

DESCRIPTION

The EV2410A-J-00A Evaluation Board is designed to demonstrate the capabilities of MP2410AGJ. The MP2410AGJ is a 24V monolithic synchronous step-down LED driver with a built-in power MOSFET and rectifier. It achieves up to 2A continue output current with excellent load and line regulation in a tiny TSOT23-6 package. Peak current mode operation provides fast transient response and eases loop stabilization.

The EV2410A-J-00A is typically designed for driving 2 WLEDs in series (5.9V_{TYP}) LED load with 1.5A current at wide 8V to 24V input range.

The EV2410A-J-00A has high performances in efficiency, line/load regulation, deep dimming range with both analog and PWM mode. Fault condition protection includes cycle-by-cycle peak current limiting, output short circuit protection, open LED protection and thermal shutdown.

ELECTRICAL SPECIFICATION

Parameter	Symbol	Value	Units
Input Voltage	V _{IN}	8 to 24	V
Output Voltage	V _{OUT}	5.9	V
LED Current	I _{LED}	1.5	A

FEATURES

- 8V to 24V Wide Input Range
- Synchronous Step-Down Converter
- 100mΩ Internal High-side Power MOSFET
- 80mΩ Internal Low-side Synchronous Rectifier
- Peak Current Mode Control
- 1.5A Continue Output Current
- 100mV Feedback Voltage
- Up to 95% Efficiency
- Fixed 1MHz Switching Frequency
- Analog Dimming
- PWM Dimming
- Cycle-by-Cycle Current Limit
- Inherent LED Open Protection
- Output Short Circuit Protection
- Thermal Shutdown
- Auto-Restart Function

APPLICATIONS

- Infrared LED Driver
- General LED Driver
- Flashlight
- Handheld Computers Backlight

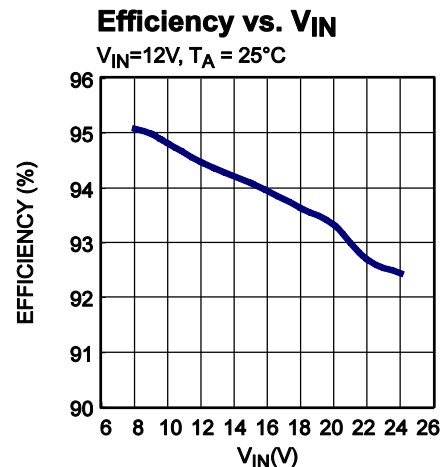
All MPS parts are lead-free, halogen free, and adhere to the RoHS directive. For MPS green status, please visit MPS website under Quality Assurance.

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EV2410A-J-00A EVALUATION BOARD



(L x W x H) 46mm x 46mm x 6mm	
Board Number	MPS IC Number
EV2410A-J-00A	MP2410AGJ



