VIN) powers the internal circuitry of the device and requires very little current. See [Table 1](#) for the maximum VIN current per device for all mid-input voltage LMZ3 devices.

[Figure 1](#) shows a typical application where only a 3.3-V rail is available. The 3.3 V is connected to the PVIN pins of the LMZ3 device and is also fed into the input of a TPS60151 charge pump device. The TPS60151 boosts the 3.3 V to 5.0 V, delivers up to 150 mA, and is packaged in a 2 mm × 2 mm QFN package. A single TPS60151 can be used to power the VIN pin of multiple LMZ3 devices. See [Table 1](#) for maximum VIN current ratings per device. The input voltage range of the TPS60151 is 2.7 V to 5.5 V.



**Figure 1. Typical 3.3-V Input Application Circuit**

[Table 1](#) lists the maximum VIN current draw for each LMZ3 device when operated from PVIN = 3.3 V.

**Table 1. Maximum V<sub>IN</sub> Current**

Part Number	Max VIN Current
LMZ31503	4 mA
LMZ31506, LMZ31506H	8 mA
LMZ31710, LMZ31707, LMZ31704	20 mA
LMZ31520, LMZ31530	30 mA

Based on which LMZ3 devices are used and the number of devices being powered, the TPS60151 may not have enough current for some applications. In that case, the TPS81256 boost converter can be used which can deliver greater than 550 mA of output current. The input voltage range of the TPS81256 is 2.5 V to 5.5 V.

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