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SFD2HB4411F

RoHS Compliant

Specifications and Applications Information

02/08/16

Smart Force LED Driver

The ERG *Smart Force Series* of LED Drivers are specifically designed for applications which require high efficiency, small footprint and LCD brightness stability from a 12 Volt dc source. The SFD2HB4411F is designed to provide backlight power for the Mitsubishi AA150XW11 display.

Designed, manufactured and supported within the USA, the SFD2H features:

- ✓ Less than 10 mm in height
- ✓ Constant LED current
- ✓ Open and short circuit protection
- ✓ High efficiency
- ✓ Separate enable and dimming function
- ✓ 1250:1 dimming ratio
- ✓ Soft start
- ✓ One year warranty

Package Configuration

1.35 [34,3]

Output

.145 [3,68] Dia. (2x)

2.80 [71,1]

2.36 [59,9]

Input

1.00 [25,5]

.219 [5,56]

.168 [4,27]

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

Mass: 13 grams typ.

Connectors

Input Connector	Output Connector *	
Molex 53261-0871	JST SM12B-SRSS-TB	
J1-1 Vin(+)	J2-1 Cathode 1	J2-7 Anode 2
J1-2 Vin(+)	J2-2 Cathode 2	J2-8 Anode 3
J1-3 Vin(+)	J2-3 Cathode 3	J2-9 Anode 4
J1-4 GND	J2-4 Cathode 4	J2-10 Anode 5
J1-5 GND	J2-5 Cathode 5	J2-11 (do not use)
J1-6 GND	J2-6 Anode 1	J2-12 (do not use)
J1-7 Enable		
J1-8 Control		

* Requires harness:
ERG part number H22910150F recommended

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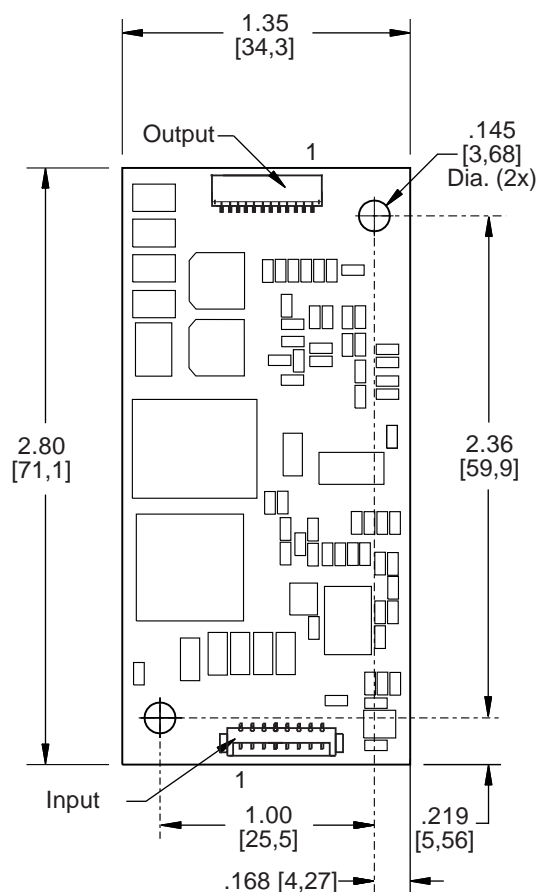
Absolute Maximum Ratings

Rating	Symbol	Value	Units
Input Voltage Range	V_{in}	-0.3 to +20	Vdc
Storage Temperature	T_{stg}	-40 to +85	°C
Enable Input Voltage	V_{Enable}	0 to +5.5	Vdc
Control Input Voltage	V_{PWM}	0 to +5.5	Vdc

Operating Characteristics

Unless otherwise noted Vin = 12.00 Volts dc and Ta = 25°C.

Characteristic	Symbol	Min	Typ	Max	Units
Input Voltage	V_{in}	+10.8	+12.0	+18.0	Vdc
Component Surface Temperature (Note 1)	T_s	-40	-	+80	°C
Input Current	I_{in}	-	1.45	-	Adc
LED String Voltage (Note 2)	V_{LED}	21	-	31	Vdc
Efficiency (Note 3)	η	-	90	-	%
Output Current (per string)	I_{out}	121	128	134	mAdc
Enable Pin (Note 4)					
Turn-on Threshold	V_{thon}	-	-	2.0	Vdc
Turn-off Threshold	V_{thoff}	0.4	-	-	Vdc
Enable Input Impedance (Note 5)	R_{Enable}	-	9	-	kOhms
Control Pin (Notes 6,7)					
Full-on Threshold	V_{thon}	-	0.5	-	Vdc
Minimum Pulse Width Threshold	V_{PWmin}	-	4.5	-	Vdc
Control Input Bias Current	I_{Cbias}	-	-	50	uA
Frequency	F_{PWM}	-	250	-	Hz

Specifications subject to change without notice.

