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# SBD4229F



## Specifications and Applications Information

01/18/13

### SmartBridge Series with Integrated PWM Dimming

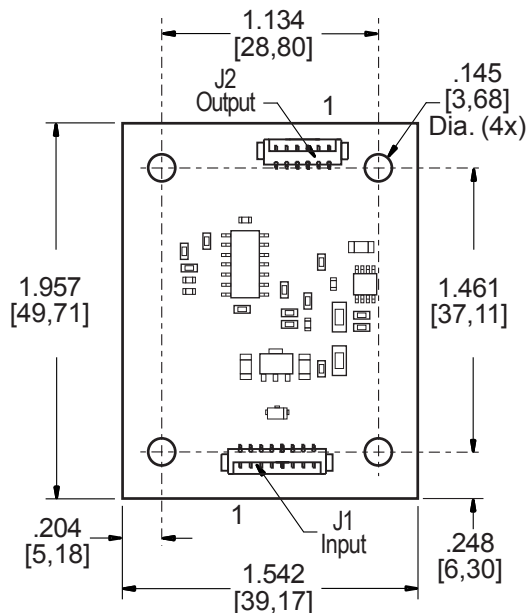
The ERG *SmartBridge Series* is designed to “bridge the gap” in current LCD systems when transitioning from an OEM CCFL backlit LCD to an OEM LED LCD panel with a built-in driver taking into consideration the parameters of the existing power setup. The result is a complete plug-and-play setup transitioning the design towards the new LED backlit LCD.

The ERG SBD4229F is specifically designed to use the current system power levels ( $V_{in}$ ), ground, enable and control signals (0-5V); outputting the required panel voltage, enable and adding a required Pulse Width Modulated (PWM) dimming signal to the OEM panel driver. The connection to the panel is completed by an integration harness.

Designed, manufactured and supported within the USA, the SBD4229F features:

- ✓ Less than 5 mm in height
- ✓ Wide input voltage range
- ✓ Provides up to 255:1 dimming range
- ✓ One year warranty
- ✓ Custom footprints are available

#### Package Configuration



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

#### Connectors

Input Connector	Output Connector
Molex 53261-0871	Molex 53261-0671
J1-1 Vin(+) J1-2 Vin(+) J1-3 GND J1-4 GND J1-5 Enable J1-6 Control J1-7 N/C J1-8 N/C	J2-1 Vin(+) J2-2 Vin(+) J2-3 GND J2-4 GND J2-5 Enable J2-6 PWM Out
Recommended input harness: H1308460F - flying lead input harness or H5106305 - DV to ERG input harness	

Mass: 6.4 grams typ.



**Absolute Maximum Ratings**

Rating	Symbol	Value	Units
Input Voltage Range	$V_{in}$	-0.3 to +20.0	Vdc
Storage Temperature	$T_{stg}$	-40 to +85	°C
Control Input Voltage	$V_{PWM}$	0 to +5.0	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	+13.2	Vdc
Component Surface Temperature	$T_s$	-40	-	+80	°C
Input Current (Note 1)	$I_{in}$	4.0	6.5	9.0	mAdc
Input Current Max (Note 2)	$I_{in}$	0	-	2	Adc
<b>Control Pin</b> (Note 3)					
Full-on Threshold	$V_{thon}$	-	1	-	Vdc
Minimum Pulse Width Threshold	$V_{PWmin}$	-	4.5	-	Vdc
Input Impedance to GND	$Z_{in}$	-	10k	-	Ohms
Frequency	$F_{PWM}$	-	245	-	Hz
<b>PWM Out</b>					
Output ON Voltage	$V_{on}$	11.95	12.00	-	Vdc
Output OFF Voltage	$V_{off}$	-	0	50	mVdc
Output Current	$I_{out}$	-100	-	100	mAdc

Specifications subject to change without notice.

Note 1  $I_{in}$  is SBD4229F current only.

Note 2  $I_{in}$  Max is total current allowed by user to power user electronics.

Note 3 Control pin is internally pulled to ground.



