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8mF42859

Four Lamp DC to AC Inverter

Specifications and Applications Information

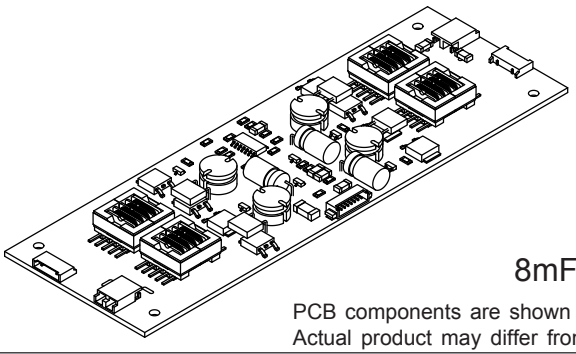
01/18/11

The ERG 8mF42859 (*8mF4 Series*) DC to AC inverter features onboard connectors and can be dimmed using an external pulse-width modulated control signal or using the onboard PWM with an external analog voltage. This unit is 9mm in height and the four mounting holes make installation straight forward.

Powered by a regulated +12 Volt DC source, the 8mF42859 is designed to power the backlight of the Optrex T-51511D150-FW-A-AC 4-lamp display.

Product Features

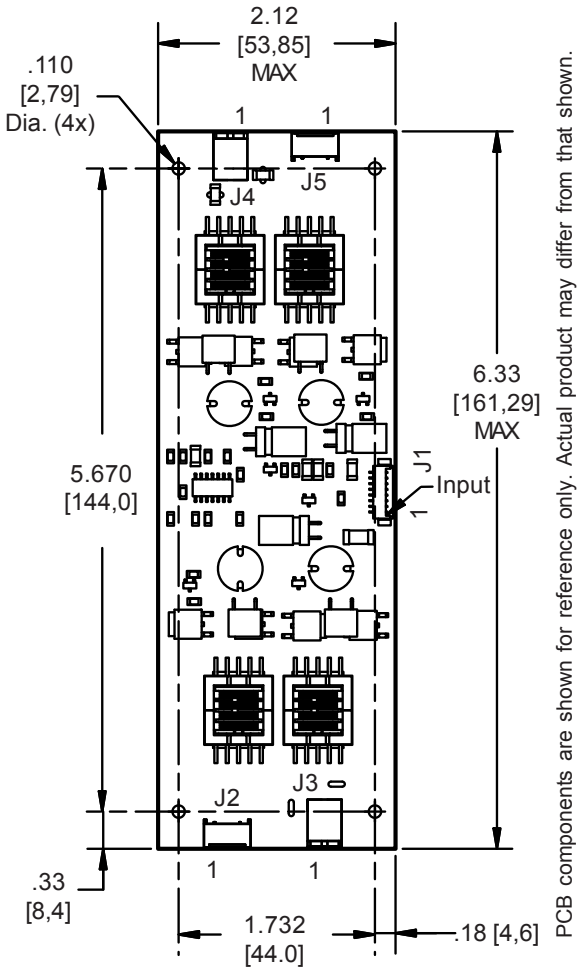
- ✓ Small Package Size, less than 9 mm in height
- ✓ High Dimming Ratio
- ✓ High Efficiency
- ✓ Made in U.S.A.



8mF4 Series

PCB components are shown for reference only. Actual product may differ from that shown.

Package Configuration



Mass: 93 grams

Connectors		
Input Molex 53261-0871	Output (2X) JST SM02(4.0)B-BHS-1-TB	Output (2X) JST SM02B-BHSS-1-TB

Pin Descriptions

J1-1 +Vin J1-2 +Vin J1-3 GND J1-4 GND J1-5 Enable/PWM J1-6 Control J1-7 N/C J1-8 N/C	J2-1 ACreturn1 J2-2 ACreturn2	J3-1 ACout1 J3-2 ACout2
	J5-1 ACreturn3 J5-2 ACreturn4	J4-1 ACout3 J4-2 ACout4

Absolute Maximum Ratings

Rating	Symbol	Value	Units
Input Voltage Range	V_{in}	-0.3 to +13.2	Vdc
Storage Temperature	T_{stg}	-40 to +85	°C

Operating Characteristics

With a load simulating the referenced display and lamp warm-up of 20 minutes.
Unless otherwise noted Vin = 12.00 Volts dc and Ta = 25°C.

