

Model

LS680-1

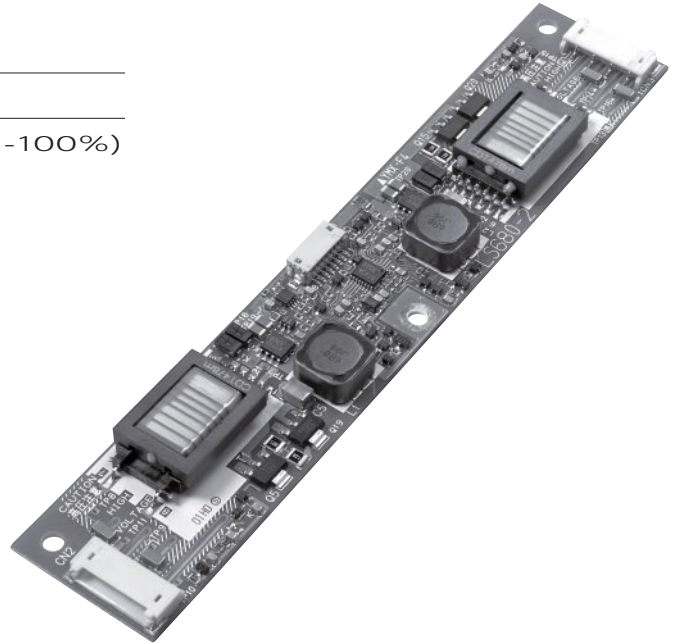
12 Volt Input

Four Tube CCFT Inverter (8W)

Brightness Control (PWM Dimming 30-100%)

Physical Specifications

Dimensions:	160mm x 30mm x 10mm (6.299" x 1.181" x 0.39")
Operating Temp:	0 to 60°C, convection cooling
Relative Humidity:	20% to 90%, non-condensing
Storage:	-20 to 85°C/5-95% RH
Impact Resistance:	50G half wave per 2 msec
Vibration Resistance:	10-55-10 Hz/min @ 1.5mm



Input Specifications*

Item	Condition	Standard
Input Voltage Rated Tolerance	—	12 Vdc
	Continuous Operation Starting Condition (Discharge Starting Voltage)	10.8 Vdc - 13.2 Vdc 10.8 Vdc - 13.2 Vdc
Max. Input Current	$V_{IN} = 12$ Vdc Luminance @ Max.	2.0 A
Max. Input Power	$V_{IN} = 12$ Vdc Luminance @ Max.	24 W
On/Off Input Current	On $V_{CONT} = 2.0 - V_{CC}$	$I_{MAX} = 4.0$ mA
	Off $V_{CONT} = GND-0.8$ Vdc	$I_{MAX} = 50$ μ A

*Above Specifications Occur @ 25 \pm 5°C

Output Specifications*

Item	Condition	Standard		
		MIN	TYP	MAX
Output Voltage (Vrms)	$V_{IN} = 10.8$ Vdc	1500	1650	—
Tube Current for 2 Lamps (mArms)	Luminance @ Max. ($V_{CONT} = 3.8$ V)	12.5	14.0	15.5
	Luminance @ Min. ($V_{CONT} = 2.0$ V)	—	7.5	—
Max. Power Output for 2 Lamps (W)	$V_{IN} = 12$ Vdc/Luminance @ Max.	—	—	8.0
Ignition Frequency (kHz)	Luminance @ Max.	50	60	70

*Above specifications occur @ 25 \pm 5°C & $V_{IN} = 10.8 - 13.2$ Vdc.

