

## DESCRIPTION

The EV3391EY-00A is an evaluation board for the MP3391EY, a step-up converter designed for large liquid-crystal displays that employ an array of LEDs as the light source. It can drive up to 8 WLED strings in parallel with 80mA maximum current.

The MP3391 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 MP3391 is flexible for extending LED channels with two or more MP3391s in parallel.

The MP3391 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 | $V_{IN}$  | 10 – 28                               | V     |
| LEDs #        |           | 8 strings parallel and 12 LEDs/string |       |
| LED Current   | $I_{LED}$ | 60/string                             | mA    |

## FEATURES

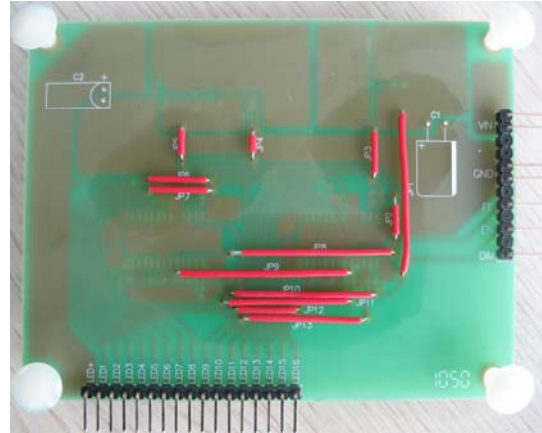
- 10V to 28V Input Voltage Range
- External Power MOSFET
- Up to 90% Efficiency
- Programmable Over Voltage Protection
- Drives up to 8 Strings Parallel 2.5% Current Regulation Accuracy Between Strings
- Programmable Switching Frequency:
- PWM or DC Input Burst PWM Dimming
- Open and Short LED Load Protection
- Thermal Shutdown
- Flexible Extended Channels Applications

## APPLICATIONS

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

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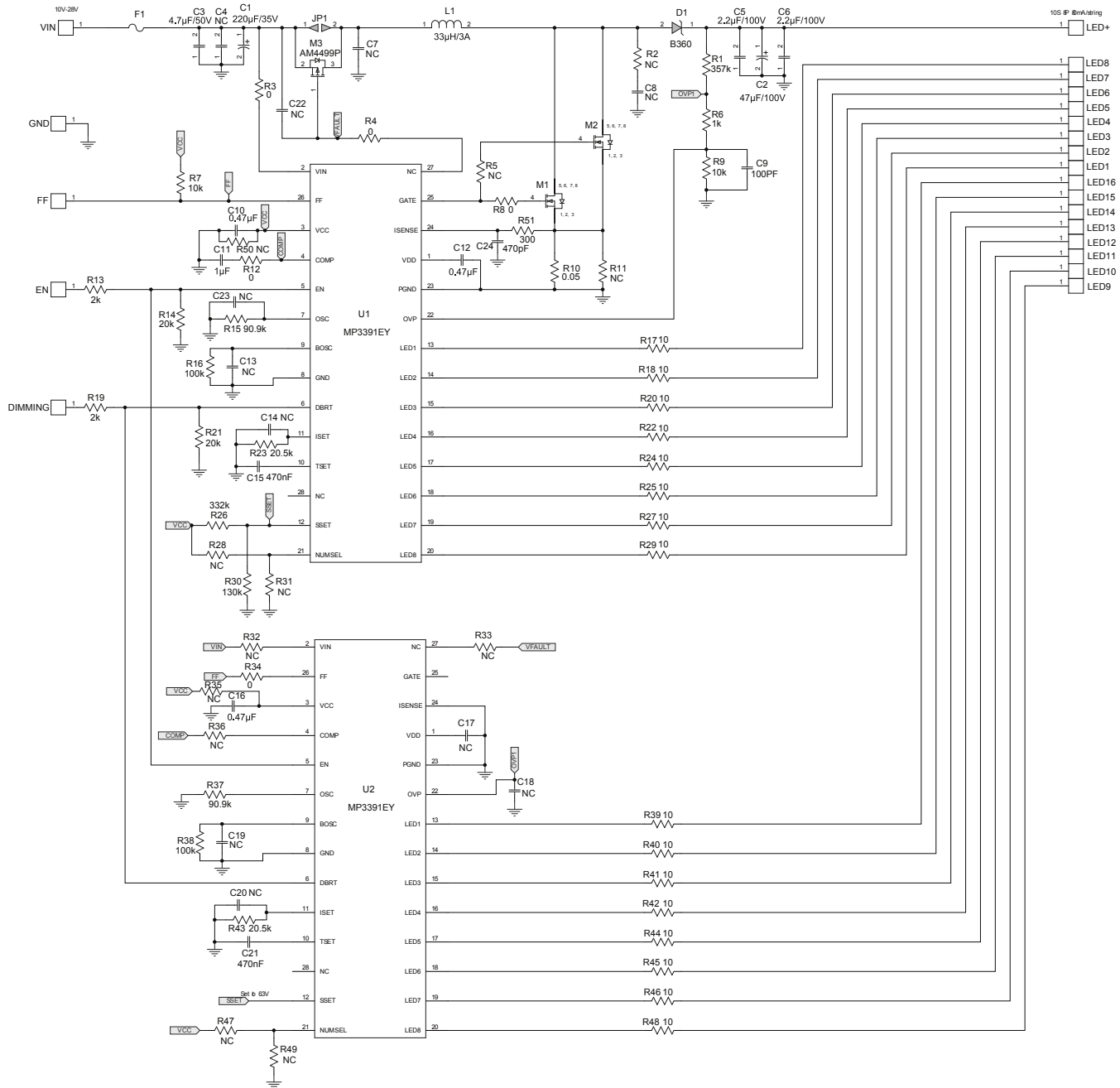
**EV3391EY-00A EVALUATION BOARD**



