



Endicott Research Group, Inc.

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# DMD42966

## Specifications and Applications Information

04/28/04

Preliminary

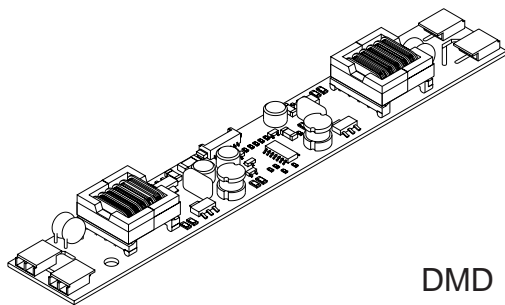
### Four Tube DC to AC Inverter

The ERG DMD42966 (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 DMD42966 is designed to power the backlight of the Toshiba LTM15C458C/458S.

### Product Features

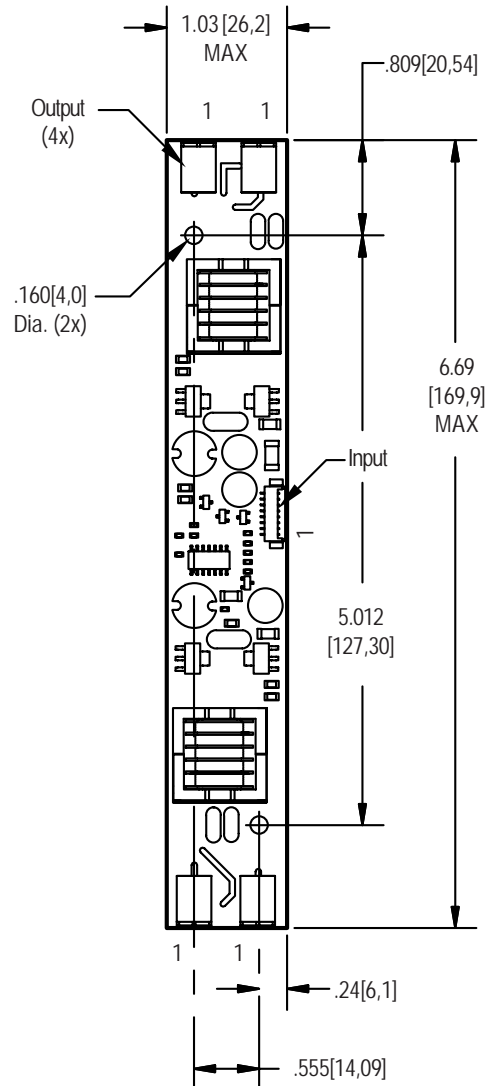
- ✓ Small Package Size, less than 13mm in height.
- ✓ High Dimming Ratio
- ✓ High Efficiency
- ✓ Made in U.S.A.



DMD Package

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

### Package Configuration



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

Mass: 45 grams

### Pin Descriptions

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

### Connectors

Output	Input
JST SM02B-BHSS-1-TB	Molex 53261-0890



## Absolute Maximum Ratings (Note 1)

Rating	Symbol	Value	Units
Input Voltage	$V_{in}$	-0.3 to +13.2	Vdc
Operating Temperature	$T_a$	-0 to +85	°C
Storage Temperature	$T_s$	-40 to +85	°C

## Recommended Operating Conditions

Rating	Symbol	Value	Units
Input Voltage	$V_{in}$	+10.8 to 12.6	Vdc
Operating Temperature <small>(Note 2)</small>	$T_a$	0 to +50	°C

## Electrical Characteristics

Unless otherwise noted  $V_{in} = 12.00$  Volts dc and  $T_a = 25^\circ\text{C}$

Characteristic	Symbol	Min	Typ	Max	Units
Input Current	$I_{in}$	-	1.62	1.9	$A_{DC}$
Input Ripple Current	$I_{rip}$	-	20	-	$mA_{pk-pk}$
Operating Frequency	$F_o$	34	39	44	KHz
Efficiency	$\eta$	-	87	-	%
Output Voltage (no load)	$V_{start}$	1500	-	-	V
Output Voltage (with lamp)	$V_{out}$	-	690	-	V
Output Current (per tube)	$I_{out}$	-	6.1	-	mArms
<b>Enable (pin J2-5)</b>					
Turn-off Threshold	$V_{thoff}$	-	-	1	V
Turn-On Threshold	$V_{thon}$	2.5	-	-	V
Impedance to $V_{in}$	$R_{Disable}$	9.5	10.0	10.5	V

**(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°C is possible if airflow is provided.

Input voltage specification modified for clarity on 4/2004.



