Endicott Research Group, Inc.

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DMD44024F

RoHS Compliant

Specifications and Applications Information

01/26/11

Four Lamp DC to AC Inverter

The ERG DMD44024F (DMD Series) DC to AC inverter features onboard connectors and can be easily dimmed using the onboard PWM Dimming or an external PWM generator.

Powered by a regulated +12 Volt DC source, the DMD44024F is designed to power the backlight of the Hitachi TX43D21VC0CAA.
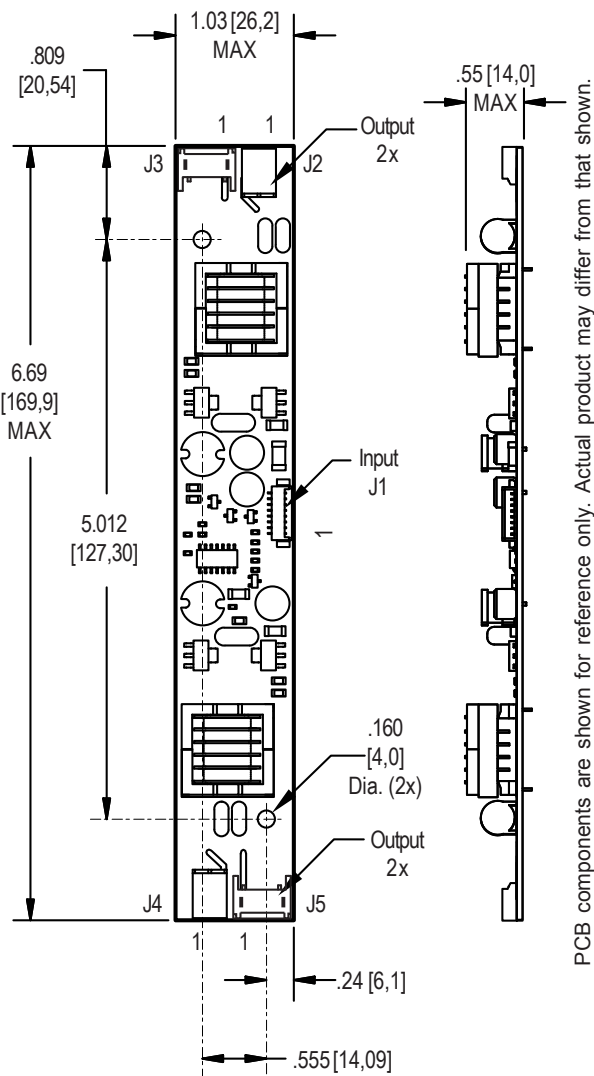
Product Features

✓ Small Package Size

✓ High Dimming Ratio

✓ High Efficiency

✓ Made in U.S.A.
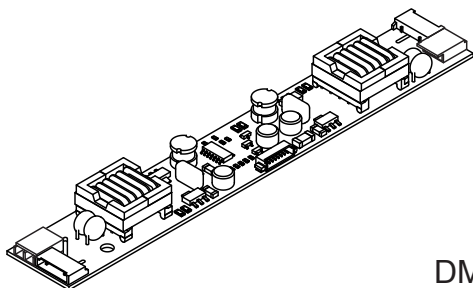
DMD Package

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

Package Configuration

1.03 [26,2] MAX

.809 [20,54]

.55 [14,0] MAX

J3   J2   Output 2x

6.69 [169,9] MAX

Input J1

5.012 [127,30]

.160 [4,0] Dia. (2x)

Output 2x

J4   J5

.24 [6,1]

.555 [14,09]

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

Mass: 45 grams

Connectors

Output	Input
J2,J4 JST SM02B-BHSS-1-TB	J1 Molex 53261-0871
J3,J5 JST SM02(4.0)B-BHS-1-TB	

Pin Descriptions

J3-1 ACreturn	J1-1 +Vin	J2-1 ACout
J3-2 ACreturn	J1-2 +Vin	J2-2 ACout
	J1-3 GND	
J4-1 ACout	J1-4 GND	
J4-2 ACout	J1-5 Enable	J5-1 ACreturn
	J1-6 Control	J5-2 ACreturn
	J1-7 GND	
	J1-8 GND	

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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	^{o}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 (note 1) Temperature	T_s	-20	-	+80	^{o}C
Input Current (note 2)	I_{in}	-	1.74	2.00	Adc
Input Ripple Current	I_{rip}	-	20	-	mA$_{pk-pk}$
Operating Frequency	F_o	33	38	43	kHz
Minimum Output Voltage (note 3)	V_{out} (min)	1800	-	-	Vrms
Efficiency (note 4)	η	-	87	-	%
Output Current (per lamp)	I_{out}	-	6.5	-	mArms
Output Voltage	V_{out}	-	700	-	Vrms
Enable Pin					
Turn-off Threshold	V_{thoff}	GND	-	0.8	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) Efficiency calculated using resistive loads.

