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MA262371

Specifications and Applications Information

01/11/11

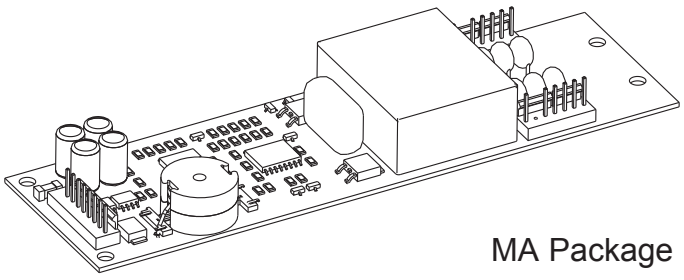
Six Lamp DC to AC Inverter

The ERG MA262371 (MA *Series*) DC to AC inverter features onboard connectors and can be easily dimmed using an external pulse-width modulated control signal or by using the onboard PWM with an analog control voltage. This unit is only 17mm in height and the four mounting holes make installation very straight forward.

Powered by a regulated 12 Volt DC source, the MA262371 is designed to power the backlight of the Sharp LQ196U1LG01 display.

Product Features

- ✓ Small Package Size, less than 17mm in height
- ✓ High Efficiency
- ✓ Made in U.S.A.

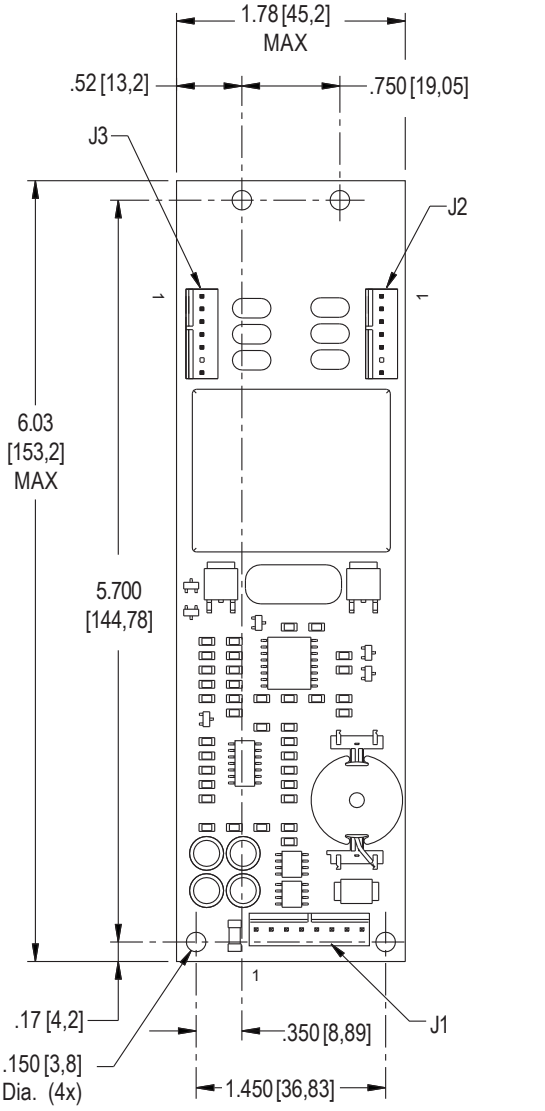


MA Package

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

Connectors	
Input	Outputs
J1 Molex 22-23-2081	J2, J3 Molex 22-23-2071

Package Configuration



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

Mass: 100 grams

Pin Descriptions

J1-1 +Vin	J2-1 N/C	J3-1 N/C
J1-2 +Vin	J2-3 N/C	J3-3 N/C
J1-3 GND	J2-5 N/C	J3-5 N/C
J1-4 GND	J2-7 ACout	J3-7 ACout
J1-5 Control	J2-9 ACout	J3-9 ACout
J1-6 Enable	J2-11 ACout	J3-11 ACout
J1-7 PMout	J2-13 ACreturn	J3-13 ACreturn
J1-8 Hi-Bright		

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}	-	2.5	2.8	Adc
Input Ripple Current	I_{rip}	-	150	-	mA_{pk-pk}
Operating Frequency	F_o	40	45	50	kHz
Minimum Output Voltage (note 3)	V_{out} (min)	2000	-	-	Vrms
Efficiency	η	-	86	-	%
Output Current (per lamp) Hi-Bright open	$I_{out\ Hi/O}$	-	6.0	-	mArms
Output Current (per lamp) Hi-Bright grounded	$I_{out\ Hi/G}$	-	7.75	-	mArms
Enable Pin					
Turn-off Threshold	V_{thoff}	GND	-	0.8	Vdc
Turn-on Threshold	V_{thon}	2.0	-	Vin	Vdc

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.

