Powering the NXP i.MX 7 processor with the TPS6521815 PMIC

**Can you change PMICs?**

Using a multi-rail power management IC (PMIC) for an applications processor is common, but typically the vendor recommends the PMIC that should be used for each processor. Even if the suggested PMIC is not ideal for the needs of the processor, often the complexity makes it difficult to swap out the PMIC for another solution. The purpose of this tech note is to show that the TPS6521815 PMIC can provide power for the i.MX 7Solo and 7Dual processors.

**Why the TPS6521815?**

The TPS6521815 device has an input range from 2.7 to 5.5 V, making it appropriate for system-on-module applications powered from a 3.3-V or 5-V DC supply or a Li-Ion battery. The device has four step-down converters that provide the 1-V/1.1-V power rail required for the ARM® and SoC cores, the 1.2-V (or 1.5-V, 1.35-V) rail required for DDR3L (or DDR3, LPDDR3) memory, a 1.8-V rail required for the analog domain plus additional I/Os, and a 3.3-V rail required for VDD_SNVS and I/Os. A low-dropout (LDO) regulator provides 1.5-V for a peripheral IC (mPCIe in this design). Two load switches provide power for USB devices and other peripheral I/Os. The TPS6521815 automatically sequences these rails in the correct power-up sequence for the i.MX 7Solo and 7Dual processors.

**How do you make the switch?**

The TPS6521815 output voltages and sequencing order are determined by an EEPROM-backed register map, which can be programmed using the BOOSTXL-TPS65218 socketed booster pack. Samples of the TPS6521815RSLR can be programmed during the prototype phase of product development and soldered down on the TPS65218EVM-100 or the prototype PCB of the final product to evaluate the performance of the PMIC. To order pre-programmed samples of the TPS6521815RSLR for the NXP i.MX 7Solo, 7Dual processor that match this tech note, contact the programming services organization at ARROW.
Table 1. i.MX 7Solo and 7Dual Power Requirements

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References

Texas Instruments, TPS6521815 User-Programmable Power Management IC (PMIC) With 6 DC/DC Converters, 1 LDO, and 3 Load Switches Data Sheet, Nov. 2019


NXP Semiconductors, i.MX 7Solo Family of Applications Processors Data Sheet (IMX7SCEC), Rev. 6, 03/2019

NXP Semiconductors, i.MX 7Dual Family of Applications Processors Data Sheet (IMX7DCEC), Rev. 6, 03/2019

NXP Semiconductors, i.MX 7DS Power Consumption Measurement Application Note (AN5383), Rev. 0, 11/2016

0.1 Trademarks

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Revision History

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

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<td>• Updated part number from TPS65218D0 to TPS6521815</td>
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