Off-Line High Voltage EL Lamp Driver

Ordering Information

Device	Package Options			
	8-Lead SO	8-Lead SO + Slug	7-Pin TO-220	Die
HV809	HV809LG	HV809SG	HV809K2	HV809X

Features

- Processed with HVCMOS® technology
- Input voltage up to 200V DC
- 400V peak-to-peak output voltage
- Output load up to 350nF (100 in² for 3.5nF/in² lamp)
- Adjustable output lamp frequency
- Adjustable On/Off pulsing frequency

Applications

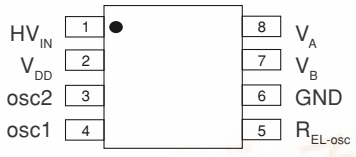
- Electronic Organizers
- Handheld Portable Computers
- Display Signs
- Portable Instrumentation Equipment

General Description

The Supertex HV809 is an off-line high voltage EL lamp driver integrated circuit designed for driving EL lamps of up to 350nF at 400Hz. The input supply voltage can be a rectified nominal 120V AC source or any other DC source up to 200V. The HV809 will supply the EL lamp with an AC square wave with a peak-to-peak voltage of two times the input DC voltage.

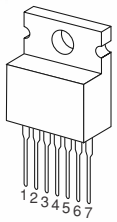
The HV809 has two internal oscillators, a low output voltage linear regulator, and a high voltage output H-bridge. The high voltage output H-bridge frequency is set by an external resistor connected between the $R_{EL\text{-}osc}$ and GND pins. The EL lamp is connected between V_A and V_B. For the HV809 in the 8-pin package, an external RC network can be connected between the oscillator's osc1 and osc2 pins to pulse the EL lamp on and off.

Pin Configurations



top view
SO-8

TAB: GND



7 -Pin
TO-220

Pin 01: osc1
Pin 02: V_{DD}
Pin 03: $R_{EL\text{-}osc}$
Pin 04: GND
Pin 05: V_B
Pin 06: V_A
Pin 07: HV_{IN}
TAB: GND

Absolute Maximum Ratings

HV_{IN}, Input Voltage		+210V
V_{DD}, Internal Logic Voltage		+15V
Operating Temperature Range		-25°C to +85°C
Storage Temperature Range		-55°C to +150°C
Power Dissipation	SO-8	500mW
	SO-8 + Slug	1.5 Watts
	7 Pin TO-220	15 Watts

Note:
*All voltages are referenced to GND.

For detailed circuit and application information, please refer to Application Note AN-H36.

Electrical Characteristics

DC Characteristics (Over recommended operating conditions unless otherwise specified, T_A = 25°C)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
I_{IN}	High voltage supply current			70	mA	HV_{IN} = 170V, R_{EL} = 1.0MΩ, C_L = 350nF
				9	mA	HV_{IN} = 170V, R_{EL} = 1.0MΩ, C_L = 50nF
I_{INQ}	Quiescent supply current			400	µA	HV_{IN} = 170V, R_{EL-osc} = 1.0MΩ, osc1 = GND, No Load
				100	µA	HV_{IN} = 170V, R_{EL-osc} = 1.0MΩ osc1 = V_{DD}, No Load
I_{SINK}	osc2 sink current		300		µA	V_{osc2} = 1.0V
I_{SOURCE}	osc2 source current		100		µA	V_{osc2} = V_{DD} -1.0V
I_{osc1}	osc1 logic input leakage current		±10		µA	V_{osc1} = 0V and V_{DD}
V_H	osc1 hysteresis voltage		2.5		V	
V_{A-B}	Min differential output voltage across lamp			400	V	HV_{IN} = 200V
V_{DD}	Internal supply voltage	8	10	12	V	No load on V_{DD}
$I_{DD\ (OUT)}$	Maximum output V_{DD} current			4	mA	For HV809K2, ΔV_{DD} = 1.0V

AC Characteristics (Over recommended operating conditions unless otherwise specified, T_A = 25°C)

Symbol	Parameter	Min	Typ	Max	Units	Conditions
f_{EL}	V_{A-B} output drive frequency	320	400	480	Hz	R_{EL-osc} = 1.0MΩ, osc1 = GND, C_L = 350nF
		0.8	1.0	1.2	KHz	R_{EL-osc} = 390KΩ, osc1 = GND, C_L = 150nF
t_r	Output rise time		180	250	µs	CL = 150nF, HV_{IN} = 170V
t_f	Output fall time		50	100	µs	CL = 150nF, HV_{IN} = 170V

