EV24833-A-N-00A

3A,55V
White LED Driver

The Future of Analog IC Technology

DESCRIPTION

The EV24833-A-N-00A Evaluation Board is designed to demonstrate the capabilities of MP24833-A. The MP24833-A is a 55V, 3A, white LED driver suitable for either step-down or inverting step-up/down applications.

EV24833-A-N-00A is compatible with step-down (Buck) and inverting step-up/down (Buck-boost) applications.

- For step-down application, short “JP1”, open “JP2”, connect LED load to “LED+” and “LED-”
- ; For step-up/down application, short “JP2”, open “JP1”, connect LED load to “LED+” and “LED-”

ELECTRICAL SPECIFICATION

	Parameter	Symbol	Value	Units
Buck-boost	Input Voltage	VIN	15~25	V
	LED Voltage	VLED	3~21	V
	LED Current	ILED	1	A
Buck	Input Voltage	VIN	28~50	V
	LED Voltage	VLED	3~21	V
	LED Current	ILED	1	A

FEATURES

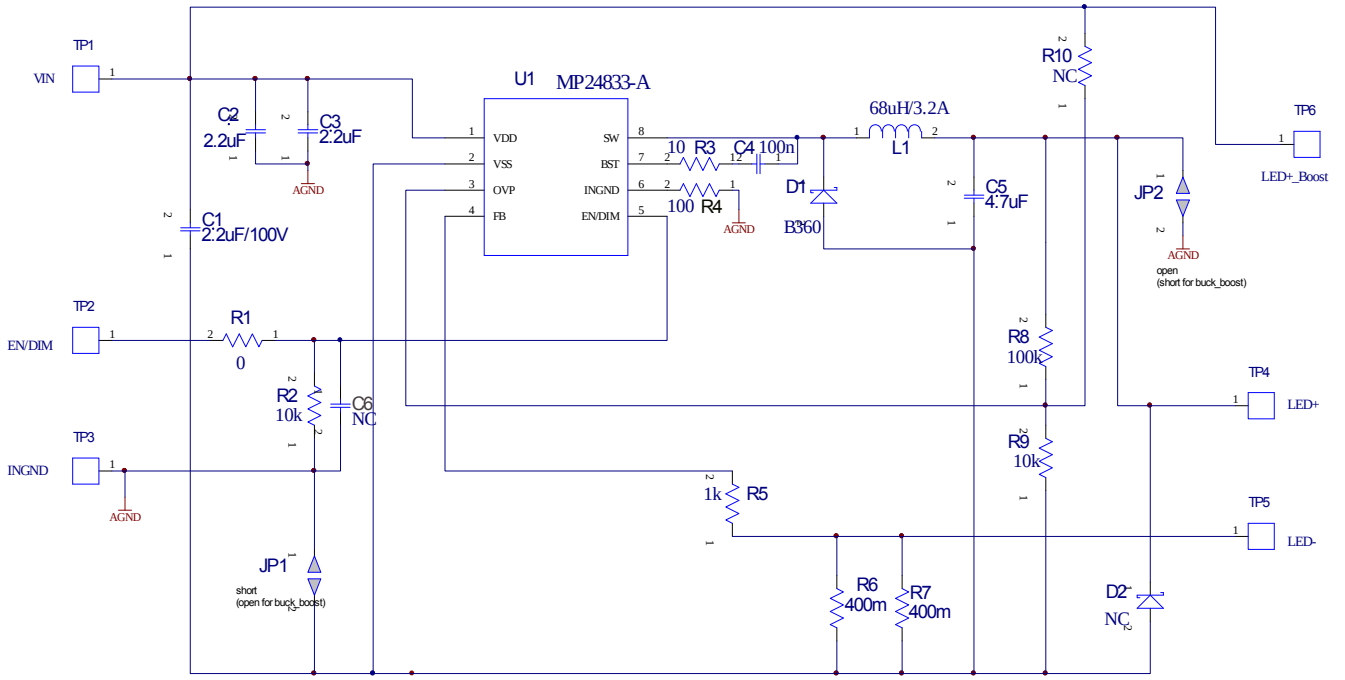
- 3A Maximum Output Current
- Unique Step-Up/Down Operation (Buck-Boost Mode)
- Wide 4.5V-to-55V Operating Input Range for Step-Down Applications (Buck Mode)
- 0.19Ω Internal Power MOSFET Switch
- Fixed 200kHz Switching Frequency
- Analog and PWM Dimming
- 0.198V Reference Voltage
- 6μA Shutdown Mode
- No Minimum Number of LEDs Required
- Stable with Low ESR Output Ceramic Capacitors
- Cycle-by-Cycle Over-Current Protection
- Thermal Shutdown Protection
- Open Strings Protection
- Output Short-Circuit Protection
- Available in an SOIC8EP Package

