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Specifications and Applications Information

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Preliminary

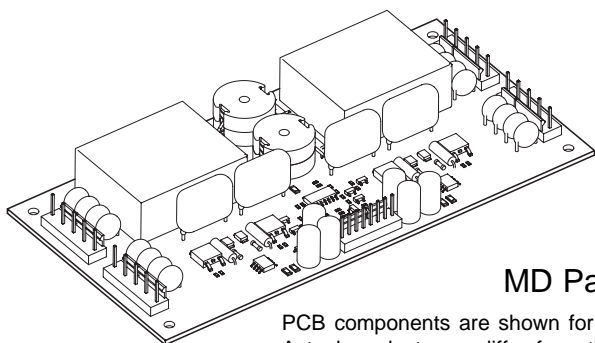
The ERG MD263028 (MD Series) DC to AC inverter features onboard connectors and can be easily dimmed using an external pulse-width modulated control signal. This unit is only 17mm in height and the five mounting holes makes installation very straight forward.

Powered by a regulated 12 Volt DC source, the MD263028 is designed to power a 16 tube Landmark C090A backlight.

Product Features

- ✓ Small Package Size, less than 17mm in height.
- ✓ High Dimming Ratio (Greater than 1000:1)
- ✓ High Efficiency
- ✓ Made in U.S.A.

This unit complements our MC Series of DC to AC Inverters



MD Package

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

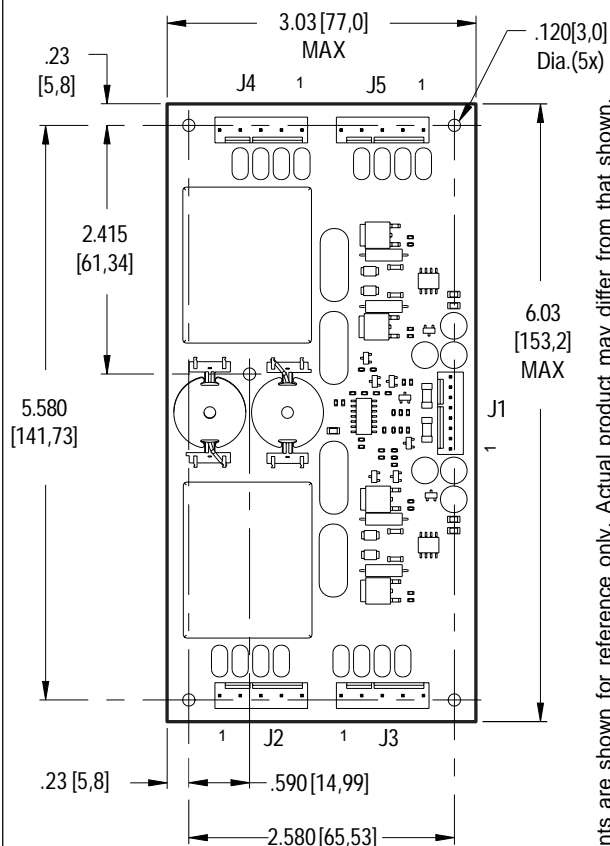
Connectors

J1 Molex 22-05-3081	J2, J3, J4, J5 Molex 22-23-2091
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MD263028

**SixteenTube
DC to AC Inverter**

Package Configuration



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

Mass: 190 grams

Pin Descriptions

J1-1 Vin	J2, J3, J4, J5
J1-2 Vin	1 ACout
J1-3 Vin	3 ACout
J1-4 GND	5 ACout
J1-5 GND	7 ACout
J1-6 GND	9 ACcommon
J1-7 Enable	
J1-8 Control	



Absolute Maximum Ratings (Note 1)

Rating	Symbol	Value	Units
Input Voltage	V_{in}	-0.3 to +13.2	V_{DC}
Disable	$V_{Disable}$	-0.3 to $V_{in} + 0.3$	V_{DC}
Operating Temperature	T_a	0 to +70	$^{\circ}C$
Storage Temperature	T_s	-40 to +85	$^{\circ}C$

Recommended Operating Conditions

Rating	Symbol	Value	Units
Input Voltage	V_{in}	+6 to 13.2	V_{DC}
Operating Temperature <small>(Note 2)</small>	T_a	0 to +50	$^{\circ}C$

Electrical Characteristics

Unless otherwise noted $V_{in} = 12.00$ Volts DC , $T_a = 25$ $^{\circ}C$ and unit has been running for 20 minutes.

Characteristic	Symbol	Min	Typ	Max	Units
Inverter					
Input Current <small>(Note 3)</small>	I_{in}	-	6.7	7.7	A_{DC}
Input Ripple Current	I_{rip}	-	20	-	mA_{pk-pk}
Operating Frequency	F_o	34	39	44	KHz
Efficiency	η	-	83	-	%
Output Voltage (no load) <small>(Note 4)</small>	V_{start}	1700	-	-	V
Output Voltage (with lamp)	V_{out}	-	670	-	V
Output Current (per tube)	I_{out}	-	6.2	-	$mArms$
Enable (pin J1-7)					
Turn-Off Threshold	V_{thoff}	0	-	1	V
Turn-On Threshold	V_{thon}	2.5	-	V_{in}	V
Impedance to V_{in}	$R_{Disable}$	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 50 $^{\circ}C$ is possible if airflow is provided in any case, surface temperature at top center of transformer must not exceed 85 $^{\circ}C$.

(Note 3) Initial cold start current may exceed 7.7 ADC.

(Note 4) Provided data is not tested but guaranteed by design.



