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Taiyo Yuden
LS460-RH

For any questions, you can email us directly:
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LCD Backlight Driver

Model

LS460-RH

RoHS COMPLIANT

12 Volt Input
Dual Tube CCFT Inverter
Brightness Control

Physical Specifications*

Dimensions:	20mm x 120mm x 9.5mm (0.787" x 4.72" x 0.374")
Weight:	20g (0.704 oz)
Operating Temp:	0 to 55°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	—	12 Vdc
Tolerance	Continuous Operation	10.8 Vdc - 13.2 Vdc
	Starting Condition (Discharge Starting Voltage)	10.8 Vdc - 13.2 Vdc
Max. Input Current	V_{IN} = 10.8 Vdc Luminance @ Max.	0.65A
Input Current	Control Terminal H = V_{IN} V_{IN} = 13.2 Vdc	3.0 µA (Lamp Off)
Max. Rush Current	V_{IN} = 13.2 Vdc Luminance @ Max.	3.0 $A_{zero\text{-}p}$/0.3 ms
Max. Input Power	V_{IN} = 12 Vdc Luminance @ Max.	7.0W
Control Terminal Input Current	Control Terminal L = 0.0 - 0.4 Vdc V_{IN} = 13.2 Vdc	I_{LOW} = -0.4mA over (Lamp Lighting)
	Control Terminal H = Open	— (Lamp Off)

*Above specifications occur @ 25 ± 5°C.

Output Specifications*

Item	Condition	Standard MIN	TYP	MAX
Output Voltage (Vrms)	V_{IN} = 12.0 Vdc	—	1300	—
Tube Current (mArms)	Vcont = 0.0 V	4.2	4.7	5.2
	Vcont = 2.5 V	—	2.4	—
Max. Power Output (W)	V_{IN} = 12 Vdc/Luminance @ Max.	—	—	5.5
Ignition Frequency (kHz)	Luminance @ Max.	—	47	—
DC/DC Converter Frequency (kHz)	Luminance @ Max.	—	90	—

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

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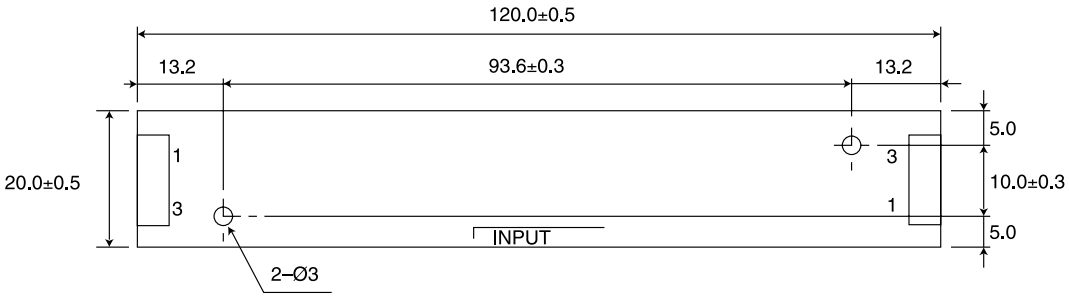
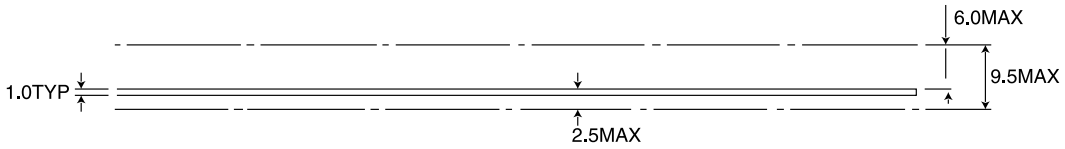
Insulating Withstand Voltage

Item	Rating Description	
Insulating Withstand Voltage	Primary - Secondary	1.5 KVa Impulse
Insulating Resistance	Primary - Secondary Winding - Core	500 Vdc More than 100MΩ





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FM 32227

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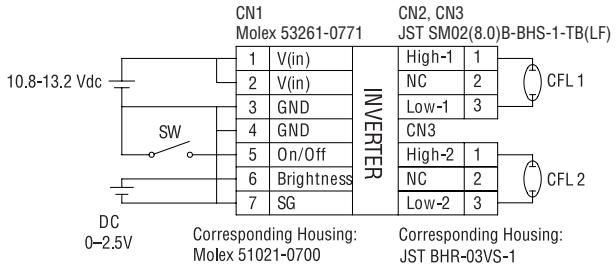
Tech Notes

