

Off-Line High Voltage EL Lamp Driver

Ordering Information

| Device | Package Options | | | |
|--------|-----------------|-----------|--------------|--------|
| | 8-Lead P-Dip | 8-Lead SO | 7-Pin TO-220 | Die |
| HV809 | HV809P | HV809LG | HV809K2 | HV809X |

Features

- Processed with HVC MOS[®] 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

Absolute Maximum Ratings

| | | |
|--|-----------------|----------|
| HV _{IN} , Input Voltage | +220V | |
| V _{DD} , Internal Logic Voltage | +15V | |
| Operating Temperature Range | -25°C to +85°C | |
| Storage Temperature Range | -55°C to +150°C | |
| Power Dissipation | 8 Pin DIP | 1.0 Watt |
| | SO-8 | 500mW |
| | 7 Pin TO-220 | 15 Watts |

Note:

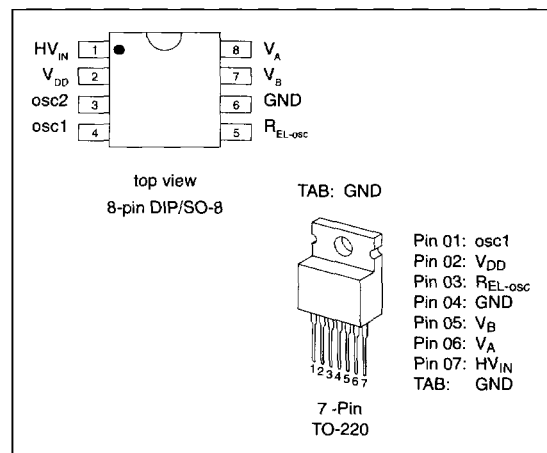
*All voltages are referenced to GND.

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-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



Electrical Characteristics

DC Characteristics (Over recommended operating conditions unless otherwise specified, $T_A = 25^\circ\text{C}$)

| Symbol | Parameter | Min | Typ | Max | Units | Conditions |
|---------------|---|-----|-----|----------|---------------|--|
| I_{IN} | High voltage supply current | | | 70 | mA | $HV_{IN} = 170\text{V}$, $R_{EL} = 1.0\text{M}\Omega$, $C_L = 350\text{nF}$ |
| | | | | 9 | mA | $HV_{IN} = 170\text{V}$, $R_{EL} = 1.0\text{M}\Omega$, $C_L = 50\text{nF}$ |
| I_{INQ} | Quiescent supply current | | | 400 | μA | $HV_{IN} = 170\text{V}$, $R_{EL-osc} = 1.0\text{M}\Omega$, $osc1 = \text{GND}$, No Load |
| | | | | 100 | μA | $HV_{IN} = 170\text{V}$, $R_{EL-osc} = 1.0\text{M}\Omega$, $osc1 = V_{DD}$, No Load |
| I_{SINK} | osc2 sink current | | 600 | | μA | $V_{osc2} = 1.0\text{V}$ |
| I_{SOURCE} | osc2 source current | | 600 | | μA | $V_{osc2} = V_{DD} - 1.0\text{V}$ |
| I_{osc1} | osc1 logic input leakage current | | | ± 10 | μA | $V_{osc1} = 0\text{V}$ and V_{DD} |
| V_H | osc1 hysteresis voltage | | 2.5 | | V | |
| V_{A-B} | Min differential output voltage across lamp | | | 400 | V | $HV_{IN} = 200\text{V}$ |
| 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, $\Delta V_{DD} = 1.0\text{V}$ |

AC Characteristics (Over recommended operating conditions unless otherwise specified, $T_A = 25^\circ\text{C}$)

| Symbol | Parameter | Min | Typ | Max | Units | Conditions |
|----------|----------------------------------|-----|-----|-----|---------------|---|
| f_{EL} | V_{A-B} output drive frequency | 320 | 400 | 480 | Hz | $R_{EL-osc} = 1.0\text{M}\Omega$, $osc1 = \text{GND}$, $C_L = 350\text{nF}$ |
| | | 0.8 | 1.0 | 1.2 | KHz | $R_{EL-osc} = 330\text{K}\Omega$, $osc1 = \text{GND}$, $C_L = 150\text{nF}$ |
| t_r | Output rise time | | 100 | 170 | μs | $CL = 150\text{nF}$ |
| t_f | Output fall time | | 100 | 170 | μs | $CL = 150\text{nF}$ |

