

## DESCRIPTION

The EV3399EF-00A is an evaluation board for the MP3399EF, a 12 LED channels step-up converter designed for large liquid-crystal displays that employ an array of LEDs as the light source. The board builds with two MP3399EF in parallel to drive 24 strings LEDs with 60mA maximum current.

The MP3399 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 MP3399 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	$V_{IN}$	8 – 28	V
LEDs #		24 strings parallel & 12 LEDs/string	
LED Current	$I_{LED}$	20/string	mA

## FEATURES

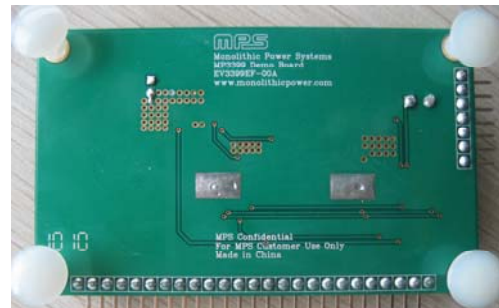
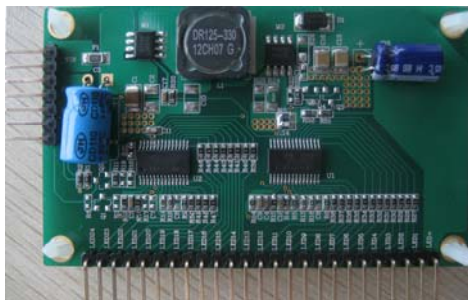
- 8V to 28V Input Voltage Range
- External Power MOSFET
- Up to 90% Efficiency
- Programmable Over Voltage Protection
- Drives up to 24 Strings Parallel 2.5% Current Regulation Accuracy Between Strings
- Programmable Switching Frequency:
- PWM Dimming
- Open and Short LED Load Protection
- Thermal Shutdown

## APPLICATIONS

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

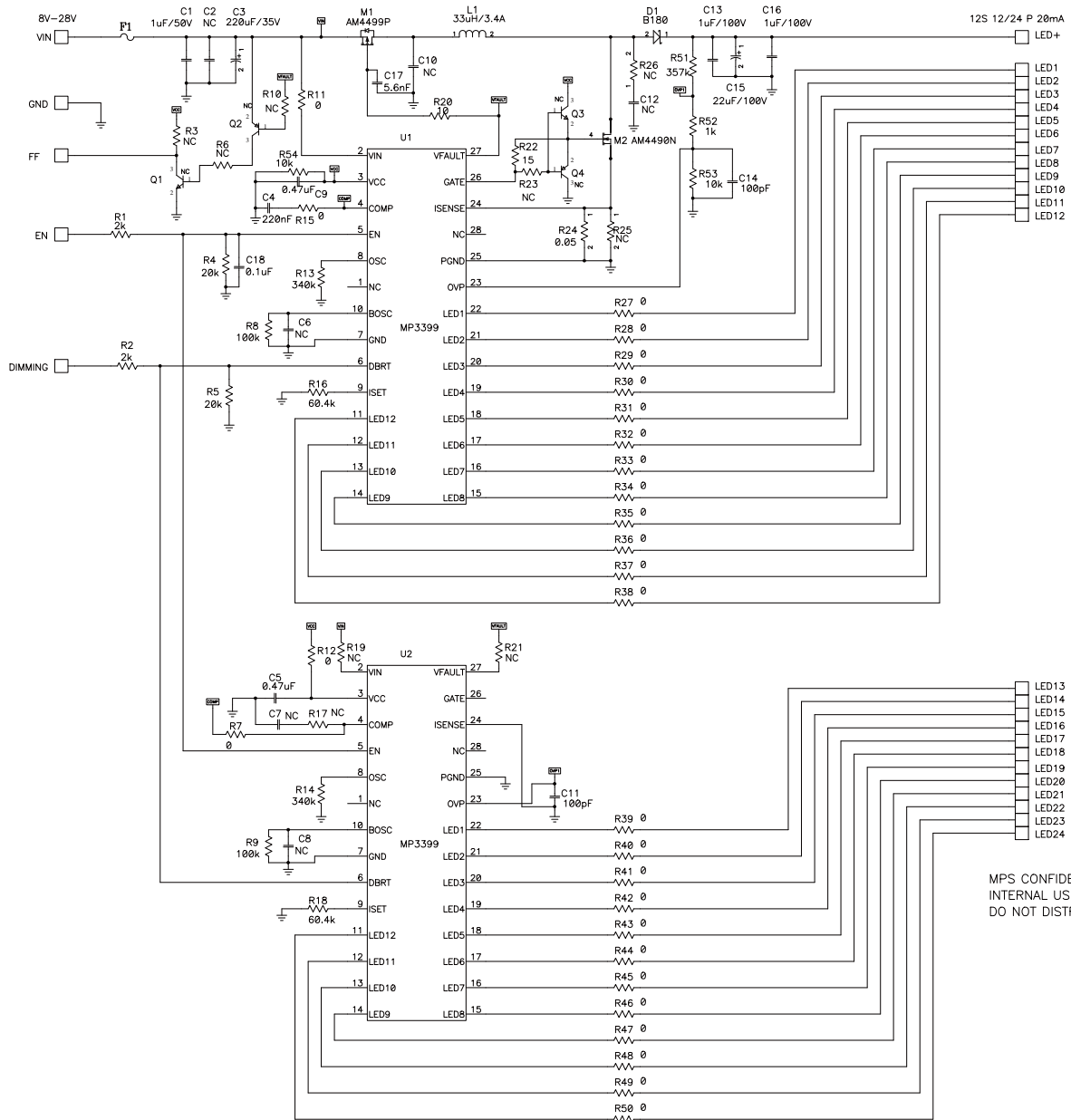
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## EV3399EF-00A EVALUATION BOARD



