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SFWE250J4F



Specifications and Applications Information

01/27/10

Preliminary

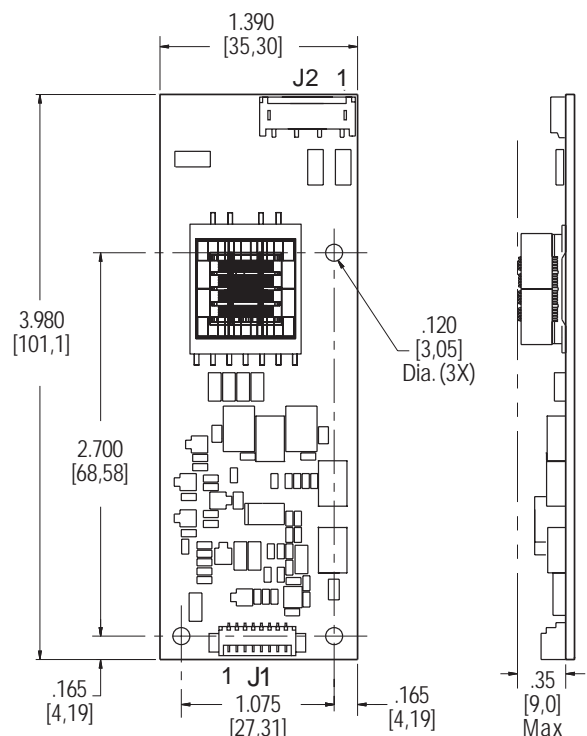
The ERG SFWE250J4F DC to AC inverter supports a wide input voltage range for use in applications where a regulated supply voltage is not available. Onboard dimming assists in final product integration providing a large dimming ratio from a supplied analog voltage.

The SFWE250J4F inverter is designed to power the backlights of a variety of displays.

Product Features

- ✓ Wide input voltage range of 7 to 24 volts
- ✓ Onboard dimming
- ✓ Open lamp fault detection and shutdown
- ✓ Low Distortion
- ✓ Soft-start
- ✓ Made in U.S.A.

Package Configuration



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

Mass: 30 grams

Connectors

Input
 J1
 Molex 53261-0871

Outputs
 J2
 JST SM04(4.0)B-BHS-1-TBLFSN

Pin Descriptions

J1-1	Vin	J2-1	ACout 1
J1-2	Vin	J2-2	ACout 2
J1-3	Vin	J2-3	ACreturn
J1-4	GND	J2-4	ACreturn
J1-5	GND		
J1-6	GND		
J1-7	Enable		
J1-8	Control		

* Analog Dimming option available



Absolute Maximum Ratings (Note 1)

Parameter	Symbol	Value	Unit
Input Voltage	V_{in}	-0.3 to +25.0	V_{dc}
Operating Temperature <small>(Note 2)</small>	T_a	0 to +70	°C
Storage Temperature	T_s	-40 to +85	°C
Enable Pin	V_{Enable}	-0.3 to +5.25	V_{dc}
Control Pin	$V_{Control}$	-0.3 to +5.25	V_{dc}

Electrical Characteristics

Unless otherwise noted, $7 V_{dc} \leq V_{in} \leq 24V_{dc}$ volts DC, with simulated load, $T_a = 25^\circ C$ and the inverter has been running for 20 minutes.

Characteristic	Symbol	Min	Typical	Max	Unit
Input Voltage <small>(Notes 3,4)</small>	V_{in}	+7.0	+12.0	+24.0	V_{dc}
Input Current	I_{in}	-	0.99 ($V_{in} = 7V_{dc}$) 0.56 ($V_{in} = 12V_{dc}$) 0.29 ($V_{in} = 24V_{dc}$)	-	A_{dc}
Operating Frequency	F_o	48	50	52	kHz
Efficiency	η	-	80 ($V_{in} = 7V_{dc}$) 80 ($V_{in} = 12V_{dc}$) 77 ($V_{in} = 24V_{dc}$)	-	%
Output Voltage (no load)	V_{start}	-	-	2400	V_{rms}
Output Lamp Current (per lamp) <small>(Note 5)</small>	I_{lamp}	-	5.0	-	mA_{rms}
Onboard PWM Frequency	F_{PWM}	-	260	-	Hz
Enable turn-on threshold voltage	V_{thon}	2.40	3.30	5.25	V_{dc}
Enable turn-off threshold voltage	V_{thoff}	-	-	0.7	V_{dc}

Notes:

1. Reliable and predictable operation of the inverter is not guaranteed with applied stresses near or beyond those listed. Operation at these limits may reduce device reliability and is therefore not recommended.
2. For optimum reliability, the operating temperature should be kept below 70°C. Reliable operation above 70°C is possible if external airflow is provided and care is taken to ensure that the surface temperature of all components is below 85°C.
3. V_{in} is measured at the pcb connector. Power cable losses will vary by application and should be accounted for in the power supply or battery system design.
4. Operation down to 5.5Vdc is possible at a reduced lamp current level.
5. Lamp current value assumed a 500 V_{rms} run voltage.