## Application Information

The ERG SBD4229F has been designed to be configured in multiple ways:

### NO DIMMING

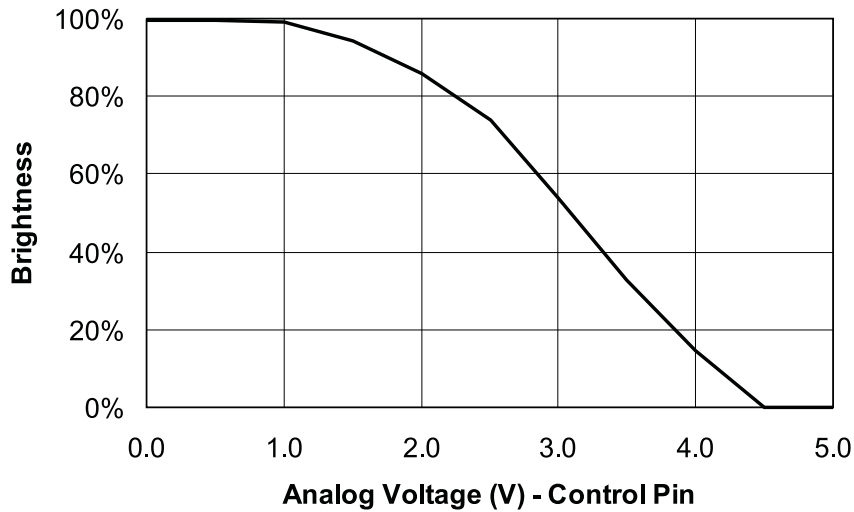
- OPERATION: The SBD4229F can be configured to operate without dimming by floating the Control (J1-6) pin.
- Pin 1,2 of connector J1 must be connected to +Vin, between 10.8 and 13.2 Vdc. Pins 3 and 4 of connector J1 must be connected to GND.

### 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 (J1-6). Display brightness is modulated by controlling the Control Pin voltage as shown in Graph 1.
- Pin 1,2 of connector J1 must be connected to +Vin, between 10.8 and 13.2 Vdc. Pins 3 and 4 of connector J1 must be connected to GND.



## ONBOARD PWM DIMMING



Graph 1

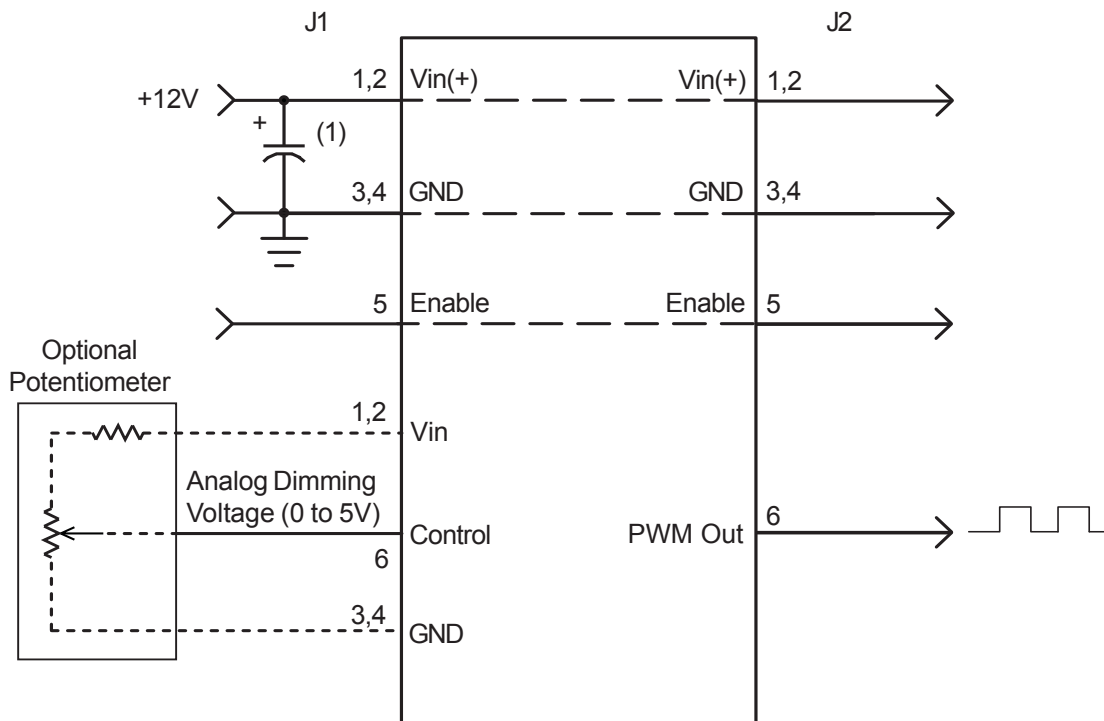


Figure 1

- (1) Low ESR type input by-pass capacitor (10 uF - 220 uF) may be required to reduce reflected ripple and to improve power supply response.



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