

SP6136 Converts 5.25V to 1.2V at 5A

Date: June 15, 2006

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Part Number: SP6136ER1

Application Description: Digital Set Top Box (STB) Core Supply Voltage

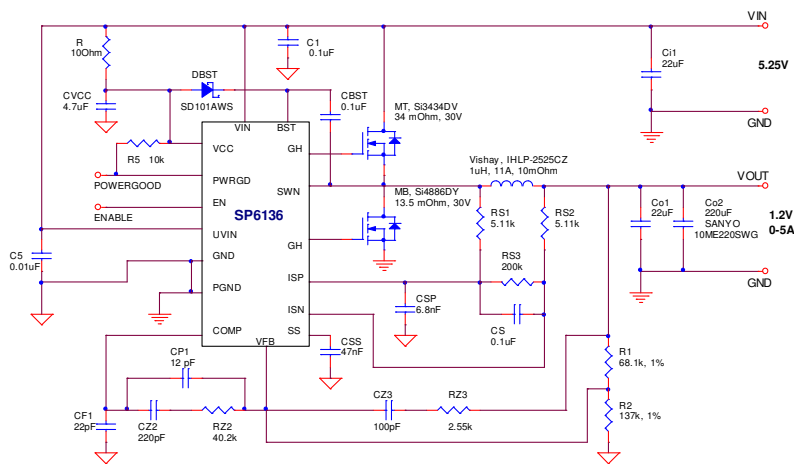
Electrical Requirements:

Input Voltage	4.5V – 5.5V
Output Voltage	1.2V
Output Current	5A

Circuit Description:

This buck converter has been designed to provide 1.2V output at 5A for powering a digital STB core supply voltage. Small form factor and low cost dictated the choice of the controller and external components. The SP6136 is a high performance buck regulator controller that provides all necessary functions required by a buck regulator: Over-current protection, Ppower-good output, adjustable UVLO and Enable input. The constant switching frequency (600kHz) optimizes against switching losses.

This report includes the application schematic and Figures 1 through 5 to illustrate electrical performance of the design.



Circuit Schematic -- also shown on page 5 in larger format

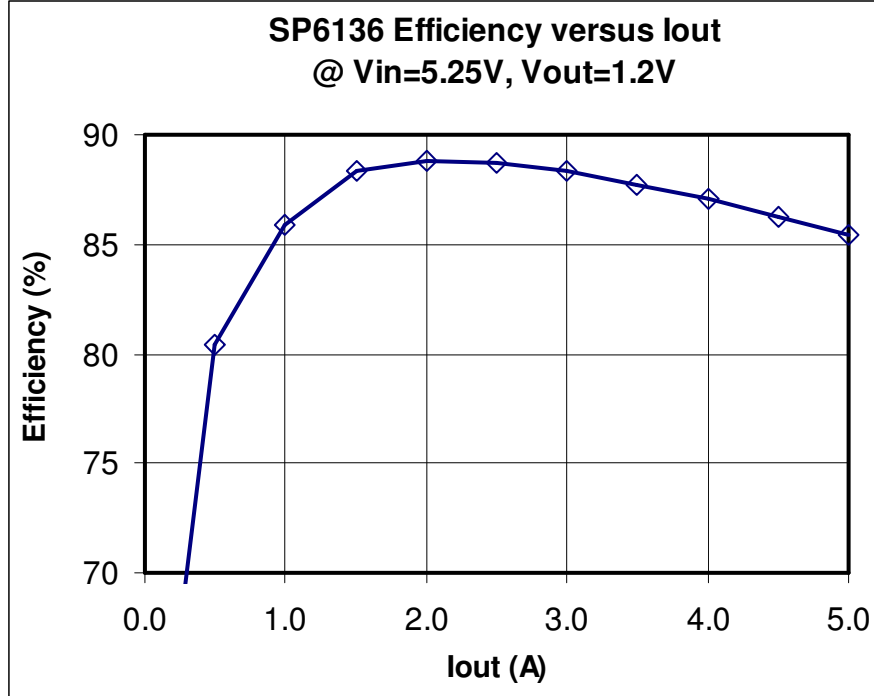


Figure 1: Converter Efficiency vs. Output Current, $T_A = 25^\circ\text{C}$, natural convection

