

Multi-MHz Silicon Platform for Point-of-Load DC-DC Power-Train

Abstract

This technology offer document describes a 50 MHz monolithic power-train platform comprising switches and driver power-train for next generation point-of-load applications. Target markets include power-supply-on-chip for portable and wearable electronic equipment and space-sensitive circuit boards. The initial target specification is a 2.8 – 5 V input to 0.5 - 4.5 V output 500mA step-down converter, operating with switching frequency in the 20-50 MHz range. The final platform specification is for similar voltage ranges, but with current at up to 2A, and integrated power converter footprints and bounding volumes of approximately 4 mm² and 4 mm³ respectively — a significant space saving over comparable products on the market today.

Innovative Aspects

- X 6 smaller than current product footprints
- High efficiency power-train (> 90%), enabled by the configurability of the power train

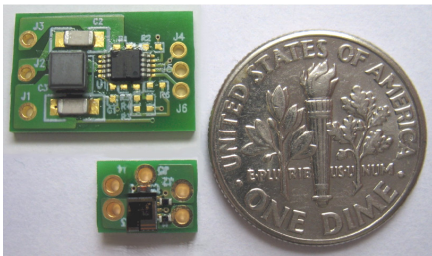


Figure shows level of size reduction from current industry product to smaller size targetted by this silicon technology

Monolithic power-trains offer significant advantages in terms of reduced component count size and manufacturability.

By increasing the switching frequency into the tens of megahertz range, integration of the required inductor and capacitance into the one IC package will be enabled.

Benefits and Advantages

This integrated power supply solution provides a significant advantage in space constrained and miniaturised applications while offering efficiencies of over 90%. The configuration interface makes it an ideal product-development test-bench for researchers interested in characterising component or power system performance at 20 – 50 MHz.

Current State of Development

20 MHz power-trains have been designed and fabricated, as have compatible inductor-in-silicon die. A 50 MHz version is currently being prototyped and should be available end Q2 2008.

IP status

Patent filed.

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