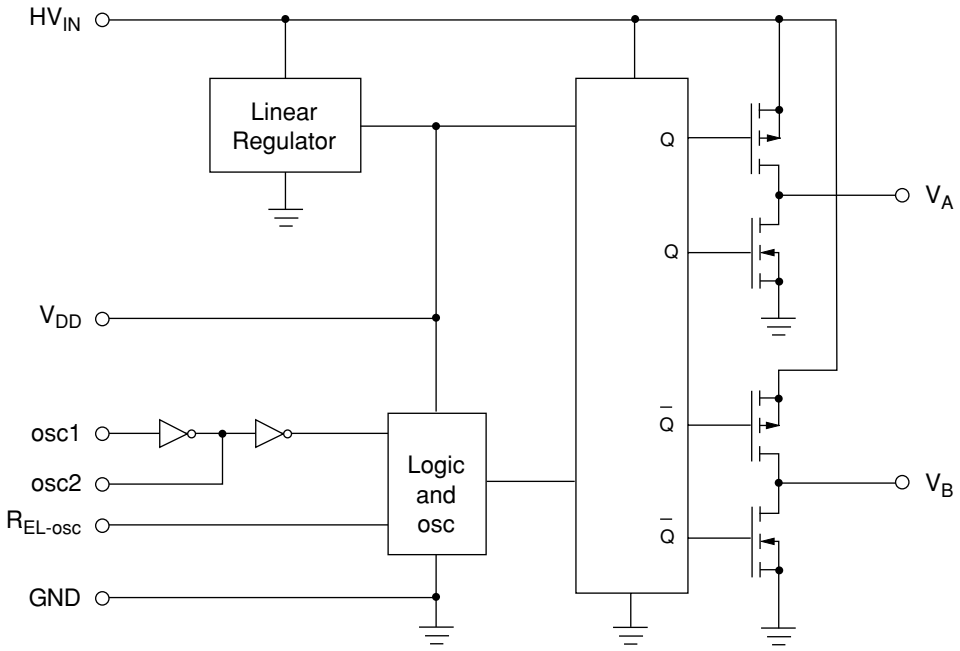
Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Units	Conditions
HV_{IN}	High voltage input	50		200	V	
C_L	Load capacitance			350	nF	R_{EL-osc} = 1.0MΩ, HV_{IN} = 170V
				150	nF	R_{EL-osc} = 390KΩ, HV_{IN} = 170V
T_A	Operating temperature	-25		85	°C	