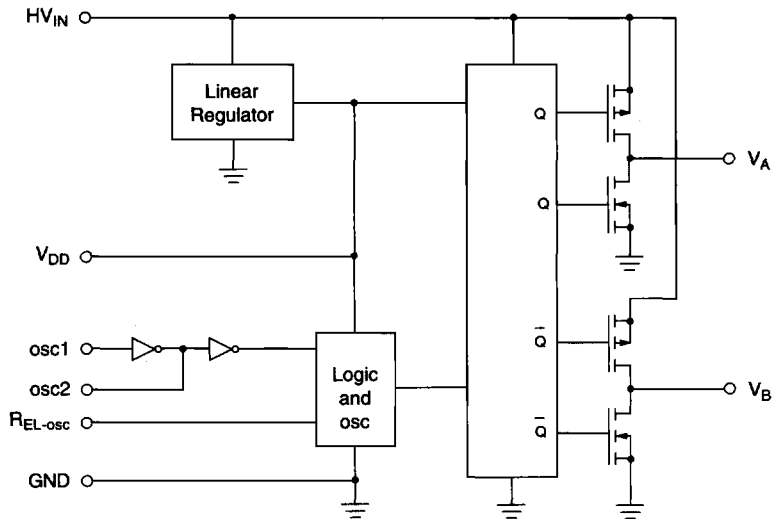
Recommended Operating Conditions

| Symbol | Parameter | Min | Typ | Max | Units | Conditions |
|-----------|-----------------------|-----|-----|-----|------------------|--|
| HV_{IN} | High voltage input | 50 | | 200 | V | |
| C_L | Load capacitance | | | 350 | nF | $R_{EL-osc} = 1.0\text{M}\Omega$, $HV_{IN} = 170\text{V}$ |
| | | | | 150 | nF | $R_{EL-osc} = 330\text{K}\Omega$, $HV_{IN} = 170\text{V}$ |
| T_A | Operating temperature | -25 | | 85 | $^\circ\text{C}$ | |

Function Table

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

Block Diagram



Typical Applications

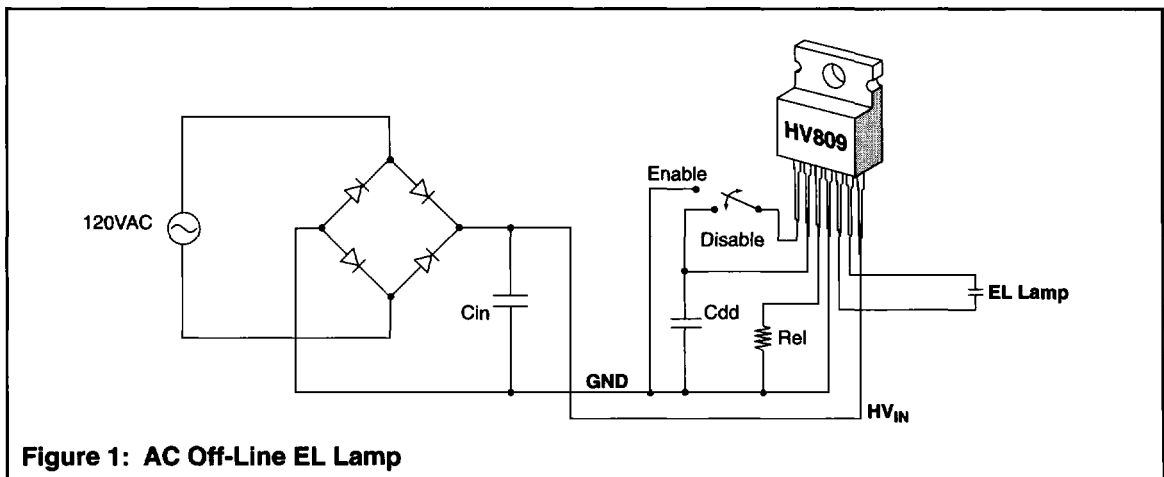


Figure 1: AC Off-Line EL Lamp

Typical Application

