



## EV2480-N-00A

### Hysteretic Step Down High Power LED Driver

#### DESCRIPTION

The EV2480-N-00A Evaluation Board is designed to demonstrate the capabilities of MP2480DN. The MP2480 is step-down switching regulator to deliver a constant current of up to 3A for high power LED

With a 30-36V input VIN and a EN DC signal which is higher than 2V, EV2480-N-00A can deliver a regulated voltage to drive a LED string. The LED current is regulated to about 2A.

#### ELECTRICAL SPECIFICATION

| Parameter     | Symbol           | Value | Units |
|---------------|------------------|-------|-------|
| Input Voltage | VIN              | 30-36 | V     |
| Enable        | EN               | 2- 5  | V     |
| Dimming       | DIM              | 2- 5  | V     |
| LED Current   | I <sub>LED</sub> | 2     | A     |
| LED Voltage   | V <sub>LED</sub> | 24    | V     |

#### FEATURES

- Wide 5V to 36V Operating Input Range
- Up to 95% Efficiency
- Hysteretic Control with No Compensation
- No Output Capacitor Required
- $\pm 3\%$  LED Current Accuracy
- Up to 2MHz Switching Frequency
- Up to 20kHz Dimming Frequency
- 200mV Reference Voltage
- Short-Circuit Protection with Integrated High-Side MOSFET
- Thermal Shut Down

#### AVAILABLE IN SOIC8- EPAPPLICATIONS

- High Power LED Driver
- General Lighting and LCD Backlighting
- Constant Current Source

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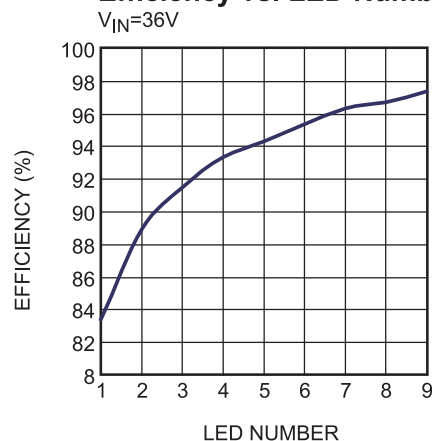
#### EV2480-N-00A EVALUATION BOARD



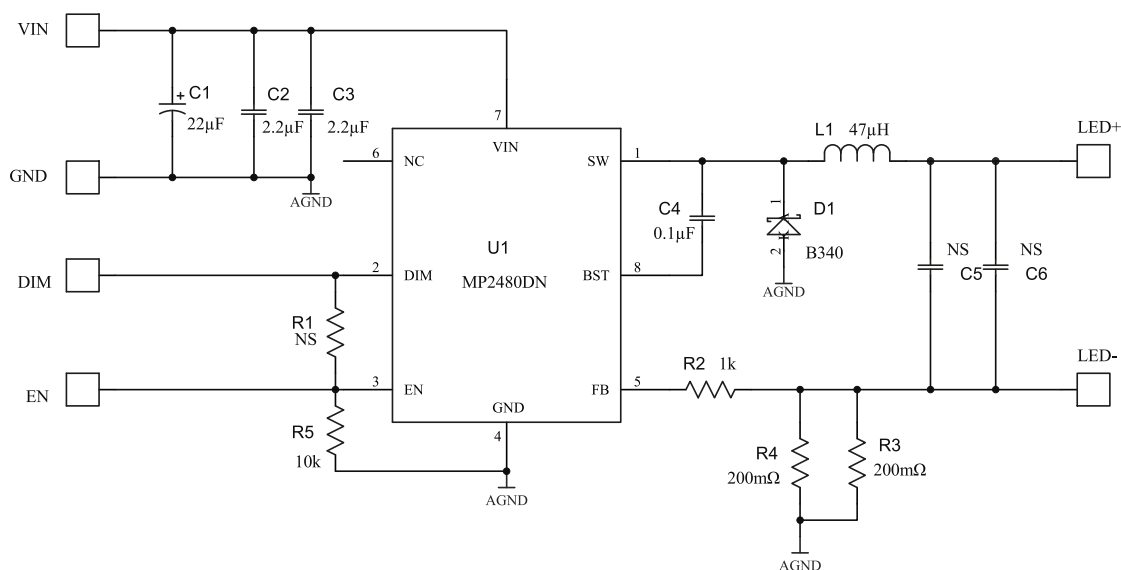
(L x W x H) 6.35cm x 6.35cm x 0.8cm

| Board Number | MPS IC Number |
|--------------|---------------|
| EV2480-N-00A | MP2480DN      |