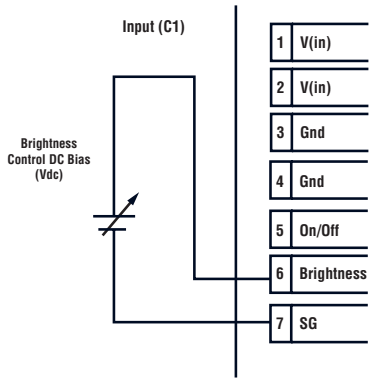
Connection Diagram

LS460-RH



Output Current Optimization Method

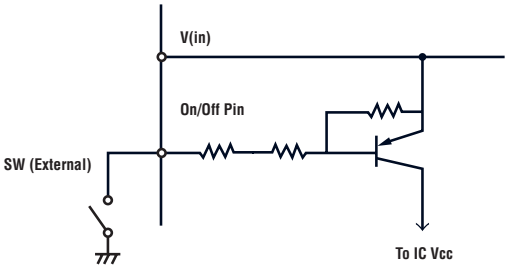
Maximum output current can be adjusted by applying bias voltage between brightness control pins as shown below.



DC Bias	Typical Output Current	Maximum Output Current
0.00 V	4.8 mA	5.2 mA
0.80 V	4.5 mA	5.0 mA
1.20 V	4.0 mA	4.5 mA
1.60 V	3.5 mA	4.0 mA
2.00 V	3.0 mA	3.5 mA
2.40 V	2.5 mA	3.0 mA

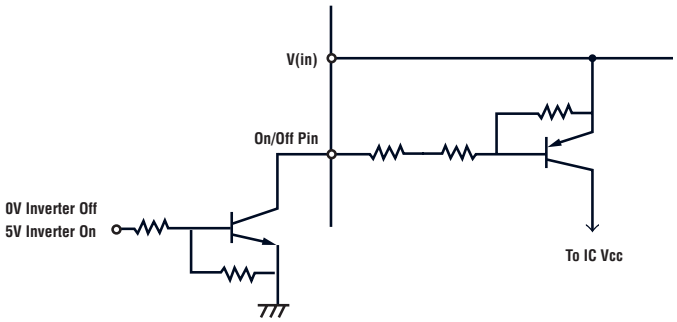
On/Off Control

The on/off control is achieved by using the on/off pin on the input side of LS460. The circuit for the remote on/off circuitry consists of an active low TTL switch. When the circuit is open, the V(in) is cut off. When the circuit is closed, V(in) is activated. A mechanical switch or a TTL/CMOS gate needs to be placed between the remote on/off pin and ground creating a condition where the circuit is closed to activate the inverter. Either one of the following will be required for the inverter to operate:



1. Tie on/off pin to ground.
2. Add mechanical switch between on/off pin and ground, close switch.
3. Add TTL/CMOS switch between on/off and ground. Circuit must be closed for unit to operate (as shown above right).

One recommended use of logic switch for remote on/off is shown in the diagram below. Electrical specification for on/off terminal is Low 0 to 0.4V, -0.4 mA or higher when switch is closed.



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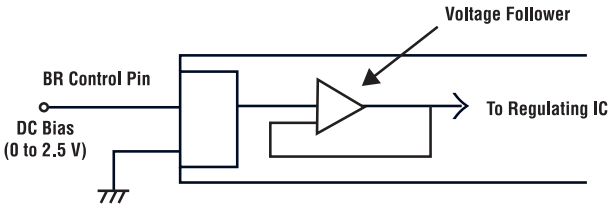
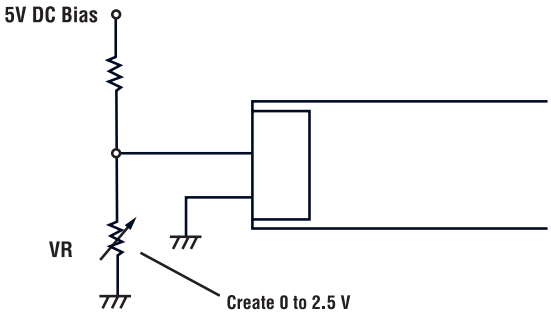
Tech Notes

Brightness Control Using a Potentiometer

The LS460 brightness control is done by applying a DC bias of 0 to 2.5V to the brightness control pins. Unlike the single tube inverters like the LS380s, brightness control for dual tube inverters cannot be accomplished with a potentiometer. The reason for this is that the LS460 has a voltage follower, or a sub-regulator built into the unit to synchronize both outputs. This voltage follower compensates for resistive load to the brightness control circuitry.



However, by using a voltage separator circuit consisting of a potentiometer, a virtual brightness control by potentiometer can be achieved.



Note that current which will run between the brightness control pin will be in a trivial 3.0μA range.

Mean Time Between Failures (MTBF)

By using the MIL-HDBK 217E Condition Ground Benign method, the MTBF for the LS460 is calculated at 787,407 hours.

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