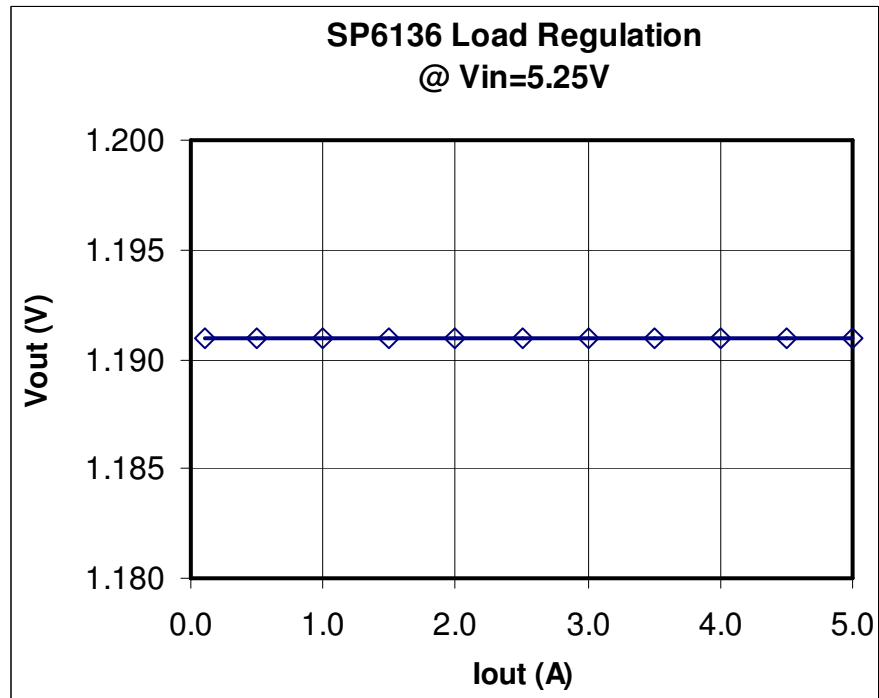


Figure 2: Converter Load Regulation

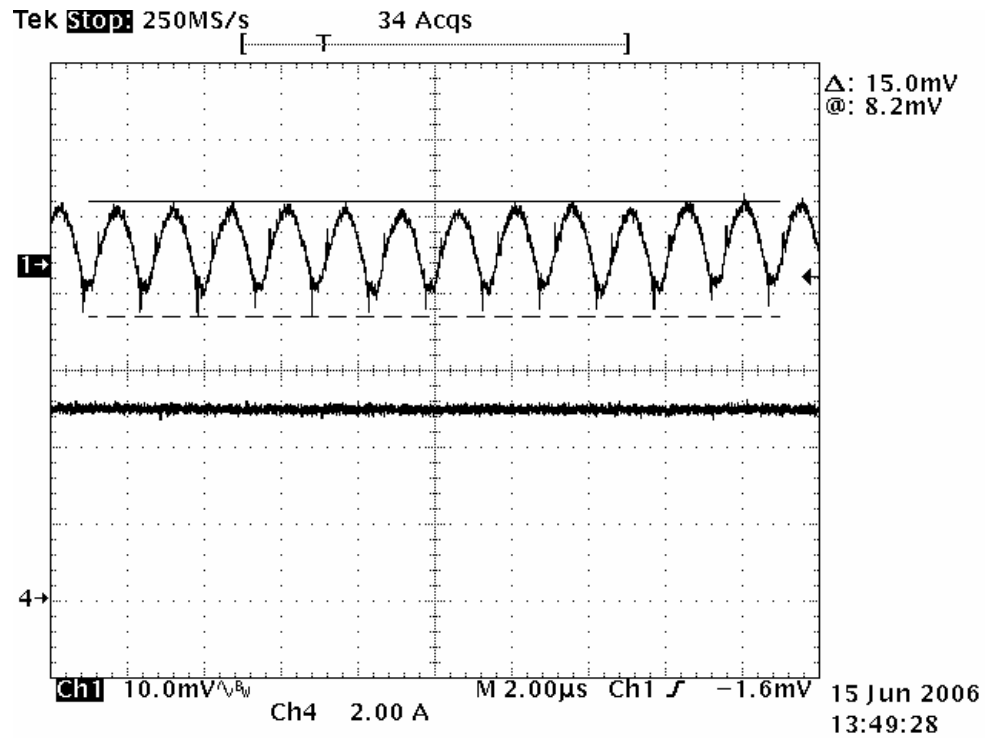


Figure 3: Output Ripple is 15mV @ IOUT = 5A. Ch1: Output Ripple, ch2: IOUT.

