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PMIC Is Tailored for MPUs With Dynamic Voltage Scaling

[Microchip's](#) MCP16503 is an integrated PMIC for general purpose MPUs (embedded microprocessor units) requiring dynamic voltage scaling (DVS). It contains four buck regulators, two auxiliary LDOs and a comprehensive interface to the MPU, which includes an interrupt flag and a 1-MHz I²C interface. The buck channels can support loads up to 1 A and are designed to be 100% duty cycle capable (see Figs. 1 and 2).

The MCP16503's regulators' startup voltages are adjustable using resistors. After start-up, regulators can be fully adjusted using I²C.

According to the vendor, the integration and flexibility provided by the MCP16503 reflects Microchip's strength in providing proven, system-level solutions that pair seamlessly with its industrial and edge AI computing platforms, enabling faster time-to-market and lower overall design risk for next-generation industrial applications.

For more information, see the [product page](#) or the [datasheet](#)

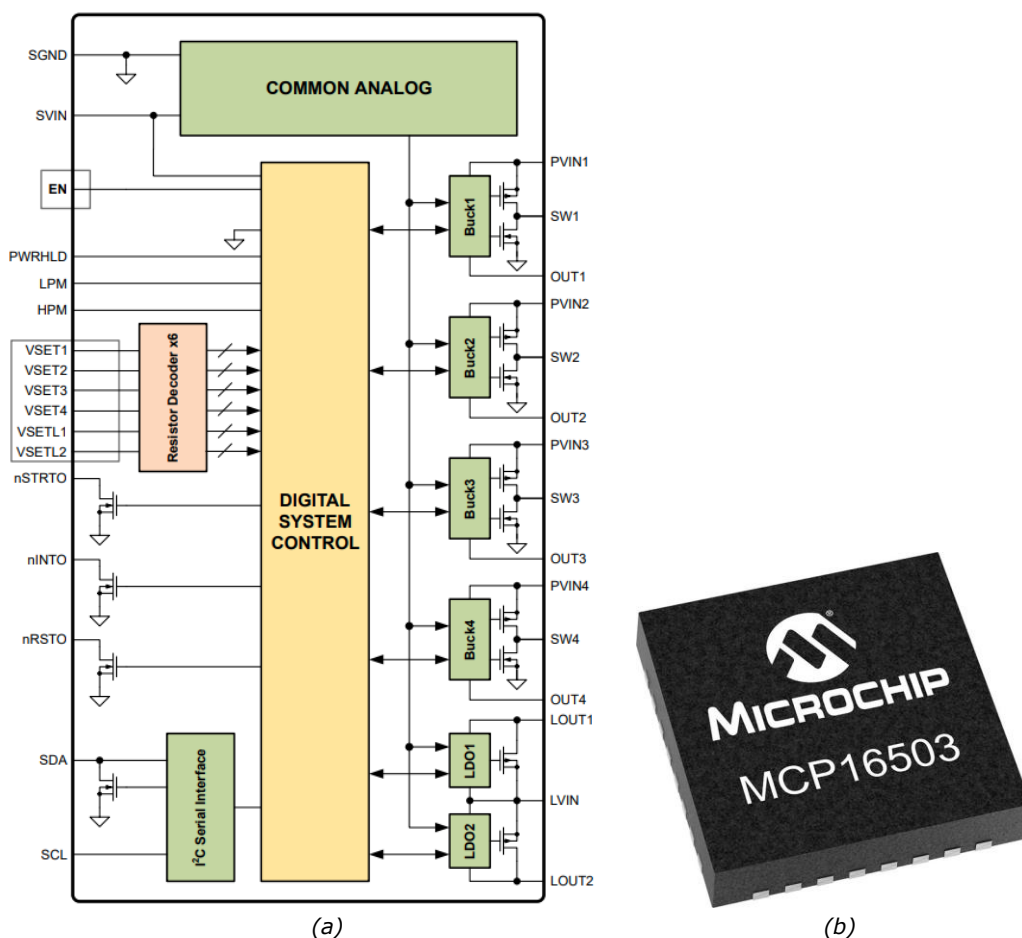


Fig 1. The MCP16503 features four dc-dc buck converters capable of delivering 1 A each, two LDOs with 300-mA current capability, I²C programmable output voltages and four operating modes: active, low power, hibernate and high-performance mode. The internal block diagram (a) and an image of the package (a) are shown here.