Characteristic	Symbol	Min	Typ	Max	Units
Input Voltage	V_{in}	+10.8	+12.0	+12.6	Vdc
Component Surface Temperature (note 1)	T_s	-20	-	+80	°C
Input Current (note 2)	I_{in}	-	1.52	1.75	Adc
Input Ripple Current	I_{rip}	-	40	-	mA_{pk-pk}
Operating Frequency	F_o	41	46	51	kHz
Minimum Output Voltage (note 3)	V_{out} (min)	1400	-	-	Vrms
Efficiency	η	-	84	-	%
Output Current (per lamp)	I_{out}	-	6.7	-	mArms
Output Voltage	V_{out}	-	570	-	Vrms
Enable Pin (note 4)					
Turn-off Threshold	V_{thoff}	GND	-	0.5	Vdc
Turn-on Threshold	V_{thon}	2.5	-	Vin	Vdc
Impedance to Vin	R_{Enable}	-	10	-	kOhms

Specifications subject to change without notice.

(Note 1) Surface temperature must not exceed 80 degrees C; thermal management actions may be required.
(Note 2) Input current in excess of maximum may indicate a load/inverter mismatch condition, which can result in reduced reliability. Please contact ERG technical support.
(Note 3) Provided data is not tested but guaranteed by design.
(Note 4) The inverter is always enabled with an internal pullup resistor tied to the enable pin. A ground on the enable input will turn the inverter off.

Application Notes:

1) The minimum distance from high voltage areas of the inverter to any conductive material should be .12 inches per kilovolt of starting voltage.
2) Mounting hardware to be non-conductive.
3) Open framed inverters should not be used in applications at altitudes over 10,000 feet.
4) ACreturn should be left floating, not grounded.
5) Contact ERG for possible exceptions.

Onboard PWM

Unless otherwise noted Vin = 12.00 Volts DC , T_a = 25 °C and unit has been running for 20 minutes.

Characteristic	Symbol	Min	Typ	Max	Units
Frequency	f_{pwm}	-	160	-	H_Z
Control Full On	V_{ctrll}	-	<.5	-	V
Control Full Off	V_{ctrlh}	-	>4.5	-	V
Control Input Bias Current	I_{cbias}	-	-	10	uA

Pin Descriptions

Vin Input voltage to the inverter. Both pins should be connected for optimum reliability and efficiency .

GND Inverter ground. Both pins should be connected for optimum reliability and efficiency.

Control Analog voltage input to the onboard pulse width modulator. Increasing this voltage increases the off time of the onboard PWM resulting in decreased brightness.

Enable/ Disable Inverter Enable/Disable. If this pin is driven high, the inverter is enabled. Pull this pin low to disable inverter operation.

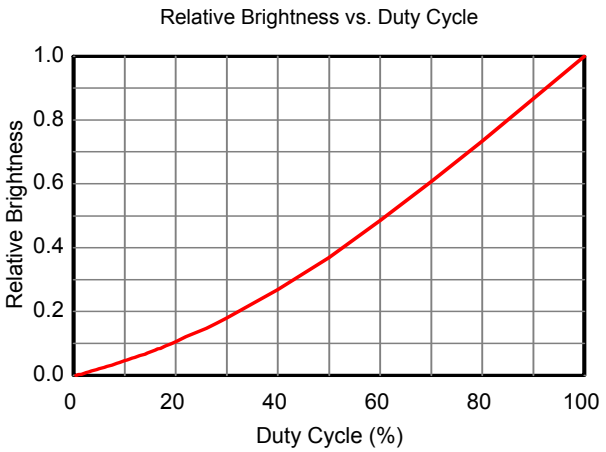
Application information

The 8mF4 series of inverters is designed to power up to four cold cathode fluorescent lamps with combined power from ten watts to forty watts. An external enable/disable control and an onboard analog controlled pulse width modulator provide flexibility in allowing either PWM or analog methods for dimming. The 8mF4 inverter can reliably dim to less than 0.5% duty cycle, which results in an electrical dimming ratio of greater than 200:1. Depending upon the attached backlight assembly, optical dimming ratios of greater than 1000:1 can be accomplished. Graph 1 shows the relationship of relative brightness to duty cycle for a typical backlight assembly.

