# Buck Converter with Minimum Component Count to Drive LEDs (21.5V @ 450mA)

(ACTIVE) PMP2493.3

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## Description

The TPS40200 controller can be used as a low-cost LED driver. With an input voltage rating of 4.5 to 52 V, it can power LED strings with regulated current and up to a 45 V drop across the string. Current is sensed across a resistor between the cathode of the string and ground and is compared against a 696 mV reference to provide regulated current. Because the driver is a buck and not a boost or flyback, an open string will not produce voltages above the input voltage and over-voltage protection is not needed. The driver can operate in either the continuous or discontinuous mode. For output voltages above 35 V the discontinuous mode is needed due to duty cycle limitation above 35 V. The circuit shown has a Pulse Width Modulator (PWM) input for dimming purposes. Targeted current can be set with jumpers.

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## Bill of Materials (BOM)

Find the complete list of components in this reference design.

Download BOM

## Parametrics

| | PMP2493.3 |
|---|---|
| Vin (Max) (V) | 47 |
| Vin (Min) (V) | 43 |
| Vout (Nom) (V) | 21.5 |
| Iout (Max) (A) | .45 |
| Output Power | 9.675 |
| Isolated/Non-Isolated | Isolated |
| Input Type | DC |
| Topology | Buck- Non Sync |

## TI Devices (2)

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| Part Number | Name | Product Family | Sample & Buy | Design Kits & Evaluation Modules |
|---|---|---|---|---|
| TPS40200 | Wide Input Non-Synchronous Buck DC/DC Controller | Controller (External Switch) | Sample & Buy | View Design Kits & Evaluation Modules |
| UCC2897 | Current Mode Active Clamp PWM Controller | AC/DC and Isolated DC/DC Power Supply | Sample & Buy | Not Available |

## CAD/CAE symbols

| Part # | Package \| Pins | CAD File (.bxl) | STEP Model (.stp) |
|---|---|---|---|
| TPS40200 | SOIC (D) \| 8 | Download | Download |
| | VSON (DRB) \| 8 | Download | - |

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## Technical Documents

### User Guides (1)

| Title | Abstract | Type | Size (KB) | Date | Views |
|---|---|---|---|---|---|
| PMP2493 TEST RESULTS | | PDF | 1133 | 17 Jan 2011 | 22 |

### Design Files (2)

| Title | Abstract | Type | Size (KB) | Date | Views |
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| PMP2493 BOM | | PDF | 20 | 17 Jan 2011 | 46 |
| PMP2493 SCHEMATIC | | PDF | 88 | 17 Jan 2011 | 38 |

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