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.

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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. The two pins should be connected for optimum reliability and efficiency.

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

Control   Analog voltage input to the onboard pulse width modulator. Decreasing this voltage increases the ON time of the onboard PWM resulting in increased 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 DMD series of inverters is designed to power up to four cold cathode fluorescent lamps. An external analog control interfaces with an onboard pulse width modulator to provide dimming control. The DMD inverter can reliably dim to less than 5% duty cycle.
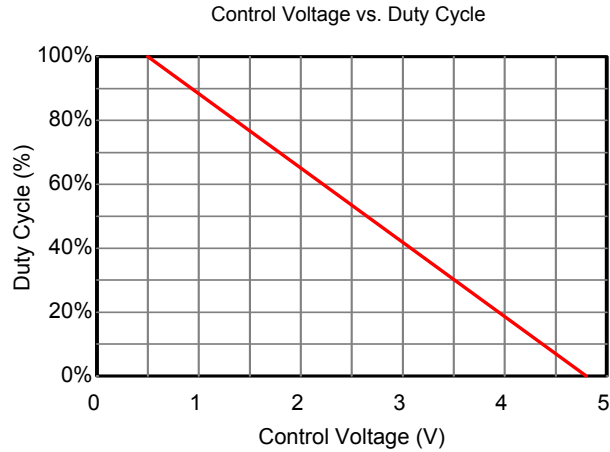
External shutdown of the inverter is accomplished using the Enable pin. Pulling this pin low (below Vthoff) disables the inverter. Enabling the inverter is accomplished by pulling this pin high (above Vthon).

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 1 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.

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Control Voltage vs. Duty Cycle

Graph 1

Typical Application

+12V → +Vin

+Vin

GND

GND

GND

GND

+5V →

Control
0V FULL ON
5V FULL OFF

Enable

+ On
- Off

ACout — Lamp 1

ACout — Lamp 2

J2

ACreturn

ACreturn

J3

ACout — Lamp 1
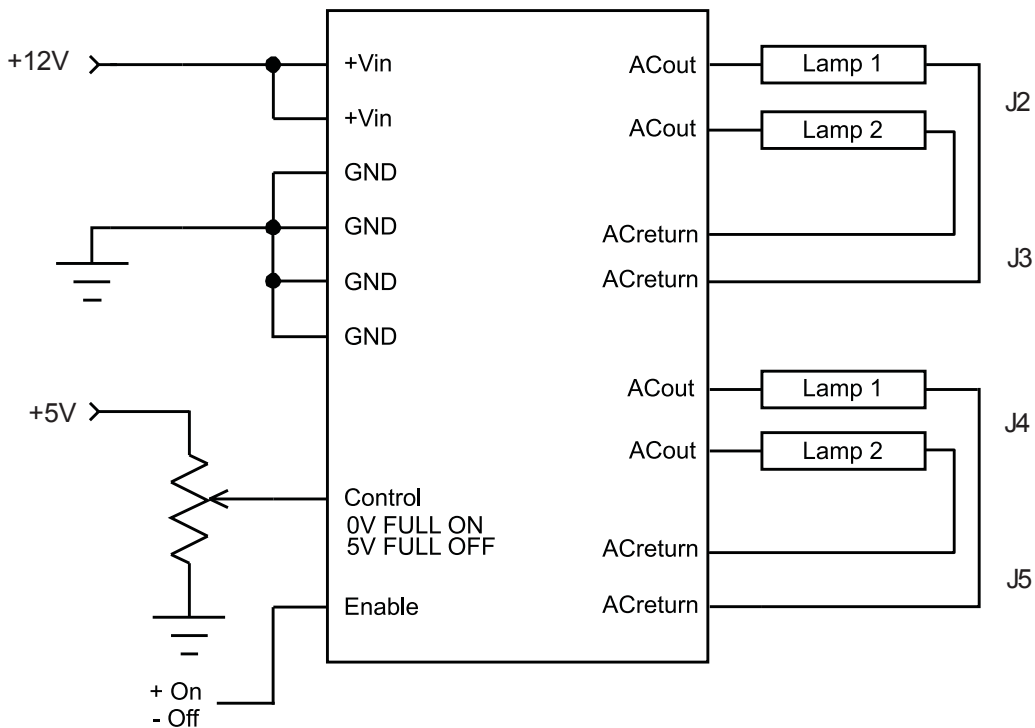
ACout — Lamp 2

J4

ACreturn

ACreturn

J5

Figure 1

Endicott Research Group, Inc. (ERG) reserves the right to make changes in circuit design and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by ERG is believed to be accurate and reliable. However, no responsibility is assumed by ERG for its use.