Endicott Research Group, Inc.
2601 Wayne St., Endicott, NY 13760
607-754-9187 Fax 607-754-9255
http://www.ergpower.com

# 8mAD3750F

RoHS Compliant

## Specifications and Applications Information

11/28/07 Preliminary

## Two Lamp DC to AC Inverter

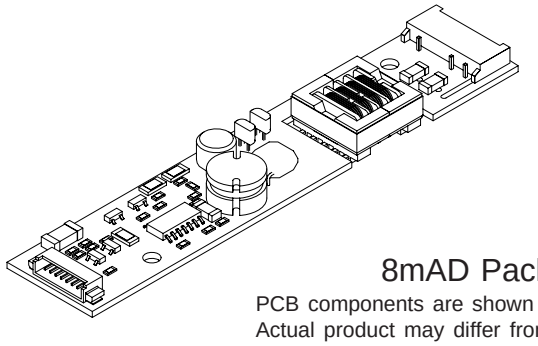
The ERG 8mAD3750F (**8m Series**) DC to AC inverter features onboard connectors and can be easily dimmed using an external analog control signal or external PWM generator.

Powered by a regulated +12 Volt DC source, the 8mAD3750F is designed to power the Optrex T-55225D104J-FW-A-AAN LCD display backlight.

## Product Features

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

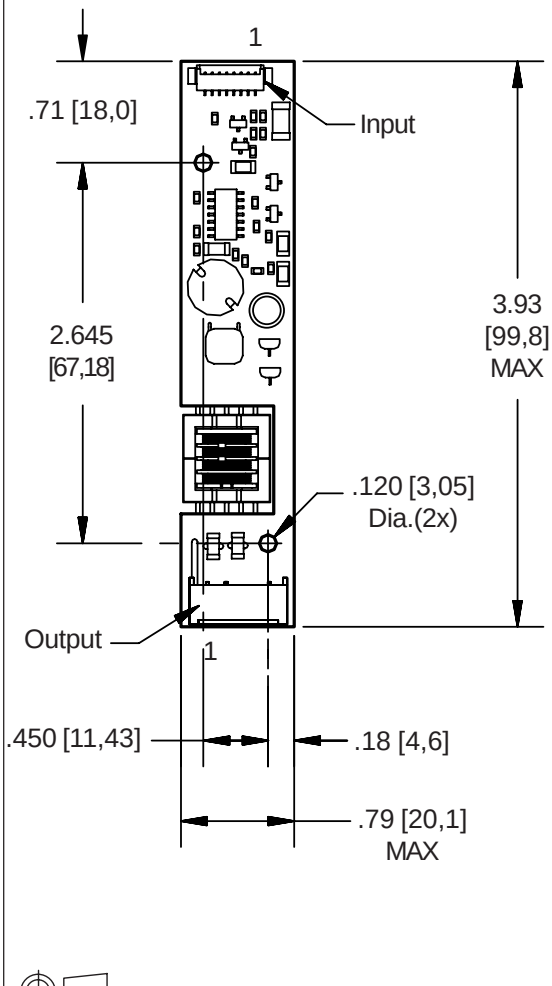
This unit complements our 8m Series of DC to AC Inverters



8mAD Package
PCB components are shown for reference only. Actual product may differ from that shown.

| Connectors | |
|---|---|
| Input J1<br>Molex 53261-0871 | Output J2<br>JST SM04(4.0)B-BHS-1-TB |

## Package Configuration




### Pin Descriptions

| | |
|---|---|
| J1-1 +Vin<br>J1-2 +Vin<br>J1-3 GND<br>J1-4 GND<br>J1-5 Enable<br>J1-6 Control<br>J1-7 N/C<br>J1-8 GND | J2-1 ACout<br>J2-2 ACout<br>J2-3 N/C<br>J2-4 ACreturn |

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## 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 5 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 2) | Ts | -20 | - | +80 | °C |
| Input Current (note 1) | $I_{in}$ | - | 0.62 | 0.71 | Adc |
| Input Ripple Current | $I_{rip}$ | - | 20 | - | $mA_{pk-pk}$ |
| Operating Frequency | $F_o$ | 41 | 46 | 51 | kHz |
| Minimum Output Voltage (note 3) | Vout (min) | 1500 | - | - | Vrms |
| Efficiency (note 5) | **h** | - | 80 | - | % |
| Output Current (per lamp) | $I_{out}$ | - | 6.0 | - | mArms |
| Output Voltage | $V_{out}$ | - | 450 | - | 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 | $R_{Enable}$ | 44.6 | 47.0 | 49.4 | kOhms |

Specifications subject to change without notice.

