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EV3399EY-00A

24 strings White LED Driver Evaluation Board

DESCRIPTION

The EV3399EY-00A is an evaluation board for the MP3399EY, a 12 LED channels step-up converter designed for large liquid-crystal displays that employ an array of LEDs as the light source. The board builds with two MP3399EY in parallel to drive 24 strings LEDs with 60mA maximum current.

The MP3399 uses external power mosfet and internal current mode, fixed frequency architecture and includes current ballast in each string terminal, which achieves 2.5% current regulation accuracy between strings. Low feedback voltage at each LED string help reduce power loss and improve efficiency.

The MP3399 has multiple features to protect the converter from fault conditions, including under-voltage lockout, current limiting, over voltage, short LED, open LED and thermal shut-down protection.

ELECTRICAL SPECIFICATIONS

| Parameter | Symbol | Value | Units |
|---------------|-----------|---|-------|
| Input Voltage | V_{IN} | 8 – 28 | V |
| LEDs # | | 24 strings parallel & 12 LEDs/string | |
| LED Current | I_{LED} | 20/string | mA |

FEATURES

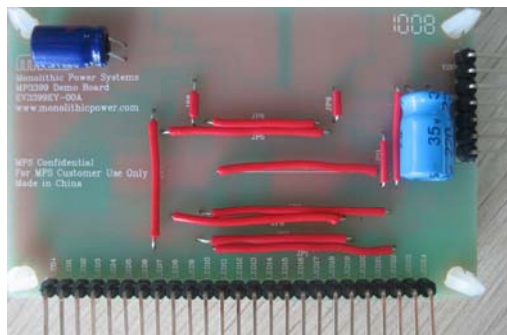
- 8V to 28V Input Voltage Range
- External Power MOSFET
- Up to 90% Efficiency
- Programmable Over Voltage Protection
- Drives up to 24 Strings Parallel 2.5% Current Regulation Accuracy Between Strings
- Programmable Switching Frequency:
- PWM Dimming
- Open and Short LED Load Protection
- Thermal Shutdown

APPLICATIONS

- Notebook PC
- LCD Monitor
- LCD TV
- Handy Terminals Display
- Automotive Systems and Tablet Computer

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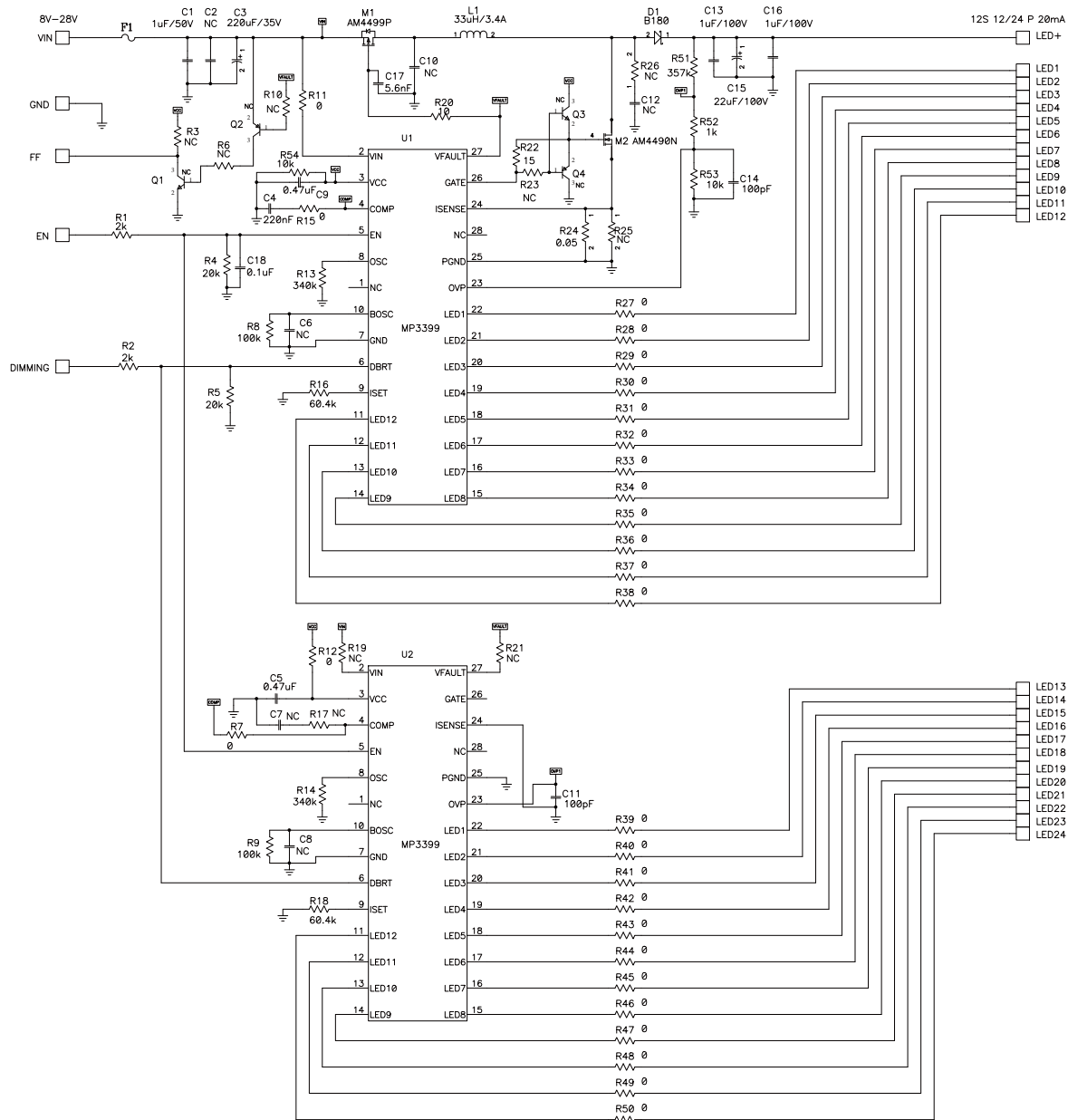
EV3399EY-00A EVALUATION BOARD



