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SFDZDB3965F



## Specifications and Applications Information

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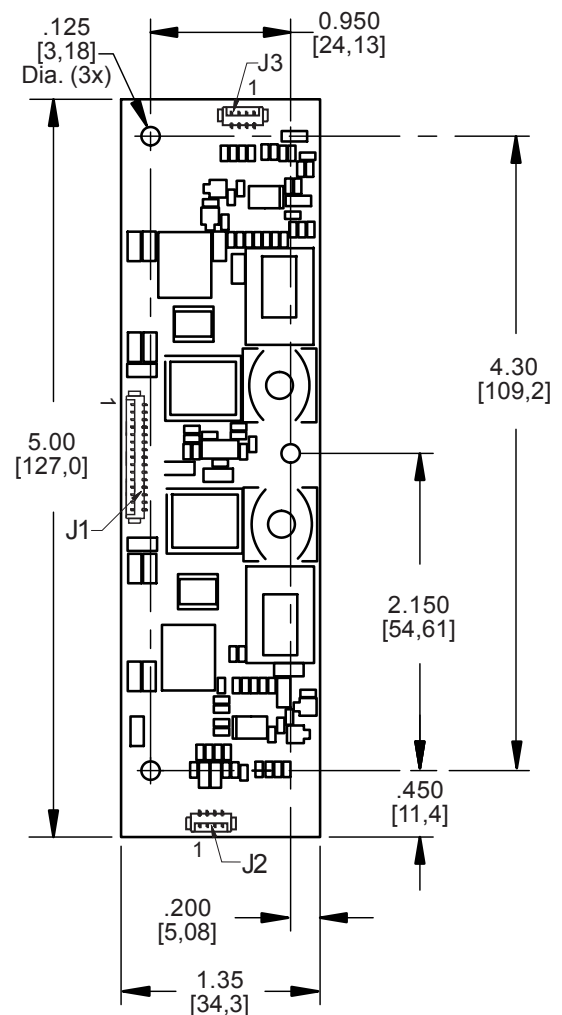
## Smart Force LED Driver

The ERG *Smart Force Series* of LED Drivers are specifically designed for applications which require high efficiency, wide dimming and LCD brightness stability over a wide input voltage range. The SFDZDB3965F is designed to provide backlight power for OEM LCD displays and ERG's custom line of LED rails.

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

- ✓ Constant LED current
- ✓ High efficiency
- ✓ On-board PWM dimming
- ✓ High dimming ratio
- ✓ Separate enable and dimming function
- ✓ Open/short circuit protection
- ✓ Soft start
- ✓ One year warranty

### Package Configuration



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

Mass: 35 grams



### Connectors

Input Connector		Output Connectors			
Molex 53261-1571		Molex 53261-0471			
J1-1,2,3	Vin(+)	J2-1	Cathode 1	J3-1	Cathode 3
J1-4,5,6	Vin(+)	J2-2	Anode 1	J3-2	Anode 3
J1-7,8,9	GND	J2-3	Cathode 2	J3-3	Cathode 4
J1-10,11,12	GND	J2-4	Anode 2	J3-4	Anode 4
J1-13	Enable				
J1-14	N/C				
J1-15	Control				

**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
Control Voltage	$V_{Control}$	0 to 6.0	Vdc
Enable Input Voltage	$V_{Enable}$	0 to 6.0	Vdc

**Operating Characteristics**

Unless otherwise noted  $V_{in} = 12.00$  Volts dc and  $T_a = 25^{\circ}\text{C}$ .

Characteristic	Symbol	Min	Typ	Max	Units
Input Voltage	$V_{in}$	+10.8	+12.0	+18.0	Vdc
Component Surface Temperature (Note 1)	$T_s$	-20	-	+80	°C
Input Current (Note 2)	$I_{in}$	1.85	2.18	2.51	Adc
LED String Voltage	$V_{LED}$	36	-	50	Vdc
Efficiency (Note 2)	$\eta$	-	90	-	%
Output Current (per string)	$I_{out}$	127	134	140	mArms
<b>Enable Pin</b>					
Turn-on Threshold (Note 3)	$V_{thon}$	-	-	1.8	Vdc
Turn-off Threshold	$V_{thoff}$	0.6	-	-	Vdc
Enable Input Impedance (Note 4)	$R_{Enable}$	-	8.5	-	kOhms
<b>Control Pin</b> (Notes 5,6)					
Full-on Threshold	$V_{fon}$	-	1.0	-	Vdc
Minimum Pulse Width Threshold	$V_{PWmin}$	-	4.5	-	Vdc

Specifications subject to change without notice.

- Note 1 Surface temperature must not exceed  $80^{\circ}\text{C}$ ; thermal management actions may be required.
- Note 2 Input Current and Efficiency are calculated with 44V LED strings.
- Note 3 Enable pin is internally pulled up above the Turn-on Threshold.
- Note 4 Enable pin input impedance is  $8.5\text{ k}\Omega$  to 3V with 12V input voltage.
- Note 5 Internally pulled up above the Turn-on Threshold.
- Note 6 Control pin input impedance is  $485\text{ k}\Omega$ .



## Onboard PWM

Unless otherwise noted  $V_{in} = 12.00$  Volts DC,  $T_a = 25$  °C and unit has been running for 5 minutes.

