



The Future of Analog IC Technology®

# EV6001DN-00D

WLED Driver  
Evaluation Board

## GENERAL DESCRIPTION

The EV6001DN-00D is an evaluation board for the WLED driver application. It can drive 6 20mA strings of WLEDs with up to 10 WLEDs per string. EV6001DN-00D has good current balance among 6 strings. It also has PWM dimming, EN function, and open circuit voltage protection.

This device is available in an 8-pin SOIC package with an exposed pad.

## ELECTRICAL SPECIFICATIONS

| Parameter      | Symbol    | Value    | Units |
|----------------|-----------|----------|-------|
| Input Voltage  | $V_{IN}$  | 7 – 21   | V     |
| Output Voltage | $V_{OUT}$ | 33       | V     |
| Output Current | $I_{OUT}$ | 20mA x 6 | mA    |

## FEATURES

- Integrated 150V Power Switch
- Integrated 100V Startup Circuit
- Cycle-by-Cycle Current Limiting
- PWM Dimming
- Open Circuit Protection
- Backlight Current Balance

## APPLICATIONS

- LCD Panel Backlight
- General and Accent Lighting

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## EV6001DN-00D EVALUATION AND LED BOARDS



(L x W x H) 2.6" x 0.6" x 0.2"  
(6.5cm x 1.5cm x 0.5cm)

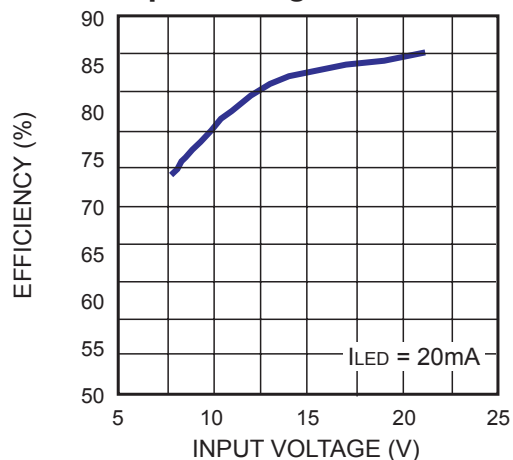
| Board Number | MPS IC Number |
|--------------|---------------|
| EV6001DN-00D | MP6001DN      |



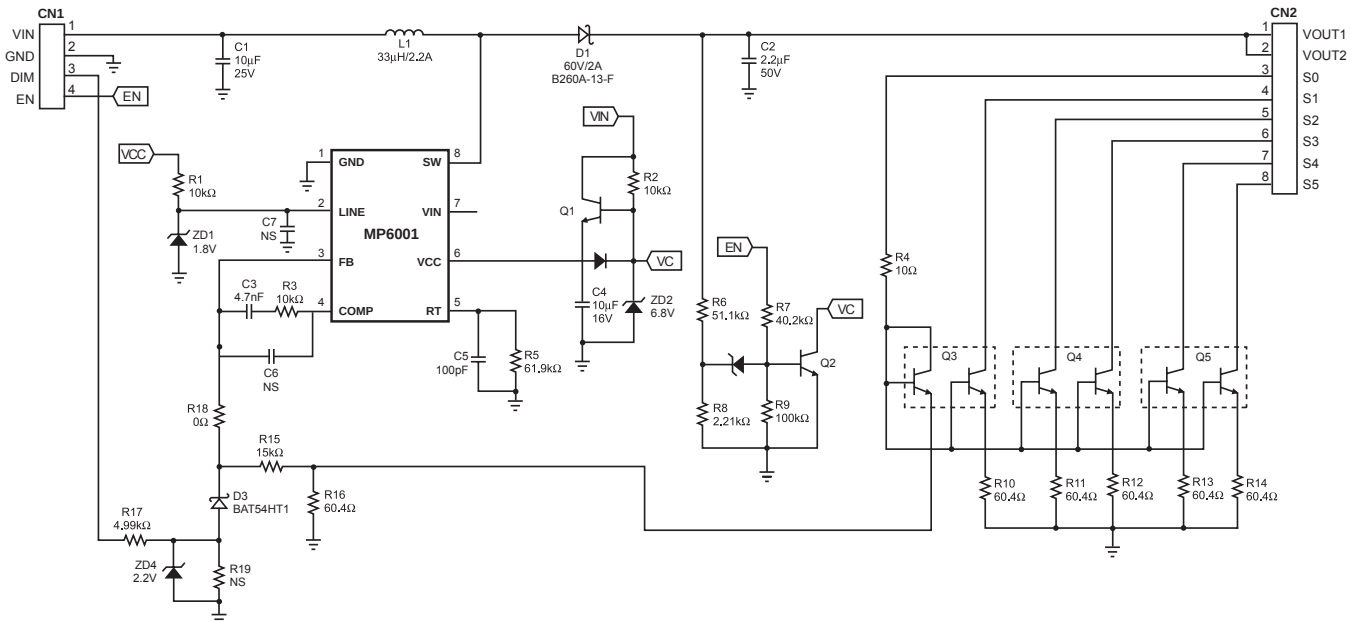
(L x W x H) 3.3" x 0.8" x 0.2"  
(8.5cm x 2.0cm x 0.5cm)

| Board Number          | MPS IC Number |
|-----------------------|---------------|
| MP6001 LED Board -00C | MP6001DN      |

