MP3398L

Step up, 4 strings, Max. 350mA/string
Analog and PWM dimming, White LED Controller

The Future of Analog IC Technology

DESCRIPTION

The MP3398L is a step-up controller with 4 current channels, which is designed to drive WLED arrays for large-size LCD-panel backlighting applications. It is flexible to expand the number of LED channels by two or more ICs in parallel sharing a single inductive power source.

The MP3398L uses peak-current mode with fixed switching frequency. The frequency is programmable by an external setting resistor. The MP3398L drives an external MOSFET to boost up the output voltage from a 5V to 28V input supply. It regulates the current in each LED string to the value set by an external current-setting resistor.

The MP3398L applies 4 internal current sources for current balance. The current matching can achieve 2.5% regulation accuracy between strings. Its low regulation voltage on LED current sources reduces power loss.

The MP3398L can support both analog and PWM dimming independently to meet the different dimming-mode request. In addition, rich protection modes are also integrated including OCP, OTP, UVP, OVP, LED short/open protection, inductor/diode short protection.

The MP3398L is available in SOIC16 package.

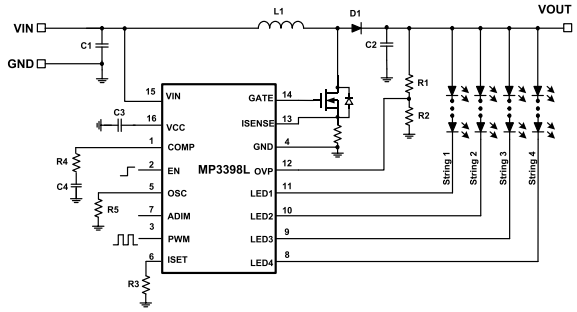
FEATURES

- 4-String, Max 350mA/String WLED Driver
- 4.5V to 28V Input Voltage Range
- 2.5% Current Matching Accuracy Between Strings
- Programmable Switching Frequency
- PWM and Analog Dimming Mode
- Cascading Capability with a Single Power Source
- LED Open and Short LED Protection
- Programmable Over-Voltage Protection
- Recoverable Thermal Shutdown Protection
- Over Current Protection
- Inductor/Diode short Protection
- Under-Voltage Lockout
- SOIC16 Package

APPLICATIONS

- Desktop LCD Flat Panel Displays
- Flat Panel Video Displays
- 2D/3D LCD TVs and Monitors

TYPICAL APPLICATION

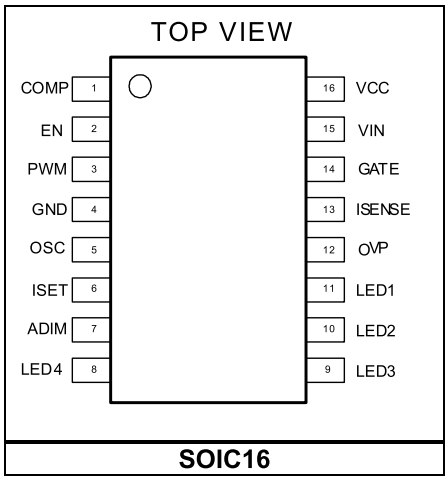


ORDERING INFORMATION

Part Number	Package	Top Marking
MP3398LGS*	SOIC16	MP3398L

* For Tape & Reel, add suffix –Z (e.g. MP3398LGS–Z);

PACKAGE REFERENCE



SOIC16

ABSOLUTE MAXIMUM RATINGS (1)

VIN ..... -0.3V to +30V
V_{GATE} ..... -0.3V to +6.5V
VCC ..... -0.3V to +6.5V
V_{LED1} to V_{LED4} ..... -1V to +55V
V_{ISENSE} ..... -0.5V to +6.5V
All Other Pins ..... –0.3V to VCC
Continuous Power Dissipation (T_A = 25°C) (2)
SOIC16 ..... 1.56W
Junction Temperature ..... 150°C
Lead Temperature ..... 260°C

Recommended Operating Conditions (3)

Supply Voltage V_{IN} ..... 4.5V to 28V
LED Current (Backlight) ..... 10mA to 350mA
Operating Junction Temp. (T_J). -40°C to +125°C

Thermal Resistance (4) θ_{JA} θ_{JC}

SOIC16 ..... 80 ..... 35 .... °C/W

Notes:

1) Exceeding these ratings may damage the device. The voltage is measured with a 20MHz bandwidth limited oscilloscope.
2) The maximum allowable power dissipation is a function of the maximum junction temperature T_J (MAX), the junction-to-ambient thermal resistance θ_{JA}, and the ambient temperature T_A. The maximum allowable continuous power dissipation at any ambient temperature is calculated by P_D (MAX) = (T_J (MAX)-T_A)/θ_{JA}. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.
3) The device is not guaranteed to function outside of its operating conditions.
4) Measured on JESD51-7, 4-layer PCB.