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## Specifications and Applications Information

02/05/07

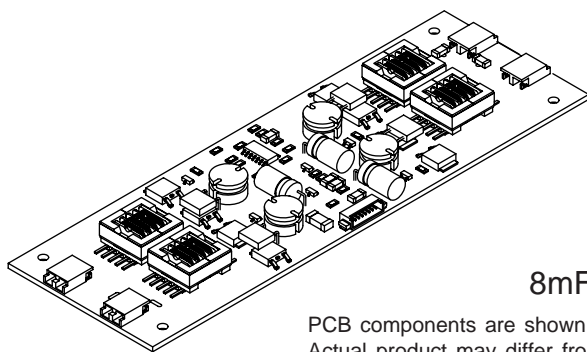
Preliminary

The ERG 8mF43463F (*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 makes installation straight forward.

Powered by a regulated +12 Volt DC source, the 8mF43463F is designed to power the AU M170EG01 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.

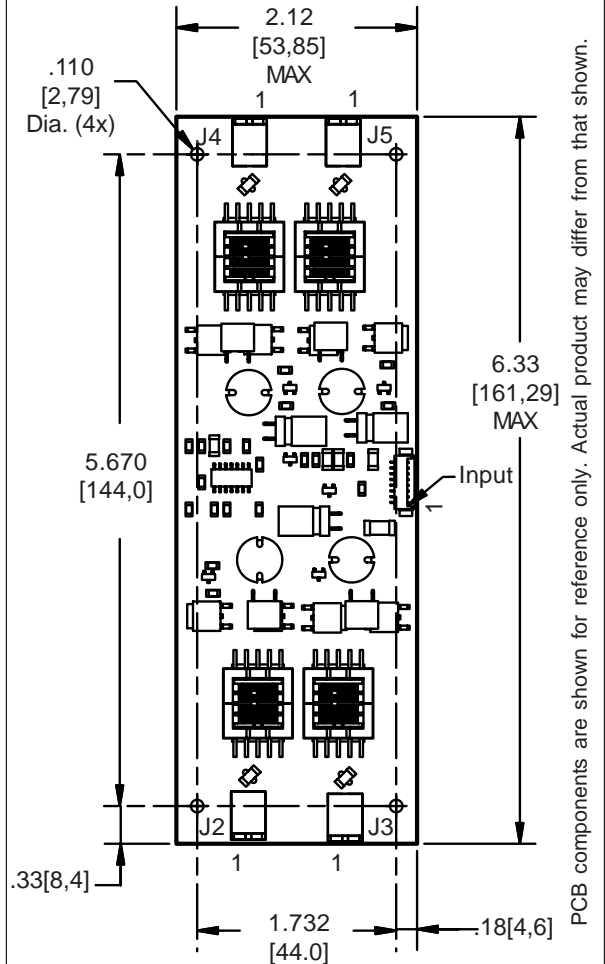
### Connectors

Input Molex 53261-0871	Output (2X) ACcom JST SM02B-BHSS-1-TB	Output (2X) JST SM02B-BHSS-1-TB
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# 8mF43463F

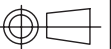
Four Lamp  
DC to AC Inverter

### Package Configuration



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

Mass: 93 grams



### Pin Descriptions

J1-1 Vin	J2,J3-1 ACout J2,J3-2 ACreturn
J1-2 Vin	
J1-3 GND	
J1-4 GND	
J1-5 Enable/PWM	J4,J5-1 ACout J4,J5-2 ACreturn
J1-6 Control	
J1-7 N/C	
J1-8 N/C	



## 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  $V_{in} = 12.00$  Volts dc and  $T_a = 25^\circ\text{C}$ .

Characteristic	Symbol	Min	Typ	Max	Units
Input Voltage	$V_{in}$	+10.8	+12.0	+12.6	Vdc
Component Surface Temperature	$T_s$	-20	-	+80	°C
Input Current (Note 1)	$I_{in}$	-	2.03	2.33	Adc
Input Ripple Current	$I_{rip}$	-	40	-	mA <sub>pk-pk</sub>
Operating Frequency	$F_o$	35	40	45	kHz
Minimum Output Voltage	$V_{out}(\text{min})$	1500	-	-	Vrms
Efficiency	$\eta$	-	83	-	%
Output Current (per lamp)	$I_{out}$	-	7.7	-	mA <sub>rms</sub>
Output Voltage	$V_{out}$	-	660	-	Vrms
<b>Enable Pin</b>					
Turn-off Threshold	$V_{thoff}$	GND	-	.5	Vdc
Turn-On Threshold	$V_{thon}$	2.0	-	$V_{in}$	Vdc
Impedance to $V_{in}$	$R_{Enable}$	9.5	10.0	10.5	kOhms

**(Note 1)** Reliable and predictable operation of the device is not guaranteed with applied stresses at or beyond those listed in "Absolute Maximum Ratings". Operation at these limits may reduce device reliability and is therefore not recommended. Please refer to "Recommended Operating Conditions" for reliable operation of the device.

**(Note 2)** Reliable operation above 70°C is possible if airflow is provided.

### 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 should 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  $V_{in} = 12.00$  Volts DC ,  $T_a = 25$  °C and unit has been running for 20 minutes.