EVALUATION BOARD SCHEMATIC

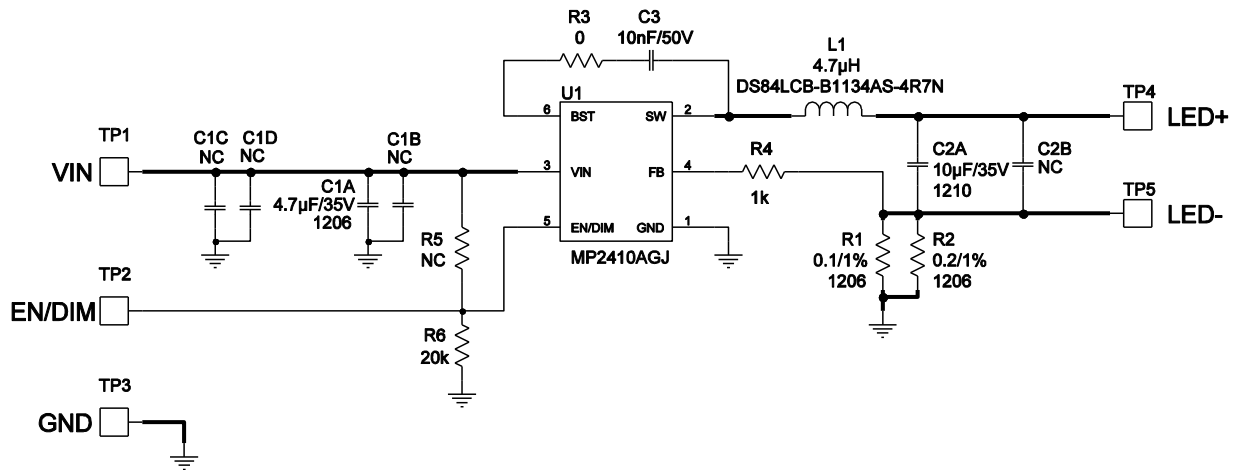


Figure 1 - Schematic

EV2410A-J-00A BILL OF MATERIALS

Qty	Ref	Value	Description	Package	Manufacturer	Manufacturer _P/N
1	C1A	4.7µF/35V	Ceramic Cap, 35V, X7R	1206	Taiyo Yuden	GMK316A7475KL-T
4	C1B,C1C C1D,C2B	NC				
1	C2A	10µF/35V	Ceramic Cap, 35V, X7R	1210	muRata	GRM32ER7YA106KA12L
1	C3	10nF/50V	Ceramic Cap, 50V, X7R	0603	muRata	GRM188R71H103KA01D
1	L1	4.7µH	Inductor, 4.7µH, 3.9A	SMD	TOKO	DS84LCB-B1134AS-4R7N
1	R1	100mΩ	Thick Film Chip RES, 1%	1206	CYNTEC	RL1632H-R100-FN
1	R2	200mΩ	Thick Film Chip RES, 1%	1206	Yageo	RL1206FR-070R2L
1	R3	0Ω	Thick Film Chip RES, 1%	0603	Yageo	RC0603FR-070RL
1	R4	1kΩ	Thick Film Chip RES, 1%	0603	Yageo	RC0603FR-071KL
1	R5	NC				
1	R6	20kΩ	Thick Film Chip RES, 1%	0603	Yageo	RC0603FR-0720KL
1	U1	MP2410A	Sync Step-down LED Driver	TSOT23-6	MPS	MP2410AGJ-Z

PRINTED CIRCUIT BOARD LAYOUT (DOUBLE-SIDED)