(Operating Characteristics notes are continued on next page.)

Note 1   Surface temperature must not exceed 80°C, except Q1, which cannot exceed 105°C.
Note 2   If maximum string voltage is exceeded, driver will enter overvoltage self protection mode and shut down. Reducing the LED string voltage then toggling the Enable and/or power cycling the driver, will restart the driver.
Note 3   Efficiency is calculated using a 24.6V LED string.
Note 4   If the Enable pin is floated, the driver defaults to the OFF mode.
Note 5   Enable pin input impedance is 9kΩ to ground.
Note 6   If the Control pin is floated while the Enable pin is active high, the driver defaults to the full ON mode.
Note 7   Control pin input impedance is 100kΩ to ground.

Application Information

The ERG SFD2H4411F has been designed to be configured in multiple ways:
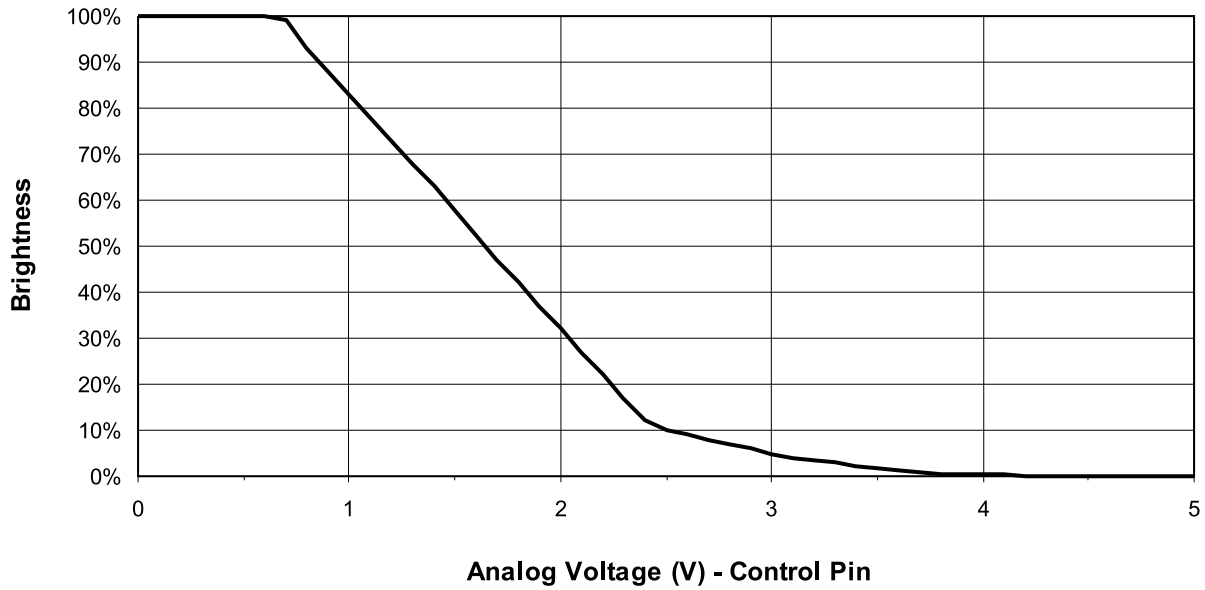
NO DIMMING
- OPERATION: The SFD2H can be configured to operate without dimming by floating the Control (J1-8) pin.
- Pins 1, 2 and 3 of connector J1 must be connected to +Vin, between 10.8 and 18 Vdc. Pins 4, 5 and 6 of connector J1 must be connected to GND.
- Enable Pin (J1-7) must be high for the driver to be on.
- Disabling driver: Pulling the Enable Pin (J1-7) below the minimum turn-off threshold or allowing the Enable Pin to float, will disable the driver.

