

## High Voltage EL Lamp Driver

### Ordering Information

Device	Input Voltage	Package Options	
		8-Lead SO	Die
HV824	1.0V to 1.6V	HV824LG	HV824X

### Features

- Processed with HVCMOS® technology
- 1.0V to 1.6V supply voltage
- DC to AC conversion
- Permits the use of high-resistance elastomeric lamp connectors
- Adjustable output lamp frequency to control lamp color, lamp life, and power consumption
- Adjustable converter frequency to eliminate harmonics and optimize power consumption
- Enable/disable function
- Low current draw under no load condition

### Applications

- Pagers
- Portable Transceiver
- Portable Instrumentation
- Cellular Phones

### Absolute Maximum Ratings\*

Supply Voltage, $V_{DD}$	-0.5V to +2.0V
Output Voltage, $V_{CS}$	-0.5V to +120V
Operating Temperature Range	-25°C to +85°C
Storage Temperature Range	-65°C to +150°C
Power Dissipation	400mW

**Note:**

\*All voltages are referenced to GND.

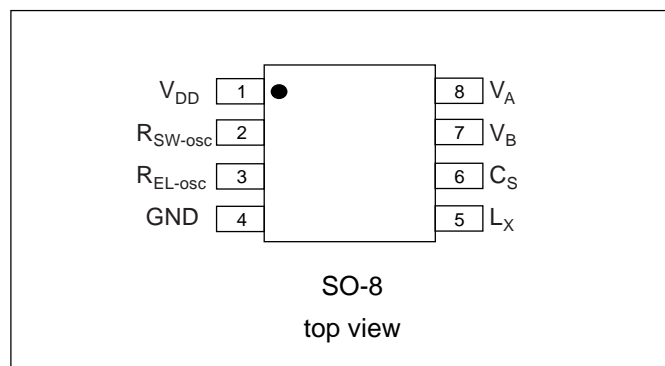
### General Description

The Supertex HV824 is a high voltage driver designed to drive EL lamps with capacitive loads of 2nF to 15nF. The input supply voltage range is 1.0V to 1.6V. The device uses a single inductor and a minimum number of passive components. Typical output voltage applied to the EL lamp is 120V to 150V peak-to-peak. The HV824 can be enabled/disabled by connecting the  $R_{SW}$  resistor to  $V_{DD}$ /ground. In die form, the device has an enable bar pad which enables the IC when it is at logic low.

The HV824 has two internal oscillators, a switching MOSFET, and a high voltage EL lamp driver. The frequency for the switching MOSFET is set by an external resistor connected between the  $R_{SW-osc}$  pin and the  $V_{DD}$  pin. The EL lamp driver frequency is set by an external resistor connected between the  $R_{EL-osc}$  pin and the  $V_{DD}$  pin. An external inductor is connected between the  $L_x$  and  $V_{DD}$  pins. A 0.01 $\mu$ F to 0.1 $\mu$ F capacitor is connected between  $C_s$  and GND pins. The EL lamp is connected between  $V_A$  and  $V_B$ .

The switching MOSFET charges the external inductor and discharges it into the 0.01 $\mu$ F to 0.1 $\mu$ F capacitor at  $C_s$ . The voltage at  $C_s$  will start to increase. Once the voltage at  $C_s$  reaches a nominal value of 75V, the switching MOSFET is turned OFF to conserve power. The outputs  $V_A$  and  $V_B$  are configured as an H-bridge and are switching in opposite states to achieve a maximum voltage of 180V peak-to-peak across the EL lamp.