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Pin Descriptions

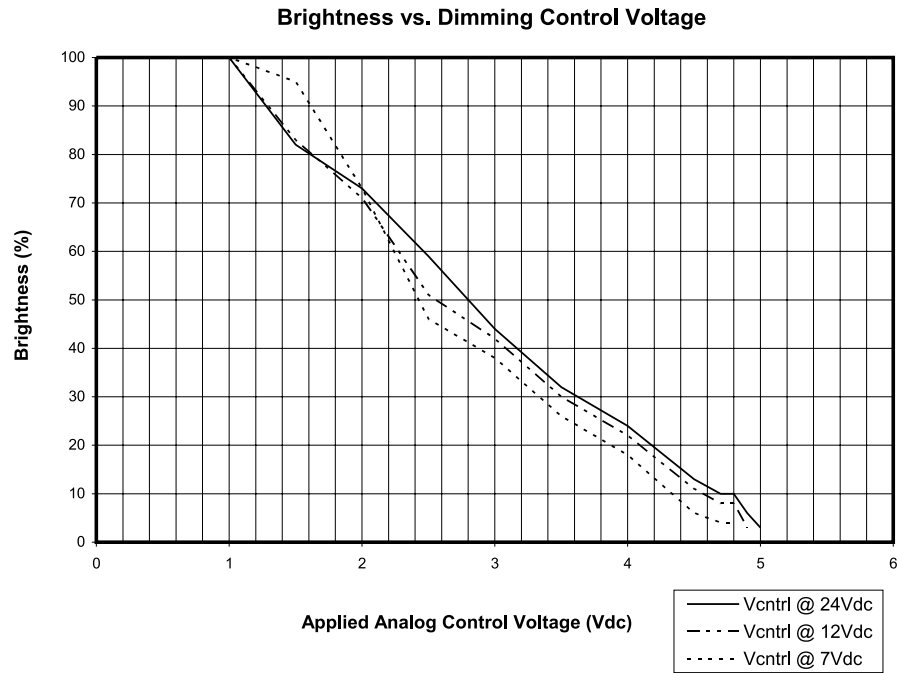
Pin	Description
Vin	Inverter input voltage. All three pins should be connected for optimum reliability and efficiency .
GND	Inverter ground. All three pins should be connected for optimum reliability and efficiency.
Enable	Inverter Enable. A high level signal on this pin enables inverter operation.
Control	Dimming control. This pin controls the brightness of the inverter. Connecting this pin to ground causes the inverter to supply full lamp current for full brightness. Reference Graph 1.
Lamp ACout 1, 2	High side lamp output. This should be connected to the high voltage side of the display lamp connectors.
Lamp ACreturn	Return side lamp output. This should be connected to the low voltage side of the display lamp connectors. Lamp current is sensed from this connection, it must not be externally grounded to chassis and/or DC ground.

Application Information

The SFWE250J4F inverter is designed to power the backlights of a variety of displays. Onboard regulation allows for a connection to an unregulated power source such as a battery or low cost wall module. An onboard PWM for dimming eases system integration by allowing for an analog voltage supplied by a potentiometer or digital to analog converter to achieve a wide dimming ratio. Open lamp fault detection circuitry protects the inverter from an open lamp condition caused by a broken or malfunctioning lamp.

Dimming of the inverter is accomplished by placing an analog voltage on the Control pin. The level of this voltage controls the brightness of the attached display. Connecting the Control pin to ground results in the maximum brightness of the display. Increasing the voltage on this pin gradually decreases the brightness until the display extinguishes. If dimming is not required in the application, simply connect this pin to ground. For optimum reliability, this pin must not be left floating.

The Enable pin on the inverter provides a convenient way to turn off the inverter. Grounding this pin turns the inverter off while either pulling this pin up to a logic high turns the inverter on. Do not float this pin.



Graph 1

NOTES

- (1) Dimming below 5% is possible only if the lamp fault detection circuit is disabled. Contact ERG for details.
- (2) Reverse dimming option is available; i.e. 0Vdc = MIN brightness, +5Vdc = MAX brightness. Contact ERG for details.



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