

High Brightness 10in² EL Lamp Driver Demoboard

General Description

The Supertex HV816DB2 is a high brightness demoboard with the circuitry to drive a 10in² EL lamp using the HV816 in a 4x4 QFN-16 package.

Simply connect the board to a power supply and an EL lamp as shown in the circuit schematic on the following page. The HV816DB2 circuit has been optimized to drive an EL lamp size of 10in². For different EL frequencies or smaller EL lamps sizes, the demoboard can be re-optimized by changing some of the component values.

The output voltage is typically $\pm 180V$ for high lamp brightness, using a single supply input voltage of 5.0V. An external N-channel MOSFET, Supertex TN2425 is used to boost the output voltage to a nominal value of 180V with an input voltage of 5.0V.

For split supply applications, the diode BAS20 between VIN and VDD has to be removed so separate supplies can be used for VIN and VDD.

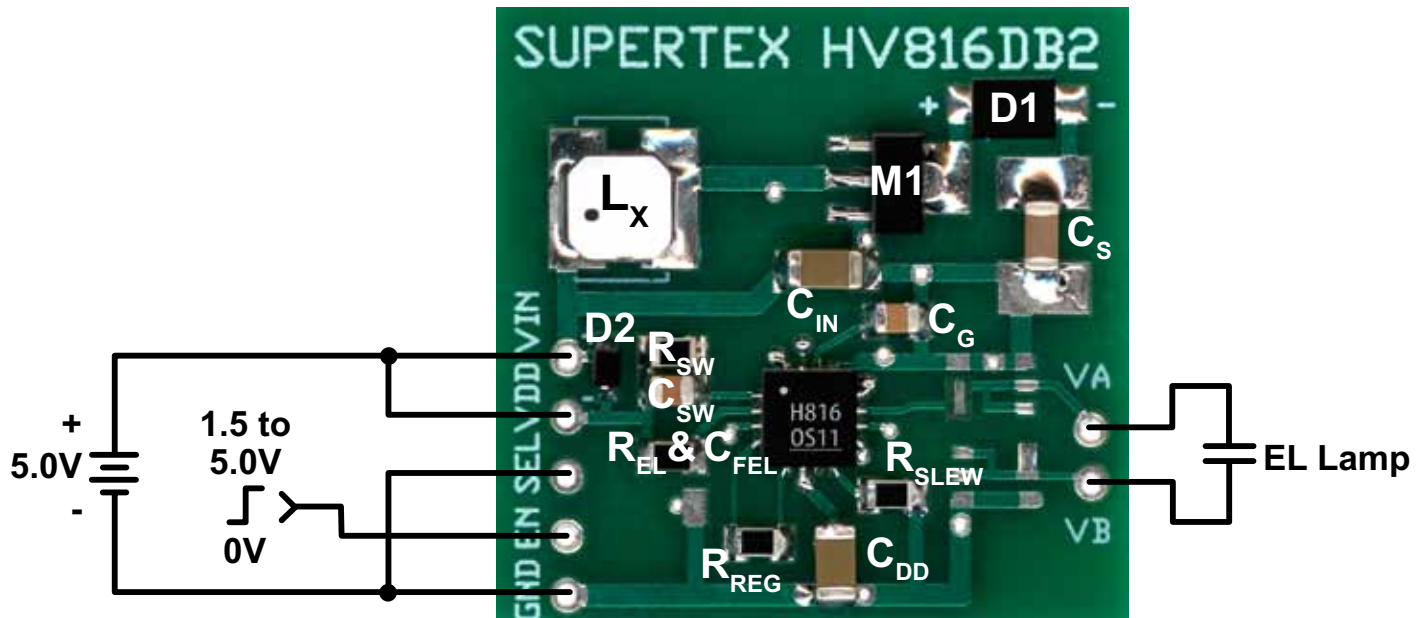
The discharge rate on the output for EL lamp can be adjusted to minimize audible noise. By increasing the value of the

R_{SLEW} resistor, the discharge rate will increase, which will reduce audible noise but will also reduce brightness. R_{SLEW} can be set to a value between 100k Ω and 500k Ω with 100k Ω for maximum brightness.

The HV816DB2 has the provision to set the EL lamp frequency using the resistor R_{EL} on the board or by an external clock input at the S_{EL} pin. To use an external clock input, the REL resistor should be removed and the REL-Osc pin should be connected to GND.

Specifications	
V_{DD} input voltage	2.7 to 5.5V
V_{IN} inductor supply voltage	4.5 to 5.0V
Typical supply current	150mA
Lamp size	10in ²
Lamp frequency	190Hz
Converter frequency	150kHz
Board dimensions	27mm x 27mm

Board Layout and Connection Diagram



Connections:

VIN, Input

Inductor input voltage. Single supply can be used for V_{IN} and V_{DD} or separate supplies can be used. If separate supplies are used, the diode BAS20 between V_{IN} and V_{DD} has to be removed. The input range for V_{IN} is 4.5 to 5.0V.

VDD, Input

Device input voltage. Single supply can be used for V_{IN} and V_{DD} or separate supplies can be used. If separate supplies are used, the diode BAS20 between V_{IN} and V_{DD} has to be removed. The input range for V_{DD} is 2.7 to 5.5V.

GND

Device Ground. Connect to power supply ground.

EN, Input

A CMOS logic input which enables/disables the lamp driver. A logic high (1.5V to V_{DD}) enables the driver and a logic low (0 to 0.2V) disables the driver.

