

I-DRIVE, 15.2 WATT LED DRIVER

Dual Mode, 95V, (0-160mA Day), (0-25mA NVIS)

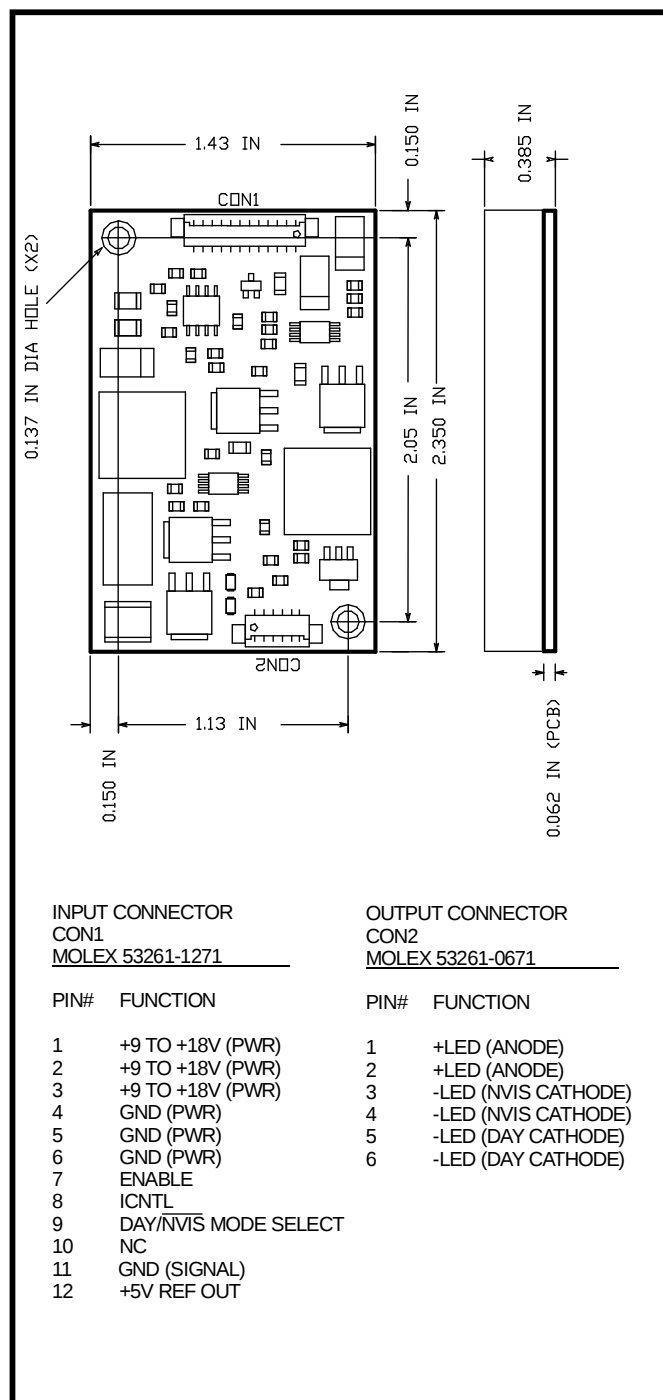
GENERAL DESCRIPTION

The ACI-2146D provides a single board LED Driver solution for the powering of a LED backlight consisting of two types of LEDs, High Bright "Day" LEDs, and IR filtered "NVIS" LEDs.

This driver operates as a Dual Mode constant current LED Driver. In "Day" mode, the driver supplies power out of the Day channel (CON2, pins 1 and 5), and in the "NVIS" mode, out of the NVIS channel (CON2, pins 1 and 3). Mode selection is accomplished via a signal provided by the user on pin 9 of CON1.

The driver is capable of driving series connected LEDs with a forward drop of up to 95V, and operates over an input voltage range of +9V to +18V.

This driver also features an enable and intensity control input with logarithmic output brightness response, yielding a combined dimming range of greater than 10,000 to 1.



MECHANICAL/ENVIRONMENTAL

Weight = 20.5 grams

Altitude = 35,000 ft max.

