Description
The PMP30364_RevC reference design uses the UCC28910 flyback controller with integrated MOSFET to generate a non-isolated output (6.5V@0.6A) from an 100VDC to 411VDC input. The UCC28910 provides constant-voltage and constant-current output regulation without the use of an optical coupler. The valley switching operation reduces switching losses and achieves high efficiency.
1 Test Prerequisites

1.1 Voltage and Current Requirements

Table 1. Voltage and Current Requirements

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>SPECIFICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>$V_{IN}$</td>
<td>108VDC - 411VDC</td>
</tr>
<tr>
<td>$V_{OUT}$</td>
<td><a href="mailto:6.5@0.6A">6.5@0.6A</a></td>
</tr>
<tr>
<td>Nominal switching frequency</td>
<td>50kHz</td>
</tr>
</tbody>
</table>
2 Testing and Results

2.1 Efficiency Graphs

Figure 1. Efficiency

![Efficiency Graph](image)

2.2 Efficiency Data

Figure 2. Load Regulation

![Load Regulation Graph](image)
2.3 Thermal Images

Figure 3. The images below show the infrared images taken from the FlexCam after 15min at full load output power.

<table>
<thead>
<tr>
<th>Name</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Snubber R4</td>
<td>40.3°C</td>
</tr>
<tr>
<td>Controller U1</td>
<td>44.5°C</td>
</tr>
<tr>
<td>Transformer T1</td>
<td>39.3°C</td>
</tr>
<tr>
<td>Diode D3</td>
<td>39.9°C</td>
</tr>
<tr>
<td>Diode D1</td>
<td>38.1°C</td>
</tr>
</tbody>
</table>

Input Voltage = 411VDC
Output Power = 4.9W

2.4 Dimensions

59mm x 22mm
3 Waveforms

3.1 Switching

Figure 4. Switchnode

Input Voltage = 411VDC
Output Power = 4.9W
Figure 5. Switchnode

Input Voltage = 411VDC
Output Power = 4.9W
3.2 **Output Voltage Ripple**

![Figure 6. 6.5Vout Ripple Voltage](image)

*Input Voltage = 250VDC
Output Power = 4.9W*
3.3 Load Transients

Figure 7. Load Transient Response 6.5V output

Input Voltage = 108VDC
6.5Vout Load current = 0.1 to 0.6A
15Vout Load current = 0A
Figure 8. Load Transient Response 6.5V output

Input Voltage = 250VDC
6.5Vout Load current = 0.1 to 0.6A
15Vout Load current = 0A
Input Voltage = 410VDC
6.5Vout Load current = 0.1 to 0.6A
15Vout Load current = 0A
3.4 Start-up Sequence

Figure 10. Startup

Input Voltage = 108VDC
6.5Vout Load current = 0.6A
15Vout Load current = 0A
Figure 11. Startup

Input Voltage = 250VDC
6.5Vout Load current = 0.6A
15Vout Load current = 0A
Figure 12. Startup

Input Voltage = 411VDC
6.5Vout Load current = 0.6A
15Vout Load current = 0A
### 3.5 Shutdown Sequence

**Figure 13. Shutdown**

Input Voltage = 250VDC  
6.5Vout Load current = 0.6A  
15Vout Load current = 0A
3.6 Other

Figure 14. Secondary Side Switchnode 6.5Vout

Input Voltage = 250VDC
6.5Vout Load current = 0.6A
Output Power = 4.9W
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