ONBOARD PWM DIMMING

- OPERATION: Onboard PWM configuration as shown in Figure 1 allows the user to control display brightness by controlling the onboard PWM generator. The user is responsible to provide an analog control signal.
- DIMMING: Dimming is accomplished by applying an analog voltage to the Control Pin (J1-8). Display brightness is modulated by controlling the Control Pin voltage as shown in Graph 1 and Graph 2.
- ENABLE/DISABLE: The driver may be enabled or disabled (turned on and off) by applying a DC voltage to the Enable Pin(J1-7). Enable Pin on and off levels are specified in the Operating Characteristics section of the data sheet.
- Pins 1, 2 and 3 of connector J1 must be connected to +Vin, between 10.8 and 18 Vdc. Pins 4, 5 and 6 of connector J1 must be connected to GND.
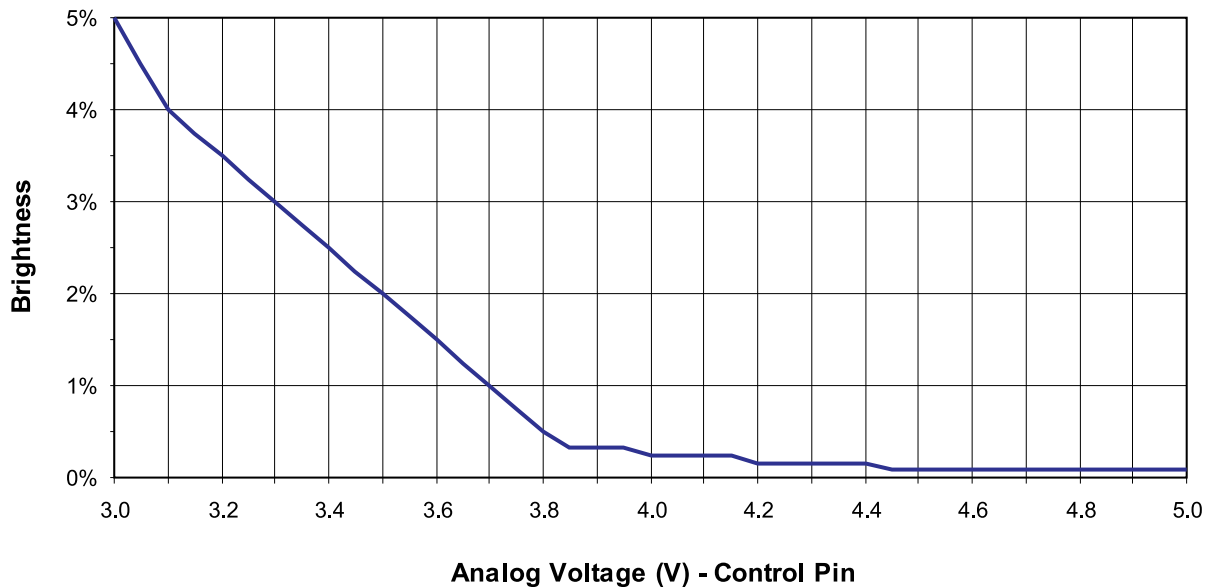
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ONBOARD PWM DIMMING

Analog Voltage (V) - Control Pin

<u>Graph 1</u>

EXPANDED VIEW OF ONBOARD PWM DIMMING
(lower dimming region)

Analog Voltage (V) - Control Pin

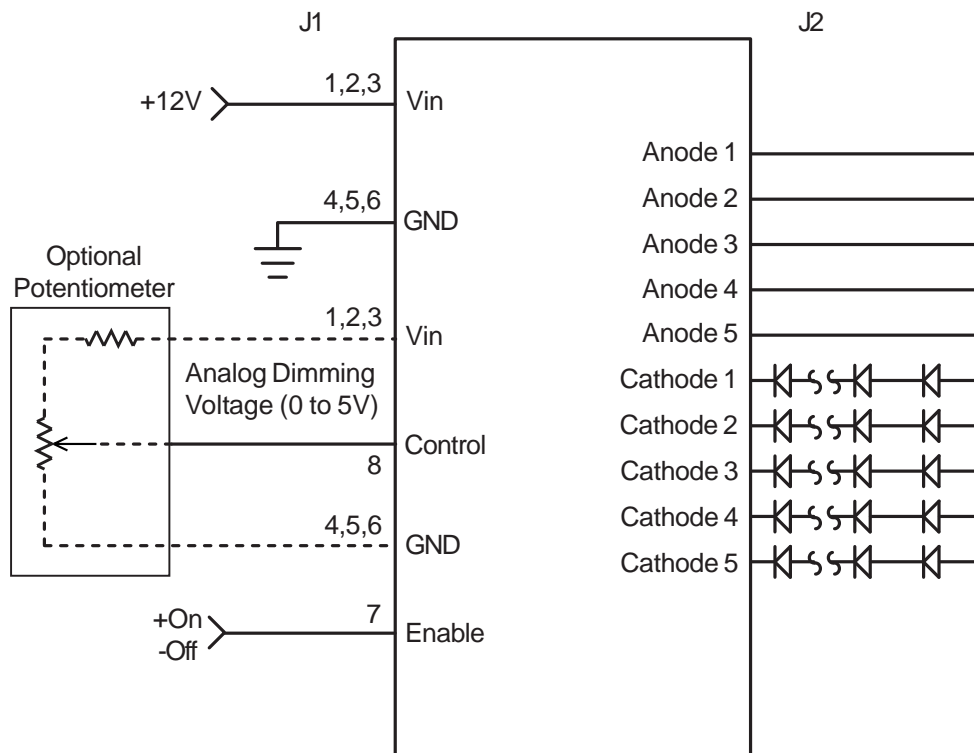<u>Graph 2</u>

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Figure 1

Endicott Research Group, Inc. (ERG) reserves the right to make changes in circuit design and/or specifications at any time without notice. Accordingly, the reader is cautioned to verify that data sheets are current before placing orders. Information furnished by ERG is believed to be accurate and reliable. However, no responsibility is assumed by ERG for its use.