(L x W x H) 7.8cm x 4.7cm x 1.0cm

Board Number	MPS IC Number
EV3399EF-00A	MP3399EF

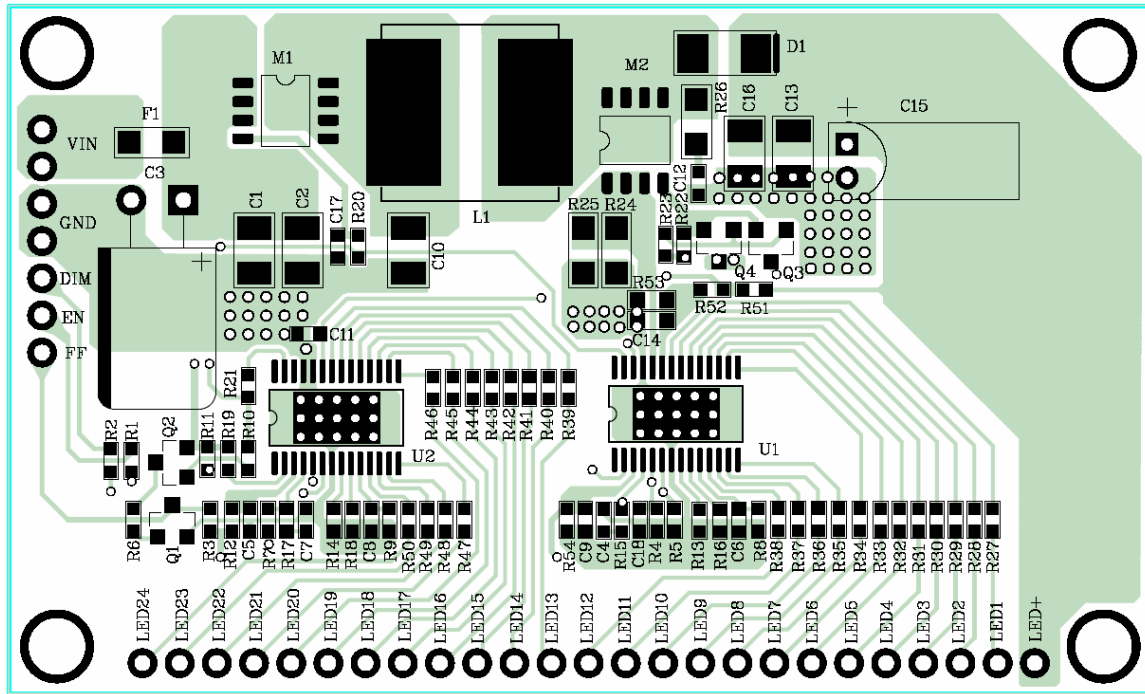
**EVALUATION BOARD SCHEMATIC**


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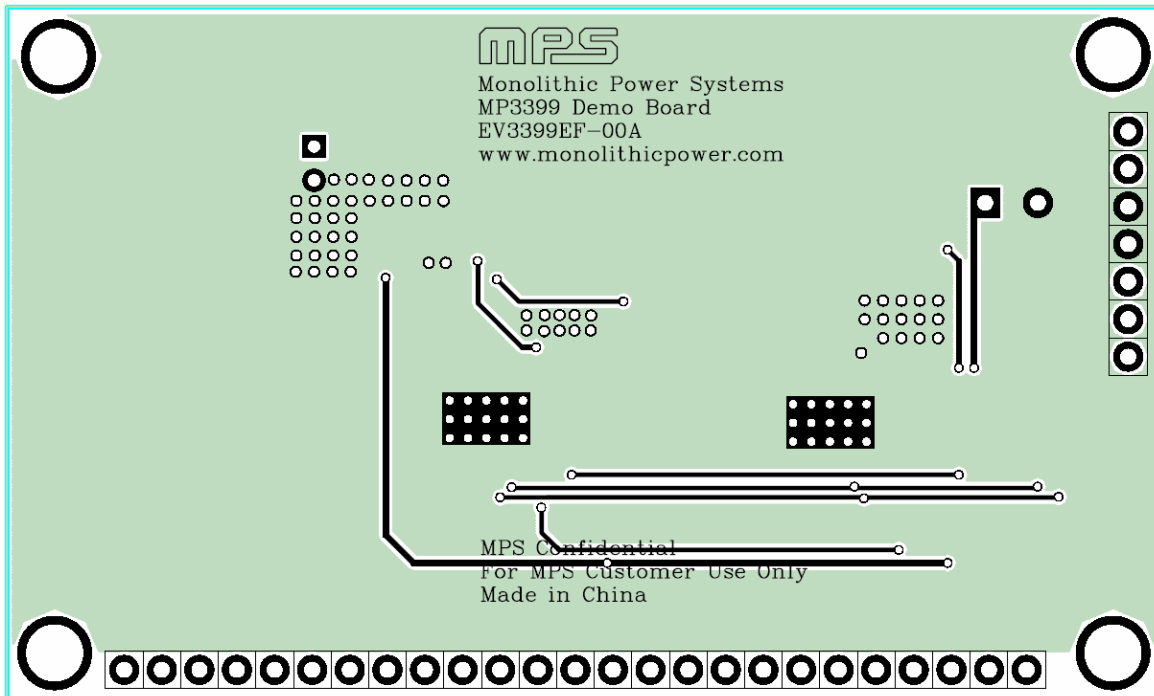
**EV3399EF-00A BILL OF MATERIALS**

Qty	RefDes	Value	Description	Package	Reference	Manufacturer P/N
1	C1	1 $\mu$ F	Ceramic Capacitor, 50V, X7R	1210	TAIYO YUDEN	UMK325BJ105KH-T
3	C2,C10,C12	NC		1210		
1	C3	220 $\mu$ F	Electrolytic Capacitor, 35V			
1	C4	220nF	Ceramic Capacitor, 50V, X7R	0603	Murata	GRM188R71H224KA93D
2	C5,C9	0.47 $\mu$ F	Ceramic Capacitor, 25V, X7R	0603	Murata	GRM1885C1E474JA01D
3	C6,C7,C8	NC		0603		GRM1885C1H101JA01D
2	C11,C14	100pF	Ceramic Capacitor, 50V, COG	0603	Murata	GRM1885C1H474JA01D
1	C15	22 $\mu$ F	Electrolytic Capacitor, 100V			
2	C13,C16	1 $\mu$ F	Ceramic Capacitor, 100V, X7R	1210	Murata	GRM32ER71H105KA88L
1	C17	5.6nF	Ceramic Capacitor, 50V, X7R	0603	Murata	GRM188R71H562KA01
1	C18	0.1 $\mu$ F	Ceramic Capacitor, 50V, X7R	0603	Murata	GRM188R71H105KA93D
1	D1		Diode Schottky, 80V, 1A	SMA	Diodes Inc	B180
1	F1	0 $\Omega$	Fuse, 2A, 63V	1206		
1	L1	33 $\mu$ H	Inductor, 3.84A	SMD	Cooper	DR125-330-R
1	M1		P- channel MOSFET	SO8		AM4499P
1	M2		N- channel MOSFET	SO8		AM4490N
2	Q1,Q3	NC	NPN, Transistor	SOT323		
2	Q2,Q4	NC	PNP, Transistor	SOT323		
2	R1,R2,	2k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-072KL
2	R4,R5	20k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-0720KL