Onboard PWM

Unless otherwise noted $V_{in} = 12.00$ Volts DC , $T_a = 25$ °C and unit has been running for 5 minutes.

Characteristic	Symbol	Min	Typ	Max	Units
Frequency	f_{pwm}	-	160	-	Hz
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. The three pins should be connected for optimum reliability and efficiency .
- GND** Inverter ground. The three 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. The inverter is full on when this voltage is near inverter ground.
- Enable** Inverter Enable. Pull this pin low to disable inverter operation. This pin must be high to enable the inverter. The onboard PWM is always utilized.

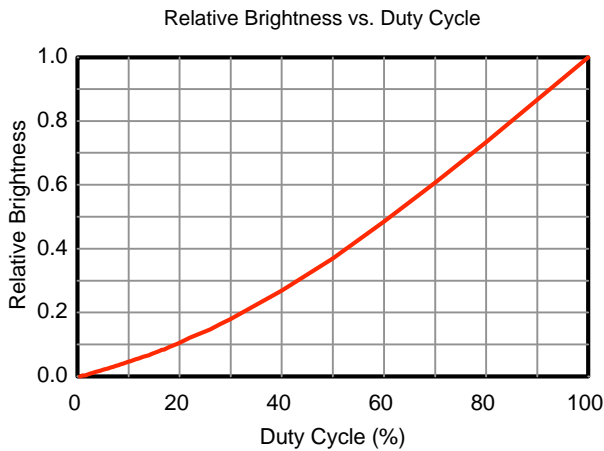
Application information

The MD series of inverters is designed to power up to sixteen cold cathode fluorescent tubes with combined power from ten watts to sixty watts. An external analog control interfaces with an onboard pulse width modulator to provide dimming control. The MD 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.

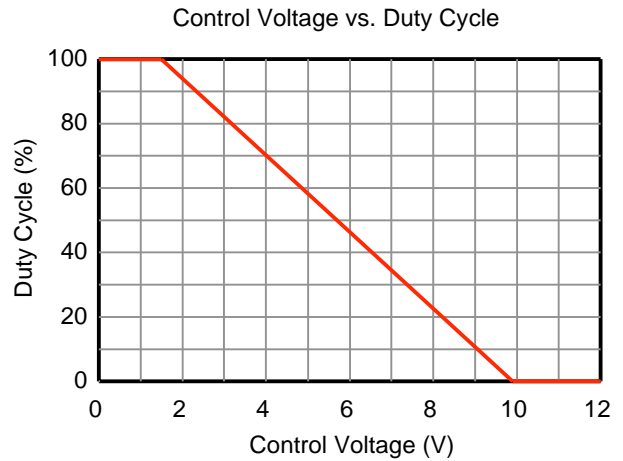
External shutdown of the inverter is accomplished using the Enable pin. Pulling this pin low (below V_{thoff}) disables the inverter. Enabling the inverter is accomplished by pulling this pin high (above V_{thon}).

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 2 shows 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.



Graph 1



Graph 2

Typical Application

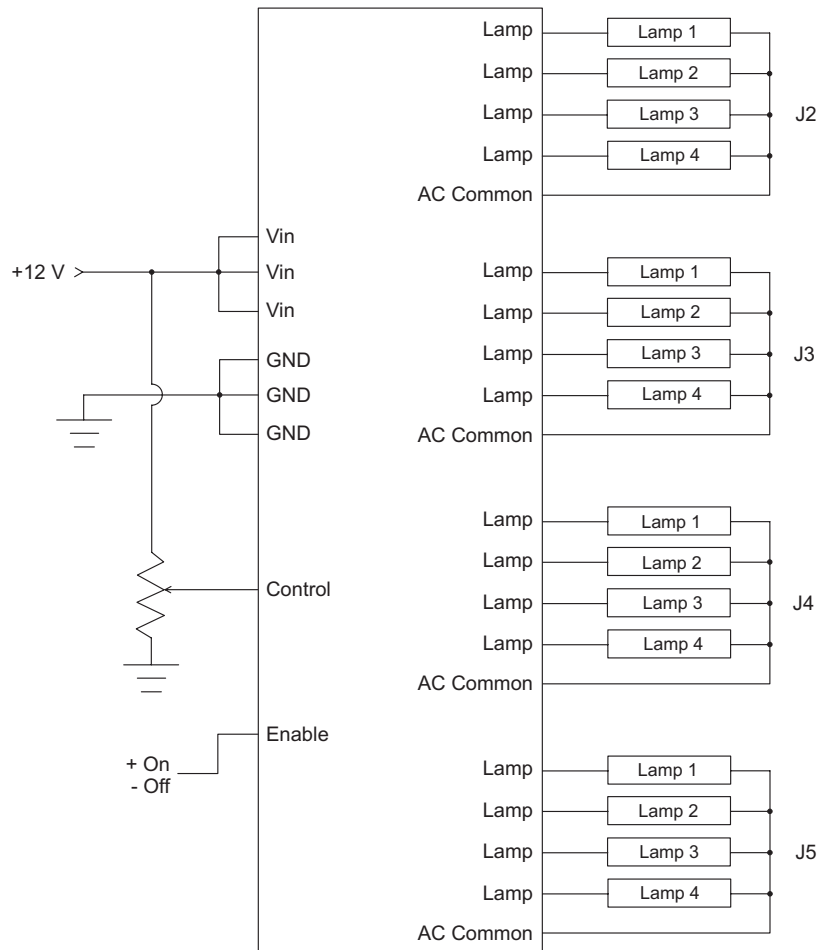


Figure 1



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