

## High-Voltage, Low Noise EL Lamp Driver

### Ordering Information

Device	Package Options		
	MSOP-8	SO-8	Die
HV828	HV828MG*	HV828LG	HV828X

\* Product supplied on 1000 piece carrier tape reels.

### Features

- ☐ 1.8V to 3.5V operating supply voltage
- ☐ Low noise
- ☐ DC to AC conversion
- ☐ Adjustable output frequency
- ☐ Adjustable switch frequency
- ☐ Output voltage regulation
- ☐ Enable/disable function

### Applications

- ☐ Mobile cellular phones
- ☐ Pagers
- ☐ Portable Transceivers
- ☐ Remote Control Units
- ☐ Calculators

### Absolute Maximum Ratings\*

Supply Voltage, $V_{DD}$	-0.5V to +4.5V
Output Voltage, $V_{CS}$	-0.5V to +120V
Operating Temperature Range	-25° to +85°C
Storage Temperature Range	-65°C to +150°C
MSOP-8 Power Dissipation	250mW
SO-8 Power Dissipation	400mW

#### Note:

\*All voltages are referenced to GND.

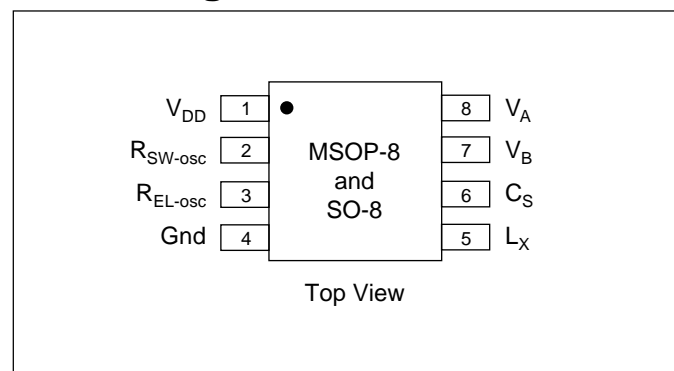
### General Description

The Supertex HV828 is a high voltage driver designed for driving EL lamps of up to 5 in<sup>2</sup>. The input supply voltage range is from 1.8V to 3.5V. The device is designed to reduce the amount of audible noise emitted by the lamp. The device uses a single inductor and a minimum number of passive components. The nominal regulated output voltage that is applied to the EL lamp is  $\pm 80V$ . The chip can be enabled/disabled by connecting the resistor on  $R_{SW-OSC}$  to  $V_{DD}/ground$ .

The HV828 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 supply pin  $V_{DD}$ . The EL lamp driver frequency is set by an external resistor connected between  $R_{EL-OSC}$  pin and the  $V_{DD}$  pin. An external inductor is connected between the  $L_X$  and  $V_{DD}$  pins. A 0.01-0.1 $\mu F$  capacitor is connected between  $C_S$  and ground. The EL lamp is connected between  $V_A$  and  $V_B$ .

The switching MOSFET charges the external inductor and discharges it into the capacitor at  $C_S$ . The voltage at  $C_S$  will start to increase. Once the voltage at  $C_S$  reaches a nominal value of 80V, 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 160V 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
$R_{DS(on)}$	On-resistance of switching transistor			7.0	$\Omega$	$I=100\text{mA}$
$V_{CS}$	Max. output regulation voltage	75	80	85	V	$V_{DD}=1.8\text{V to }3.5\text{V}$
$V_{A-B}$	Max. of differential output voltage across lamp	150	160	170	V	$V_{DD}=1.8\text{V to }3.5\text{V}$
$I_{DDQ}$	Quiescent $V_{DD}$ supply current			150	nA	$R_{SW-osc} = \text{Low}$
$I_{DD}$	Input current going into the $V_{DD}$ pin			150	$\mu\text{A}$	$V_{DD} = 1.8\text{V to }3.5\text{V}$ . See Figure 1.
$I_{IN}$	Input current including inductor current			25	mA	$V_{IN} = 3.0\text{V}$ . See Figure 1.
$V_{CS}$	Output voltage on $V_{CS}$	72	77		V	$V_{IN} = 3.0\text{V}$ . See Figure 1.
$f_{EL}$	$V_{A-B}$ output drive frequency	212	250	288	Hz	$V_{IN} = 3.0\text{V}$ . See Figure 1.
$f_{SW}$	Switching transistor frequency		80		KHz	$V_{IN} = 3.0\text{V}$ . See Figure 1.
D	Switching transistor duty cycle		88		%	See figure 1.