Humidity < 95% non-condensing

Size (L x W x H) = 2.35 IN x 1.43 IN x 0.385 IN

PCB thickness = 0.062 IN

Mounting Holes = 0.137 IN diameter (X2)

Input Power & Control Connector = CON1

LED Output Connector = CON2

RoHS Compliant

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)	20	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)	9.0	18.0	Vdc
Vf	Series Connected Cumulative LED Forward-Drop Voltage	36	95	Vdc
Icntl	LED Intensity Control Voltage	0.1	4.9	Vdc

ELECTRICAL CHARACTERISTICS (Part 1 of 2)

Vin = +12V, Icntl = +4.9V, Enable = +5V, unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Nom	Max	Unit
OCV	Open Circuit Voltage	No Load	133	140	147	Vdc
ENoff	Enable Control, Unit Off	Pin 7 <= 0.5V			0.5	Vdc
Enon	Enable Control, Unit ON	Pin 7 >= 2.0V	2.0			Vdc
Ms	Mode Select, Day Mode	Pin 9 >= 2.0V	2.0			Vdc
Ms	Mode Select, NVIS Mode	Pin 9 <= 0.5V			0.5	Vdc
Msd	Mode Select Delay (Time for output channel to switch to alternate mode/channel)			0.2		sec
+5Vref	+5V Output Reference Voltage	1K Ohm Load to Ground (Pin 12)	4.75	5.0	5.25	Vdc
Iind	Input Current Draw (Disabled)	Enable (Pin 7) = 0V		8		mA
Eff	Electrical Efficiency		87			%

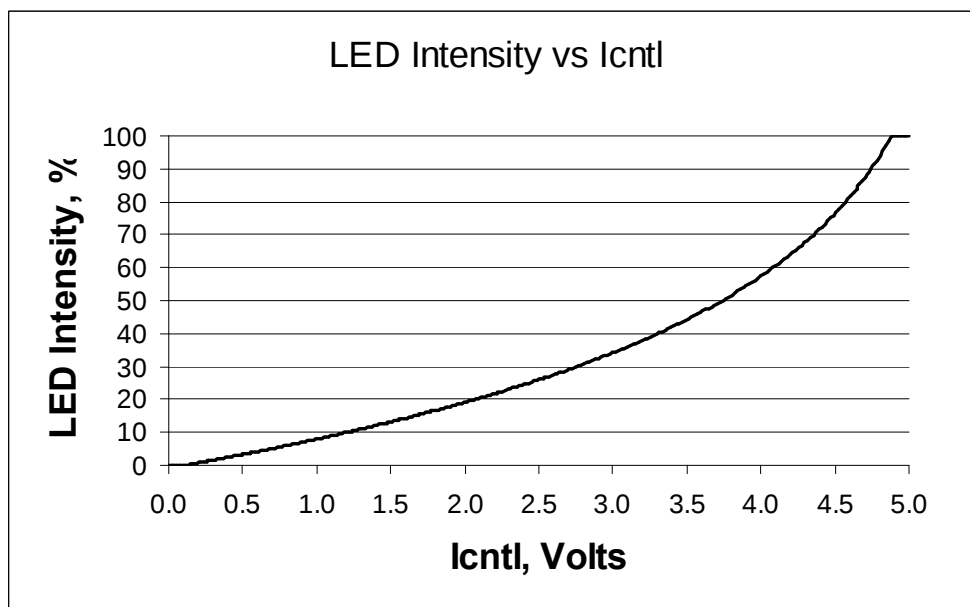
Electricals continued on page 3.