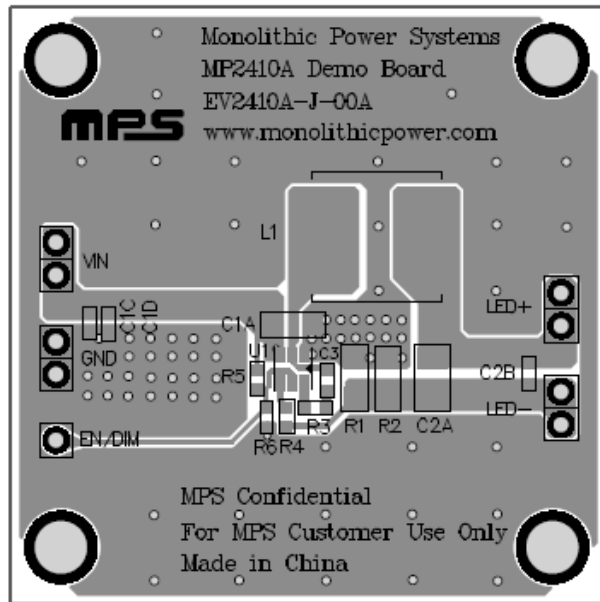


Figure 2 - Top Layer

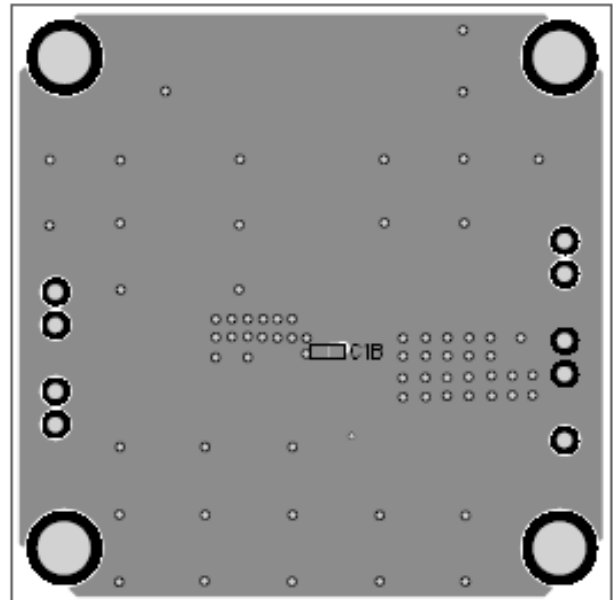


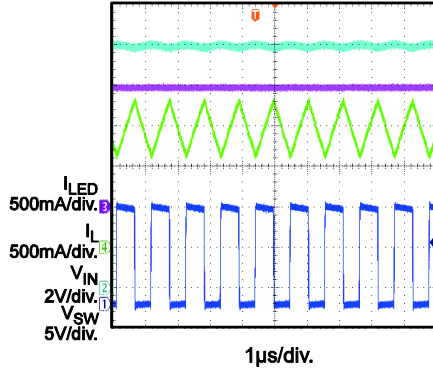
Figure 3 - Bottom Layer

EVB TEST RESULTS

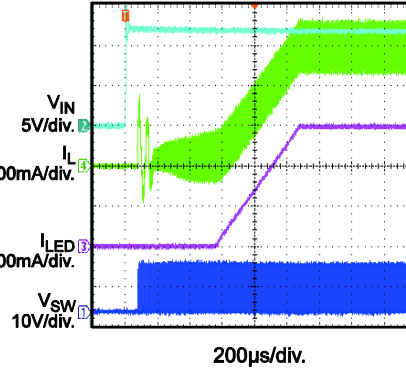
Performance waveforms are tested on the evaluation board.

$V_{IN}=12V$, 2 WLEDs in series, $V_{OUT}=5.9V$, $I_{LED}=1.5A$, $L=4.7\mu H$, $T_A = 25^\circ C$, unless otherwise noted.