### Pin Configuration



## Electrical Characteristics

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

Symbol	Parameter	Min	Typ	Max	Units	Conditions
$I_{DDQ}$	Quiescent $V_{DD}$ supply current		50	100	nA	$R_{SW-osc}=\text{Low}$
$I_{DD}$	Input current going into the $V_{DD}$ pin			450	$\mu\text{A}$	$V_{DD}=1.5\text{V}$ .
$I_{IN}$	Input current including inductor current.			70	mA	$V_{DD}=1.5\text{V}$ . See Figure 1.
$V_{P-P}$	Output voltage peak-to-peak	140	150	160	V	$V_{DD}=1.5\text{V}$ . See Figure 1.
		130				$V_{DD}=1.0\text{V}$ . See Figure 1.
$f_{EL}$	$V_{A-B}$ output drive frequency	300	333		Hz	$V_{DD}=1.5\text{V}$ . See Figure 1.
D	Switching transistor duty cycle		88		%	
$C_{LOAD}$	EL panel capacitance load range	2.0		15	nF	

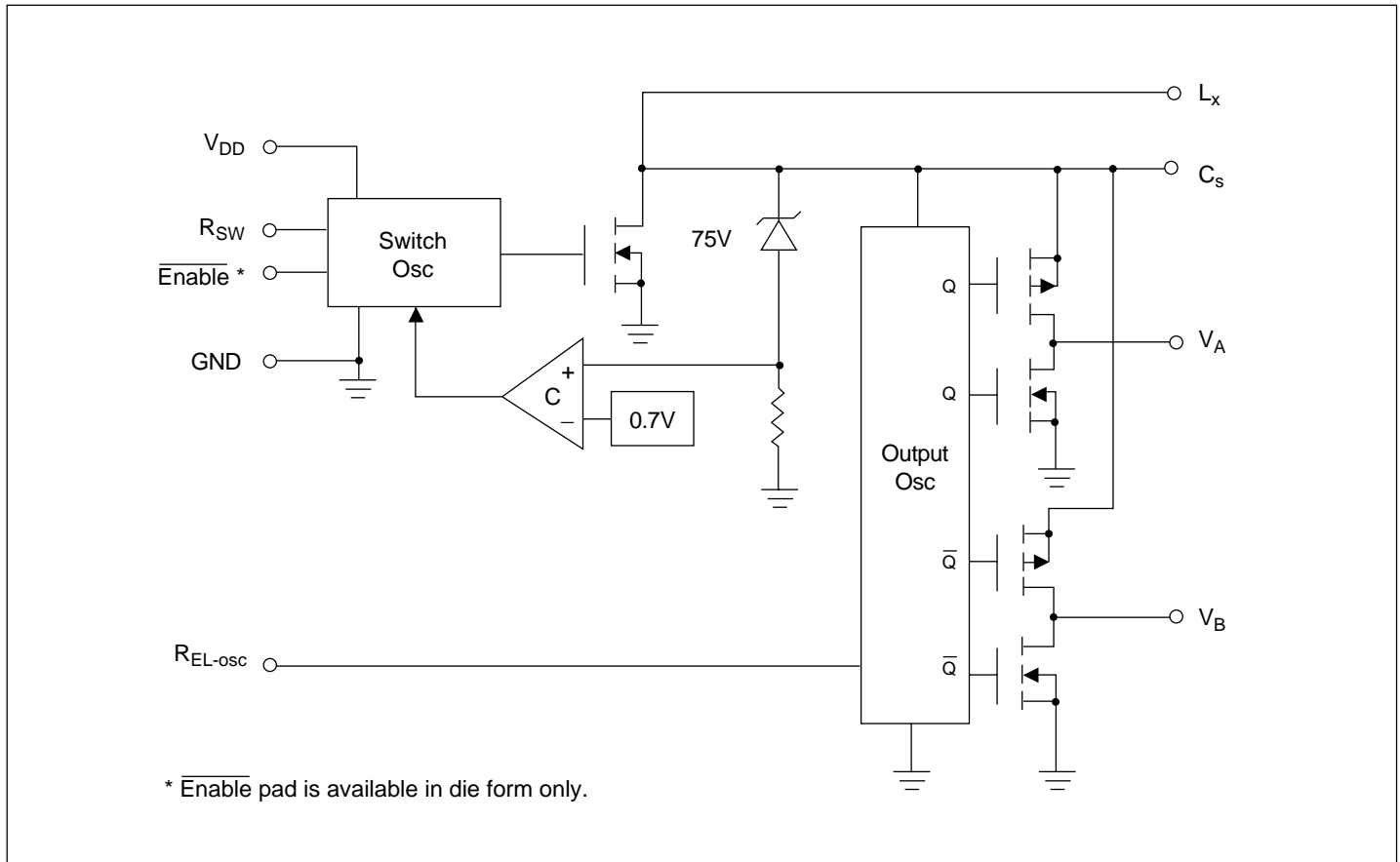
## Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Units	Conditions
$V_{DD}$	Supply voltage	1.0		1.6	V	
$T_A$	Operating temperature	-25		85	$^\circ\text{C}$	