#### Efficiency vs. LED Number



## EVALUATION BOARD SCHEMATIC



## EV2480-N-00A BILL OF MATERIALS

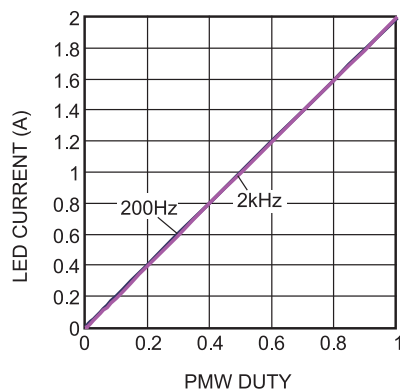
| Qty | Ref   | Value    | Description                 | Package  | Manufacturer | Part Number         |
|-----|-------|----------|-----------------------------|----------|--------------|---------------------|
| 1   | C1    | 22µF     | Electrolytic Capacitor,50V  | DIP      |              | 22µF./50V           |
| 2   | C2,C3 | 2.2µF    | Ceramic Capacitor,50V,X7R   | 1206     | muRata       | GRM32ER71H225 KA88L |
| 1   | C4    | 0.1µF    | Ceramic Cap., 50V, 10%, X7R | 0603     | muRata       | GRM188R71H104K      |
| 2   | C5,C6 | NC       |                             | 1206     |              |                     |
| 1   | D1    | B340     | Diode Schottky              | SMC      | Diodes Inc.  | B340                |
| 1   | L1    | 47µH     | Inductor 2.7A               | SMD      | Wurth        | 744770147           |
| 1   | R1    | NC       |                             | 0603     |              |                     |
| 1   | R2    | 1k       | Film Res., 1%               | 0603     | Yageo        | RC0603FR-071KL      |
| 2   | R3,R4 | 200mΩ    | Film Res., 1%               | 1206     | Yageo        | RL1206FR-070R2L     |
| 1   | R5    | 10k      | Film Res., 1%               | 0603     | Yageo        | RC0603FR-0710KL     |
| 1   | U1    | MP2480DN | MPS WLED Driver             | SOIC8-EP | MPS          | MP2480DN            |

## EVB TEST RESULTS

Performance waveforms are tested on the evaluation board.

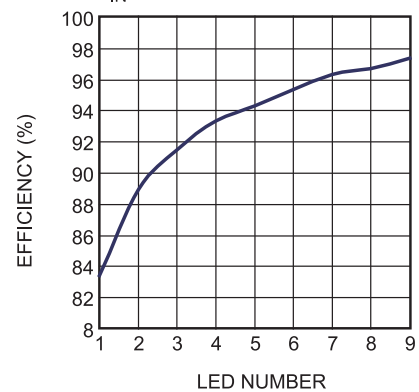
V<sub>IN</sub> = 30V, I<sub>LED</sub> = 2A, 7 LEDs Load, T<sub>A</sub> = 25°C, unless otherwise noted.