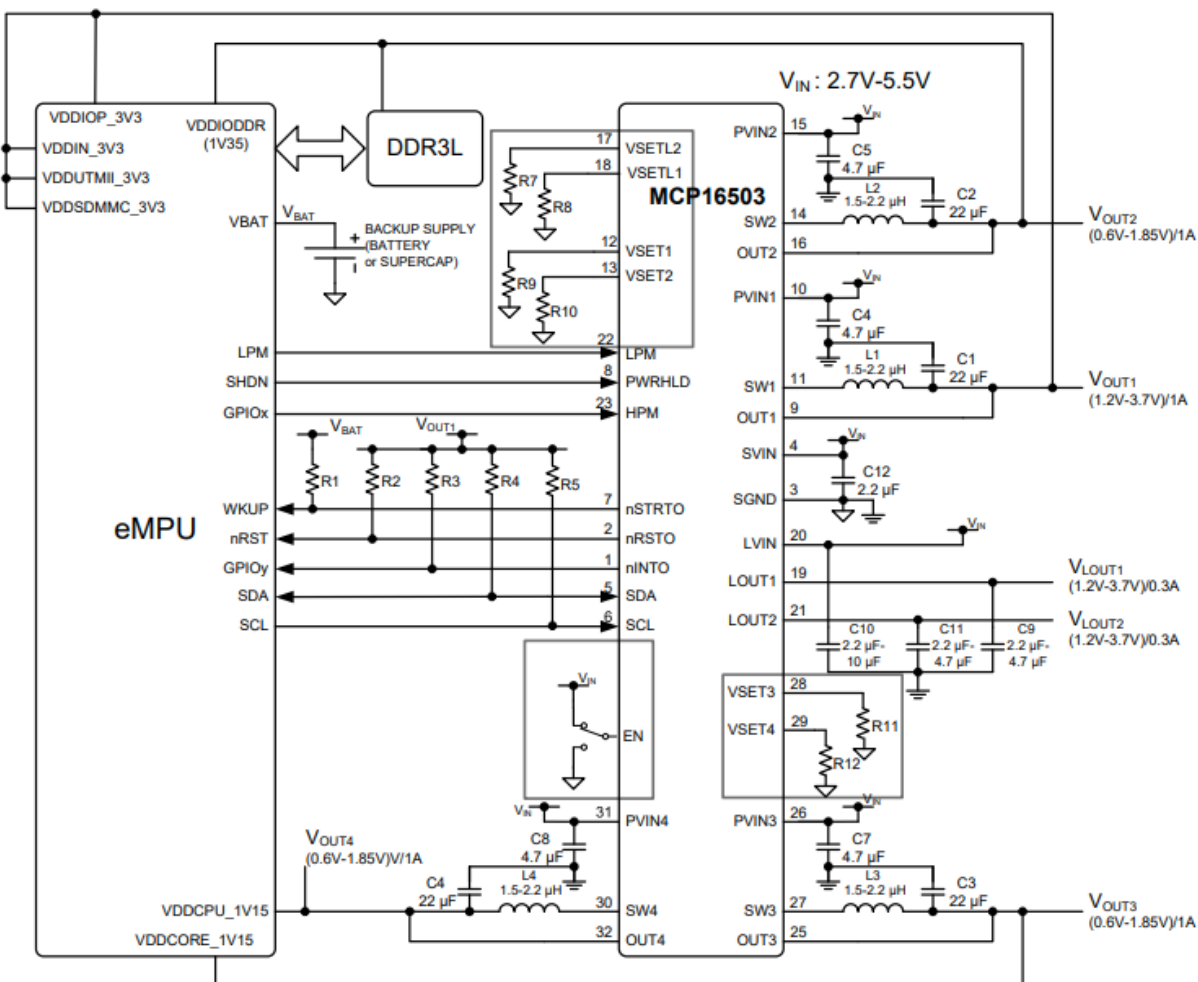


Fig. 2. Typical application schematic for the MCP16503. The PMIC's buck channels employ peak-current-mode control and have internal frequency compensation for the voltage regulation loop. The slope compensation is optimized for inductors in the 1.5- μ H to 2.2- μ H range. A minimum output capacitor of 22 μ F is required for stable operation. The chip's LDOs are designed for operation with low-ESR ceramic output capacitors of 2.2 μ F (minimum value) for loads up to 150 mA, and of 4.7 μ F (minimum value) for loads up to 300 mA. The total rail capacitance should not exceed 50 μ F.