



Endicott Research Group, Inc.

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SBD4213F



Specifications and Applications Information

05/04/12

Preliminary

SmartBridge DC-DC Converter with Integrated PWM Dimming

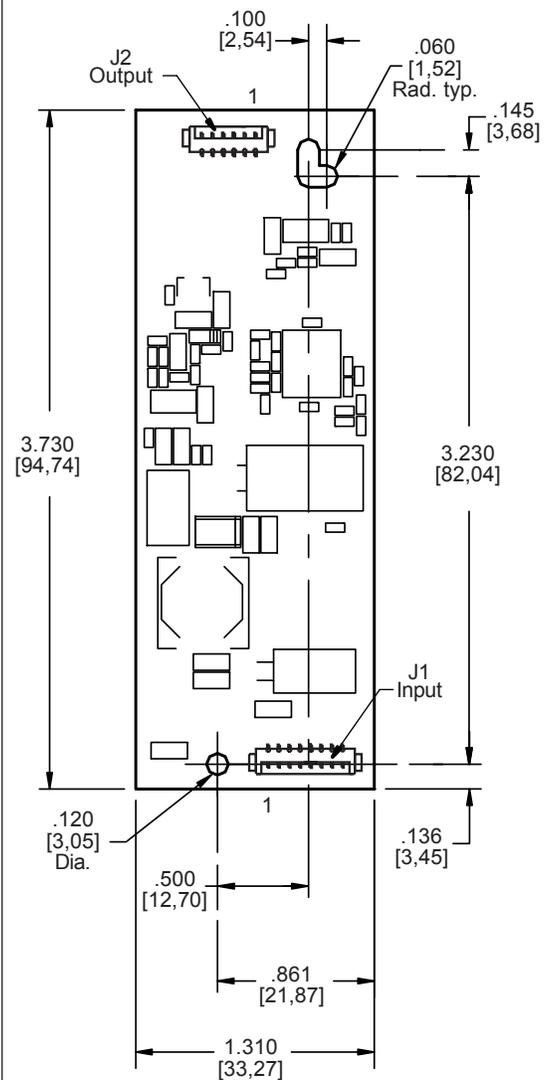
The ERG *SmartBridge Series* is designed to “bridge the gap” in current LCD systems when transitioning from an OEM CCFL backlit LCD to an OEM LED LCD panel with a built-in driver taking into consideration the parameters of the existing power setup. The result is a complete plug-and-play setup transitioning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

The ERG SBD4213F is specifically designed for applications requiring a step-up conversion from a 5 Volt DC supply to a 12 Volt DC source. The SBD4213F passes through both the Enable signal and ground. The SBD4213F utilizes the analog Control signal to convert it to a 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 SBD4213F features:

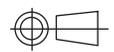
- ✓ Less than 11 mm in height
- ✓ Provides up to 255:1 dimming range
- ✓ One year warranty
- ✓ Soft start
- ✓ Custom footprints are available

Package Configuration



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

Mass: TBD grams typ.



Connectors

Input Connector	Output Connector
Molex 53261-0871	Molex 53261-0671
J1-1 Vin(+5 Vdc) J1-2 Vin(+5 Vdc) J1-3 GND J1-4 GND J1-5 Enable J1-6 Control J1-7 N/C J1-8 N/C	J2-1 Vout(+12 Vdc) J2-2 Vout(+12 Vdc) 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	

**Absolute Maximum Ratings**

Rating	Symbol	Value	Units
Input Voltage Range	V_{in}	-0.3 to +6.0	Vdc
Storage Temperature	T_{stg}	-40 to +85	°C
Control Input Voltage	V_{PWM}	0 to +5.0	Vdc

Operating CharacteristicsUnless otherwise noted $V_{in} = 5.00$ Volts dc and $T_a = 25^{\circ}\text{C}$.

Characteristic	Symbol	Min	Typ	Max	Units
Input Voltage	V_{in}	+4.5	+5.0	+5.5	Vdc
Component Surface Temperature	T_s	-40	-	+80	°C
Input Current	I_{in}	0.5	0.6	0.7	Adc
Peak Inrush Current (Note 1)	I_{peak}	0	2.0	-	Adc
Control Pin (Notes 2,3)					
Full-on Threshold	V_{thon}	-	1	-	Vdc
Minimum Pulse Width Threshold	V_{PWmin}	-	4.5	-	Vdc
Minimum Pulse Width Period	T_{PWmin}	-	16	-	μsec
Input Impedance to GND	Z_{in}	-	10k	-	Ohms
Frequency	F_{PWM}	-	245	-	Hz
PWM Out					
Output ON Voltage	V_{on}	3.8	4.3	4.8	Vdc
Output OFF Voltage	V_{off}	0	0.3	0.8	Vdc
Output Current	I_{out}	-15	-	15	mAdc
Vout (+12 Vdc)					
Output Voltage	V_{out}	11.4	12.0	12.6	Vdc
Output Current	I_{out}	0	0.20	0.45	Adc
Output Voltage Ripple (Note 4)	V_{rip}	-	0.07	-	Vrms
Load Regulation (Note 4)	I_{reg}	-	± 0.25	-	%
Efficiency	η	-	80	-	%

Specifications subject to change without notice.