## 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
Control Input Bias Current	$I_{cbias}$	-	-	10	uA

## Pin Descriptions

- Vin** Input voltage to the inverter. The four pins should be connected for optimum reliability and efficiency.
- GND** Inverter ground. The two 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.

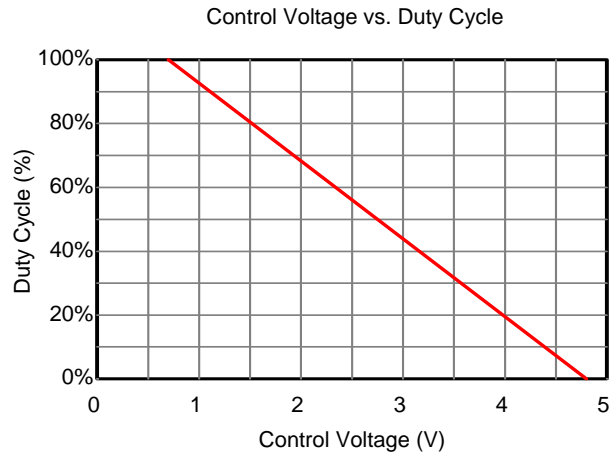
## Application information

The DMD series of inverters is designed to power up to four cold cathode fluorescent tubes. 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  $V_{thoff}$ ) 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 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.



Graph 1

### Typical Application

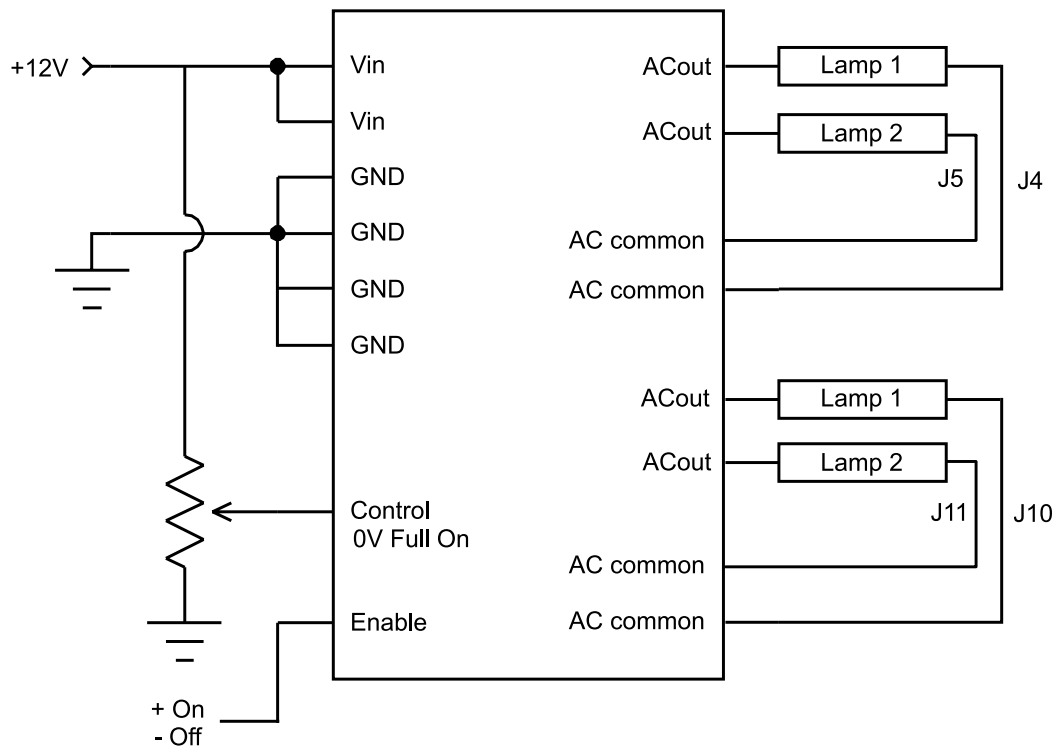


Figure 1



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