

Description

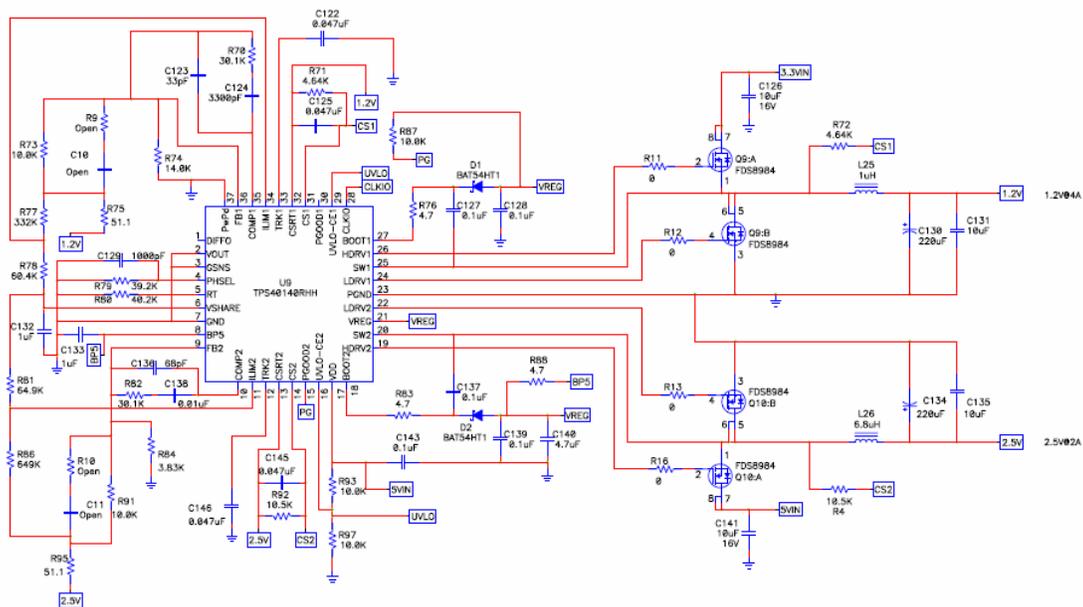
The TPS40140 is a dual synchronous buck controller that can be used for a two phase single output or for two independent outputs. The controller has an input voltage rating of 4.5 to 15 volts for the chip VCC and 2 to 40volts for the power stage. It will work in many applications with 5, 12 and 24 volt inputs. The controller can also accept input voltages from two different sources. Current mode control uses the inductor DCR to minimize impacts on the efficiency. A current sense resistor could be used for improved accuracy. Additionally, the chip features a 700 mV reference with better than 1% accuracy over temperature.

This circuit uses the TPS40140 in the dual synchronous buck configuration. A buck is typically used when the output voltage is always lower than the input voltage. Key considerations for this design are low output noise and synchronized switching. The TPS40140 provides a CLKIO pin that can be connected between devices to create up to 16 phases that are optimally shifted. The converter in this case is 5V to 2.5V@2A and 3.3V to 1.2V@4A.

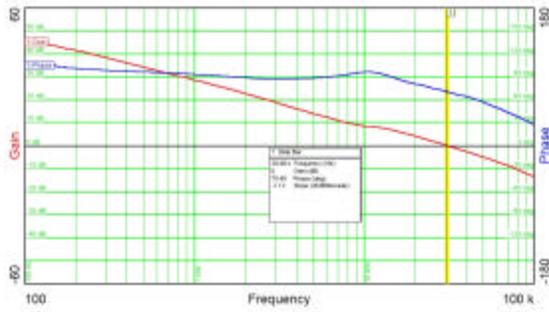
Specifications

Parameter	Test Conditions	Min	Typ	Max	Unit
Input Voltage		4.5 / 3.0	5 / 3.3	5.5 / 3.6	Volts
Output Voltage		2.43 / 1.17	2.5 / 1.2	2.57 / 1.23	Volts
Output Ripple				10	mV pp
Output Current		0		2 / 4	Amp
Switching Frequency			750		kHz

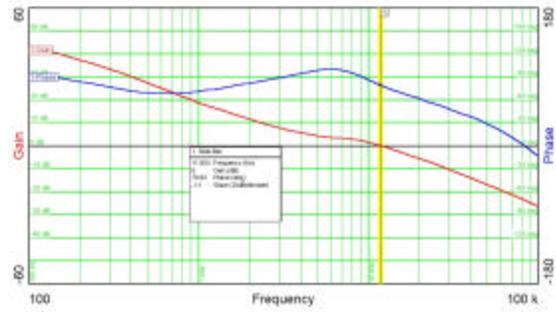
PMP 2958 Schematic



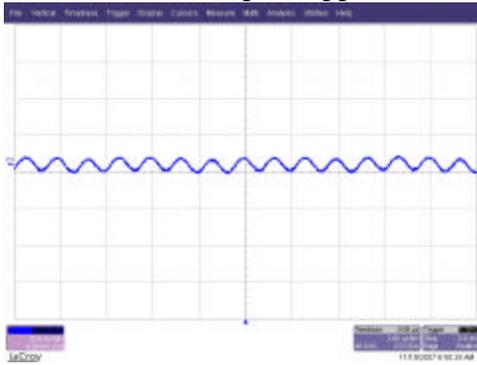
Control Loop 1.2V



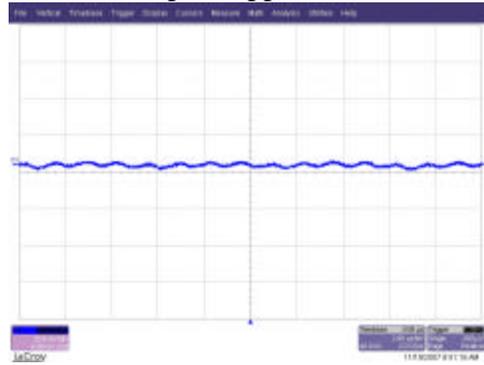
Control Loop 2.5V



Output Ripple 1.2V



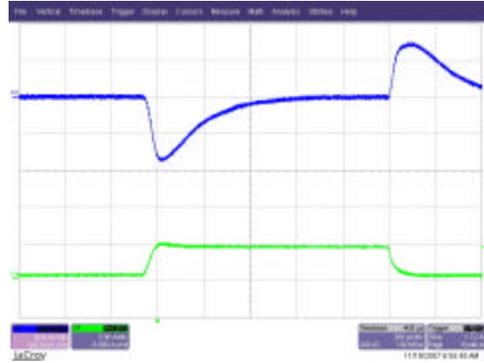
Output Ripple 2.5V



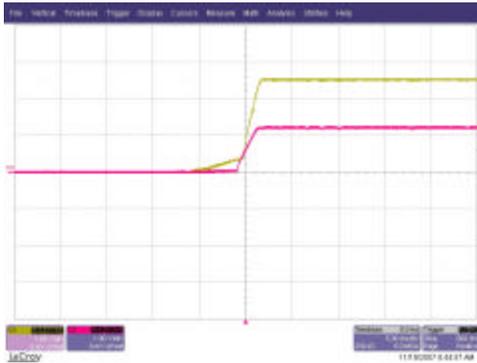
Load Step 1.2V



Load Step 2.5V



Turn - On



Switch Node



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Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265
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