APPLICATIONS

- General LED Illumination
- LCD Backlight Panels
- Notebook Computers
- Automotive Internal Lighting
- Portable Device

EV24833-A-N-00A EVALUATION BOARD

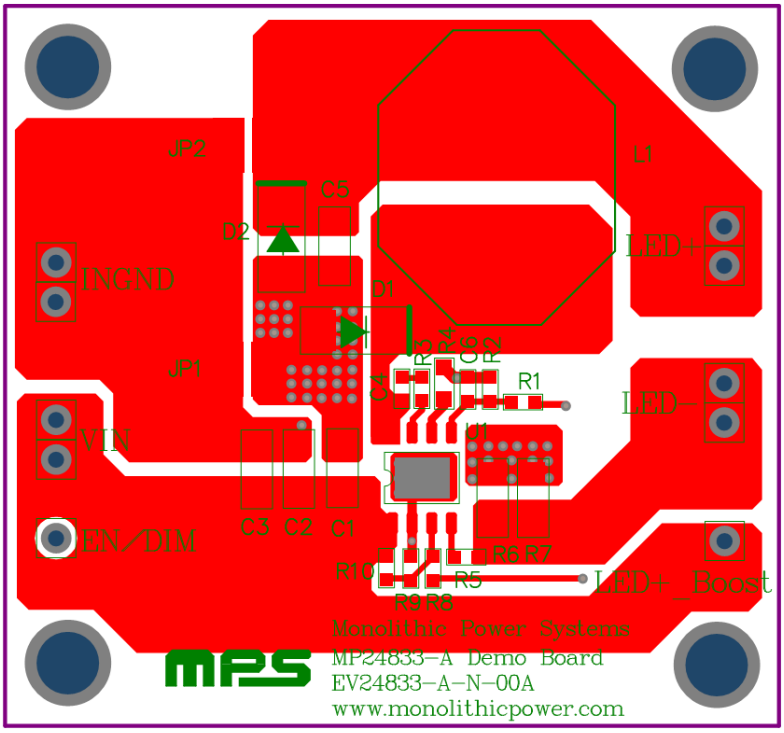
EVALUATION BOARD SCHEMATIC



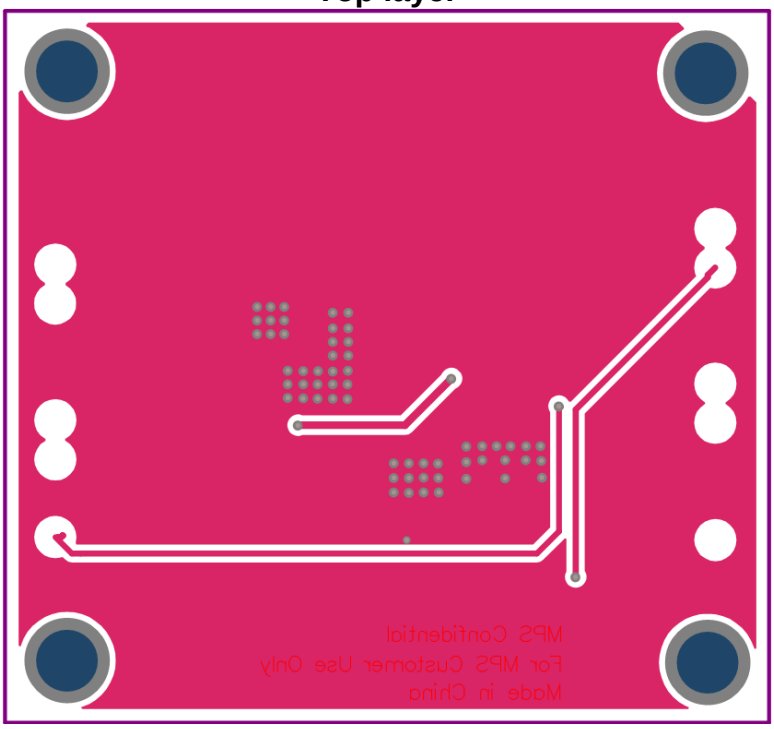
EV24833-A-N-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Part Number
1	C1	2.2µF	Ceramic Capictor,100V, X7S, 1206	1206	TDK	C3216X7S2A225K
2	C2, C3	2.2µF	Ceramic Capictor,50V, X7R, 1206	1206	muRata	GRM31CR71H225KA8
1	C4	100nF	Ceramic Capictor,50V, X7R, 0603	0603	muRata	GRM188R71H104KA93D
1	C5	4.7µF	Ceramic Capictor,50V, X7R, 1206	1206	muRata	CRM32ER71H475KA88L
1	D1	B360A	Schottky Doide, 60V, 3A, SMA	SMA	Diode	B360A
1	D2	NC		SMA		
1	L1	68µH/3.2A	Inductor, 68uH, 88.5mOhm, 3.2A	SMD	WURTH	7447709680
