Low Noise, Dimmable
EL Lamp Driver Demoboard

General Description

The Supertex HV860DB1 demoboard contains all necessary circuitry to demonstrate the features of the HV860 EL lamp driver.
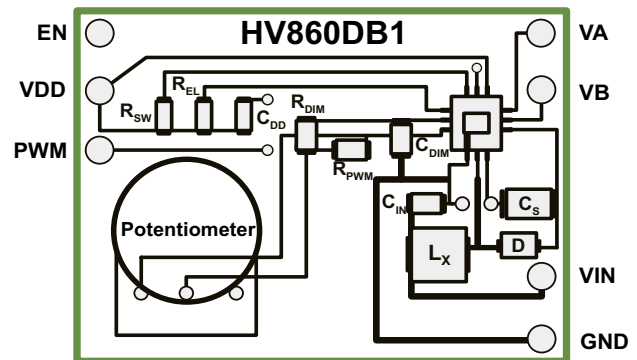
Simply connect it to a power supply and a lamp as shown in Figure1. For EL lamp dimming, either a potentiometer or an n-channel open drain PWM signal can be used, but not both.

The potentiometer is used as a variable voltage divider to change the voltage at the VREG pin. The V_{REF} is voltage divided to change the V_{REG} voltage thereby changing the V_{CS} voltage. The V_{CS} voltage amplitude, and thereby the lamp brightness, increases when the potentiometer is rotated counter-clockwise, and the lamp brightness decreases when it is rotated clockwise.

Specifications

Parameter	Value
Input voltage:	2.4 to 4.5V
VIN inductor supply voltage:	5.5V
Typical supply current:	10mA
Lamp size:	3.5in^2
Lamp frequency:	200Hz
Converter frequency:	150kHz

Board Layout and Connection Diagram

Actual Dimensions: 20mm x 25mm

Connections:

EN - (Enable Input)
A CMOS logic input which enables/disables the lamp driver. A logic high (1.5V) enables the driver and a logic low (connect to GND) disables the driver.

VDD - (IC Supply)
Supplies the HV860 EL driver IC. The supplied demo board is optimized for 3.0V operation, with an operating range from 2.4V to 4.5V. It connects to the positive terminal of a power supply.

PWM - (PWM Input)
Supplies the PWM signal for dimming the EL lamp. The frequency of this signal can vary between 20kHz and 100kHz. For EL lamp dimming using the PWM input, either the potentiometer has to be removed or its value set to for maximum lamp brightness.

The n-channel open drain PWM signal pulls the 10kΩ resistor to ground. When the duty cycle of this PWM signal is changed, the

effective voltage on the V_{REG} pin is changed. This changes the V_{CS} voltage, and hence the lamp brightness. The higher the duty cycle, the higher the lamp brightness, and vice versa.

VA and VB - (Lamp Connections)
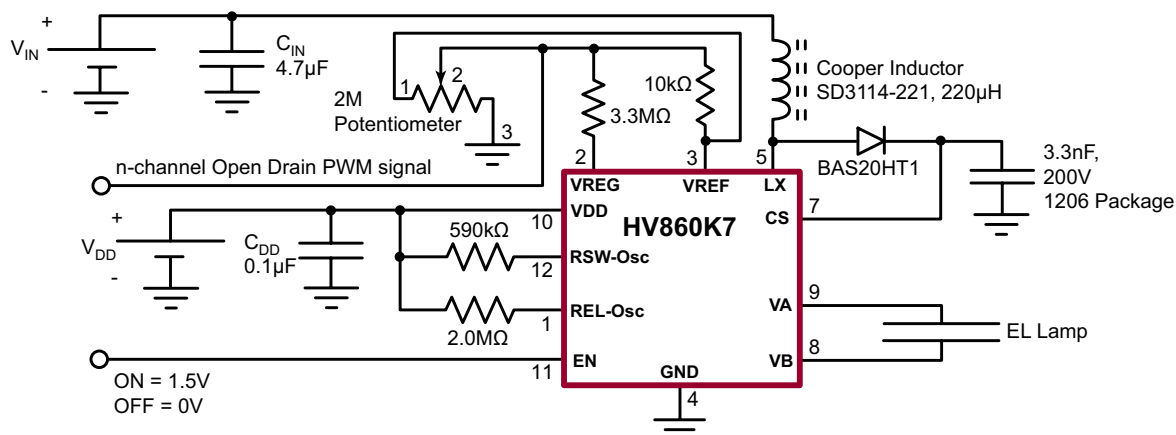They connect to the EL lamp terminals. Polarity is irrelevant.

VIN - (Inductor Supply)
Supplies the high voltage power converter. The demo board is optimized for 5.5V operation. It connects to the positive terminal of a power supply.

GND - (Circuit Ground)
Connect to VDD and VIN negative terminals. Supply bypass capacitor for both VDD and VIN are provided on the demo board. External supply bypass capacitors are not required.

Note:
   All of the above connections must be made before powering up the supply voltages.
   The V_{REG} pin should not be touched after power-up.

Figure 1: Circuit Schematic

Typical Performance

The specific external components used in the circuit schematic are: L_x = 220µH Cooper (SD3114-221), C_s = 3.3nF 200V NPO and the 2MΩ potentiometer.

Lamp Size (in²)	V_{DD} (V)	V_{IN} (V)	I_{IN} (mA)	V_{CS} (V)	f_{EL} (Hz)	Brightness	
						ft-lm	cd/m2
3.5	3.0	5.2	9.0	110	190	6.20	21.21
3.5	3.0	5.5	8.4	110	190	6.22	21.27
3.5	3.0	5.8	7.9	110	190	6.24	21.33

Bill of Materials

Component	Description	Package	Manufacturer	Part Number
L_X	220µH inductor	---	Cooper	SD3114-221
C_S	3.3nF, 200V, NPO chip capacitor	1206	Tecate	CMC-200/332JN1206T
R_{SW}	1%, 590kΩ chip resistor	0603	Any	---
R_{EL}	1%, 2MΩ chip resistor	0603	Any	---
R_{DIM}	5%, 3.3MΩ chip resistor	0603	Any	---
R_{PWM}	1%, 10kΩ chip resistor	0603	Any	---
C_{DIM}	Optional capacitor for dimming control	---	---	---
C_{IN}	4.7µF, 10V ceramic chip capacitor	0603	Any	---
C_{DD}	0.1µF, 16V ceramic chip capacitor	0603	Any	---
Diode	200V fast recovery diode	SOD-323	Diodes Inc.	BAS20HT1
POT	2MΩ Potentiometer	---	Bourns Inc.	3352T-205
U1	EL driver IC	12-Lead QFN	Supertex	HV860K7

Note:
The above circuit may be optimized further based on specification of the lamp used.

Supertex inc.
1235 Bordeaux Drive, Sunnyvale, CA 94089
Tel: 408-222-8888
www.supertex.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Microchip](#):
 [HV860DB1](#)