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# ACI-E050800-3003

## PRODUCT DATA SHEET

09/23/19

### I-DRIVE 5, 40 WATT LED DRIVER (Eight Channel 50V, 0-100mA per Channel)

#### GENERAL DESCRIPTION

The ACI-E050800-3003 represents the 5<sup>th</sup> generation of I-Drive technology used for powering LED backlights.

Operating as a true constant current source and capable of driving up to 8 banks of series connected LED's. This driver provides a complete integrated solution that is regulated over an input range of +20V to +28V.

Simple to connect and operate, this driver solution is capable of providing precise control to support dimming applications with a minimum of 3000:1.

This unit features enable and intensity control inputs.

#### MECHANICAL/ENVIRONMENTAL

Weight = 35.7 grams

Altitude = 35,000 ft max.

Humidity < 95% non-condensing

Size (L x W x H) = 3.25 IN x 2.00 IN x 0.47 IN

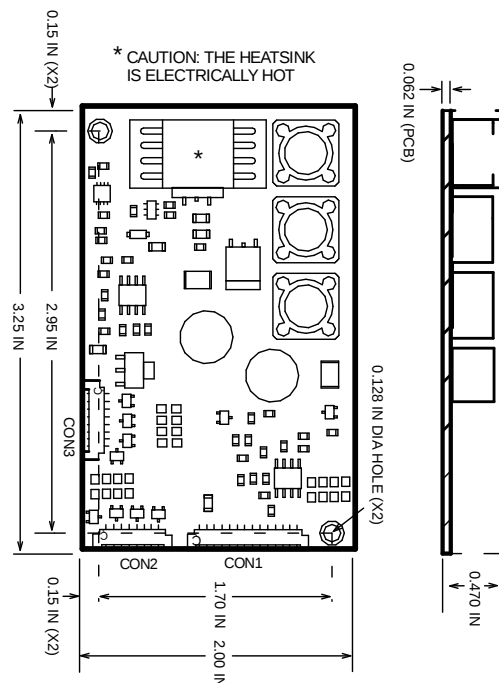
PCB thickness = 0.062 IN

Mounting Holes = 0.128 IN diameter (X2)

Input Power & Control Connector = CON1

LED Output Connectors = CON2 and CON3

RoHS Compliant



#### INPUT CONNECTOR

CON1  
MOLEX 53261-1471

| PIN# | FUNCTION          |
|------|-------------------|
| 1    | +20 to +28V (PWR) |
| 2    | +20 to +28V (PWR) |
| 3    | +20 to +28V (PWR) |
| 4    | +20 to +28V (PWR) |
| 5    | GND (PWR)         |
| 6    | GND (PWR)         |
| 7    | GND (PWR)         |
| 8    | GND (PWR)         |
| 9    | ENABLE            |
| 10   | ICNTL             |
| 11   | TBD               |
| 12   | TBD               |
| 13   | +5VDC REF OUT     |
| 14   | GND (SIGNAL)      |

#### OUTPUT CONNECTORS

CON2  
MOLEX 53261-0871

| PIN# | FUNCTION                 |
|------|--------------------------|
| 1    | + LED (ANODE)            |
| 2    | + LED (ANODE)            |
| 3    | + LED (ANODE)            |
| 4    | + LED (ANODE)            |
| 5    | - LED (CATHODE1) Master* |
| 6    | - LED (CATHODE2)         |
| 7    | - LED (CATHODE3)         |
| 8    | - LED (CATHODE4)         |

\*The Master Channel must always be used

#### OUTPUT CONNECTORS

CON3  
MOLEX 53261-0871

| PIN# | FUNCTION         |
|------|------------------|
| 1    | + LED (ANODE)    |
| 2    | + LED (ANODE)    |
| 3    | + LED (ANODE)    |
| 4    | + LED (ANODE)    |
| 5    | - LED (CATHODE5) |
| 6    | - LED (CATHODE6) |
| 7    | - LED (CATHODE7) |
| 8    | - LED (CATHODE8) |

### MAXIMUM RATINGS\*

| Symbol | Parameter                                               | Value       | Unit |
|--------|---------------------------------------------------------|-------------|------|
| Vin    | Supply Voltage (Referenced to Ground)                   | -0.7 to 30  | Vdc  |
| Vip    | Voltage applied to any Input Pin (Referenced to Ground) | -0.7 to 5.7 | Vdc  |
| Iop    | Current sourced or sinked from any Output Control Pin   | +/- 10      | mAdc |
| Pin    | Input Power (DC Input Voltage x DC Input Current)       | 50.7        | W    |
| Top    | Operating Temperature (Still air ambient around Driver) | -40 to +85  | °C   |
| Tstg   | Storage Temperature                                     | -40 to +105 | °C   |

\*Maximum Ratings are those values beyond which damage to the driver may occur.