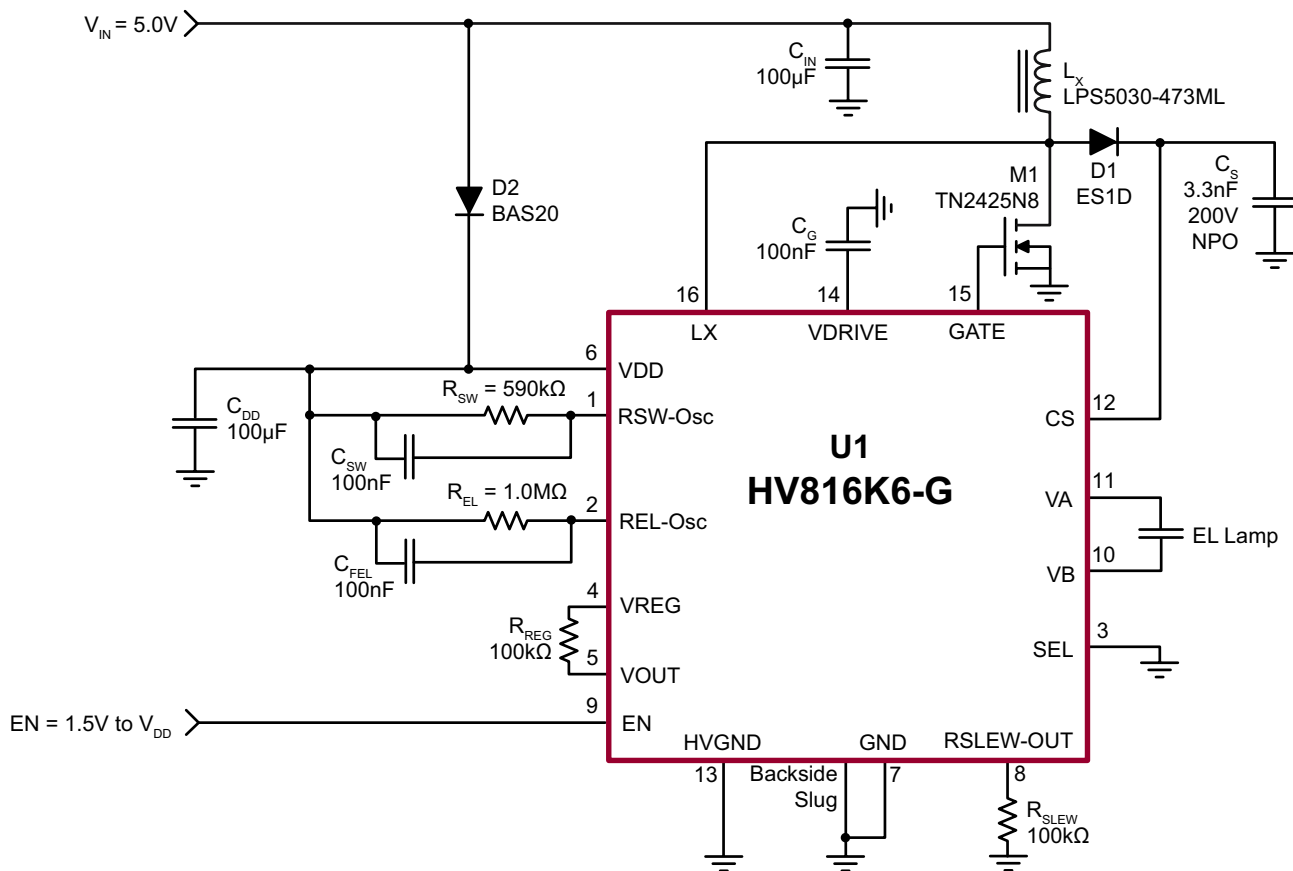
SEL, Input

CMOS logic input to set the EL frequency. To use this pin, the REL-Osc pin should be connected to GND. The frequency input at this pin should be 4x the desired output frequency. An external CLK signal can be used for this input. If this pin is not used, it should be connected to ground.

VA and VB Outputs

VA and VB are for EL Lamp connections. They should be connected to an EL lamp. Polarity is irrelevant.

HV816DB2 Circuit Schematic



Note:

C_{IN} can be in the range of 47 to 100µF.

C_{DD} can be in the range of 47 to 100µF.

Typical Performance

$V_{DD} = V_{IN}$ (V)	I_{IN} (mA)	V_{CS} (V_{PEAK})	f_{EL} (Hz)	Lamp Brightness	
				ft-lm	cd/m ²
5.0	150	190	190	15	50

Typical Performance

Ref	Description	Package	Manufacturer	Part Number
L _X	47μH Inductor	---	Coilcraft	LPS5030-473ML
C _S	3.3nF, 200V, NPO ceramic chip capacitor	1206	Any	---
R _{SW}	1% 590kΩ chip resistor	0805	Any	---
R _{EL}	1% 1.0MΩ chip resistor	0805	Any	---
R _{REG}	1% 100kΩ chip resistor	0805	Any	---
R _{SLEW}	1% 100kΩ chip resistor	0805	Any	---
M1	200V, 3.5Ω N-channel MOSFET	SOT-89	Supertex Inc.	TN2425N8-G
C _{IN}	100μF 6.3V ceramic chip capacitor	1206	Any	---
C _{DD}	100μF 6.3V ceramic chip capacitor	1206	Any	---
C _G	100nF 10V ceramic chip capacitor	0805	Any	---
C _{SW}	100nF, 10V ceramic chip capacitor	0805	Any	---
C _{FEL}	100nF, 10V ceramic chip capacitor	0805	Any	---
D1	1.0A surface mount super fast diode	SMA	Diodes Inc.	ES1D
D2	High voltage switching diode	SOD-323	ON Semi	BAS20HT1
U1	EL Driver IC	16-Lead (4x4) QFN	Supertex Inc.	HV816K6-G

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