1	R1	0Ω	Film Resistor;5%	0603	Yageo	RC0603JR-070RL
1	R3	10Ω	Film Resistor;1%	0603	Yageo	
2	R2, R9	10kΩ	Film Resistor;1%	0603	Yageo	RC0603FR-0710KL
1	R4	100Ω	Film Resistor;1%	0805		
1	R5	1kΩ	Film Resistor;1%	0603	Ralec	RF0603-1K
2	R6, R7	400mΩ	Film Resistor;1%	1206	Yageo	
1	R8	100kΩ	Film Resistor;1%	0603	Yageo	
1	R10	NC		0603		
1	U1	MP24833-A	White LED driver	SOIC8EP	MPS	
1	JP2		Jumper	Jumper		

PRINTED CIRCUIT BOARD LAYOUT



Top layer

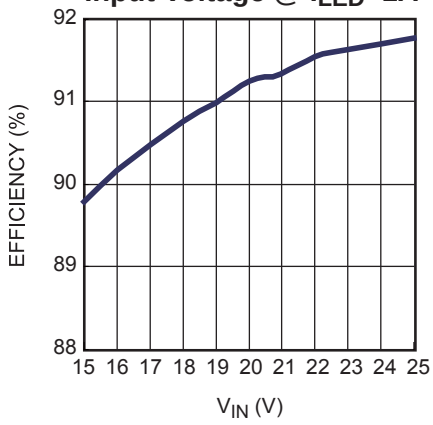


Bottom layer

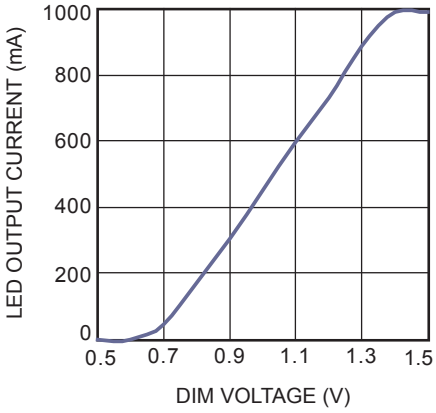
EVB TEST RESULTS *(continued)*

V_{IN} = 20V, I_{LED} = 1A, 7WLEDs in series, T_A = 25°C, Buck-boost Application, Refer to INGND, unless otherwise noted.

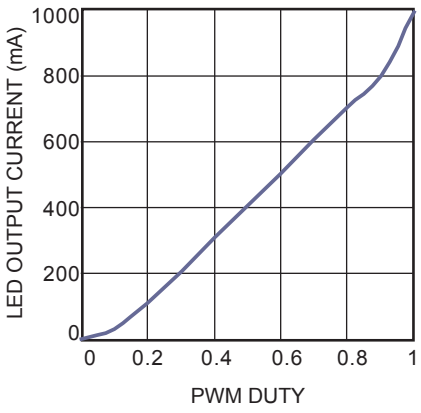
Efficiency vs. Input Voltage @ I_{LED}=1A



