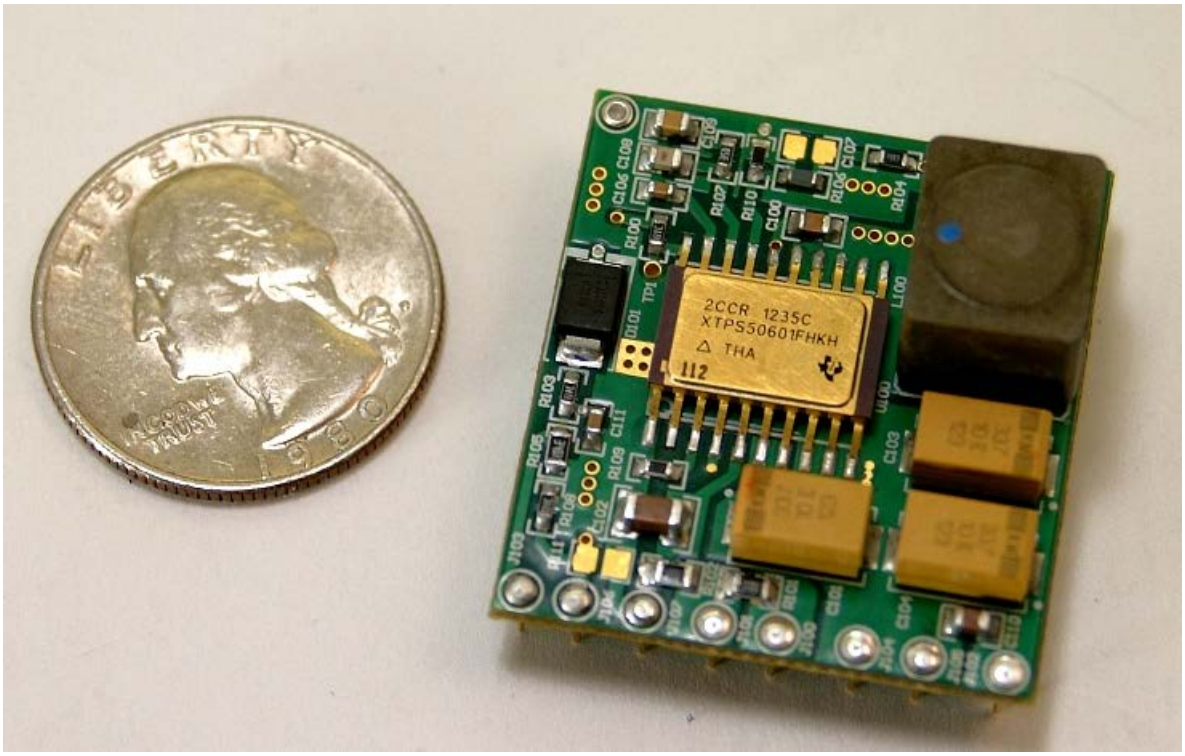
Description

The TPS50601-SP MINI POL converter is designed to demonstrate reduced footprint that can be achieved using a single sided layout. The footprint can be further reduced if configured in dual sided layout. Reference Schematic and BOM are attached for the Mini POL with recommended space qualified components. Output voltage is configured to be 1.2V.

The TPS50601-SP DC/DC converter is designed to provide up to a 6-A output in single phase operation (TPS50601SPEVM-S) and up to 12 A in dual phase operation (TPS50601SPEVM-D), when each phase is configured to provide 6-A per phase.

TPS50601-SP will operate with switching frequency of 100-kHz to 1-MHz range. For the TPS50601SPEVM-MINI, 250 kHz was selected to optimize size and efficiency of EVM. The high-side and low-side MOSFETs are incorporated inside the TPS50601-SP package along with the gate drive circuitry. The low drain-to-source on-resistance of the MOSFET allows the TPS50601-SP to achieve high efficiencies and helps keep the junction temperature low at high output currents. The compensation components are external to the integrated circuit (IC), and an external divider allows for an adjustable output voltage. Additionally, the TPS50601-SP provides adjustable soft start, tracking, and undervoltage lockout inputs.

