Efficiency and Regulation

The efficiency and regulation are shown below:

<table>
<thead>
<tr>
<th>J3</th>
<th>J3</th>
<th>J3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iout</td>
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<td>Iout</td>
</tr>
<tr>
<td>0.00</td>
<td>3.330</td>
<td>0.00</td>
</tr>
<tr>
<td>1.50</td>
<td>3.328</td>
<td>0.00</td>
</tr>
<tr>
<td>0.00</td>
<td>3.330</td>
<td>1.00</td>
</tr>
<tr>
<td>1.50</td>
<td>3.328</td>
<td>1.00</td>
</tr>
<tr>
<td>1.50</td>
<td>3.328</td>
<td>1.00</td>
</tr>
<tr>
<td>0.75</td>
<td>3.329</td>
<td>0.50</td>
</tr>
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</table>

Max Load Efficiency without bridge

<table>
<thead>
<tr>
<th>J3</th>
<th>J3</th>
<th>J3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iout</td>
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<td>Iout</td>
</tr>
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<td>1.50</td>
<td>3.328</td>
<td>1.00</td>
</tr>
<tr>
<td>1.50</td>
<td>3.328</td>
<td>1.00</td>
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<tr>
<td>1.50</td>
<td>3.328</td>
<td>1.00</td>
</tr>
<tr>
<td>0.75</td>
<td>3.329</td>
<td>0.50</td>
</tr>
</tbody>
</table>

Vin measured at FB1/FB2
Ripple and Noise

48V input; 3.3V/1.5A, 5V/1A, and 10V/200mA loads; 20MHz BWL.

3.3V Output Ripple (C29), 50mV/div
Measured 45mV peak to peak:

5V Output Ripple (C19), 50mV/div
Measured 50mV peak to peak:

10V Output Ripple (C13), 50mV/div
Measured 114mV peak to peak:

Turn On Response

48VIN, Max Loads, 1msec/div:

48VIN, 0A Loads, 1msec/div:

Top, 5V output, 1V/div; Middle, 3.3V output, 1V/div; Bottom, 10V output, 5V/div
Loop Stability

The measured Bode plot of the converter is shown below.

### Bandwidth, Phase Margin, and Gain Margin Data

<table>
<thead>
<tr>
<th>VIN</th>
<th>3.3VI</th>
<th>5VI</th>
<th>10VI</th>
<th>BW</th>
<th>PM</th>
<th>GM</th>
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<tbody>
<tr>
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<td>1.00</td>
<td>0.200</td>
<td>4.7</td>
<td>54</td>
<td>11</td>
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<td>1.00</td>
<td>0.200</td>
<td>5.0</td>
<td>58</td>
<td>17</td>
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<td>0.00</td>
<td>0.200</td>
<td>5.1</td>
<td>57</td>
<td>11</td>
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<td>5.4</td>
<td>54</td>
<td>10</td>
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<td>0.00</td>
<td>0.000</td>
<td>5.7</td>
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<td>20</td>
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<td>1.50</td>
<td>1.00</td>
<td>0.200</td>
<td>5.4</td>
<td>57</td>
<td>12</td>
</tr>
<tr>
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<td>1.00</td>
<td>0.200</td>
<td>5.7</td>
<td>60</td>
<td>17</td>
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<td>0.00</td>
<td>0.200</td>
<td>5.8</td>
<td>58</td>
<td>12</td>
</tr>
<tr>
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<td>1.50</td>
<td>1.00</td>
<td>0.000</td>
<td>6.2</td>
<td>57</td>
<td>11</td>
</tr>
<tr>
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<td>0.00</td>
<td>0.00</td>
<td>0.000</td>
<td>6.3</td>
<td>63</td>
<td>18</td>
</tr>
<tr>
<td>57.0</td>
<td>1.50</td>
<td>1.00</td>
<td>0.200</td>
<td>5.9</td>
<td>59</td>
<td>12</td>
</tr>
<tr>
<td>57.0</td>
<td>0.00</td>
<td>1.00</td>
<td>0.200</td>
<td>6.1</td>
<td>61</td>
<td>17</td>
</tr>
<tr>
<td>57.0</td>
<td>1.50</td>
<td>0.00</td>
<td>0.200</td>
<td>6.2</td>
<td>61</td>
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</tr>
<tr>
<td>57.0</td>
<td>1.50</td>
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<td>0.000</td>
<td>6.7</td>
<td>58</td>
<td>12</td>
</tr>
<tr>
<td>57.0</td>
<td>0.00</td>
<td>0.00</td>
<td>0.000</td>
<td>6.7</td>
<td>63</td>
<td>18</td>
</tr>
</tbody>
</table>
Dynamic Loading

One output at a time was pulsed. The outputs not being pulsed were loaded to their maximum value.

