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Specifications and Applications Information

09/20/01

Preliminary

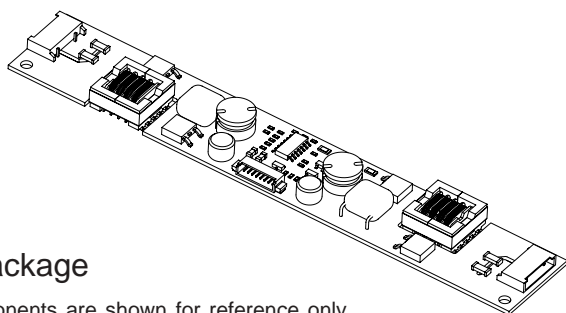
The ERG LD2601 (LD Series) DC to AC inverter features onboard connectors and can be easily dimmed using an external analog control signal or an external PWM generator.

Powered by a regulated 12 Volt DC source, the LD2601 is designed to power the backlight of the LG Philips LB121S1-A2.

Product Features

- ✓ Small Package Size, less than 9mm in height.
- ✓ High Dimming Ratio
- ✓ High Efficiency
- ✓ Made in U.S.A.

This unit complements our L Series of DC to AC Inverters



LD Package

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

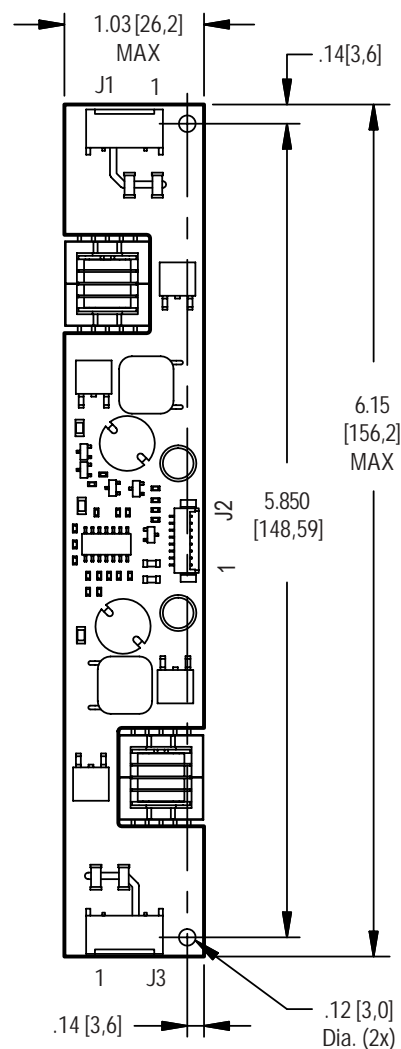
Connectors

| J1,J3 | J2 |
|-------------------------|------------------|
| JST SM03(4.0)B-BHS-1-TB | Molex 53261-0890 |

LD2601

Four Tube DC to AC Inverter

Package Configuration



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

Mass: 26 grams

Pin Descriptions

| | | |
|---------------|--------------|---------------|
| J1-1 ACout | J2-1 Vin | J3-1 ACout |
| J1-2 ACout | J2-2 Vin | J3-2 ACout |
| J1-3 ACcommon | J2-3 GND | J3-3 ACcommon |
| | J2-4 GND | |
| | J2-5 Enable | |
| | J2-6 Control | |
| | J2-7 N/C | |
| | J2-8 N/C | |



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} |
| Control | $V_{Control}$ | -0.3 to $V_{in} + 0.3$ | V_{DC} |
| 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} | +6 to 13.2 | V_{DC} |
| Operating Temperature <small>(Note 2)</small> | T_a | 0 to +50 | °C |

Electrical Characteristics

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 |
|----------------------------|---------------|------|------|----------|----------|
| Inverter | | | | | |
| Input Current | I_{in} | - | 1.7 | 1.9 | A_{DC} |
| Input Ripple Current | I_{rip} | - | 20 | - | mA pk-pk |
| Operating Frequency | F_o | 38 | 43 | 48 | KHz |
| Efficiency | η | - | 82 | - | % |
| Output Voltage (no load) | V_{start} | 1300 | - | - | V |
| Output Voltage (with lamp) | V_{out} | - | 650 | - | V |
| Output Current (per tube) | I_{out} | - | 6.4 | - | mArms |
| Enable (pin J2-5) | | | | | |
| 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°C is possible if airflow is provided.



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 two 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. 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. |

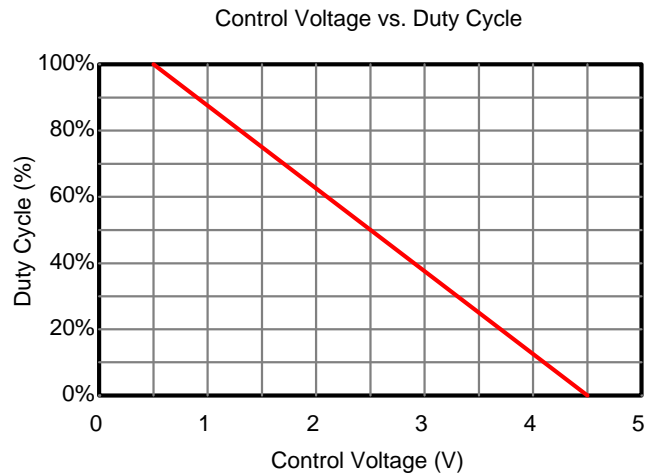
Application information

The LD series of inverters is designed to power up to four cold cathode fluorescent tubes with combined power from twelve watts. An external analog control interfaces with an onboard pulse width modulator to provide dimming control. The LD inverter can reliably dim to less than 5% duty cycle. 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

Typical Application

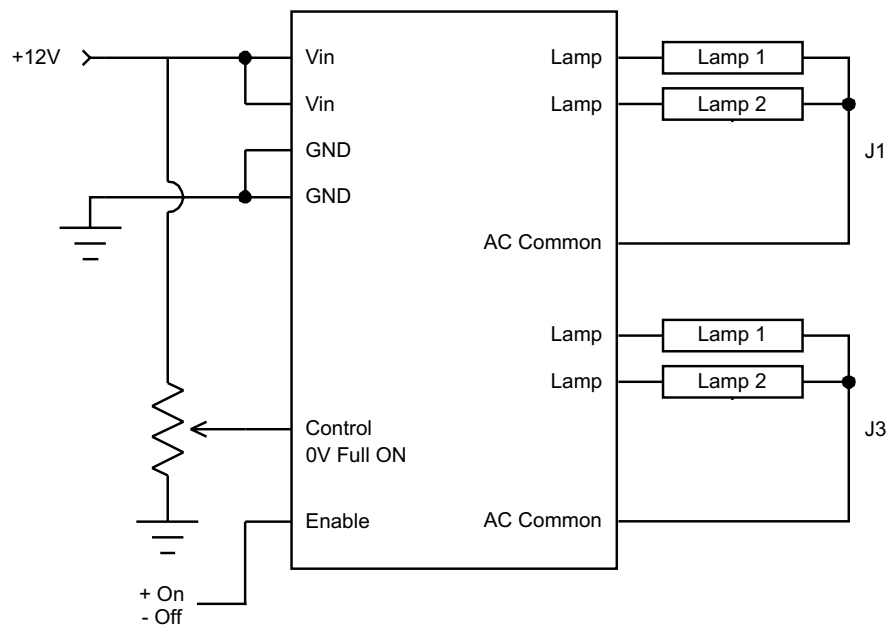


Figure 1



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