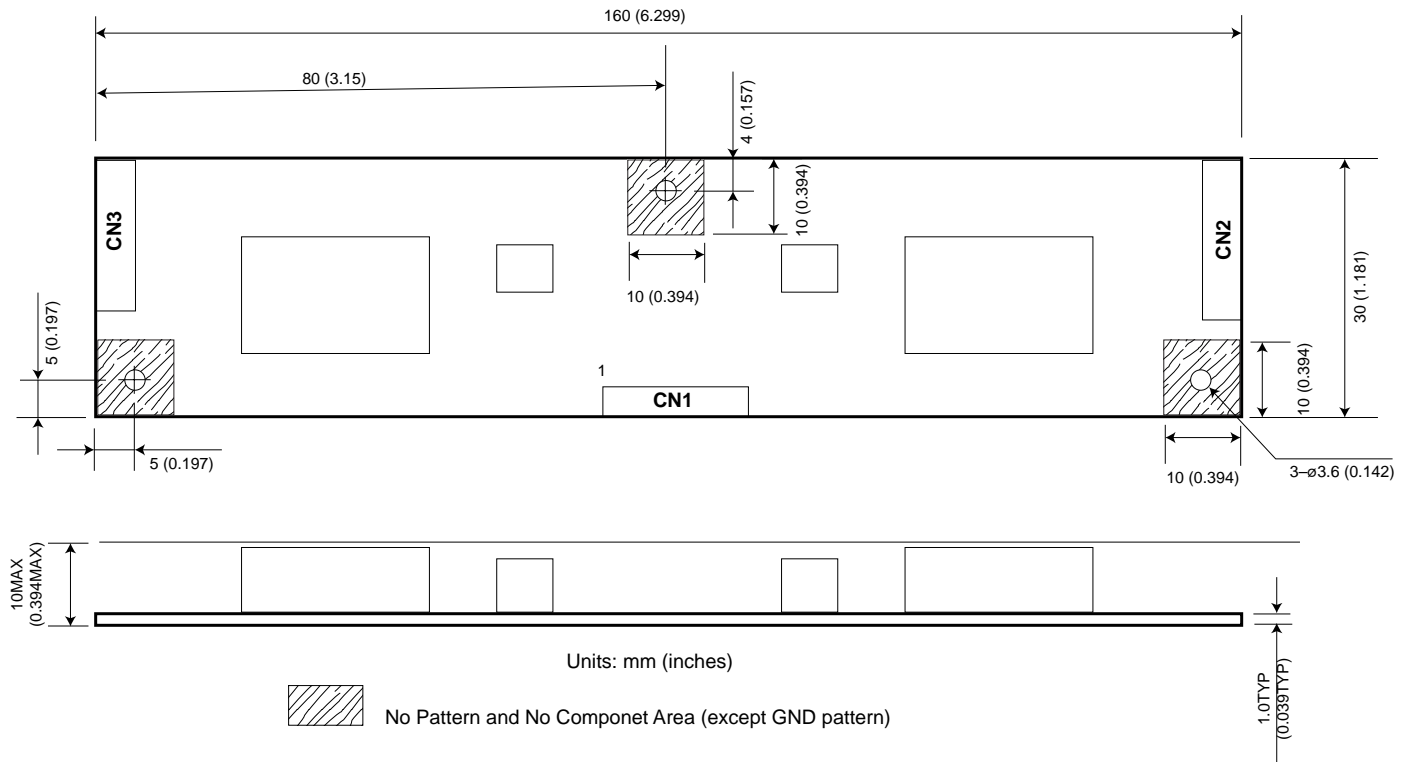
Model

LS680-1

Luminance Variance

Item	Condition	Applied Voltage	Output Current
Luminance @ Max.	Btwn. pin 4 & 6	Vcont = 3.8 V	14 mA (2 lamps)
Luminance @ Min.	Btwn. pin 4 & 6	Vcont = 2.0 V	7.5 mA (2 lamps)

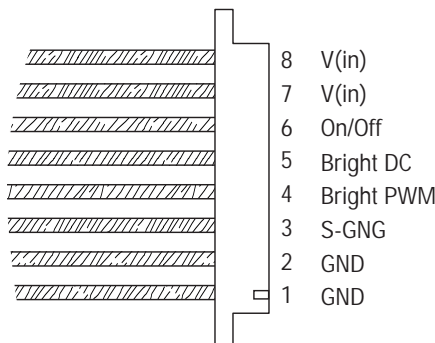
Luminance can also be controlled by applying PWM signal to pin 5 (pin 4 must be connected to GND).



