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# DMW2928

## Specifications and Applications Information

01/07/11

## Two Lamp DC to AC Inverter

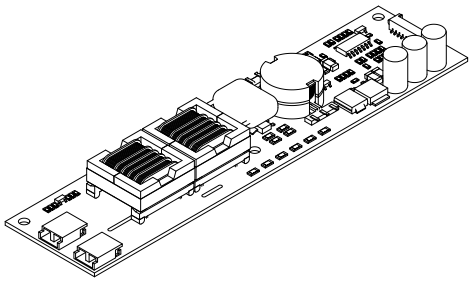
The ERG DMW2928 DC to AC inverter supports a wide input voltage range for use in applications where a regulated supply voltage is not available. Onboard dimming assists in final product integration providing a large dimming ratio from a supplied analog voltage.

The DMW2928 inverter is designed to power the Sharp LQ150X1LGN2 and LQ150X1LGN2A displays.

### Product Features

- ✓ Wide input voltage range of 7 to 18 volts
- ✓ Onboard dimming
- ✓ Open lamp detection and shutdown
- ✓ High efficiency
- ✓ Made in U.S.A.

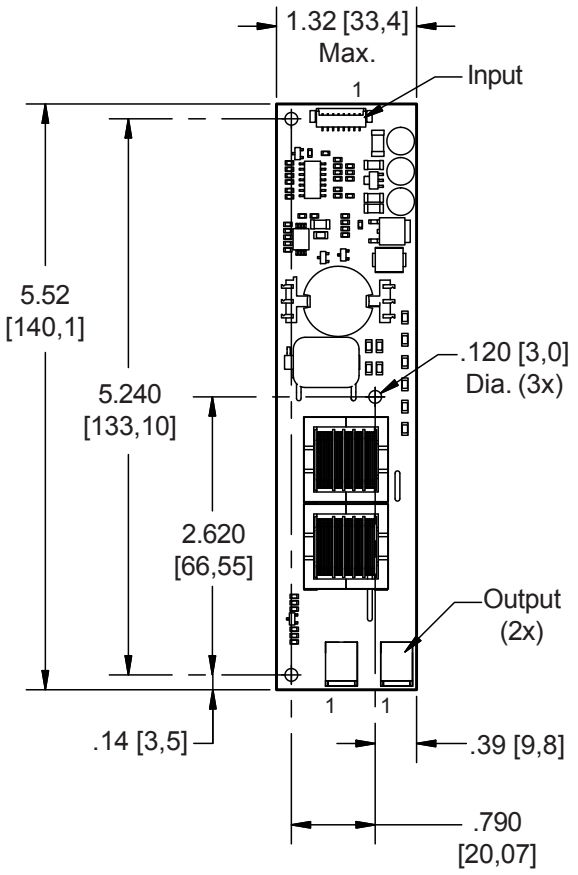
This unit complements our DMD Series of DC to AC Inverters



DMW2928

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

### Package Configuration




Mass: 50 grams

| Connectors | | | |
|---|---|---|---|
| Input | J1 | Molex | 53261-0871 |
| Output | J2,J3 | JST | SM02B-BHSS-1-TB |

| Pin Descriptions | | | |
|---|---|---|---|
| J1-1 | Vin | J2-1 | Lamp High |
| J1-2 | Vin | J2-2 | Lamp Return |
| J1-3 | Vin | | |
| J1-4 | GND | | |
| J1-5 | GND | J3-1 | Lamp High |
| J1-6 | GND | J3-2 | Lamp Return |
| J1-7 | Enable | | |
| J1-8 | Control | | |

## Absolute Maximum Ratings (Note 1)

| Parameter | Symbol | Value | Unit |
|---|---|---|---|
| Input Voltage | Vin | -0.3 to +18.0 | Vdc |
| Operating Temperature (Note 2) | $T_a$ | 0 to +85 | °C |
| Storage Temperature | $T_s$ | -40 to +85 | °C |
| Enable Pin | $V_{Enable}$ | -0.3 to +20.0 | Vdc |
| Control Pin | $V_{Control}$ | -0.3 to +5.5 | Vdc |