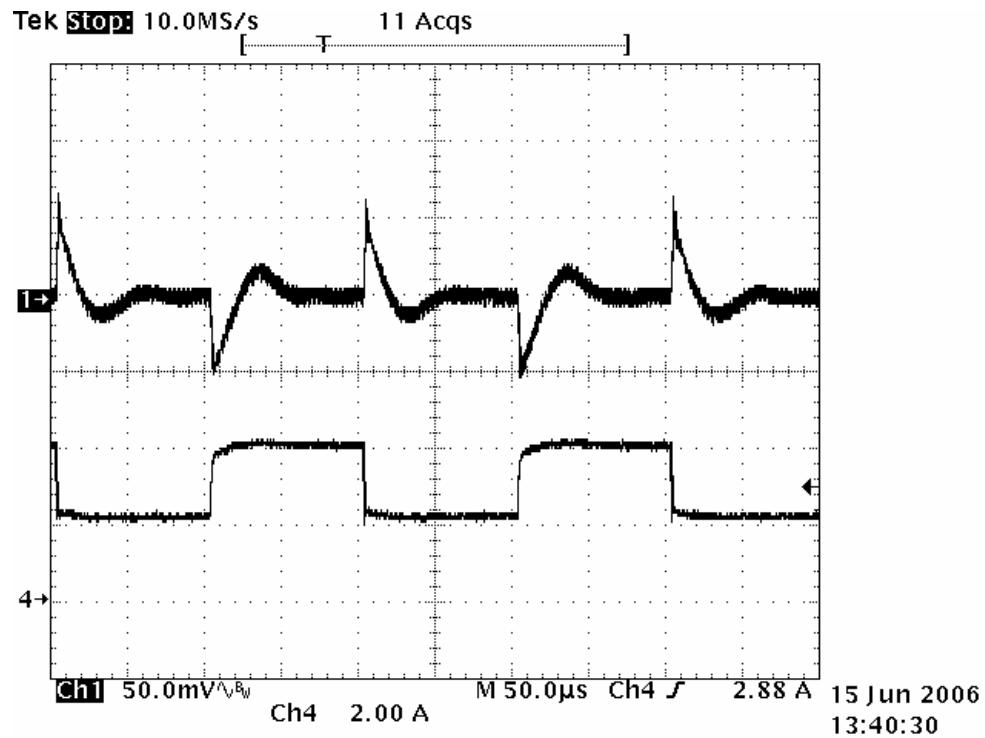


Figure 4: Step Load Response to 2A-4A. Ch1: VOUT, ch4: IOUT.

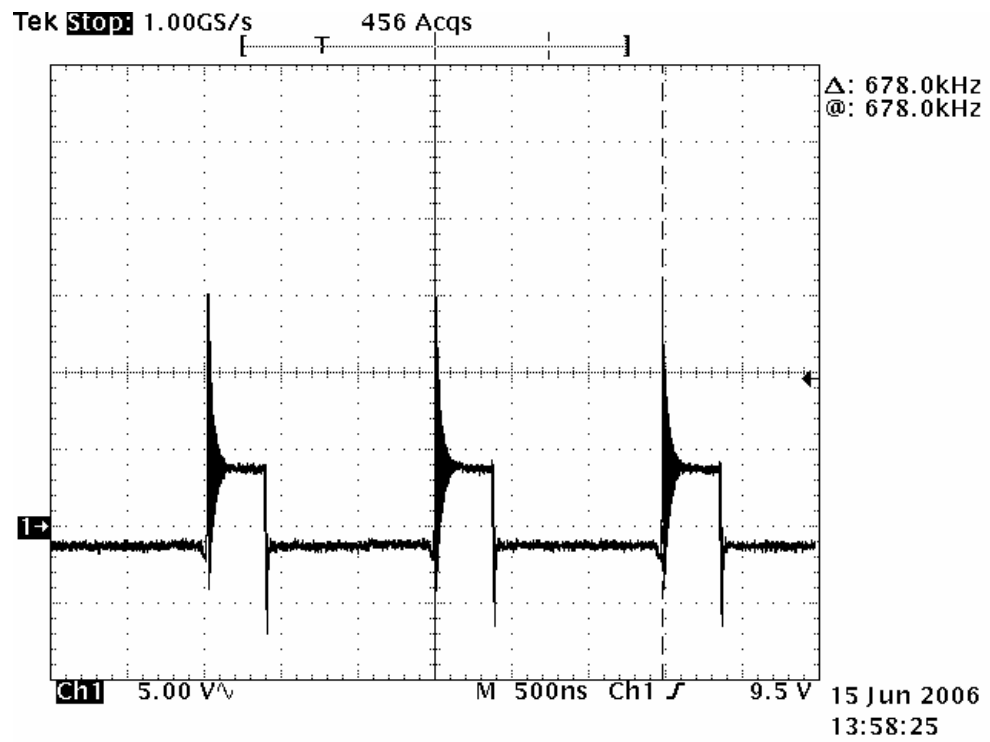


Figure 5: Switch Node, $f_s=678\text{kHz}$, $V_{IN}=5.25\text{V}$, $V_{OUT}=1.2\text{V}$, $I_{OUT}=5\text{A}$.

