Test Data
For PMP9385
3/26/2014
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1. Design Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vin Minimum</td>
<td>12.5VDC</td>
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<tr>
<td>Vin Maximum</td>
<td>15.5VDC</td>
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<tr>
<td>Vout</td>
<td>24VDC</td>
</tr>
<tr>
<td>Iout</td>
<td>8A Max.</td>
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<tr>
<td>Approximate Switching Frequency</td>
<td>250KHz</td>
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2. Circuit Description

PMP9385 is a Single-Phase Synchronous Boost Converter which accepts an input voltage of 12.5Vin to 15.5Vin and provides an output of 24Vout capable of supplying a maximum of 8A of current to the load. This design was built on the PMP7950 REV1B PCB (4-layered board; 2 oz. Copper on Top and Bottom layers, 1 oz. Copper on two inner layers). Design uses an LM5122 Synchronous Boost controller and CSD18531Q5A FETs. All tests in this report were performed at 14Vin.
3. PMP9385 Board Photos

Board Dimensions: 6.3” x 3.5”

Board Photo (Top)
Board Photo (Bottom)
4. Thermal Data

IR thermal image taken at steady state with 14Vin and 8A load (no airflow)
5. Efficiency

5.1 Efficiency Chart

![Efficiency Chart](image)

5.2 Efficiency Data

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<tr>
<th>Vin (V)</th>
<th>In (A)</th>
<th>Vout (V)</th>
<th>Iout (A)</th>
<th>Pin (W)</th>
<th>Pout (W)</th>
<th>Efficiency (%)</th>
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6 Waveforms

6.1 Load Transient Response

Load Transient Response at 14Vin and 50%-to-100% (4A-to-8A) Load Step
6.2 Startup

Startup into No Load at 14Vin
Startup into Full (8A) Load at 14Vin
6.3 Output Voltage Ripple and Switch Node Voltage

Switch Node Voltage and Output Voltage Ripple at 14Vin and No Load (Vripple ≈ 100mVp-p)
Switch Node Voltage and Output Voltage Ripple at 14Vin and Full (8A) Load (Vripple = 400mVp-p)
Loop Frequency Response at 14Vin and Full (8A) Load

(Phase Margin ≈ 40 degrees; Gain Margin ≈ -8dB; Cutoff Frequency ≈ 9.5KHz)
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