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 5 minutes.

Characteristic	Symbol	Min	Typ	Max	Units
Frequency	f_{pwm}	-	160	-	H_Z
PWM Output High	V_{pwmoh}	8.0	-	-	V
PWM Output Low	V_{pwmol}	-	-	0.8	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 Inverter enable. Pull this pin low to disable inverter operation. If this pin is left floating or driven high, the inverter is enabled. If the onboard PWM is utilized, connect this pin to PWMout.

Hi-Bright Grounding this pin increases the output current of the inverter. The increase in output current can yield an approximate 25% increase in the backlight brightness. Note that the output current with this pin grounded may exceed the lamp manufacturer's specifications, reducing overall backlight life.

PWMout Output of the onboard PWM generator.

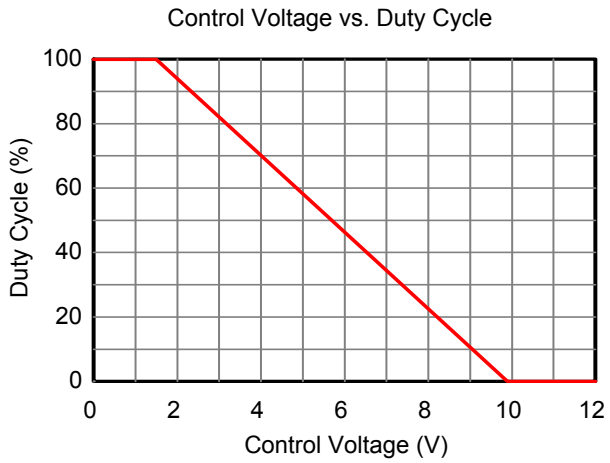
Application information

The MA series of inverters is designed to power up to twelve cold cathode fluorescent lamps with combined power from ten watts to forty watts. An external enable control and an onboard pulse width modulator provide flexibility in allowing either analog or PWM methods for dimming.

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

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

If more than one inverter is used in a backlight assembly, the PWM signal for each inverter should be synchronized to prevent flickering. If an external PWM is used, simply connect the Enable pin of each inverter to the PWM source. If the onboard PWM is used, connect the analog voltage to the Control pin of one inverter. Connect the PWMout signal of the inverter with the applied analog voltage to the Enable pin of all of the inverters, including the one with the applied analog voltage. This will utilize the PWM on only one inverter and will slave all of the other inverters.



Graph 1

Typical Application

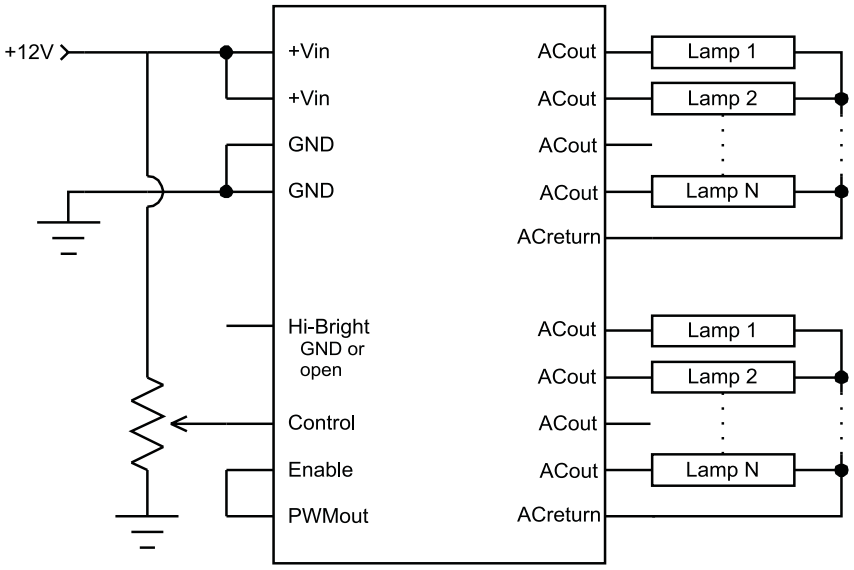


Figure 1