EVM Footprint

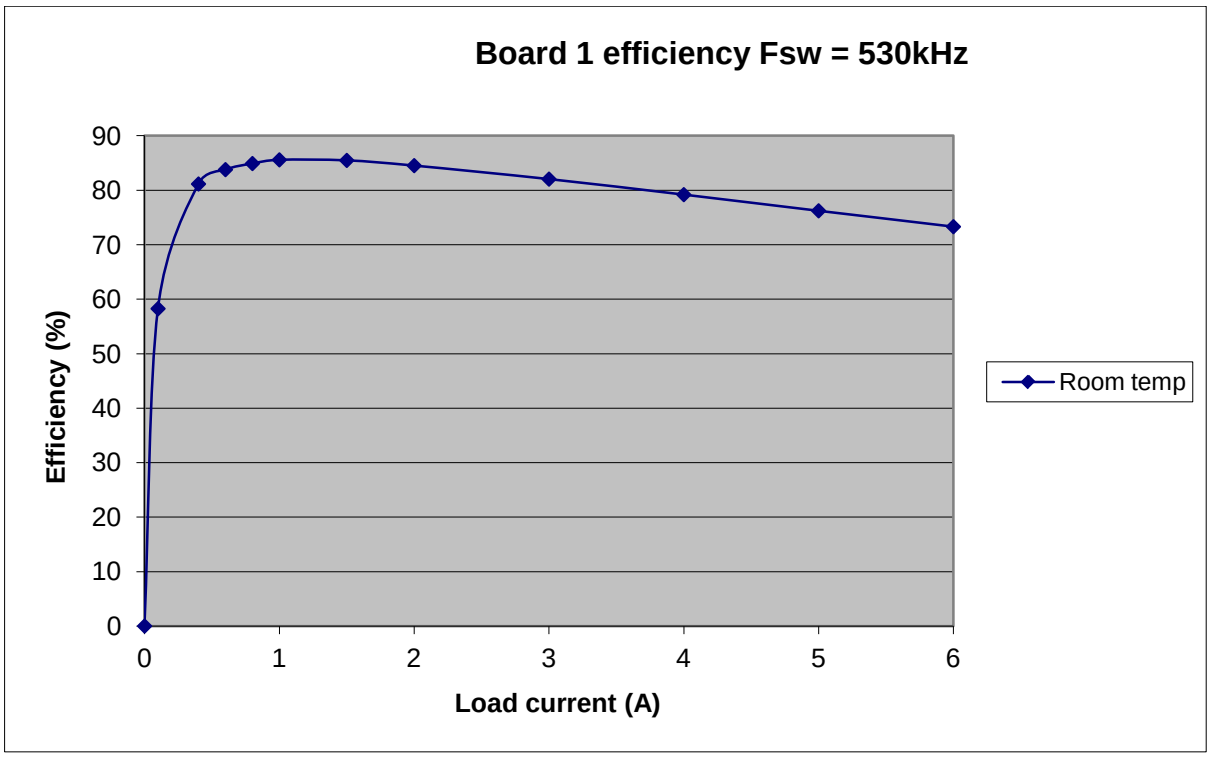


Test Results:

