Applied Concepts
INNOVATION IN POWER CONVERSION TECHNOLOGY

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ACI-F080480-3156

PRODUCT DATA SHEET

09/24/21

I-DRIVE 6, 38.4 WATT LED DRIVER

(Ten Channel, 80V, 0-48mA per Channel)

GENERAL DESCRIPTION

The ACI-F080480-3156 represents the 6th generation of I-Drive technology used for powering LED backlights.

Operating as a true constant current source and capable of driving up to10 parallel banks of series connected LEDs with a forward voltage drop up to 80V. This driver provides a complete integrated solution that is regulated over an input voltage range from +11.4V to +18.0V DC.

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 wide dimming applications.

This unit features enable and intensity control inputs.

MECHANICAL/ENVIRONMENTAL

Weight = 50.7 grams

Altitude = 35,000 ft max.

Humidity < 95% non-condensing

Size (L x W x H) = 5.00 IN x 2.00 IN x 0.540 IN

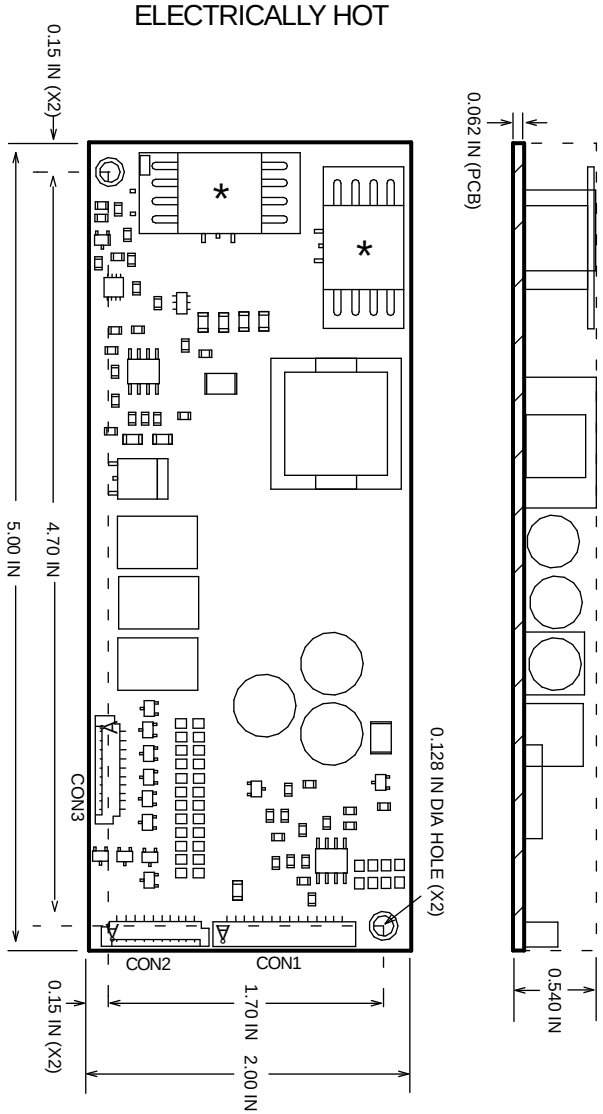
PCB thickness = 0.062 IN

Mounting Holes = 0.128 IN diameter (X2)

Input Power & Control Connector = CON1

LED Output Connector = CON2 and CON3

RoHS Compliant



PLEASE REFER TO PAGE 3,
FOR INPUT AND OUTPUT CONNECTOR PIN ASSIGNMENTS

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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)	51.0	W
Top	Operating Temperature (Still air ambient around Driver)	-30 to +70	°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)	11.4	18.0	Vdc
Vf	Series Connected Cumulative LED Forward-Drop Voltage	**Vin + 1	80	Vdc
Icntl	LED Intensity Control Voltage	0.25	4.75	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 = +12.0V, Vf = 80V per channel, # of channels = 10, Icntl = +4.75V, Enable = +5V unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Nom	Max	Unit
OCV	Open Circuit Voltage	No Load	88	93	98	Vdc
Iout	Output Current per Channel		46	48	50	mAdc
Iadj	Nominal Output Current per Channel Adjustment Range	Icntl(Pin 10) <= +0.25V or PWMcntl(Pin 10) = 0%	0			mAdc
		Icntl(Pin 10) >= +4.75V or PWMcntl(Pin 10) = 100%			48	mAdc
PWMhi	PWM High Signal Level (V_{IH})		4.75			Vdc
PWMlo	PWM Low Signal Level (V_{IL})				0.25	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	Vin = +12V		3.7		Adc
Eff	Electrical Efficiency			87		%

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Number of Channels Connected	**1***	**2***	**3***	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Maximum Output Current per Channel (mA)	480	240	160	120	96	80	68.6	60	53.3	48

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

⚠ *When using 3 channels or less, use 2 output channels in parallel to lower the current on each pin

