

I-DRIVE 5, 24.0 WATT LED DRIVER

(60V, One to Eight Channels, 0-50mA per Channel)

GENERAL DESCRIPTION

The ACI-3182 represents the 5th generation of I-Drive technology used for powering LED backlights.

Operating as a true constant current source and capable of driving up to 8 parallel banks of series connected LEDs with a forward voltage drop up to 60V. This driver provides a complete integrated solution that is regulated over an input range of +10V to +18V.

Please refer to Table 1 on page 3, for the maximum output current per channel, based on the number of channels connected.

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

Specified Components secured with 3M DP-190 Gray Epoxy

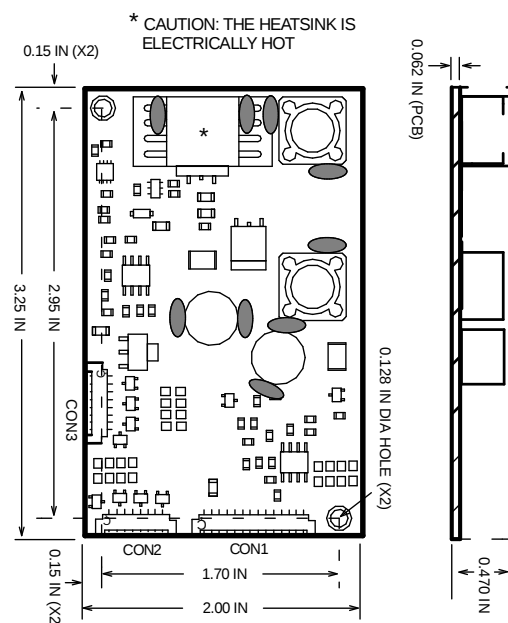
PCB Conformally Coated with Humiseal 1B73

RoHS Compliant

ACI-3182

PRODUCT DATA SHEET

03/03/22



INPUT CONNECTOR
CON1
MOLEX 53261-1471

PIN#	FUNCTION
1	+10 to +18V (PWR)
2	+10 to +18V (PWR)
3	+10 to +18V (PWR)
4	+10 to +18V (PWR)
5	GND (PWR)
6	GND (PWR)
7	GND (PWR)
8	GND (PWR)
9	ENABLE
10	ICNTL/PWM
11	TBD
12	TBD
13	+5VDC REF OUT
14	GND (SIGNAL)

OUTPUT CONNECTOR
CON2
MOLEX 53261-0871

PIN#	FUNCTION
1	+ LED (ANODE)
2	+ LED (ANODE)
3	+ LED (ANODE)
4	+ LED (ANODE)
5	- LED (CATHODE 1) Master*
6	- LED (CATHODE 2)
7	- LED (CATHODE 3)
8	- LED (CATHODE 4)

*The Master Channel must always be used.

OUTPUT CONNECTOR
CON3
MOLEX 53261-0871

PIN#	FUNCTION
1	+ LED (ANODE)
2	+ LED (ANODE)
3	+ LED (ANODE)
4	+ LED (ANODE)
5	- LED (CATHODE 5)
6	- LED (CATHODE 6)
7	- LED (CATHODE 7)
8	- LED (CATHODE 8)

MAXIMUM RATINGS*

Symbol	Parameter	Value	Unit
Vin	Supply Voltage (Referenced to Ground)	-0.7 to 20	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)	32	W
Top	Operating Temperature (Still air ambient around Driver)	-30 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)	10.0	18.0	Vdc
Vf	Series Connected Cumulative LED Forward-Drop Voltage	**Vin + 1	60	Vdc
Icntl	LED Intensity Control Voltage	0.1	3.3	Vdc
PWMcntl	Intensity Control PWM Frequency Range (User Supplied Input)	100	1000	Hz

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

ELECTRICAL CHARACTERISTICS

Vin = +12V, Vf = 60V, # of Channels = 8, Icntl = +3.3V, Enable = +5V unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Nom	Max	Unit
OCV	Open Circuit Voltage	No Load	65	72	79	Vdc
Iout	Output Current per Channel		47	50	53	mAdc
Iadj	Nominal Output Current Per Channel Adjust Range	Icntl (Pin 10) <= +0.1V or PWMcntl (Pin 10) = 0%	0			mAdc
		Icntl (Pin 10) >= +3.1V or PWMcntl (Pin 10) = 100%			50	mAdc
PWMhi	PWM High Signal Level (V _{IH})		3.3			Vdc
PWMlo	PWM Low Signal Level (V _{IL})				0.1	Vdc
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			2.3		Adc
Iind	Input Current Draw (Disabled)	Enable (Pin 9) = 0V			0.06	Adc
Eff	Electrical Efficiency			87		%