36V INPUT

3.3V load step, 150mA to 750mA:

3.3V Response
50mV/div, 1msec/div
Measured 84mV peak to peak:

5V Response
50mV/div
Measured 123mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 294mV peak to peak:
3.3V load step, 750mA to 1.5A:

3.3V Response
50mV/div, 1msec/div
Measured 112mV peak to peak:

5V Response
50mV/div
Measured 139mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 331mV peak to peak:
5V load step, 100mA to 500mA:

3.3V Response
50mV/div, 1msec/div
Measured 127mV peak to peak:

5V Response
50mV/div
Measured 161mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 372mV peak to peak:
5V load step, 500mA to 1A:

3.3V Response
50mV/div, 1msec/div
Measured 144mV peak to peak:

5V Response
50mV/div
Measured 200mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 413mV peak to peak:
10V load step, 20mA to 100mA:

3.3V Response  5V Response
50mV/div, 1msec/div  50mV/div
Measured xxmV peak to peak:  Measured xxmV peak to peak:
(No significant variation higher than (No significant variation higher than
switching frequency ripple) switching frequency ripple)

10V Response
50mV/div, 1msec/div
Measured 450mV peak to peak:

10V load step, 100mA to 200mA:

3.3V Response  5V Response
100mV/div, 1msec/div  50mV/div
Measured xxmV peak to peak:  Measured xxmV peak to peak:
(No significant variation higher than (No significant variation higher than
switching frequency ripple) switching frequency ripple)

10V Response
100mV/div, 1msec/div
Measured 275mV peak to peak:
48V INPUT

3.3V load step, 150mA to 750mA:

3.3V Response
50mV/div, 1msec/div
Measured 73mV peak to peak:

5V Response
50mV/div
Measured 103mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 247mV peak to peak:
3.3V load step, 750mA to 1.5A:

3.3V Response
50mV/div, 1msec/div
Measured 92mV peak to peak:

5V Response
50mV/div
Measured 116mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 275mV peak to peak:
5V load step, 100mA to 500mA:

3.3V Response
50mV/div, 1msec/div
Measured 109mV peak to peak:

5V Response
50mV/div
Measured 139mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 319mV peak to peak:
5V load step, 500mA to 1A:

3.3V Response
50mV/div, 1msec/div
Measured 120mV peak to peak:

5V Response
50mV/div
Measured 166mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 347mV peak to peak:
**10V load step, 20mA to 100mA:**

- 3.3V Response
  - 50mV/div, 1msec/div
  - Measured xxmV peak to peak:
  - (No significant variation higher than switching frequency ripple)

- 5V Response
  - 50mV/div
  - Measured xxmV peak to peak:
  - (No significant variation higher than switching frequency ripple)

**10V load step, 100mA to 200mA:**

- 3.3V Response
  - 100mV/div, 1msec/div
  - Measured 400mV peak to peak:

- 5V Response
  - 100mV/div
  - Measured 247mV peak to peak:
57V INPUT

3.3V load step, 150mA to 750mA:

3.3V Response
50mV/div, 1msec/div
Measured 69mV peak to peak:

5V Response
50mV/div
Measured 94mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 231mV peak to peak:
3.3V load step, 750mA to 1.5A:

3.3V Response
50mV/div, 1msec/div
Measured 86mV peak to peak:

5V Response
50mV/div
Measured 105mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 250mV peak to peak:
5V load step, 100mA to 500mA:

3.3V Response
50mV/div, 1msec/div
Measured 97mV peak to peak:

5V Response
50mV/div
Measured 130mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 291mV peak to peak:
5V load step, 500mA to 1A:

3.3V Response
50mV/div, 1msec/div
Measured 111mV peak to peak:

5V Response
50mV/div
Measured 153mV peak to peak:

10V Response
100mV/div, 1msec/div
Measured 319mV peak to peak:
10V load step, 20mA to 100mA:

3.3V Response  
50mV/div, 1msec/div  
Measured xxmV peak to peak:  
(No significant variation higher than switching frequency ripple)  
5V Response  
50mV/div  
Measured xxmV peak to peak:  
(No significant variation higher than switching frequency ripple)

10V Response  
100mV/div, 1msec/div  
Measured 369mV peak to peak:

10V load step, 100mA to 200mA:

3.3V Response  
100mV/div, 1msec/div  
Measured xxmV peak to peak:  
(No significant variation higher than switching frequency ripple)  
5V Response  
50mV/div  
Measured xxmV peak to peak:  
(No significant variation higher than switching frequency ripple)

10V Response  
100mV/div, 1msec/div  
Measured 234mV peak to peak:
Note: PMP8408 RevC is built on PMP8407 RevC PCB.
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