CN1 Input Connector
Hirose DF13-8P-1.25H
(pin number 1 is marked on PCB)

V(in)	1
V(in)	2
On/Off	3
Bright DC	4
Bright PWM	5
S-GNG	6
GND	7
GND	8

CN1 Corresponding Housing
Hirose DF13-8S-1.25C
(Hirose Connector Pin Numbers)



CN2 and CN3 Output Connectors
JST SM03 (7-D1) B-BHS-1-TB

CCFT HIGH	1
CCFT HIGH	2
NC	3
CCFT LOW	4

CN2 and CN3 Corresponding Housing
JST BHR-04VS-1

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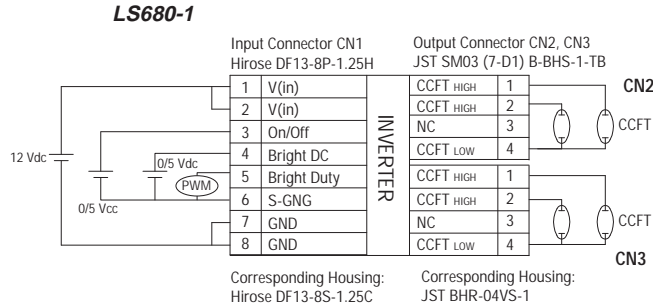
FM 32227

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Tech Notes

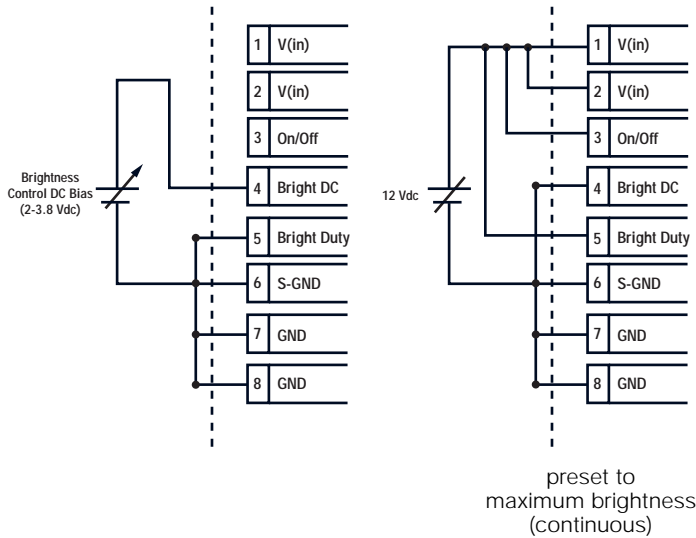
Connection Diagram



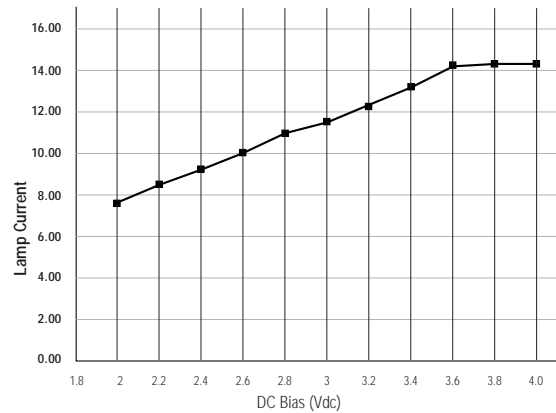
DC Bright Control Method

Maximum output current can be adjusted by applying bias voltage between brightness control pins as shown below.

Alternatively, brightness control can be done by applying PWM signal to pin 5 (pin 4 must be tied to GND).



DC Bias	Lamp Current (2 lamps)
2.0 V	7.51 mA
2.2 V	8.45 mA
2.4 V	9.28 mA
2.6 V	10.05 mA
2.8 V	11.05 mA
3.0 V	11.58 mA
3.2 V	12.30 mA
3.4 V	13.18 mA
3.6 V	14.16 mA
3.8 V	14.21 mA
4.0 V	14.21 mA



* Above specifications occur @ 25 ± 5°C, with pin 5 connected to GND, and V_{IN} = 12 Vdc.

On/Off Control

The inverter is ON if one of the following conditions are met:

- Pin 3 (On/Off) is connected to pin 1/2 (V_{IN})
- Pin 3 (On/Off) = 2 Vdc — Vcc

The inverter is OFF if one of the following conditions are met:

- Pin 3 (On/Off) is connected to pin 7/8 (GND)
- Pin 3 (On/Off) ≤ 0.8 Vdc

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