Characteristic	Symbol	Min	Typ	Max	Units
Frequency	$f_{pwm}$	-	160	-	Hz
Control Full On	$V_{ctrl}$	-	<.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.

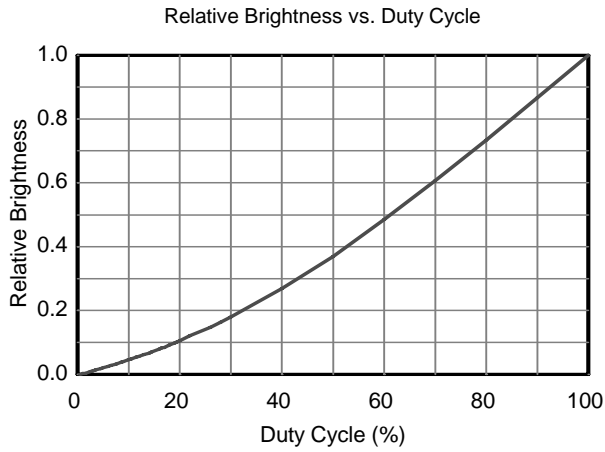
External shutdown or external PWM operation of the inverter is accomplished using the Enable/Disable pin. Enabling the inverter is accomplished by pulling this pin high (above  $V_{thon}$ ). Pulling this pin low (below  $V_{thoff}$ ) disables the inverter.

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.

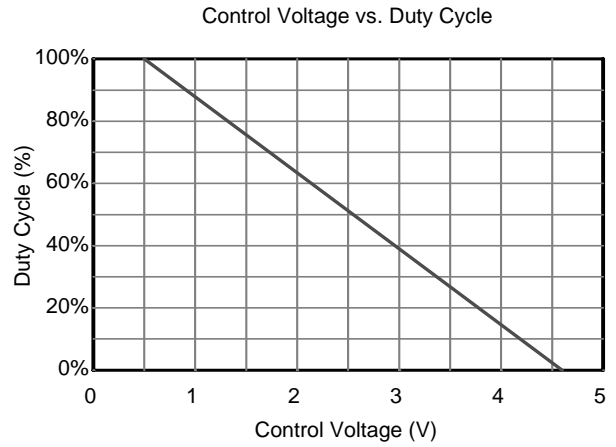
If an external PWM is used, connect the enable pin to the PWM source and connect the control pin to the inverter ground. If the onboard PWM is used, connect the analog voltage to the control pin.



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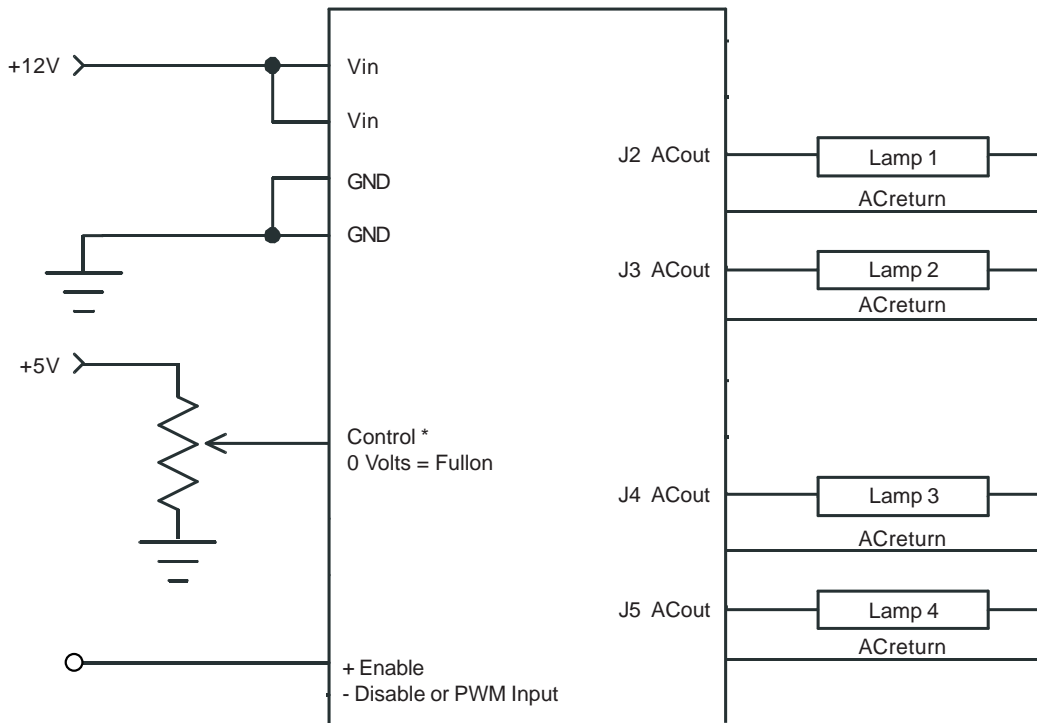


Graph 1



Graph 2

## Typical Application



\* Valid only with onboard PWM

Figure 1



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