(L x W x H) 7.8cm x 4.7cm x 1.0cm

| Board Number | MPS IC Number |
|--------------|---------------|
| EV3399EY-00A | MP3399EY |

EVALUATION BOARD SCHEMATIC



MPS CONFIDENTIAL
INTERNAL USE ONLY
DO NOT DISTRIBUTE

EV3399EY-00A BILL OF MATERIALS

| Qty | RefDes | Value | Description | Package | Reference | Manufacturer P/N |
|-----|---------------------------------|----------------|------------------------------|---------|-------------|--------------------|
| 1 | C1 | 1 μ F | Ceramic Capacitor, 50V, X7R | 1210 | TAIYO YUDEN | UMK325BJ105KH-T |
| 3 | C2,C10,C12 | NC | | 1210 | | |
| 1 | C3 | 220 μ F | Electrolytic Capacitor, 35V | | | |
| 1 | C4 | 220nF | Ceramic Capacitor, 50V, X7R | 0603 | Murata | GRM188R71H224KA93D |
| 2 | C5,C9 | 0.47 μ F | Ceramic Capacitor, 25V, X7R | 0603 | Murata | GRM1885C1E474JA01D |
| 3 | C6,C7,C8 | NC | | 0603 | | GRM1885C1H101JA01D |
| 2 | C11,C14 | 100pF | Ceramic Capacitor, 50V, COG | 0603 | Murata | GRM1885C1H474JA01D |
| 1 | C15 | 22 μ F | Electrolytic Capacitor, 100V | | | |
| 2 | C13,C16 | 1 μ F | Ceramic Capacitor, 100V, X7R | 1210 | Murata | GRM32ER71H105KA88L |
| 1 | C17 | 5.6nF | Ceramic Capacitor, 50V, X7R | 0603 | Murata | GRM188R71H562KA01 |
| 1 | C18 | 0.1 μ F | Ceramic Capacitor, 50V, X7R | 0603 | Murata | GRM188R71H105KA93D |
| 1 | D1 | | Diode Schottky, 80V, 1A | SMA | Diodes Inc | B180 |
| 1 | F1 | 0 Ω | Fuse, 2A, 63V | 1206 | | |
| 1 | L1 | 33 μ H | Inductor, 3.84A | SMD | Cooper | DR125-330-R |
| 1 | M1 | | P- channel MOSFET | SO8 | | AM4499P |
| 1 | M2 | | N- channel MOSFET | SO8 | | AM4490N |
| 2 | Q1,Q3 | NC | NPN, Transistor | SOT323 | | |
| 2 | Q2,Q4 | NC | PNP, Transistor | SOT323 | | |
| 2 | R1,R2, | 2k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-072KL |
| 2 | R4,R5 | 20k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-0720KL |
| 8 | R3,R6,R10, R17,R19,R21, R23,R26 | NC | | 0603 | | |
| 2 | R8,R9 | 100k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-07100KL |
| 28 | R7,R11,R12, R15,R27-50 | 0 Ω | Resistor, 1% | 0603 | Yageo | |
| 2 | R13,R14 | 340k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-07340KL |
| 2 | R16,R18 | 60.4k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-0760K4L |
| 1 | R20 | 10 Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-0710L |
| 1 | R22 | 15 Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-0715L |
| 1 | R24 | 0.05 Ω | Sensign resistor. 1% | 1206 | CYNTEC | RL1632H-R050-FN |
| 1 | R25 | NC | | | | |
| 1 | R51 | 357k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-07357KL |
| 1 | R52 | 1k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-071KL |
| 2 | R53,R54 | 10k Ω | Resistor, 1% | 0603 | Yageo | RC0603FR-0710KL |
| 2 | U1,U2 | | LED Driver IC | SOIC28 | MPS | MP3399EY R2 |