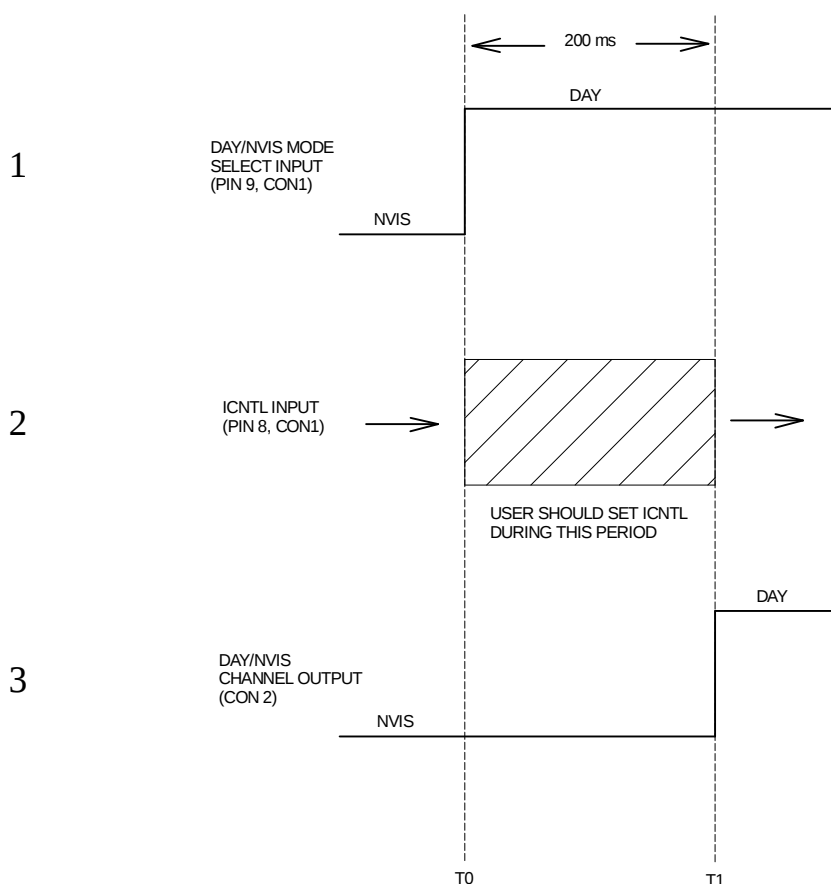
ELECTRICAL CHARACTERISTICS (Part 2 of 2)

Vin = +12V, Icntl = +4.9V, Enable = +5V unless otherwise specified.

Symbol	Parameter	Test Conditions	Min	Nom	Max	Unit
Day Mode, Ms = 5V						
Iout	Output Current		152	160	168	mA
Iadj	Nominal Output Current Adjustment Range	Icntl(Pin 8) = +0.1V to +4.9V	0		160	mA
Iin	Input Current Draw	Vf = 78V		1.2		Adc
NVIS Mode, Ms = 0V						
Iout	Output Current		23	25	27	mA
Iadj	Nominal Output Current Adjustment Range	Icntl(Pin 8) = +0.1V to +4.9V	0		25	mA
Iin	Input Current Draw	Vf = 74V		0.20		Adc
Iin	Input Current Draw	Vf = 39V		0.10		Adc

BRIGHTNESS CURVE





TIMING DIAGRAM – Example of Switching from NVIS to Day Mode

When user wants to switch modes, do the following:

1. Change to the desired mode, via Pin 9 on CON1 (This is shown to occur at T0).
2. Update Icntl setting, Pin 8 on CON1, within 200ms of mode change.
3. 200ms after mode change, the output channel will switch, and the new Icntl setting will appear (this is shown to occur at T1).

REVISION HISTORY

PART NUMBER	CHANGE	DATE
ACI-2146	Initial Design	01/24/2013
ACI-2146A	1. Decreased control response time from 250ms to 200ms. 2. Added 200ms delay to mode change output, as described in Timing Diagram on page 4 of this datasheet. 3. Changed Enable input resistor to 2.2K.	04/17/2013
ACI-2146B	1. Fixed bug in Software which held "PWM count" after mode change causing "Flash".	05/03/2013
ACI-2146C	1. Added R26 as pull up resistor. 2. Power up reset timer turned on in software.	09/10/2013
ACI-2146D	Added 0.1uF bypass capacitor from pin 9 (mode select) of CON1 to pin 11 (signal ground) of CON1 on solder-side of pcb	01/27/2015