(L x W x H) 9.9cm x 7.75cm x 1cm

| Board Number | MPS IC Number |
|--------------|---------------|
| EV3391EY-00A | MP3391EY      |

# EVALUATION BOARD SCHEMATIC



**EV3391EY-00A BILL OF MATERIALS**

| Qty | Ref   | Value        | Description                     | Package | Manufacturer      | Part Number        |
|-----|---|--------------|---------------------------------|---------|-------------------|--------------------|
| 1   | C1  | 220 $\mu$ F  | Electrolytic Capacitor,<br>35V  |         |                   |                    |
| 2   | C5,C6   | 2.2 $\mu$ F  | Ceramic Capacitor,<br>100V, X7R | 1210    | Murata            | GRM32ER71H225KA88L |
| 1   | C3  | 4.7 $\mu$ F  | Ceramic Capacitor,<br>50V, X7R  | 1210    | Murata            | GRM32ER71H475KA88L |
| 2   | C4,C7   | NC           |                                 | 1210    |                   |                    |
| 1   | C2  | 47 $\mu$ F   | Electrolytic Capacitor,<br>100V |         | Jianghai          | ECV2AVS470M        |
| 9   | C8,C13,<br>C14,C17,<br>C18,C19,<br>C20,C22,<br>C23      | NC           |                                 | 0603    |                   |                    |
| 1   | C9  | 100pF        | Ceramic Capacitor,<br>50V, COG  | 0603    | Murata            | GRM1885C1H101JA01D |
| 6   | C10,C12,<br>C15,C16,<br>C21,C24                         | 0.47 $\mu$ F | Ceramic Capacitor,<br>25V, X7R  | 0603    | Murata            | GRM1885C1H474JA01D |
| 1   | C11   | 1 $\mu$ F    | Ceramic Capacitor,<br>16V, X7R  | 0603    | Murata            | GRM188R71H105KA93D |
| 1   | C16   | 470nF        | Ceramic Capacitor,<br>10V, X7R  | 0603    | Murata            | GRM188R71H474KA93D |
| 1   | D1  |              | Diode Schottky, 90V,<br>3A      | SMB     | Diodes Inc        | B390               |
| 1   | F1  | 0 $\Omega$   | Fuse, 2A, 63V                   | 1206    | Cooper<br>Bussman | 3216FF2-R          |
| 1   | L1  | 33 $\mu$ H   | Inductor,5A                     | SMD     | Wurth             | 7447709330         |
| 1   | M3  |              | P- channel MOSFET               | SO8     |                   | AM4499P            |
| 1   | M2  | NC           |                                 | SO8     |                   |                    |
| 1   | M1  |              | N- channel MOSFET               | SO8     |                   | AG9977GH           |
| 10  | R5,R28,<br>R31,R35,<br>R47,R49,<br>R50,R32,<br>R33, R36 | NC           |                                 | 0603    |                   |                    |
| 1   | R1  | 357k         | Resistor, 1%                    | 0603    | Yageo             | RC0603FR-07357KL   |
| 1   | R2  | NC           |                                 | 0805    |                   |                    |
| 4   | R3, R8,<br>R12, R34                                     | 0 $\Omega$   | Resistor, 5%                    | 0603    | Yageo             |                    |
| 1   | R6  | 1k $\Omega$  | Resistor, 1%                    | 0603    | Yageo             | RC0603FR-071KL     |
| 2   | R9,R7   | 10k $\Omega$ | Resistor, 1%                    | 0603    | Yageo             | RC0603FR-0710KL    |
| 2   | R11,R10   | 0.1 $\Omega$ | Current Resistor, 1%            | 1206    |                   |                    |
| 2   | R13,R19   | 2k $\Omega$  | Resistor, 1%                    | 0603    | Yageo             | RC0603FR-072KL     |
| 2   | R14,R21   | 20k $\Omega$ | Resistor, 1%                    | 0603    | Yageo             | RC0603FR-0720KL    |