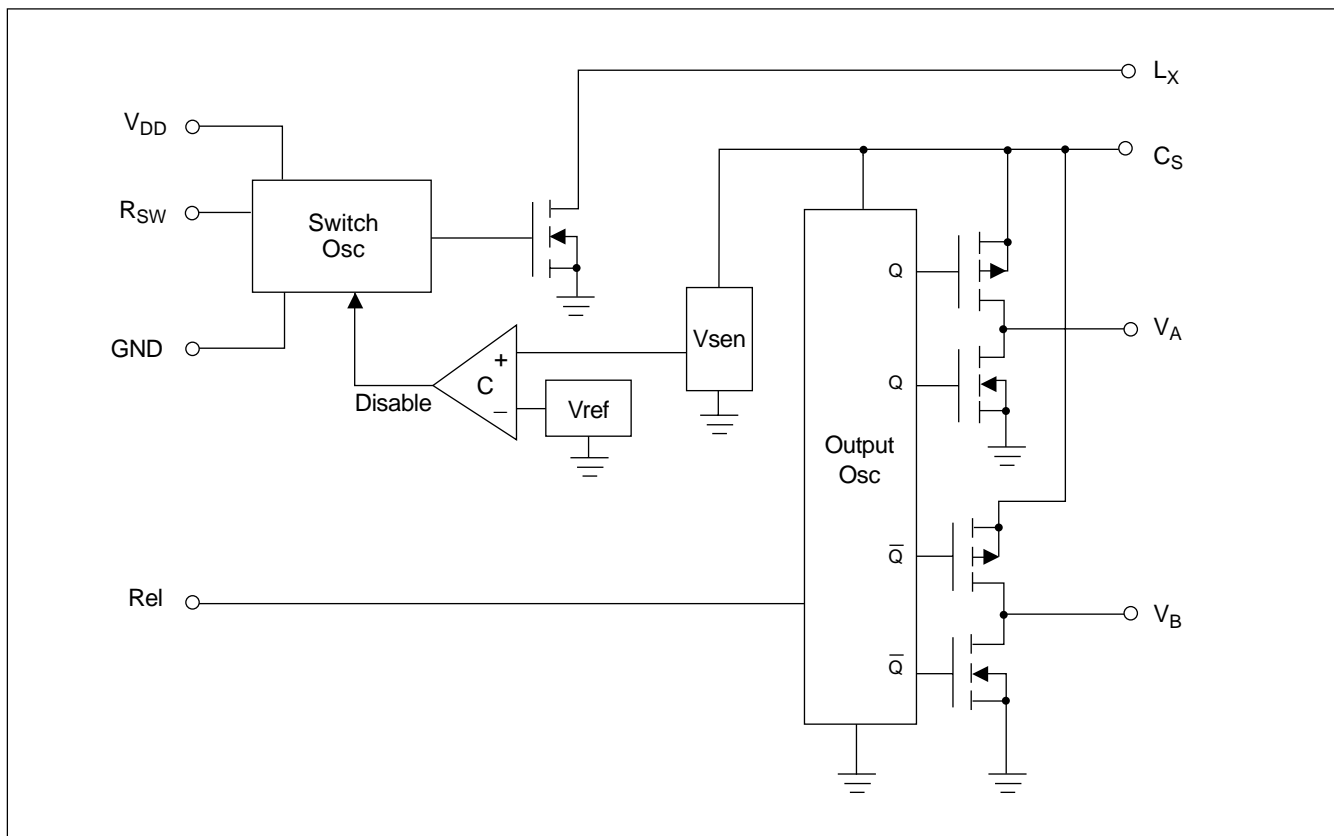
## Recommended Operating Conditions

Symbol	Parameter	Min	Typ	Max	Units	Conditions
$V_{DD}$	Supply voltage	1.8		3.5	V	
$f_{EL}$	$V_{A-B}$ output drive frequency	60		1000	Hz	
$T_A$	Operating temperature	-40		85	$^{\circ}\text{C}$	