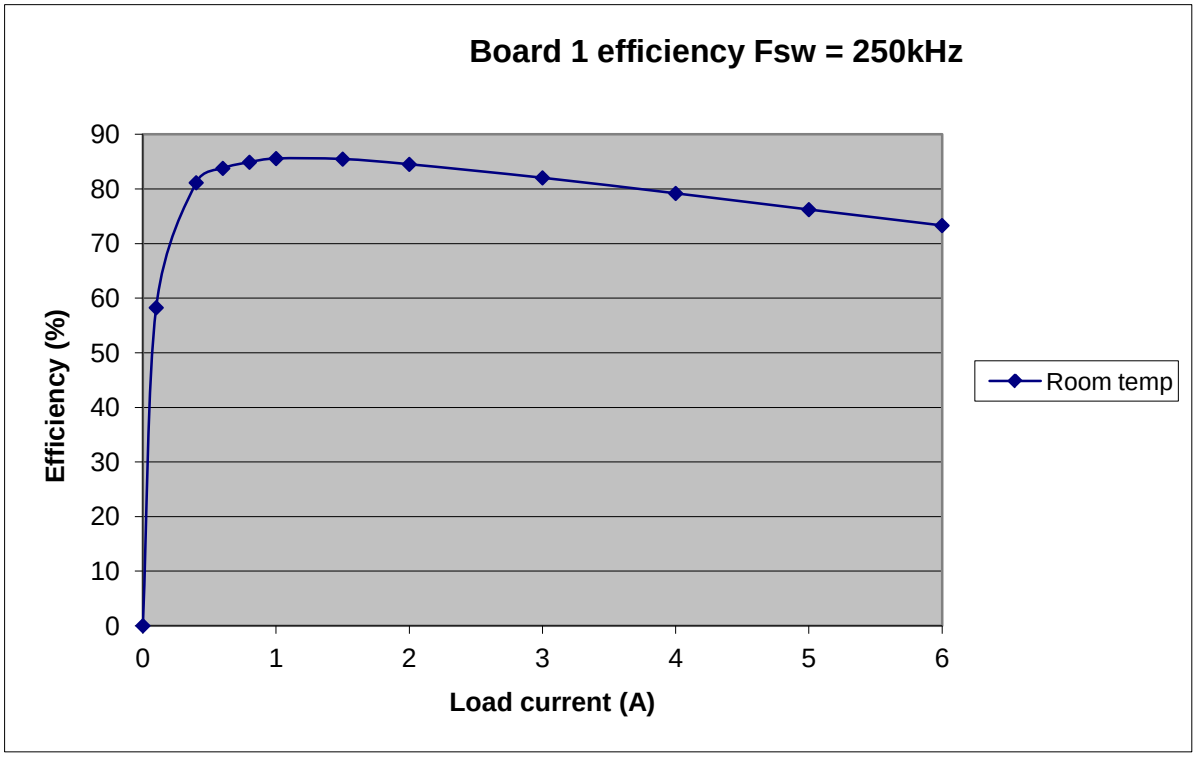
Efficiency:

Vin = 5V, Vout = 1.2V, Fsw = 530Khz.

Peak efficiency 85.56% @ 1A



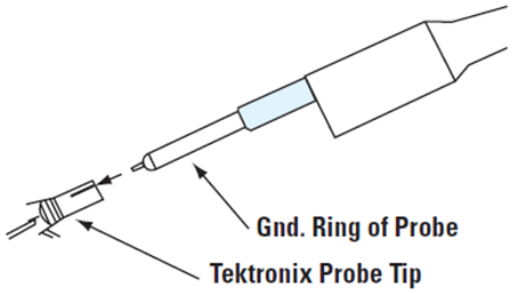
Vin = 5V, Vout = 1.2V, Fsw = 250Khz. Peak efficiency = 87.62% @1.5A

