Load: 2 LED strings in parallel. Max. LED current each string: 0.35A

1 Startup

Input voltage  = 176VAC
LED current   = 0.7A
LED voltage   = 233V
Input voltage  = 264VAC
LED current    = 0.7A
LED voltage   = 232V
2 Shutdown

Input voltage = 230VAC
LED current = 0.7A
LED voltage = 234V
3 Efficiency

![Efficiency Graph]

4 Power Factor

![Power Factor Graph]
5  Line Regulation

**PMP10116_RevC**

**line regulation**

- **LED current 0.3A**

**PMP10116_RevC**

**line regulation**

- **LED current 0.7A**
6 Harmonic Current

Input voltage  = 230VAC
LED current    = 0.7A

![Harmonic Current Chart for Vin=230VAC / Pout= 163W]
5 Control Loop Frequency Response

<table>
<thead>
<tr>
<th>Input Voltage</th>
<th>LED Current</th>
<th>LED Voltage</th>
<th>Phase margin</th>
<th>Bandwidth</th>
</tr>
</thead>
<tbody>
<tr>
<td>176VAC</td>
<td>0.71A</td>
<td>233V</td>
<td>69°</td>
<td>7Hz</td>
</tr>
<tr>
<td>230VAC</td>
<td>0.71A</td>
<td>234V</td>
<td>74°</td>
<td>10Hz</td>
</tr>
<tr>
<td>264VAC</td>
<td>0.71A</td>
<td>232V</td>
<td>55°</td>
<td>13Hz</td>
</tr>
</tbody>
</table>
6 Switch Node

Input voltage = 248VDC
LED current = 0.7A
Input voltage  = 374VDC
LED current    = 0.7A
7 Output ripple voltage and LED current

Input voltage  = 230VAC
LED current   = 0.71A
LED voltage   = 234V
8 Thermal Analysis

The images below show the infrared images taken from the FlexCam after 15min at 0.71A LED current.

<table>
<thead>
<tr>
<th>Name</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectifier D2</td>
<td>68.3°C</td>
</tr>
<tr>
<td>Resistor R19</td>
<td>65.3°C</td>
</tr>
<tr>
<td>Resistor R3</td>
<td>62.8°C</td>
</tr>
<tr>
<td>Mosfet Q1</td>
<td>52.3°C</td>
</tr>
<tr>
<td>Mosfet Q3</td>
<td>54.1°C</td>
</tr>
<tr>
<td>Diode D8</td>
<td>63.4°C</td>
</tr>
<tr>
<td>Diode D1</td>
<td>64.3°C</td>
</tr>
</tbody>
</table>

Input voltage  = 230VAC
Output power   = 232V@0.71A
Ambient temperature = 25°C
No heatsink, no airflow
9 EMI Measurement

The graph below shows the conducted emission EMI noise and the EN55022 Class-B Quasi-Peak limits (measurement from the worst case line). The load was connected to a LISN and an isolation transformer; the load was a LED string (232V@0.71A), while the input voltage was 230Vac. The receiver was set to Quasi-peak detector, 10 KHz bandwidth. The secondary side GND of the converter has been connected to the ground of the LISN.
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