- Note 1 At full load for 5ms duration.
Note 2 Control pin is internally pulled to ground.
Note 3 Control pin input impedance is 4.3k Ω .
Note 4 At full load.



Application Information

The ERG SBD4213F has been designed to be configured in multiple ways:

NO DIMMING

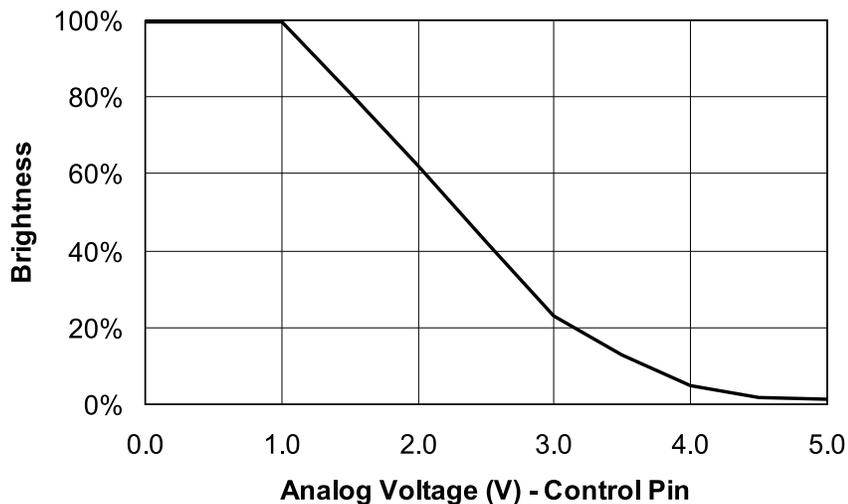
- OPERATION: The SBD4213F can be configured to operate without dimming by floating the Control (J1-6) pin.
- Pin 1,2 of connector J1 must be connected to +Vin, between 4.5 and 5.5 Vdc. Pins 3 and 4 of connector J1 must be connected to GND.

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 4.5 and 5.5 Vdc. Pins 3 and 4 of connector J1 must be connected to GND.



ONBOARD PWM DIMMING



Graph 1

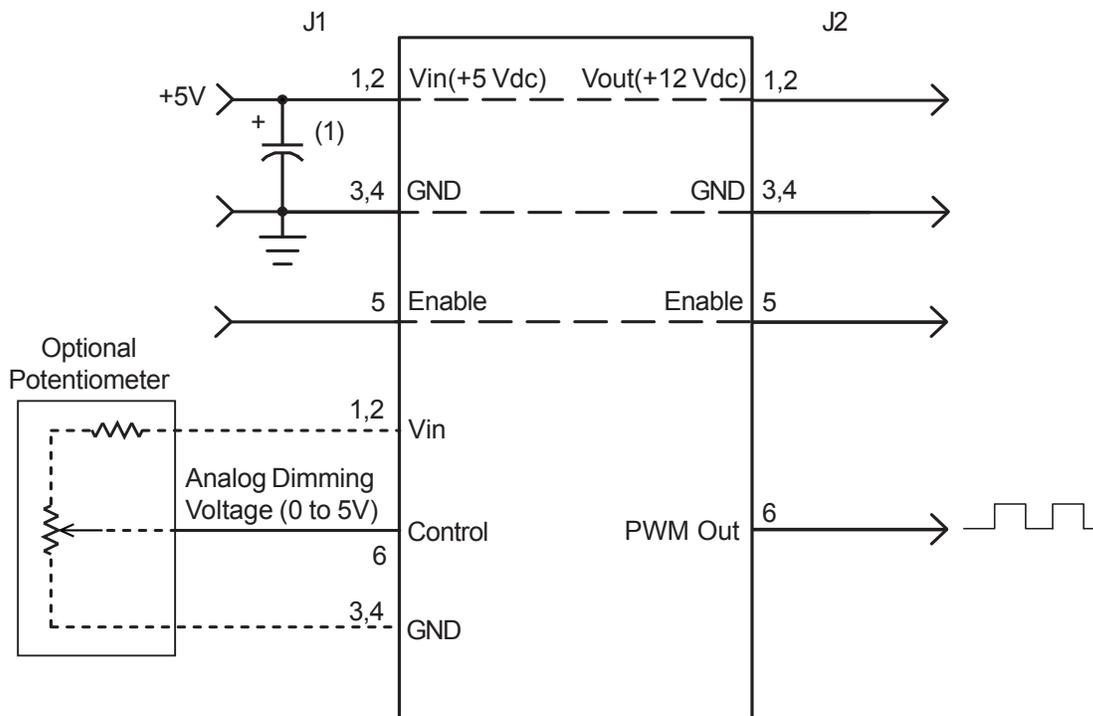


Figure 1

- (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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