**PMW Dimming Cure**

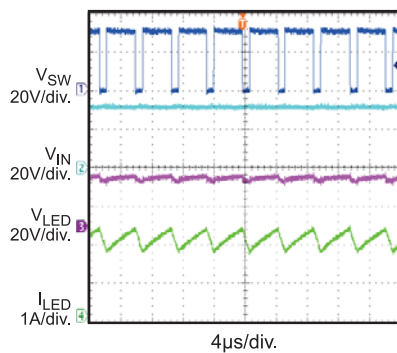


**Efficiency vs. LED Number**

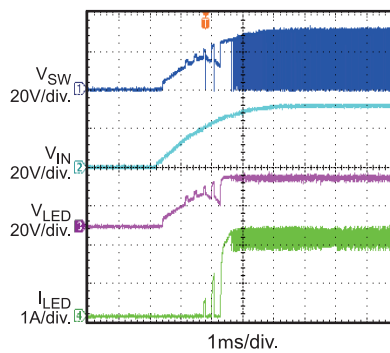
V<sub>IN</sub>=36V



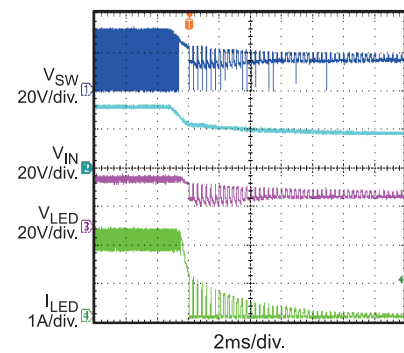
**Steady State**



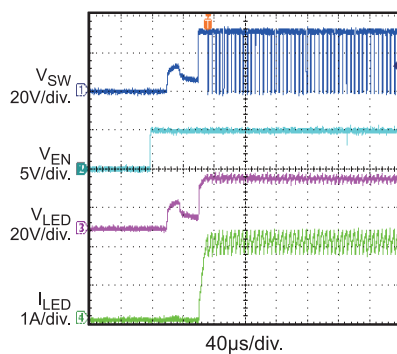
**V<sub>IN</sub> Startup**



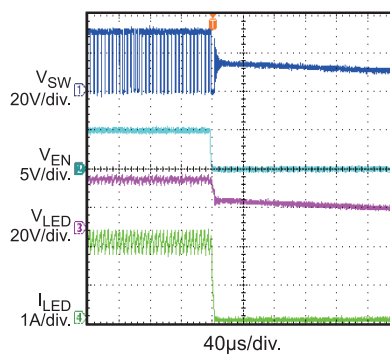
**V<sub>IN</sub> Off**



**EN Startup**

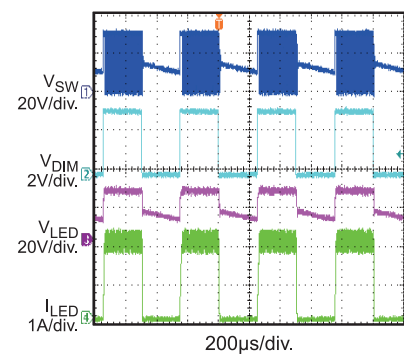


**EN Off**



**PWM Dimming**

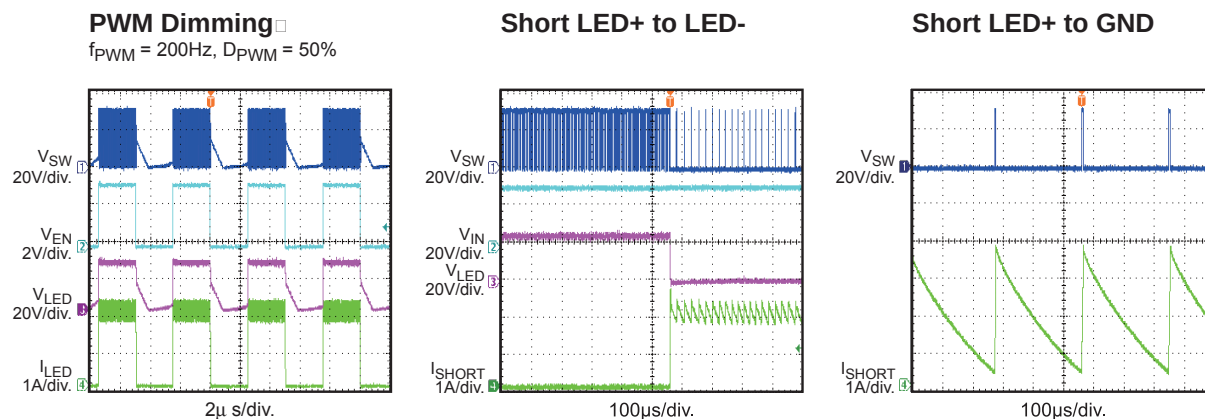
f<sub>PWM</sub> = 2kHz, D<sub>PWM</sub> = 50%



## EVB TEST RESULTS (continued)

Performance waveforms are tested on the evaluation board.

VIN = 30V, ILED = 2A, 7 LEDs Load, TA = 25°C, unless otherwise noted.



## PRINTED CIRCUIT BOARD LAYOUT

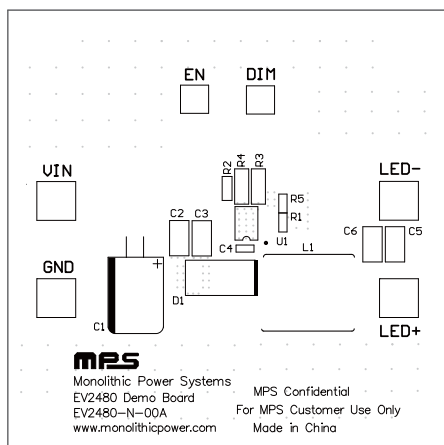


Figure 1—Top Silk Layer

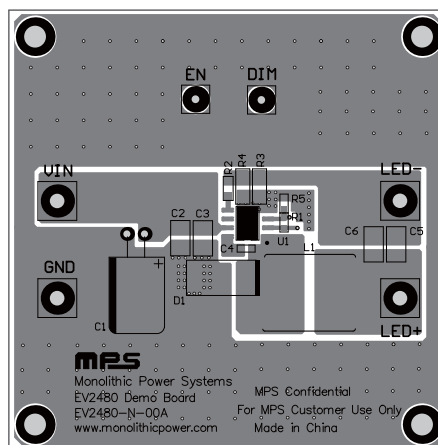


Figure 2—Top Layer

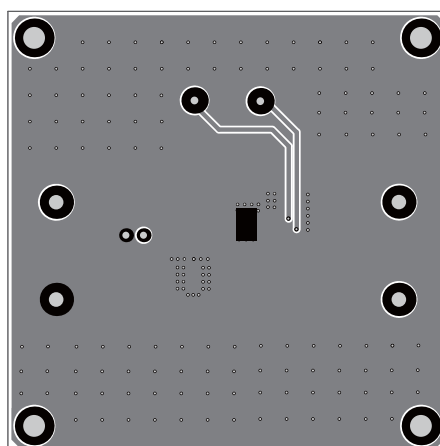


Figure 3—Bottom Layer

## QUICK START GUIDE

1. Check the LED string voltage and preset the input voltage power supply to 30-36V.
2. Set a second power supply to 2- 5V as the power supply for 'EN'.
3. Turn-off all power supplies. Connect all the power supply.
4. Connect the anode of the LED string to LED+, and the cathode to LED-.
5. Turn on the power supplies. The LED string should be lighten
6. To demo the dimming function: Connect the 'DIM' with a function generator. Set the PWM signal amplitude to 2- 5V and the frequency within 100Hz to 20kHz range.

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