PRINTED CIRCUIT BOARD LAYOUT

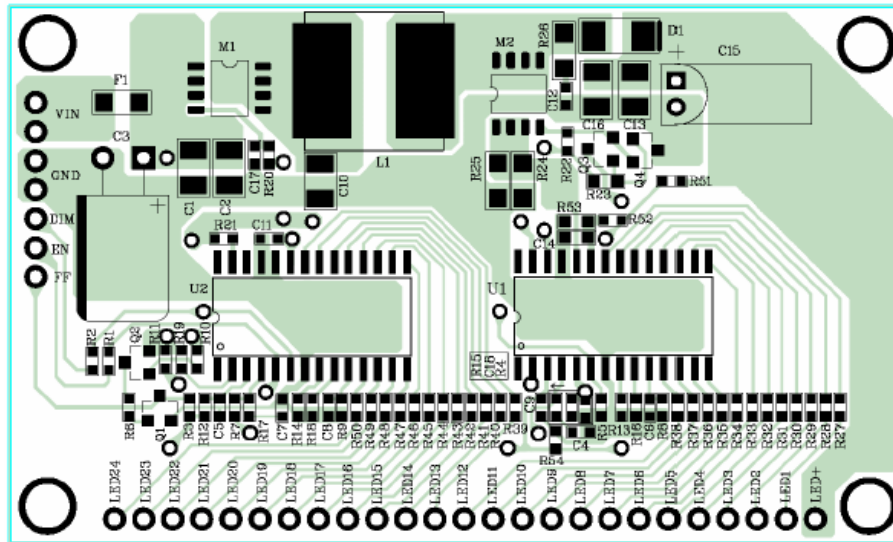


Figure 1—Top Layer

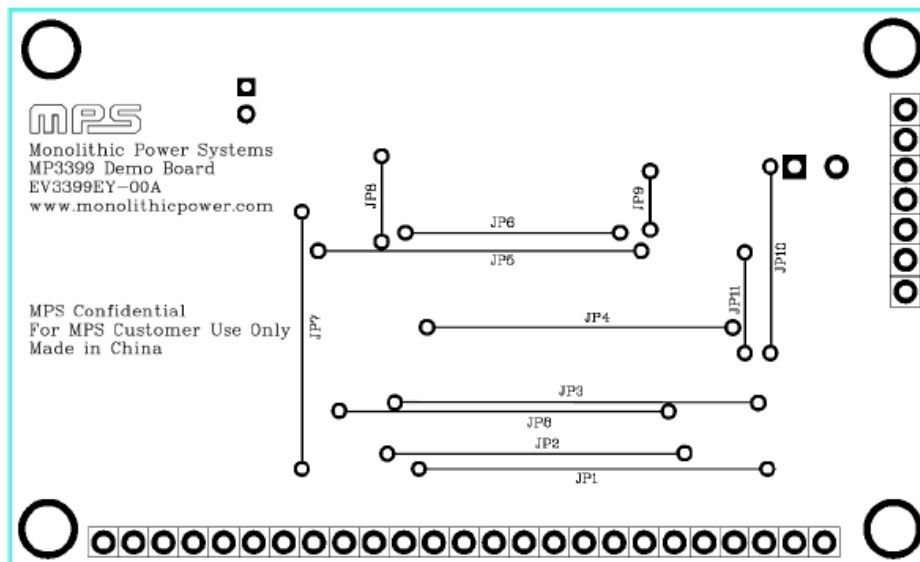


Figure 2—Bottom Layer

QUICK START GUIDE

1. Connect the positive and negative terminals of the load panel (12 white LEDs in series, 24 strings paralleled) to the LED+ and LED1~24 pins on the EV board, respectively.
2. Connect the positive and negative terminals of the power supply (8V ~ 28V) to the VIN and GND pins on the EV board, respectively.
3. Apply the PWM dimming signal on the DBRT to achieve the dimming request, the frequency of the PWM signal is recommended between 200Hz to 2kHz.
4. Drive EN pin high (5V) to enable the MP3399. The LED should be lighted.

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