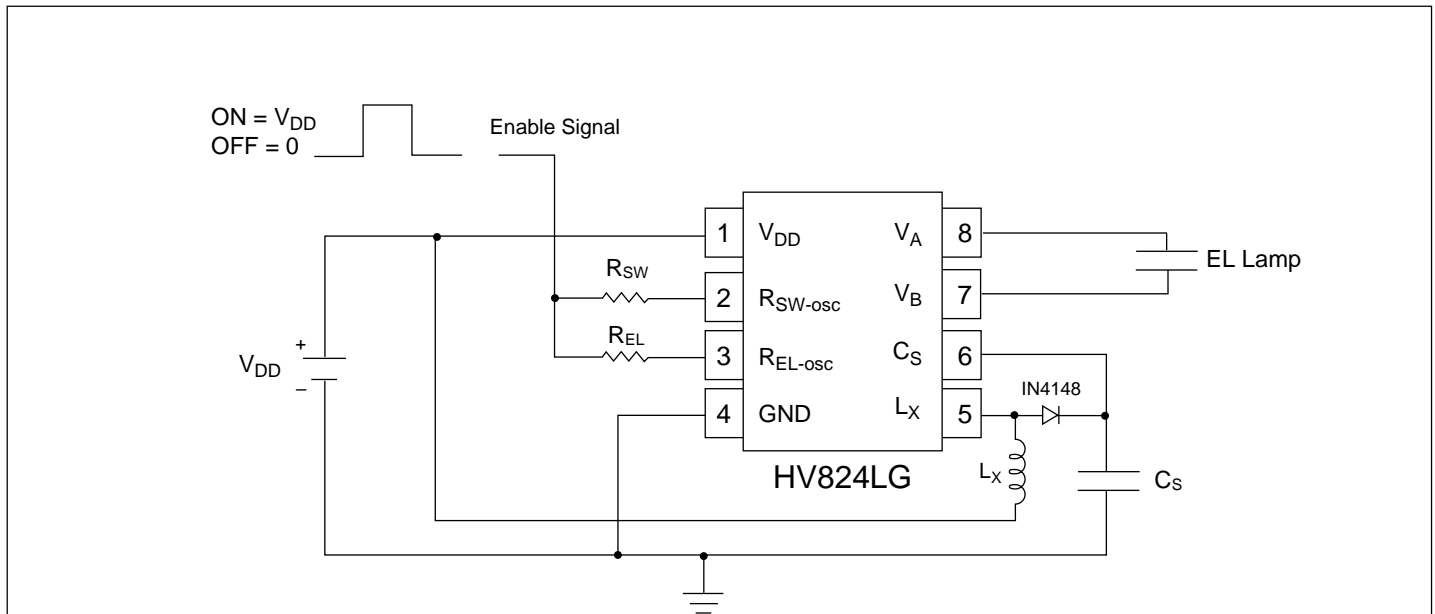
## Enable/Disable Table

Symbol	Parameter	Min	Typ	Max	Units	Conditions
$V_{IL}$	Low level input voltage to $R_{SW}$ resistor	0		0.2	V	$V_{DD}=1.0\text{V}$ to $1.6\text{V}$ .
$V_{IH}$	High level input voltage to $R_{SW}$ resistor	$V_{DD}-0.5$		$V_{DD}$	V	$V_{DD}=1.0\text{V}$ to $1.6\text{V}$ .

# Block Diagram



# Typical Application



### Typical Performance

Lamp Size	V <sub>IN</sub>	I <sub>IN</sub>	V <sub>CS</sub>	f <sub>EL</sub>	Brightness
1.5in <sup>2</sup>	1.0V-1.5V	70mA	75V	333Hz	5.0ft-lm