# Supertex inc.

**Advanced Information** 

# **High Voltage EL Lamp Driver**

**Ordering Information** 

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

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☐ Processed with	HVCMOS®	technology
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☐ 1.0V to 1.6V supply voltage

$\neg$	DC	4-	A (C		:
- 1	טט	το	AU	con	version

Permits the	use of high	n-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	

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LOW	current	draw	under no	load	condition
LOW	current	uraw	under no	ioau	Condition

#### **Applications**

	Pagers
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	Portable	Instrume	ntation
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	Cel	lul	lar	Ph	or	es

## **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 to1.6V. 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  $R_{\rm SW}$  resistor to  $V_{\rm DD}/{\rm ground}$ . 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  $R_{\text{sw-osc}}$  pin and the  $V_{\text{DD}}$  pin. The EL lamp driver frequency is set by an external resistor connected between the  $R_{\text{EL-osc}}$  pin and the  $V_{\text{DD}}$  pin. An external inductor is connected between the  $L_x$  and  $V_{\text{DD}}$  pins. A  $0.01\mu\text{F}$  to  $0.1\mu\text{F}$  capacitor is connected between  $C_s$  and GND pins. The EL lamp is connected between  $V_A$  and  $V_B$ .

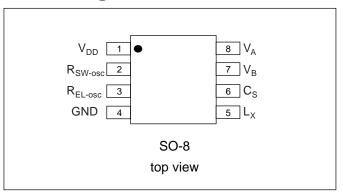
The switching MOSFET charges the external inductor and discharges it into the  $0.01\mu F$  to  $0.1\mu F$  capacitor at  $C_s$ . The voltage at  $C_s$  will start to increase. Once the voltage at  $C_s$  reaches a nominal value of 75V, the switching MOSFET is turned OFF to conserve power. The outputs  $V_A$  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.

### **Absolute Maximum Ratings\***

Supply Voltage, $V_{\rm DD}$	-0.5V to +2.0V
Output Voltage, V <sub>Cs</sub>	-0.5V to +120V
Operating Temperature Range	-25°C to +85°C
Storage Temperature Range	-65°C to +150°C
Power Dissipation	400mW

#### Note

#### **Pin Configuration**



<sup>\*</sup>All voltages are referenced to GND.

#### **Electrical Characteristics**

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

Symbol	Parameter	Min	Тур	Max	Units	Conditions
I <sub>DDQ</sub>	Quiescent V <sub>DD</sub> supply current		50	100	nA	R <sub>SW-osc</sub> =Low
I <sub>DD</sub>	Input current going into the V <sub>DD</sub> pin			450	μА	V <sub>DD</sub> =1.5V.
I <sub>IN</sub>	Input current including inductor current.			70	mA	V <sub>DD</sub> =1.5V. See Figure 1.
V <sub>P-P</sub>	Output voltage peak-to-peak	140	150	160	V	V <sub>DD</sub> =1.5V. See Figure 1.
, b-b		130				V <sub>DD</sub> =1.0V. See Figure 1.
f <sub>EL</sub>	V <sub>A-B</sub> output drive frequency	300	333		Hz	V <sub>DD</sub> =1.5V. See Figure 1.
D	Switching transistor duty cycle		88		%	
C <sub>LOAD</sub>	EL panel capacitance load range	2.0		15	nF	

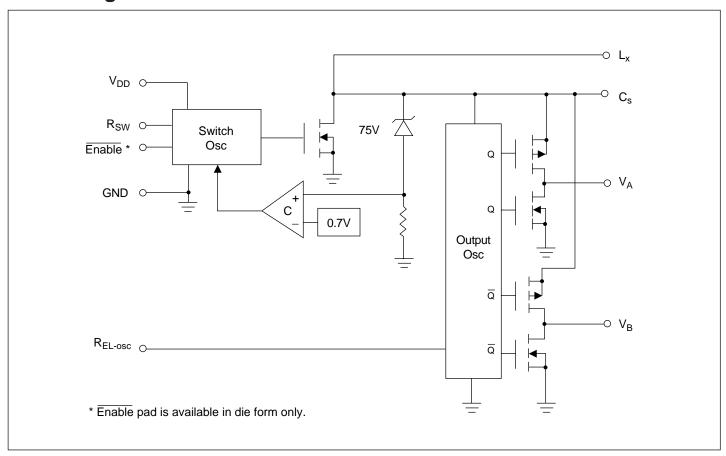
**Recommended Operating Conditions** 

Symbol	Parameter	Min	Тур	Max	Units	Conditions
V <sub>DD</sub>	Supply voltage	1.0		1.6	V	
T <sub>A</sub>	Operating temperature	-25		85	°C	

#### **Enable/Disable Table**

Sym	nbol	Parameter	Min	Тур	Max	Units	Conditions
V	' <sub>IL</sub>	Low level input voltage to R <sub>SW</sub> resistor	0		0.2	V	V <sub>DD</sub> =1.0V to 1.6V.
V	, IH	High level input voltage to R <sub>SW</sub> resistor	V <sub>DD</sub> -0.5		V <sub>DD</sub>	V	V <sub>DD</sub> =1.0V to 1.6V.

# **Block Diagram**



# **Typical Application**