### RECOMMENDED OPERATING CONDITIONS

| Symbol | Parameter                                            | Min       | Max  | Unit |
|--------|------------------------------------------------------|-----------|------|------|
| Vin    | Supply Voltage (Referenced to Ground)                | 20.0      | 28.0 | Vdc  |
| Vf     | Series Connected Cumulative LED Forward-Drop Voltage | **Vin + 1 | 50   | Vdc  |
| Icctl  | LED Intensity Control Voltage                        | 0.25      | 4.75 | Vdc  |

\*\*Vin must be less than the minimum Forward-Drop Voltage (Vf).

### ELECTRICAL CHARACTERISTICS

Vin = +24V, Vf = 50V per channel, # of channels = 8, Icctl = +4.75V, Enable = +5V unless otherwise specified.

| Symbol | Parameter                                       | Test Conditions                | Min  | Nom  | Max  | Unit |
|--------|-------------------------------------------------|--------------------------------|------|------|------|------|
| OCV    | Open Circuit Voltage                            | No Load                        | 59   | 62   | 65   | Vdc  |
| Iout   | Output Current per Channel                      |                                | 95   | 100  | 105  | mAdc |
| Iadj   | Nominal Output Current Adjust Range Per Channel | Icctl(Pin 10) ≤ +0.25V         | 0    |      |      | mAdc |
|        |                                                 | Icctl(Pin 10) ≥ +4.75V         |      |      | 100  | mAdc |
| ENoff  | Enable Control, Unit Off                        |                                |      |      | 0.5  | Vdc  |
| ENon   | Enable Control, Unit ON                         |                                | 2.0  |      |      | Vdc  |
| +5Vref | +5V Output Reference Voltage                    | 1K Ohm Load to Ground (Pin 13) | 4.75 | 5.0  | 5.25 | Vdc  |
| Iin    | Input Current Draw                              |                                |      | 1.92 |      | Adc  |
| Iind   | Input Current Draw (Disabled)                   | Enable (Pin 9) = 0V            |      |      | 0.06 | Adc  |
| Eff    | Electrical Efficiency                           |                                |      | 87   |      | %    |

**CAUTION:** Due to the high output current per channel, all eight channels must be used.

For thermal management, mount LED Driver upside down, as shown in Figure 1.  
Sandwich thermally conductive material between top of inductors and aluminum chassis.  
The objective is to pull heat away from the LED Driver, so that it does not exceed its maximum operating temperature (Top) specification.

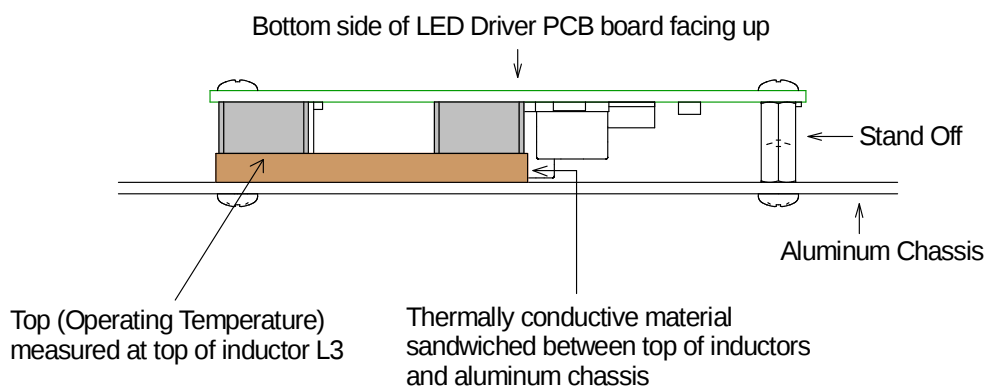


FIGURE 1. - Thermal Management (Side View)

BRIGHTNESS CURVE