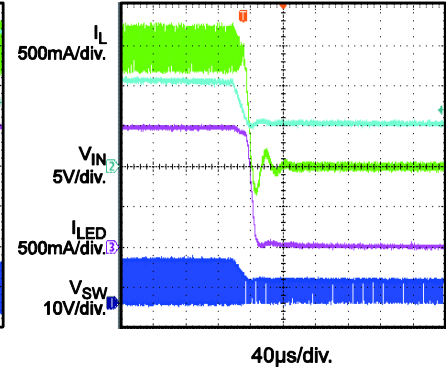
Steady State



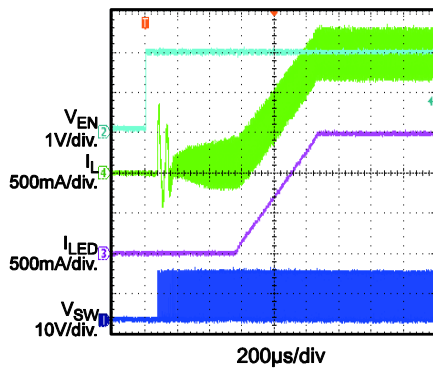
V_{IN} Start-Up



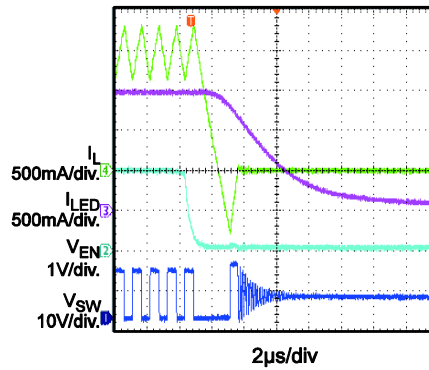
V_{IN} Shutdown



EN Start-Up

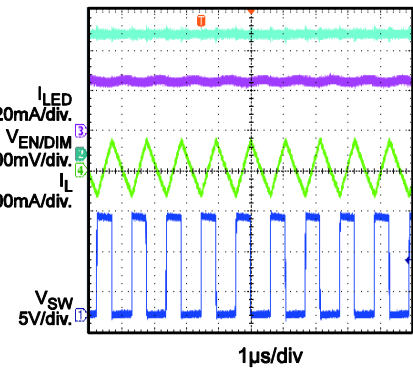


EN Shutdown



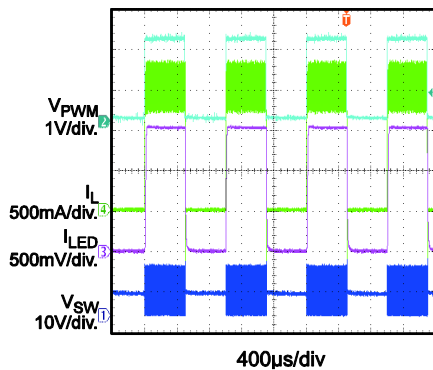
Minimum Analog Dimming

$V_{EN/DIM}=0.6V$

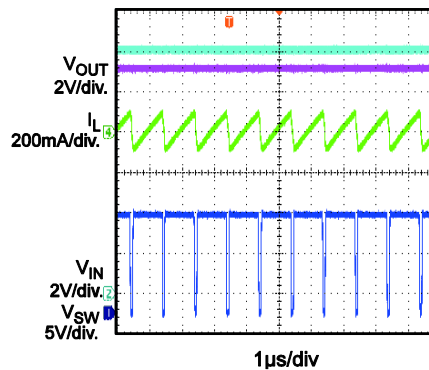


PWM Dimming

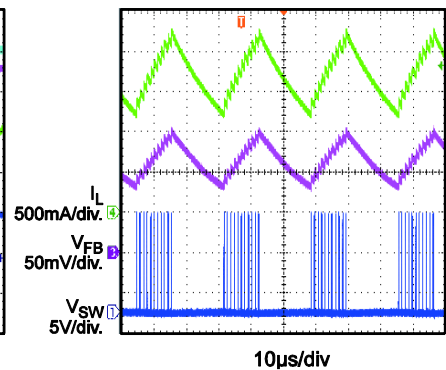
$f_{re}=1kHz$, $V_{PWM}=2V$. Duty=50%



Open LED Protection



Short LED+ to LED- Protection

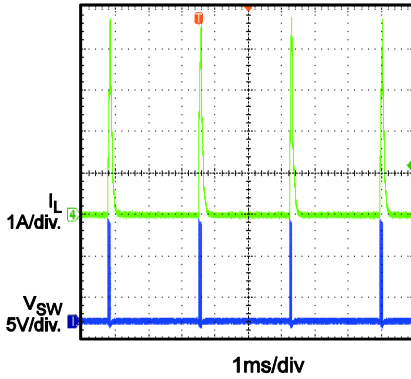


EVB TEST RESULTS *(continued)*

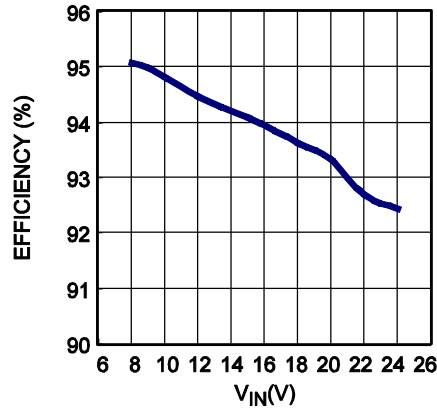
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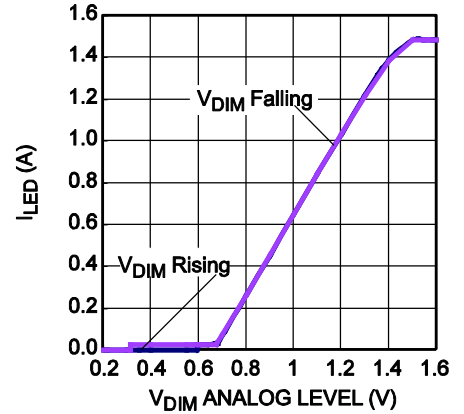
Short LED+ to GND Protection



Efficiency vs. V_{IN}



Analog Dimming Curve



PWM Dimming Curve