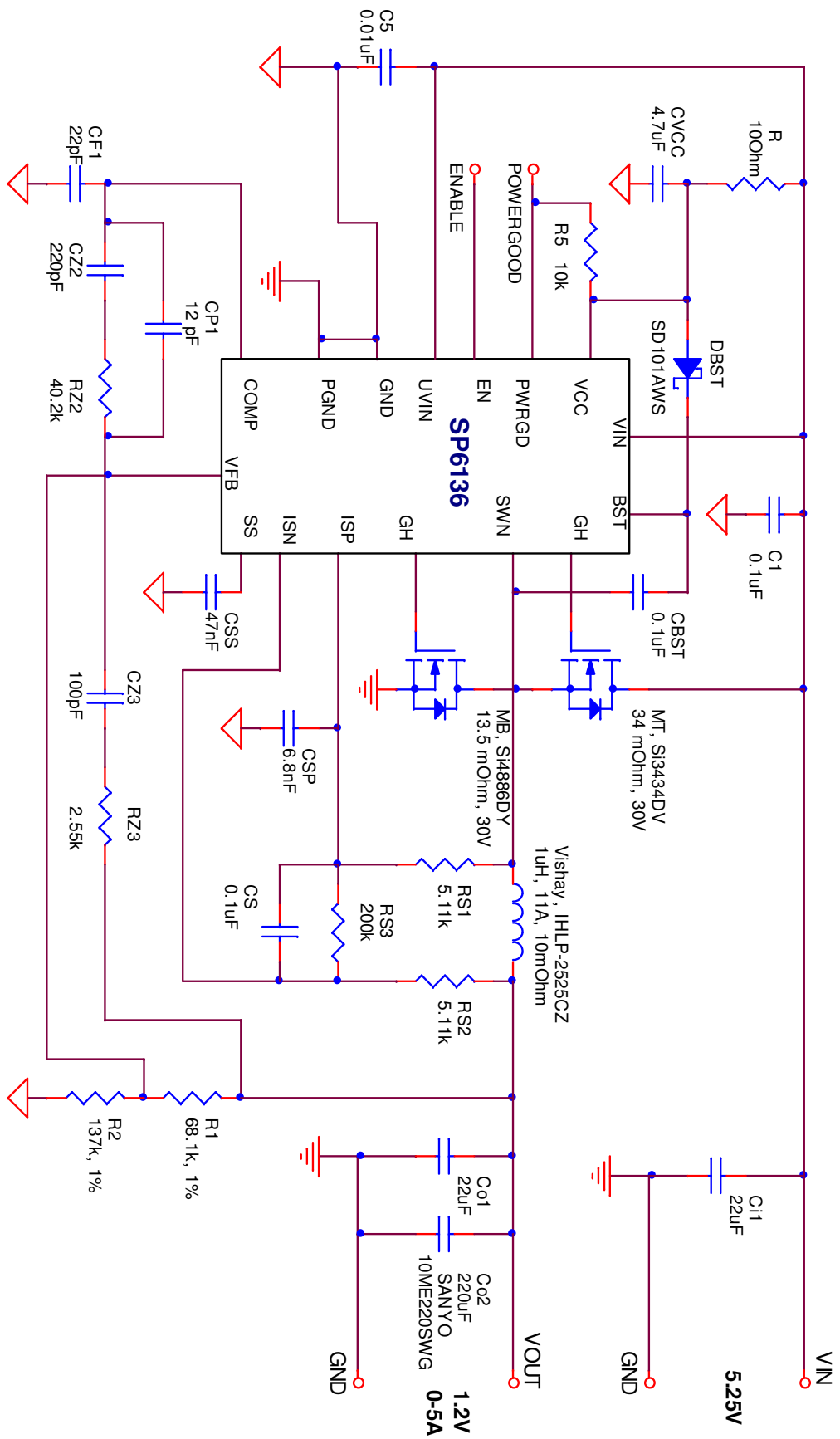


Figure 6: Circuit Schematic