EV3371-R-00A

8-Channel, Synchronous Boost WLED Driver with I²C Interface

DESCRIPTION

The EV3371-R-00A is an evaluation board designed for the MP3371, a synchronous boost converter with eight current channels designed to drive WLED arrays for LCD panels in tablets and notebook backlighting applications.

The MP3371 uses peak current mode and pulse-width modulation (PWM) control to regulate the boost converter. The MP3371 employs a standard I²C digital interface to set the operation mode, switching frequency, full-scale current for each channel, sync or non-sync mode, dimming mode and duty, and various protection thresholds.

The MP3371 features high efficiency due to low-headroom voltage for LED regulation and a small on resistance of the switching MOSFET. The synchronous rectifier saves PCB size and total BOM cost.

The MP3371 is available in a QFN-24 (4mmx4mm) package.

ELECTRICAL SPECIFICATIONS

Parameter	Symbol	Value	Units
Input voltage	V_{IN}	3 to 30	V
Output voltage	V_{LED}	<45	V
LEDs#		8 strings	
LED current /string	I_{LED}	50	mA

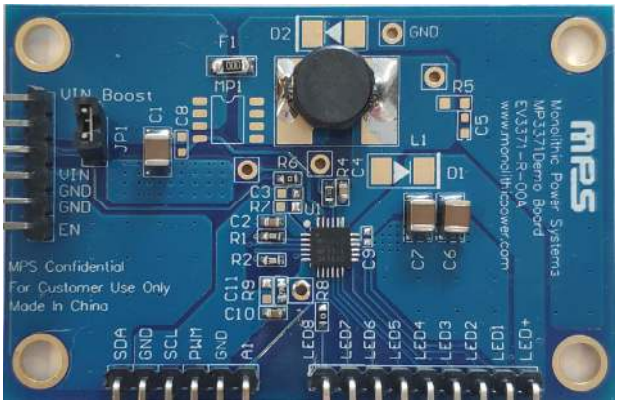
FEATURES

- 8 Channels with Maximum 50mA/Channel
- Synchronous Converter with 50V LS-FET /HS-FET with 155m/235mΩ On Resistance
- 3V to 30V Input Voltage Range
- 470mV LED Regulation Voltage at 20mA
- Max 2.5% Current Matching
- 350kHz, 500kHz, 650kHz, 800kHz, 950kHz, or 1.2MHz Selectable Switching Frequency
- A1 Pins for Two I²C Addresses
- 0mA to 50mA Full-Scale LED Current, 8-Bit, 0.196mA/Step
- Selectable Sync or Non-Sync Mode
- Multi-Dimming Operation Mode Including:
  - Analog Dimming through External PWM Input or I²C Interface, 10-Bit Resolution
  - PWM Dimming through External PWM Input or I²C Interface, 14-Bit Resolution
  - Mixed Dimming Mode through External PWM Input or I²C Interface with 6.25%, 12.5%, 25%, or 50% Transfer Point, 14-Bit PWM Duty Resolution
- Linear Smooth Dimming with 2μs, 4μs, 8μs, 16μs, 32μs, 64μs, or 128μs Step-Slope Set
- LED Short/Open, OTP, OCP, Inductor or Diode Short Protection
- 2.5V, 5V, 7.5V, or 10V LED Short Threshold
- 24V, 31V, 37.5V, or 45V OVP Threshold
- 1.8A or 2.5A Current Limit
- Cascade Function to Share Power Stage
- Available in a QFN-24 (4mmx4mm) Package

APPLICATIONS

- Tablets/Notebooks
- Automotive Displays

EV3371-R-00A EVALUATION BOARD



(LxW) 6.2cmx4.4cm

Board Number	MPS IC Number
EV3371-R-00A	MP3371GR

QUICK START GUIDE

1. Connect the power supply (3V to 30V) to:
   a) Positive (+): VIN
   b) Negative (-): GND
2. Connect the load panel (8 strings) to:
   a) Positive (+): VOUT
   b) Negative (-): LED1–LED8

   Connect any unused LEDx pins to GND using a 0Ω resister.
3. Connect the EN pin to enable a high-level (>1.5V) signal.
4. Connect the SCL, SDA, and GND pins of the evaluation board to their respective locations on the I²C interface via the configurable kit (EVKT USBI2C-02).
5. If working in external dimming mode, add a PWM input signal to the PWM terminal on the evaluation board. If working in internal dimming mode, leave the PWM pin floating or pull it to GND.