Number of Channels Connected	1*	2*	3	4	5	6	7	8
Maximum Output Current per Channel (mA)	400	200	133.3	100	80	66.7	57.1	50

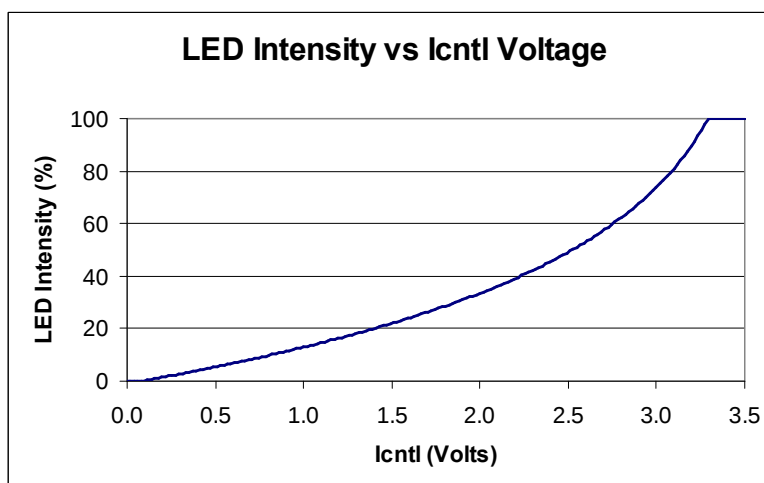
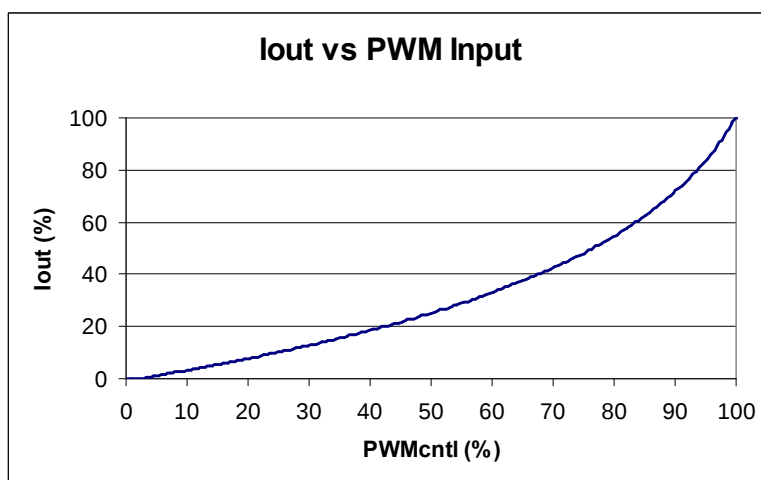
Table 1 - Maximum Output Current per Channel, based on the number of channels connected

Pin 5 of CON2 is the Master Channel and must always be used.



*When using 2 channels or less, use 2 output channels in parallel to lower the current on each pin

BRIGHTNESS CURVES



THERMAL MANAGEMENT

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.

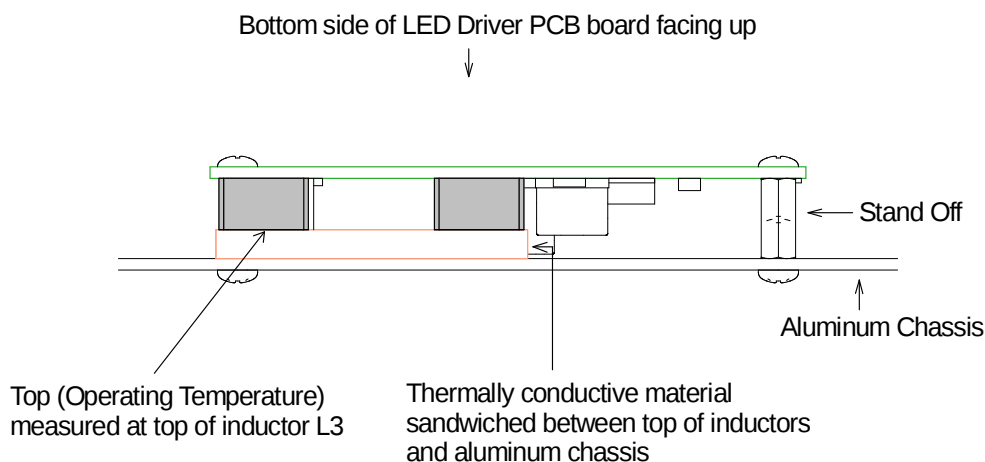


FIGURE 1. - Thermal Management (Side View)