8	R3,R6,R10, R17,R19, R21,R23,R26	NC		0603		
2	R8,R9	100k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-07100KL
28	R7,R11, R12,R15, R27-50	0 $\Omega$	Resistor, 1%	0603	Yageo	
2	R13,R14	340k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-07340KL
2	R16,R18	60.4k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-0760K4L
1	R20	10 $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-0710L
1	R22	15 $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-0715L
1	R24	0.05 $\Omega$	Sensign resistor. 1%	1206	CYNTEC	RL1632H-R050-FN
1	R25	NC				
1	R51	357k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-07357KL
1	R52	1k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-071KL
2	R53,R54	10k $\Omega$	Resistor, 1%	0603	Yageo	RC0603FR-0710KL
2	U1,U2		LED Driver IC	TSSOP28	MPS	MP3399EF R2

**PRINTED CIRCUIT BOARD LAYOUT**



**Figure 1—Top Layer**



**Figure 2—Bottom Layer**

## QUICK START GUIDE

1. Connect the positive and negative terminals of the load panel (12 white LEDs in series, 24 strings paralleled) to the LED+ and LED1~24 pins on the EV board, respectively.
2. Connect the positive and negative terminals of the power supply (8V ~ 28V) to the VIN and GND pins on the EV board, respectively.
3. Apply the PWM dimming signal on the DBRT to achieve the dimming request, the frequency of the PWM signal is recommended between 200Hz to 2kHz.
4. Drive EN pin high (5V) to enable the MP3399. The LED should be lighted.

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