POWER-ON SEQUENCE

1. VIN powers on.
2. EN powers on.
3. Set the register via the I²C interface (see Figure 1).
4. The PWM signal and LED string(s) should turn on. Program the PWM duty cycle to dim the LED current.

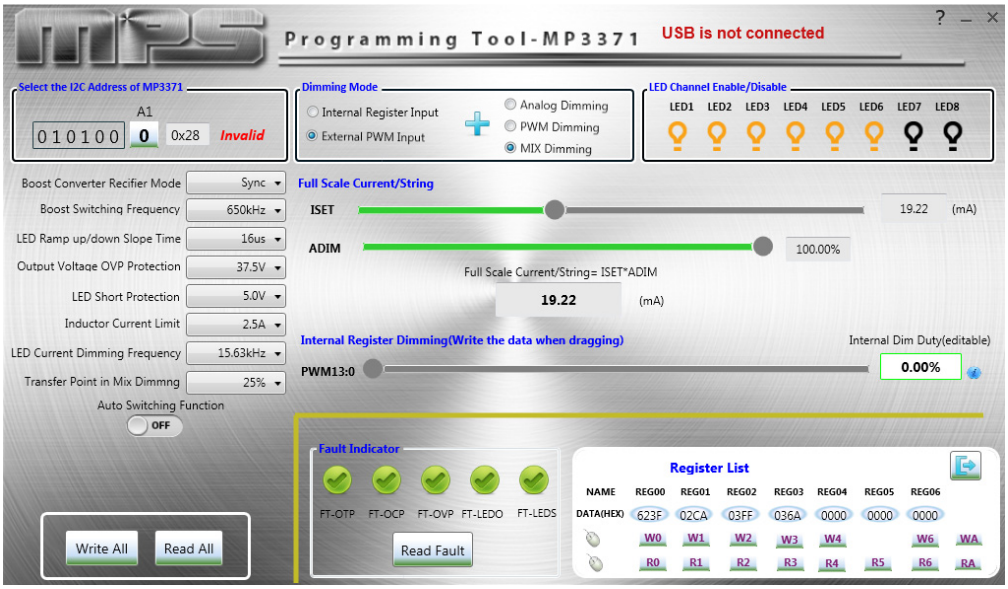
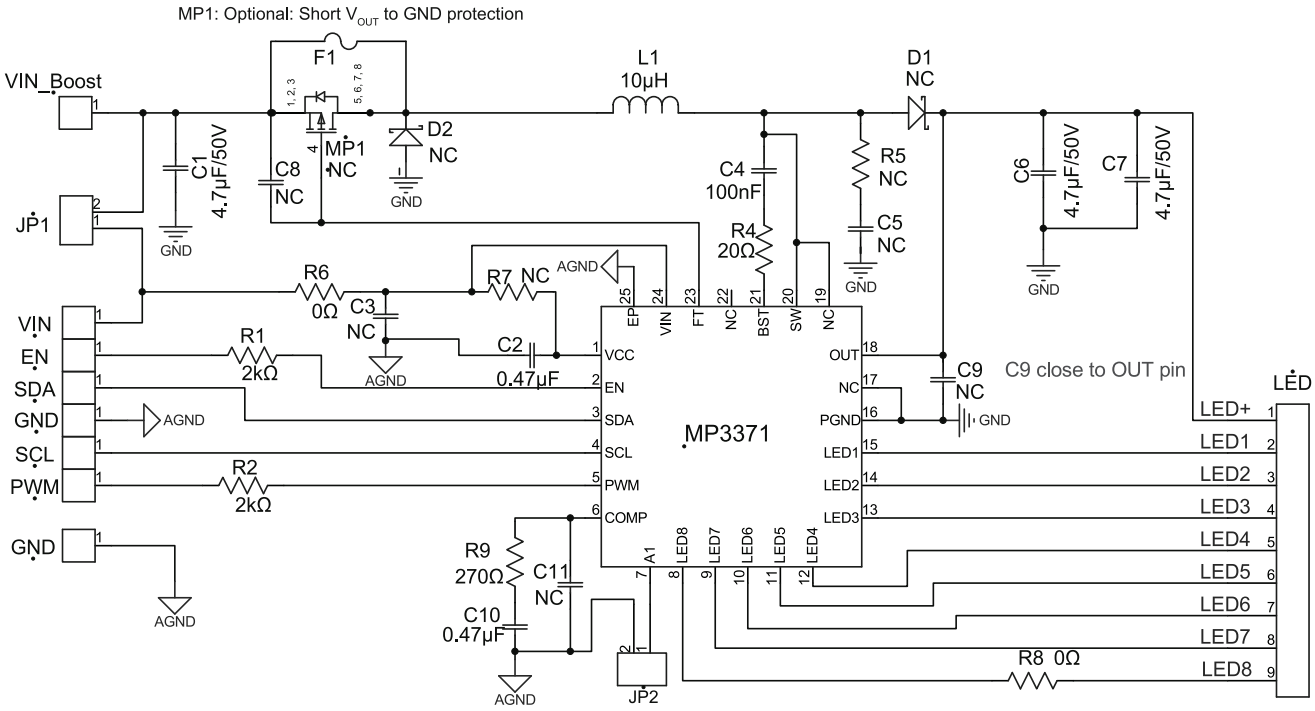