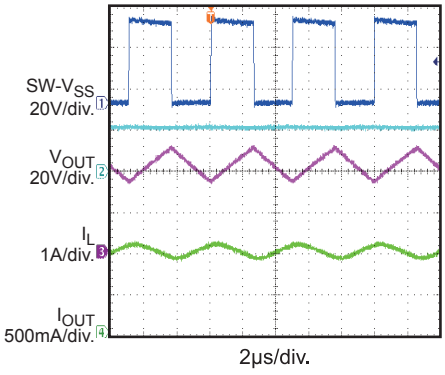
Analog Dimming



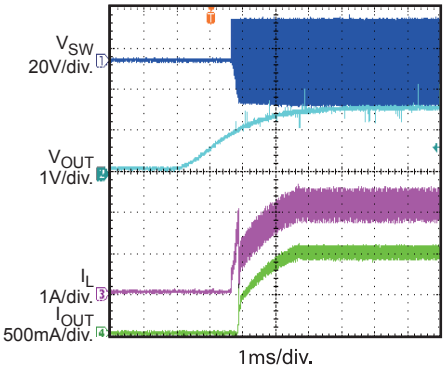
PWM Dimming



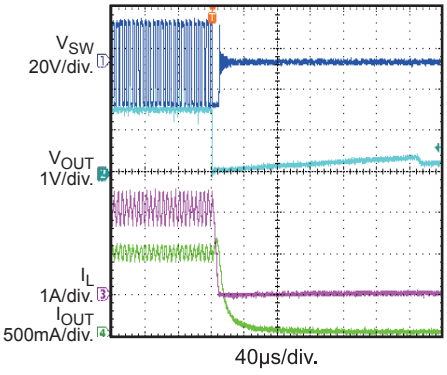
Steady State



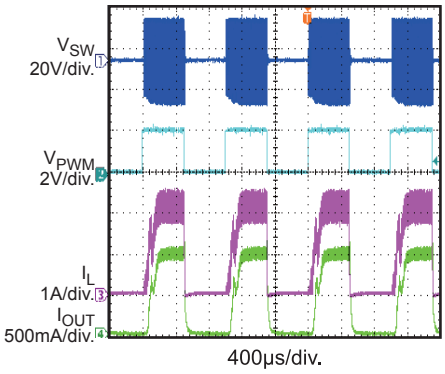
EN Start-Up



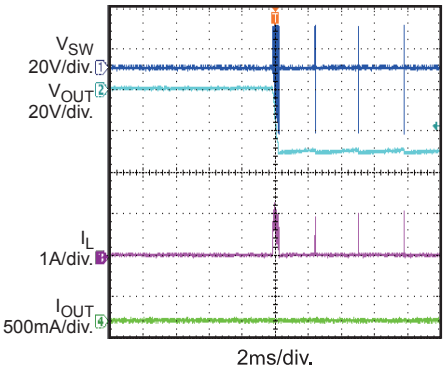
EN Shutdown



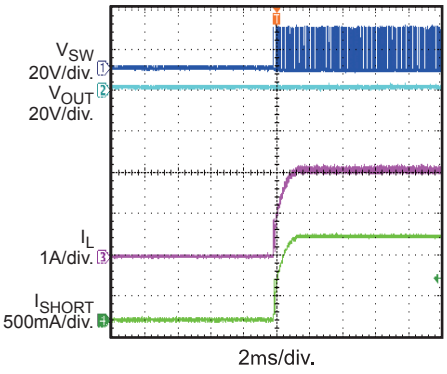
PWM Dimming



Open LED Connection



Short LED Connection



QUICK START GUIDE

1. Confirm the jumpers are connected correctly. For Buck applications short “JP1”, open “JP2”; and for Buck-boost applications, short “JP2”, and open “JP1”.
2. Check the LED string voltage and preset the input voltage power supply.
3. Set a second power supply as the power supply for “EN/DIM”.
4. Turn-off all power supplies. Connect all the power supply.
5. Connect the anode of the LED string to LED+, and the cathode to LED-.
6. Turn on the power supplies. The LED string should be lighten
7. To demo analog dimming function, adjust the second power supply which connects to “EN/DIM” connector from 0.6V to 1.6V, the amplitude of LED current is from 0% to 100% of maximum LED current.
8. To demo the PWM dimming function: apply a 100Hz-to-2kHz square wave signal with amplitude greater than 1.6V to ”EN/DIM”
9. For combined analog and PWM dimming, apply a 100Hz to 2kHz square wave signal with amplitude from 0.6V to 1.6V.
10. The EVB is also compatibles with step-up application. For step-up application, short “JP2”, open “JP1”, connect LED load to “LED+_Boost” and “LED-”.