(Note 1) 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 2) Surface temperature must not exceed 80 degrees C; thermal management actions may be required.
(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.
(Note 5) Output voltage of 500V used to calculate efficiency.

**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) 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 5 minutes.

| Characteristic | Symbol | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Frequency | $f_{pwm}$ | - | 160 | - | $H_Z$ |
| Control Input Bias Current | $I_{cbias}$ | - | - | 10 | uA |

## Pin Descriptions

**+Vin** Input voltage to the inverter.

**GND** Inverter ground.

**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. The inverter is full on when this voltage is near inverter ground.

**Enable** Inverter Enable. The inverter is always enabled with an internal pullup resistor tied to the enable pin. Pull this pin low to disable inverter operation. The onboard PWM is always utilized.

## Application information

The 8mAD series of inverters is designed to power two cold cathode fluorescent lamps each with four watts. An external analog control interfaces with an onboard pulse width modulator to provide dimming control. The 8mAD inverter can reliably dim to less than 5% duty cycle.

External shutdown of the inverter is accomplished using the Enable pin. Pulling this pin low (below Vthoff) disables the inverter.

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

If an external PWM is used, simply connect the Enable pin to the PWM source and connect the Control pin to inverter ground. If the onboard PWM is used, connect the analog voltage to the Control pin.

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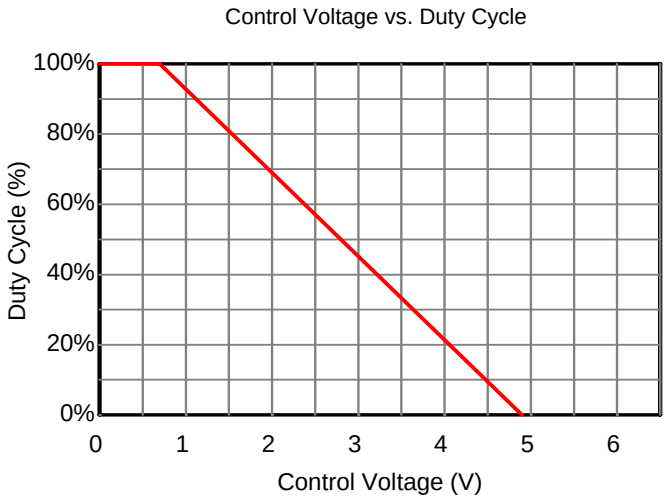


Graph 1

## Typical Application

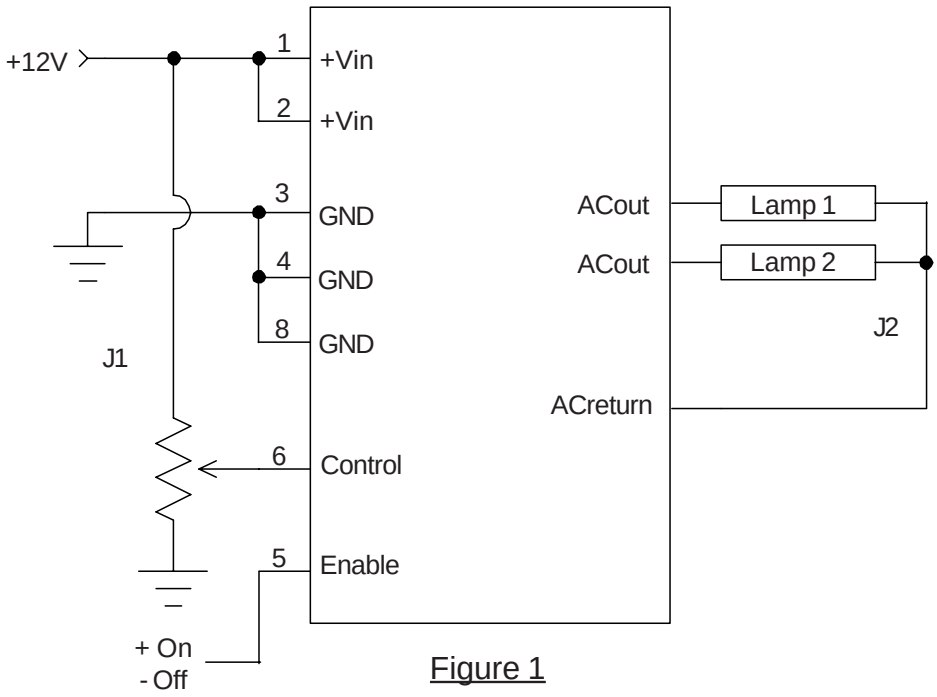


Figure 1