Figure 1: MP3371 GUI Interface

EVALUATION BOARD SCHEMATIC



EV3371-R-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer P/N
1	F1	0Ω	Fuse or resistor	1206	muRata	RC1206JR-070RL
1	MP1	NC	PMOS	SOIC-8		
3	C1, C6, C7	4.7uF	Ceramic capacitor, 50V, X7R	1210	muRata	GRM32ER71H475KA88L
2	C2, C10	470nF	Ceramic capacitor, 16V, X7R	0603	muRata	GRM188R71C474KA88D
1	C4	100nF	Ceramic capacitor, 16V, X7R	0603	muRata	GRM188R71C104KA01D
1	C3	NC	Ceramic capacitor, 50V	0603		
3	C5, C8, C11	NC	Ceramic capacitor, 50V	0603		
1	C9	NC	Ceramic capacitor, 50V	0402		
1	D1	NC	B160	SMA		
1	D2	NC		SMA		
1	L1	10uH	Inductor, 36mΩ, 3.2A	SMD	KENJET	KJH8D43-100N
2	R1, R2	2kΩ	Resistor, 2kΩ, 1%	0603	Yageo	RC0603FR-072KL
1	R4	20Ω	Resistor, 20Ω, 1%	0603	Yageo	RC0603FR-0720RL
2	R6, R8	0Ω	Resistor, 0Ω, 1%	0603	Yageo	RC0603FR-070RL
1	R9	270Ω	Resistor, 270Ω, 1%	0603	Yageo	RC0603FR-07270RL
2	R5, R7	NC	Resistor	0603		
1	JP1	Connector	2.54mm, 180°			
1	U1	MP3371	LED driver with I²C interface	QFN-24 (4mmx4mm)	MPS	MP3371GR

PCB LAYOUT

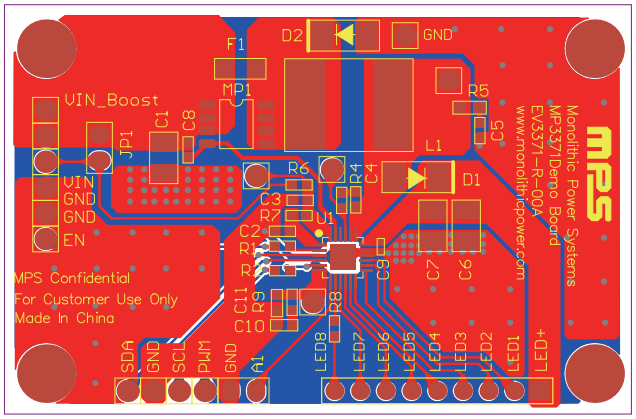


Figure 1: Top Layer

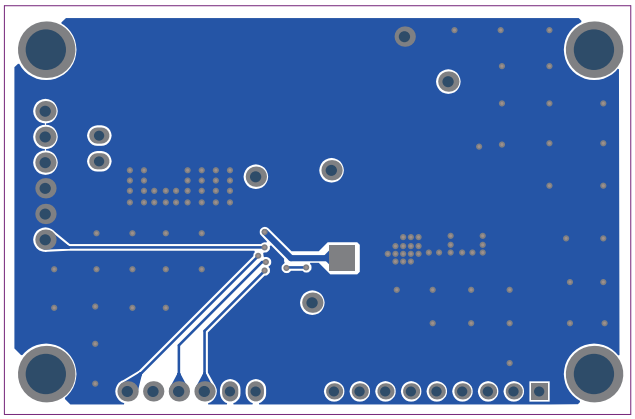


Figure 2: Bottom Layer