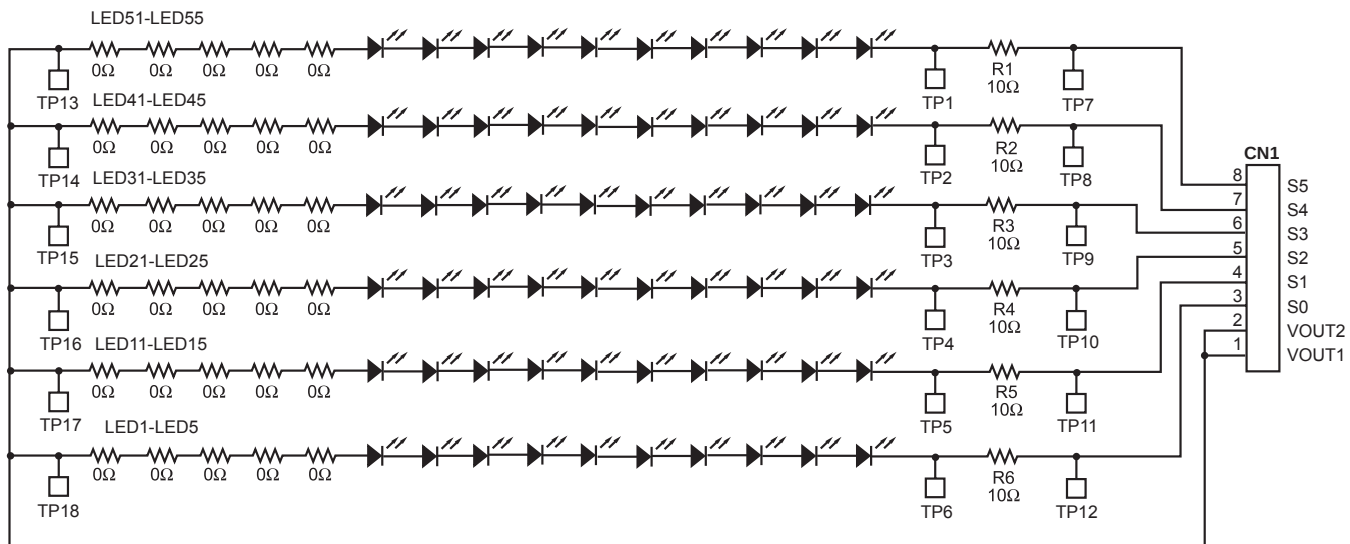
Efficiency vs  
Input Voltage



## EVALUATION BOARD SCHEMATIC



## LED BOARD SCHEMATIC



## EV6001DN-00D BILL OF MATERIALS

| Qty | Ref                                | Value          | Description                      | Package | Manufacturer          | Part Number    |
|-----|------------------------------------|----------------|----------------------------------|---------|-----------------------|----------------|
| 1   | C1                                 | 10 $\mu$ F     | Ceramic Cap., 25V, X7R           | 1210    | TDK                   | C3225X7R1E106M |
| 1   | C2                                 | 2.2 $\mu$ F    | Ceramic Cap., 50V, X7R           | 1210    | TDK                   | C3225X7R1H225K |
| 1   | C3                                 | 4.7nF          | Ceramic Cap., 50V, X7R           | 603     | TDK                   | C1608X7R1H472K |
| 1   | C4                                 | 10 $\mu$ F     | Ceramic Cap., 16V X7R            | 1206    | TDK                   | C3216X7R1C106M |
| 1   | C5                                 | 100pF          | Ceramic Cap., 50V, NPO           | 603     | TDK                   | C1608C0G1H101J |
| 2   | C6, C7                             |                | Not Stuffed                      | 603     |                       |                |
| 2   | R1, R3                             | 10k $\Omega$   | Film Res., 5%                    | 603     | Panasonic             | ERJ-3GEYJ103V  |
| 1   | R2                                 | 10k $\Omega$   | Film Res., 5%                    | 805     | Panasonic             | ERJ-6GEYJ103V  |
| 1   | R4                                 | 10 $\Omega$    | Film Res., 5%                    | 805     | Panasonic             | ERJ-6GEYJ100V  |
| 1   | R5                                 | 61.9k $\Omega$ | Film Res., 1%                    | 603     | Panasonic             | ERJ-3EKF6192V  |
| 1   | R6                                 | 51.1k $\Omega$ | Film Res., 1%                    | 603     | Panasonic             | ERJ-3EKF5112V  |
| 1   | R7                                 | 40.2k $\Omega$ | Film Res., 1%                    | 603     | Panasonic             | ERJ-3EKF4022V  |
| 1   | R8                                 | 2.21k $\Omega$ | Film Res., 1%                    | 603     | Panasonic             | ERJ-3EKF2211V  |
| 1   | R9                                 | 100k $\Omega$  | Film Res., 5%                    | 603     | Panasonic             | ERJ-3GEYJ104V  |
| 6   | R10, R11,<br>R12, R13,<br>R14, R16 | 60.4 $\Omega$  | Film Res., 1%                    | 603     | Panasonic             | ERJ-3EKF60R4V  |
| 1   | R15                                | 15k $\Omega$   | Film Res., 5%                    | 603     | Panasonic             | ERJ-3GEYJ153V  |
| 1   | R17                                | 4.99k $\Omega$ | Film Res., 1%                    | 603     | Panasonic             | ERJ-3EKF4991V  |