**Note:**
1. Reliable and predictable operation of the inverter is not guaranteed with applied stresses near or beyond those listed. Operation at these limits may reduce device reliability and is therefore not recommended.
2. For optimum reliability, the operating temperature should be kept below 50°C. Reliable operation above 50°C is possible if external airflow is provided and care is taken to ensure that the surface temperature of all components is below 85°C.

## Electrical Characteristics

Unless otherwise noted, Vin = 12.0 volts DC, $T_a$ = 25°C and the inverter has been running for 20 minutes.

| Characteristic | Symbol | Min | Typical | Max | Unit |
|---|---|---|---|---|---|
| Input Current | $I_{in}$ | | 1.02 | 1.20 | Adc |
| Operating Frequency | $F_o$ | 40 | 43 | 46 | kHz |
| Efficiency | $\eta$ | | 85 | | % |
| Output Voltage (no load) | $V_{start}$ | 2400 | | | Vrms |
| Output Lamp Current ($V_{Control}$ ~ 0 V) | $I_{lamp}$ | | 4.6 | | mArms |
| Output Lamp Current ($V_{Control}$ ~ 4.1 V) | $I_{lamp}$ | | 0 | | mArms |
| Onboard PWM Frequency | $F_{PWM}$ | | 480 | | Hz |
| Enable turn-on threshold voltage | $V_{thon}$ | 2.5 | | Vin | Vdc |
| Enable turn-off threshold voltage | $V_{thoff}$ | | | 0.7 | Vdc |
| Enable impedance to input voltage | $R_{enable}$ | | 100 | | kOhms |

**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 should be non-conductive.
3) Open framed inverters should not be used in applications at altitudes over 10,000 feet.
4) Contact ERG for possible exceptions.

### Pin Descriptions

| Pin | Description |
|---|---|
| Vin | Inverter input voltage. All three pins should be connected for optimum reliability and efficiency . |
| GND | Inverter ground. All three pins should be connected for optimum reliability and efficiency. |
| Enable | Inverter Enable. A high level signal on this pin enables inverter operation. This pin is pulled to Vin via an onboard 100 kOhm resistor. |
| Control | Dimming control. This pin controls the brightness of the inverter. Connecting this pin to ground causes the inverter to supply full lamp current for full brightness. |
| Lamp High | High side lamp output. This should be connected to the high voltage side of the display lamp connectors. |
| Lamp Return | Return side lamp output. This should be connected to the low voltage side of the display lamp connectors. Lamp current is sensed from this connection, it should not be externally grounded. |

## Application Information

The DMW2928 inverter is designed to power the Sharp LQ150X1LGN2 and LQ150X1LGN2A displays. Onboard regulation allows for a connection to an unregulated power source such as a battery or low cost wall module. An onboard PWM for dimming eases system integration by allowing for an analog voltage supplied by a potentiometer or digital to analog converter to achieve a wide dimming ratio. Open lamp detection circuitry protects the inverter from an open lamp condition caused by a broken or malfunctioning lamp.

Dimming of the inverter is accomplished by placing an analog voltage on the Control pin. The level of this voltage controls the brightness of the attached display. Connecting the Control pin to ground results in the maximum brightness of the display. Increasing the voltage on this pin gradually decreases the brightness until the display extinguishes. If dimming is not required in the application, simply connect this pin to ground. For optimum brightness, this pin must not be left floating.

The Enable pin on the inverter provides a convenient way to turn off the inverter. Grounding this pin turns the inverter off while either pulling this pin high or floating this pin turns the inverter on. Care should be taken when connecting logic devices to this pin as it is pulled to the input voltage with a 100k Ohm resistor. This pin may be left floating.

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