INPUT AND OUTPUT CONNETOR PIN ASSIGNMENTS

INPUT CONNECTOR CON1 MOLEX 87438-1443	OUTPUT CONNECTOR CON2 MOLEX 53261-1071	OUTPUT CONNECTOR CON3 MOLEX 53261-1071
PIN# FUNCTION	PIN# FUNCTION	PIN# FUNCTION
1 +11.4 to +18.0V (PWR)	1 +LED (ANODE)	1 +LED (ANODE)
2 +11.4 to +18.0V (PWR)	2 +LED (ANODE)	2 +LED (ANODE)
3 +11.4 to +18.0V (PWR)	3 +LED (ANODE)	3 +LED (ANODE)
4 +11.4 to +18.0V (PWR)	4 +LED (ANODE)	4 +LED (ANODE)
5 GND (PWR)	5 +LED (ANODE)	5 +LED (ANODE)
6 GND (PWR)	6 -LED (CATHODE #1) MASTER*	6 -LED (CATHODE #6)
7 GND (PWR)	7 -LED (CATHODE #2)	7 -LED (CATHODE #7)
8 GND (PWR)	8 -LED (CATHODE #3)	8 -LED (CATHODE #8)
9 ENABLE	9 -LED (CATHODE #4)	9 -LED (CATHODE #9)
10 ICNTL/PWM	10 –LED (CATHODE #5)	10 -LED (CATHODE #10)
11 TBD		
12 TBD		
13 +5VDC REF OUT		
14 GND (SIGNAL OUT)		

*The Master Channel must always be used.

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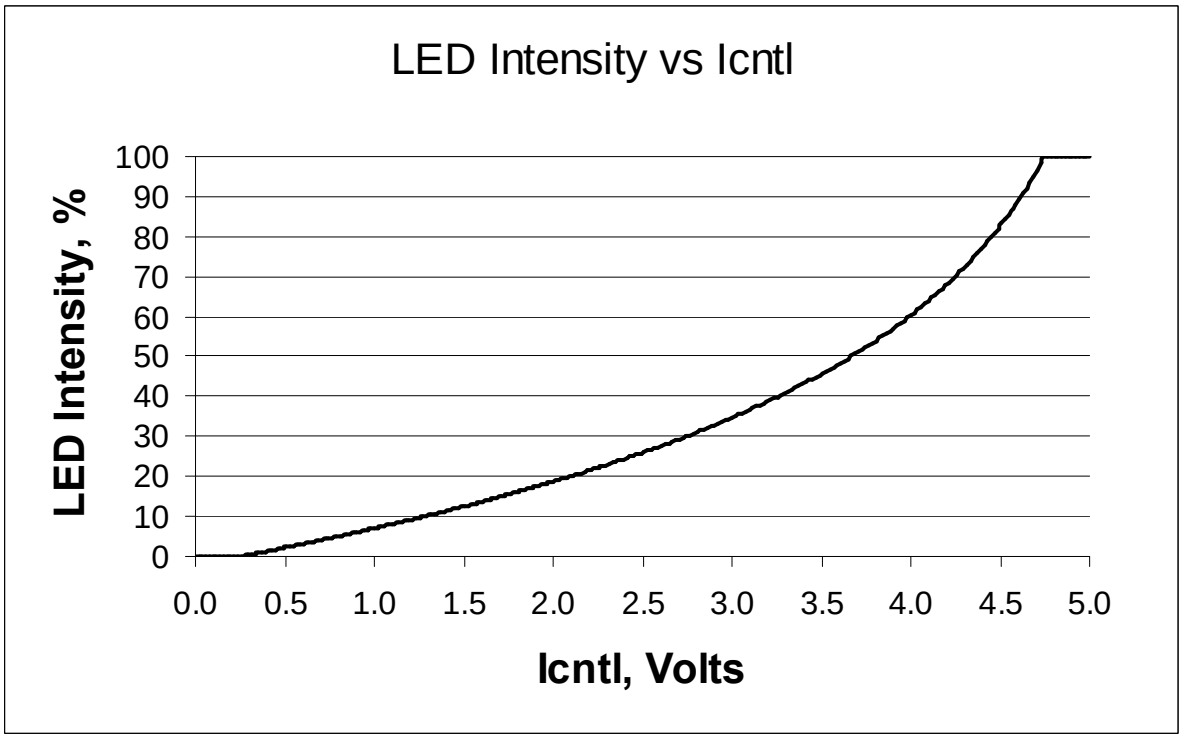
BRIGHTNESS CURVE



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For thermal management, mount LED Driver upside down, as shown in Figure 1.
Sandwich thermally conductive material between top of inductor/heatsink 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.

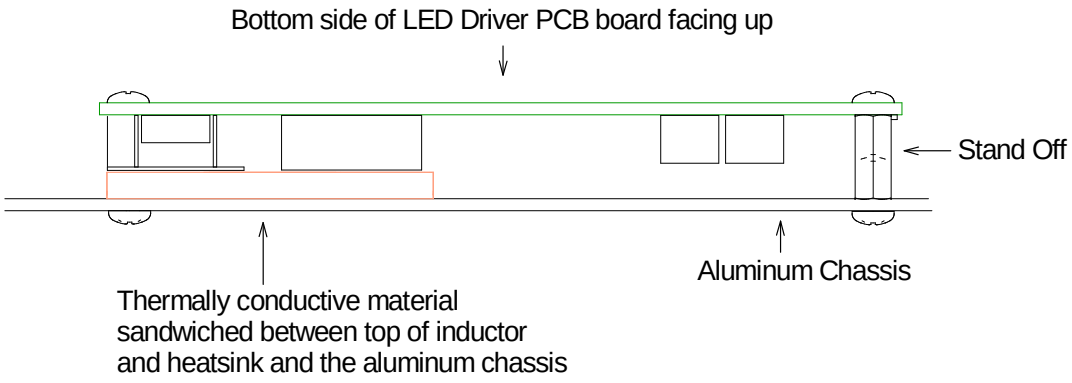

FIGURE 1. - Thermal Management (Side View)