Function Table

osc1	Outputs V_A and V_B
GND	Enabled
V_{DD}	Disabled

Block Diagram



Typical Applications

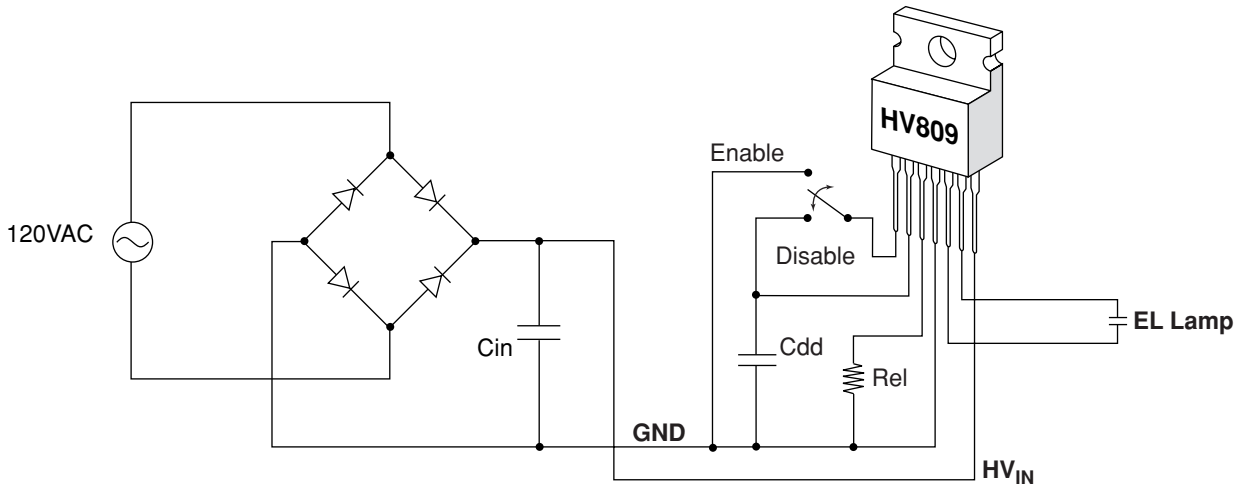


Figure 1: AC Off-Line EL Lamp

Typical Application

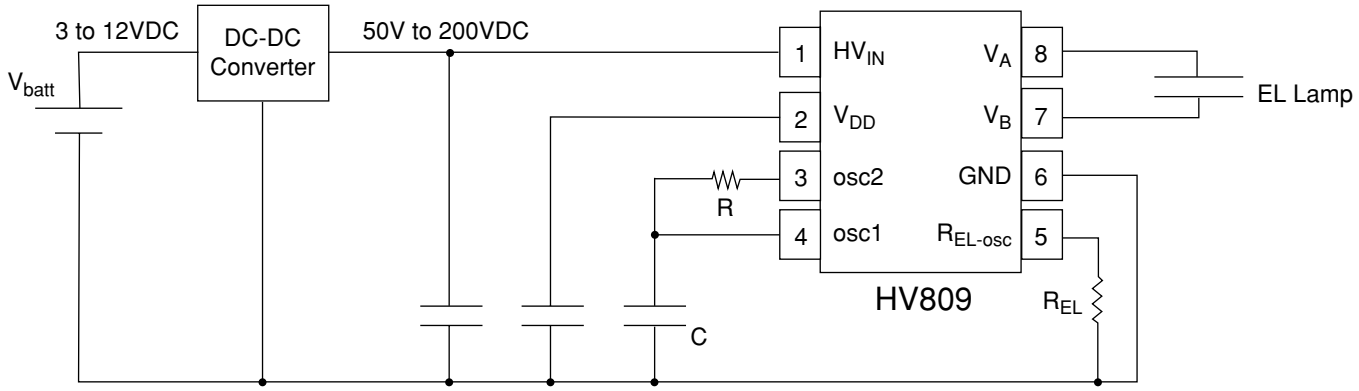


Figure 2: Pulsing EL Lamp

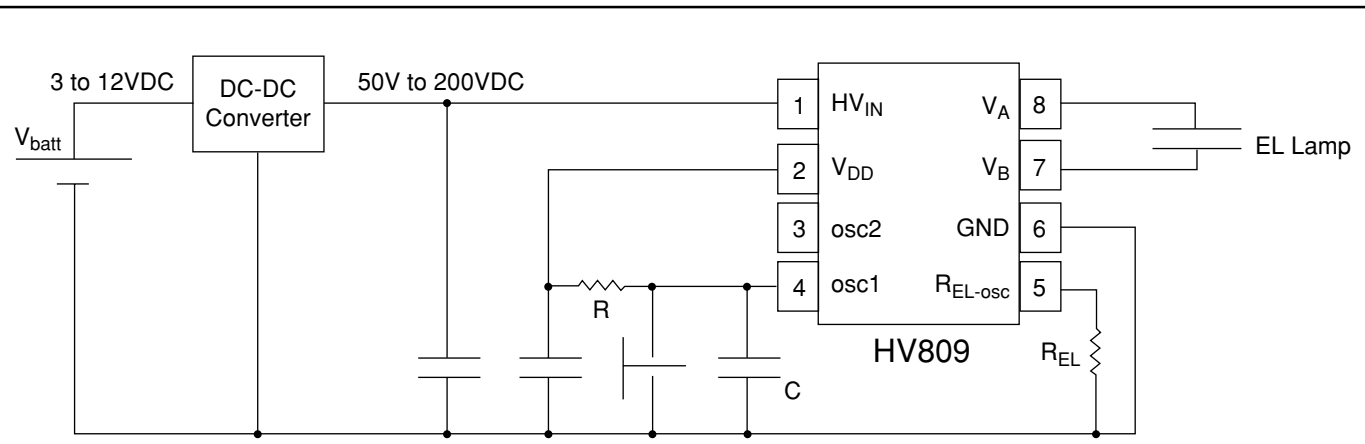


Figure 3: Push Button Delayed Turn Off

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