**EV3391EY-00A BILL OF MATERIALS** *(continued)*

| Qty | Ref  | Value  | Description   | Package | Manufacturer | Part Number      |
|-----|--|--------|---------------|---------|--------------|------------------|
| 2   | R15,R37  | 90.9kΩ | Resistor, 1%  | 0603    | Yageo        | RC0603FR-0790K9L |
| 2   | R16,R38  | 100kΩ  | Resistor, 1%  | 0603    | Yageo        | RC0603FR-07100KL |
| 16  | R17,R18,<br>R20,R22,<br>R24,R25,<br>R27,R29,<br>R39-42,<br>R44,R45,<br>R46,R48 | 10Ω    | Resistor, 1%  | 0603    | Yageo        | RC0603FR-0710L   |
| 2   | R23,R43  | 20.5kΩ | Resistor, 1%  | 0603    | Yageo        | RC0603FR-0720K5L |
| 1   | R26  | 332kΩ  | Resistor, 1%  | 0603    | Yageo        | RC0603FR-07332KL |
| 1   | R30  | 130kΩ  | Resistor, 1%  | 0603    | Yageo        | RC0603FR-07130KL |
|     | R51  | 300    | Resistor, 1%  | 0603    | Yageo        | RC0603FR-07300RL |
| 2   | U1   |        | LED Driver IC | SOIC    | MPS          | MP3391EY R1      |

PRINTED CIRCUIT BOARD LAYOUT

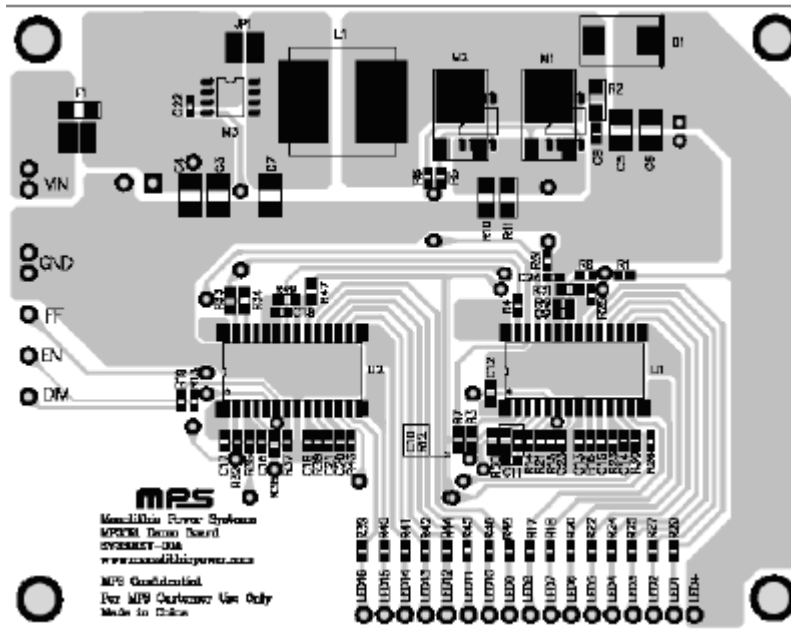


Figure 1—Top Layer

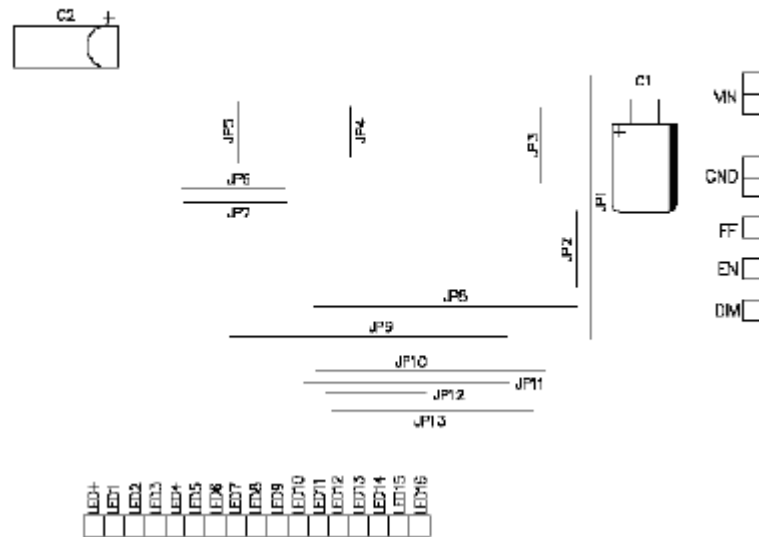


Figure 2—Bottom Layer