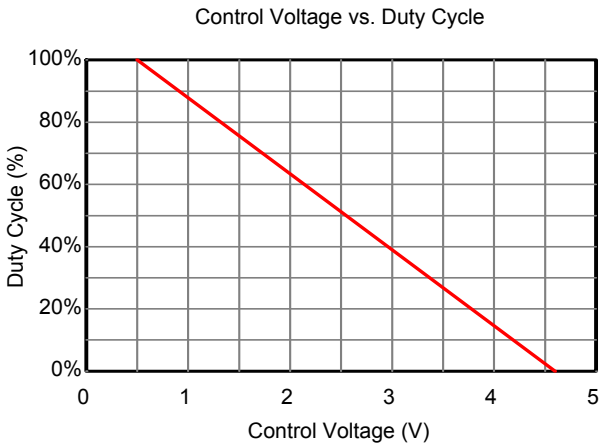
External shutdown or external PWM operation of the inverter is accomplished using the Enable/Disable pin. Enabling the inverter is accomplished by pulling this pin high (above Vthon). Pulling this pin low (below Vthoff) disables the inverter.

If analog voltage dimming is required, the onboard PWM can be enabled. The analog voltage is applied to the Control pin. Figure 1 shows how to connect the inverter for onboard PWM operation. Graph 2 shows the relationship of PWM duty cycle to input control voltage.

If an external PWM is used, connect the enable pin to the PWM source and connect the control pin to the inverter ground. If the onboard PWM is used, connect the analog voltage to the control pin.



Graph 1



Graph 2

Typical Application

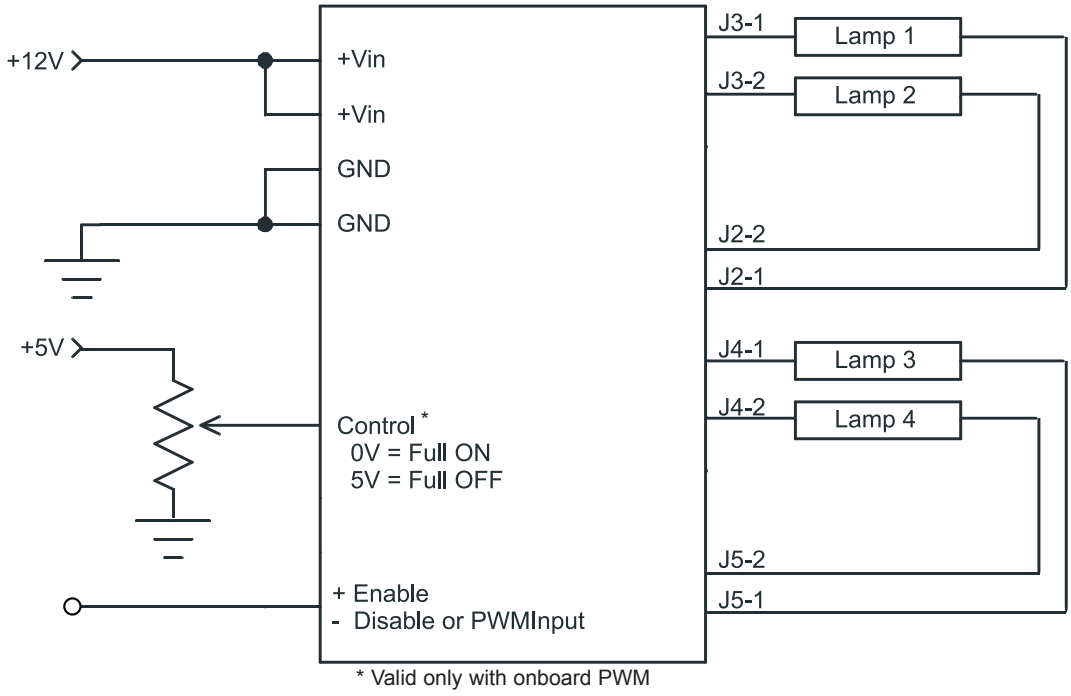


Figure 1