| 1   | R18                                | 0 $\Omega$     | Film Res., 5%                    | 603     | Panasonic             | ERJ-3GEY0R00V  |
| 1   | R19                                |                | Not Stuffed                      | 603     |                       |                |
| 1   | L1                                 | 33 $\mu$ H     | Inductor, 2.2A                   | SMD     | Sumida                | CDR7D43MN-330  |
| 2   | Q1, Q2                             |                | Transistor, NPN, 40V, 350mW      | SOT-23  | Diodes Inc            | MMBT3904-7-F   |
| 3   | Q3, Q4, Q5                         |                | Transistor, Dual NPN, 40V, 200mA | SOT-363 | Diodes Inc            | MMDT3904-7-F   |
| 2   | ZD1, ZD3                           |                | Diode Zener, 1.8V                | SOD-323 | Central Semiconductor | CMSZ1L8        |
| 1   | ZD2                                |                | Diode Zener, 6.8V                | SOD-123 | Diodes Inc            | BZT52C6V8-7    |
| 1   | ZD4                                |                | Diode Zener, 2.2V                | SOD-323 | Central Semiconductor | CMDZ2L2        |
| 1   | CN1                                |                | Connector Header, 4P, 2mm        |         | Any                   |                |
| 1   | CN2                                |                | Connector Header, 8P, 2mm        |         | Any                   |                |
| 1   | U1                                 |                | DC-DC Converter                  | SO-8    | MPS                   | MP6001DN       |

## LED BOARD BILL OF MATERIALS *(continued)*

| Qty | Ref                                                                                                                | Value | Description                  | Package | Manufacturer | Part Number   |
|-----|--------------------------------------------------------------------------------------------------------------------|-------|------------------------------|---------|--------------|---------------|
| 6   | R1 – R6                                                                                                            | 10Ω   | Film Res., 5%                | 805     | Panasonic    | ERJ-6GEYJ100V |
| 60  | LED6 – LED10<br>LED16 – LED20<br>LED26 – LED30<br>LED36 – LED40<br>LED46 – LED50<br>LED56 – LED60<br>LED61 – LED90 |       | White LED, Surface Mount     | 603     | LITE-ON Inc  | LTW-C191TS5   |
| 30  | LED1 – LED5<br>LED11 – LED15<br>LED21 – LED25<br>LED31 – LED35<br>LED41 – LED45<br>LED51 – LED55                   | 0Ω    | Film Res., 5%                | 603     | Panasonic    | ERJ-3GEY0R00V |
| 1   | CN1                                                                                                                |       | Connector Header, 8 Pin, 2mm |         | Any          |               |

## PRINTED CIRCUIT BOARD LAYOUT

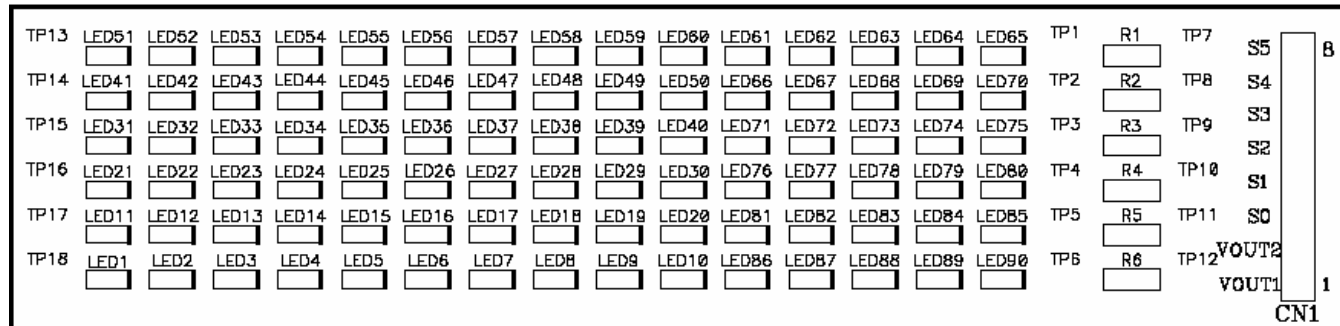


Figure 1—LED Board Top Silk Layer



Figure 2—LED Board Top Layer



Figure 3—LED Board Bottom Silk Layer



Figure 4—LED Board Bottom Layer