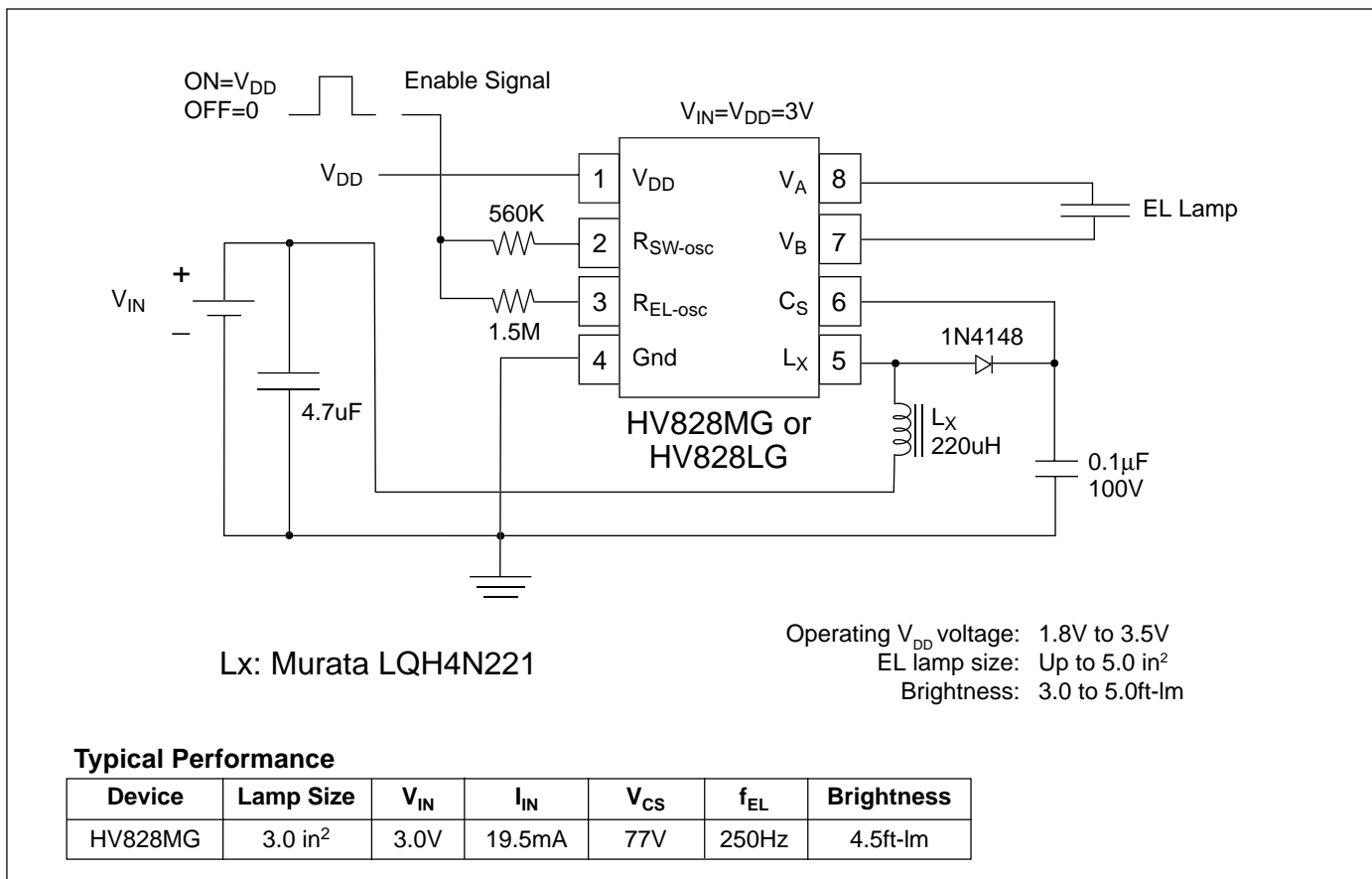
## Enable/Disable Function Table

Symbol	Parameter	Min	Typ	Max	Units	Conditions
EN-L	Logic input low voltage	0		0.5	V	$V_{DD}=1.8\text{V to }3.5\text{V}$
EN-H	Logic input high voltage	$V_{DD}-0.5$		$V_{DD}$	V	$V_{DD}=1.8\text{V to }3.5\text{V}$

## Block Diagram



**Figure 1: Typical Application**



# Typical Performance Curves for Figure 1 (3.0 in.<sup>2</sup> lamp)

$V_{DD} = V_{IN} = 1.8V - 3.5V$