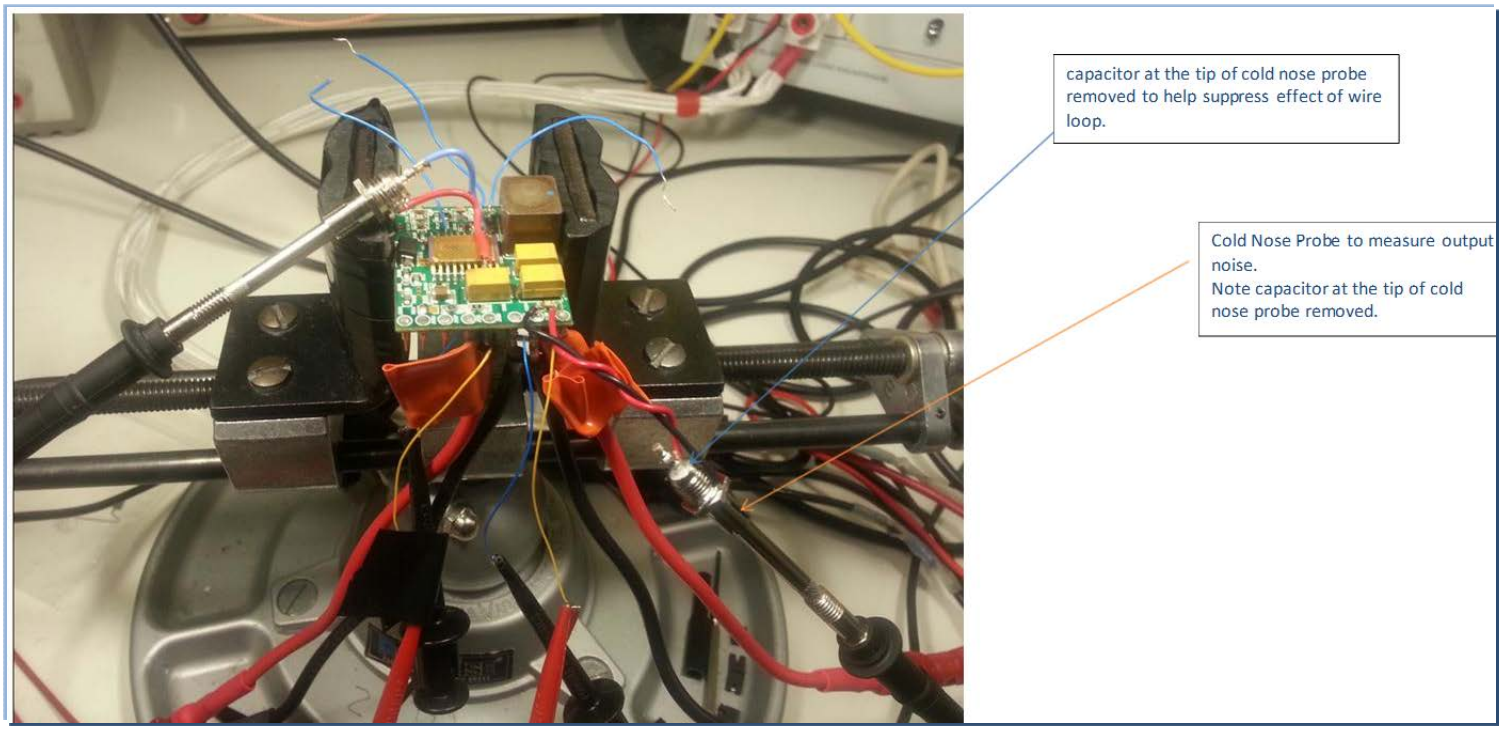


Waveforms:

Switch node and Output noise measurement using cold nose probe.

- Minimizing inductance loop
- Add 0.1uf at the tip of Tektronix probe



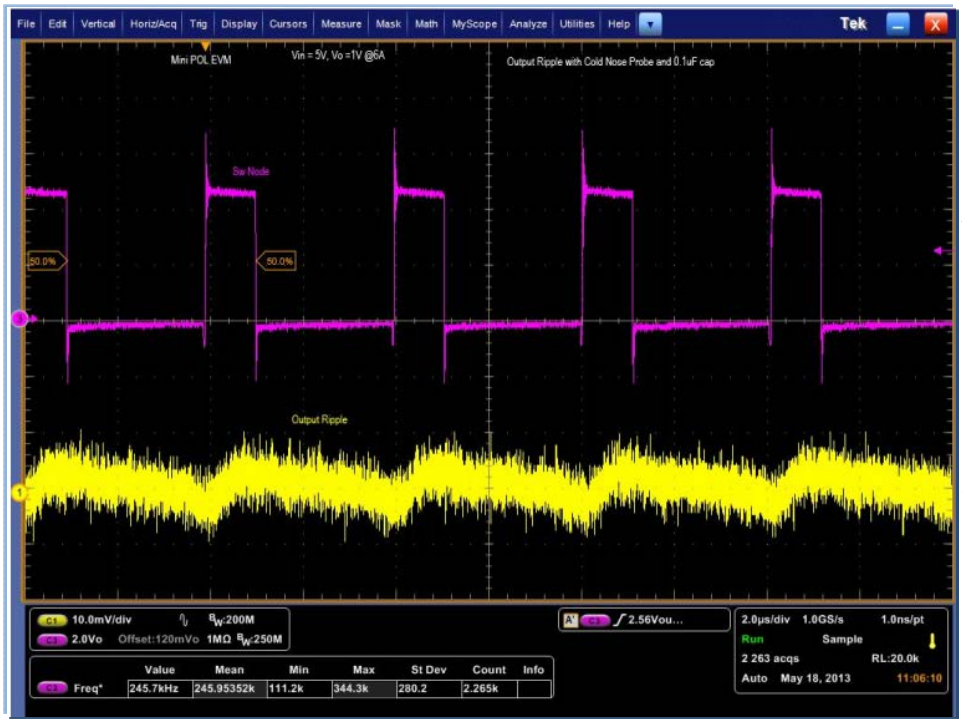


Vin =5V, Vout = 1.2V@0A

Ch 3 Switch Node

Ch 1 : Output ripple 10mV/div

Vin =5V, Vout = [1.2V@6A]



Ch3 Switch Node

Ch1: Output ripple 10mV/div

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