Characteristic	Symbol	Min	Typ	Max	Units
Frequency	$f_{pwm}$	-	245	-	Hz
Control Input Bias Current	$I_{cbias}$	-	-	10	$\mu A$

## Application Information

The ERG SFDZDB3965F has been designed to be configured in multiple ways:

### NO DIMMING

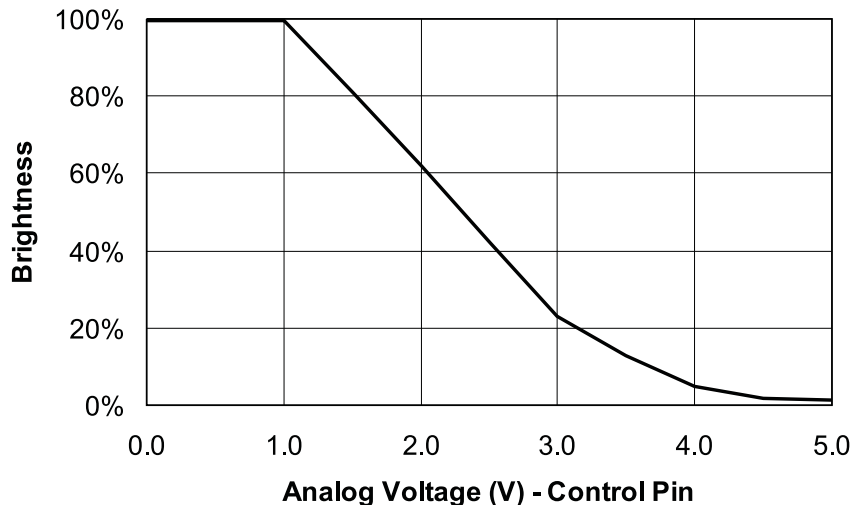
- OPERATION: The SFD driver can be configured to operate without dimming by floating the Control Pin (J1-15) and the Enable Pin (J1-13).
- Pins 1 through 6 of connector J1 must be connected to +Vin, between 10.8 and 18 Vdc. Pins 7 through 12 of connector J1 must be connected to GND.

### 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. A dimming ratio up to 255:1 is possible with this configuration.
- DIMMING: Dimming is accomplished by applying an analog voltage to the Control Pin (J1-15). Display brightness is modulated by controlling the Control Pin voltage as shown in Graph 1.
- ENABLE/DISABLE: The driver may be enabled or disabled (turned on and off) by applying a DC voltage to the Enable Pin(J1-13). Enable Pin on and off levels are specified in the Operating Characteristics section of the data sheet. The driver can also be enabled by floating the Enable Pin.
- Pins 1 through 6 of connector J1 must be connected to +Vin, between 10.8 and 18 Vdc. Pins 7 through 12 of connector J1 must be connected to GND. Pin 14 may be left floating or pulled up.



## ONBOARD PWM DIMMING



Graph 1

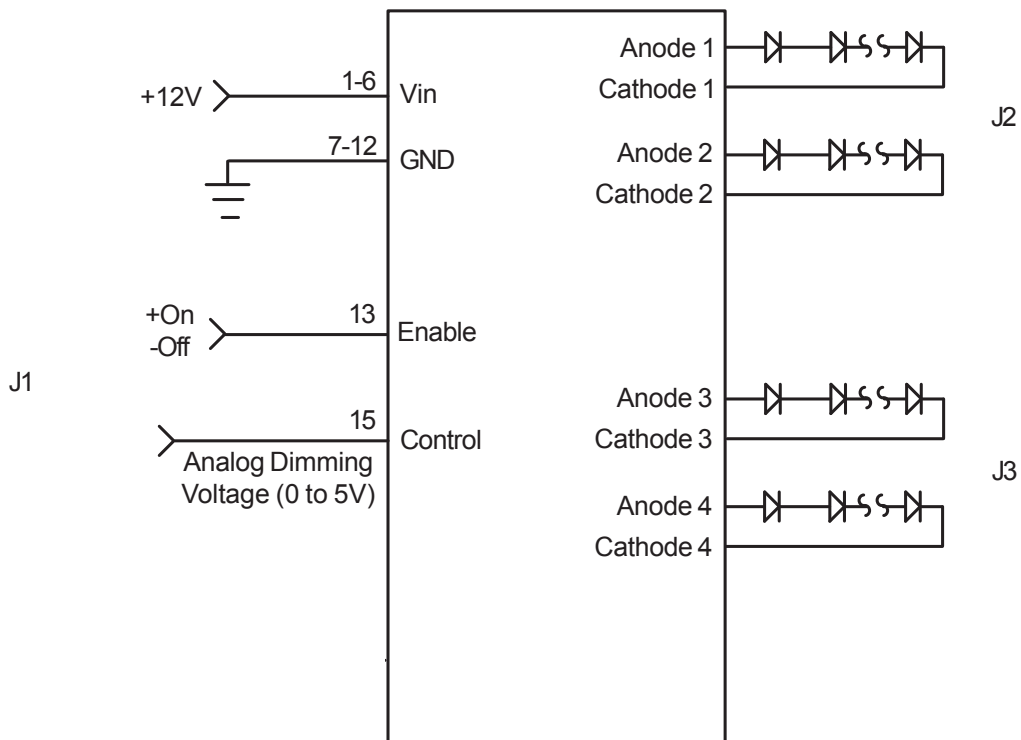


Figure 1



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