

High Voltage EL Lamp Driver IC

Features

- ▶ 1.8V to 3.5V operating supply voltage
- ▶ DC to AC conversion
- ▶ Output voltage regulation
- ▶ Adjustable output lamp frequency
- ▶ Adjustable converter frequency
- ▶ Enable/disable function

Applications

- ▶ Pagers
- ▶ Portable Transceiver
- ▶ Cellular phones
- ▶ Remote control units
- ▶ Calculators

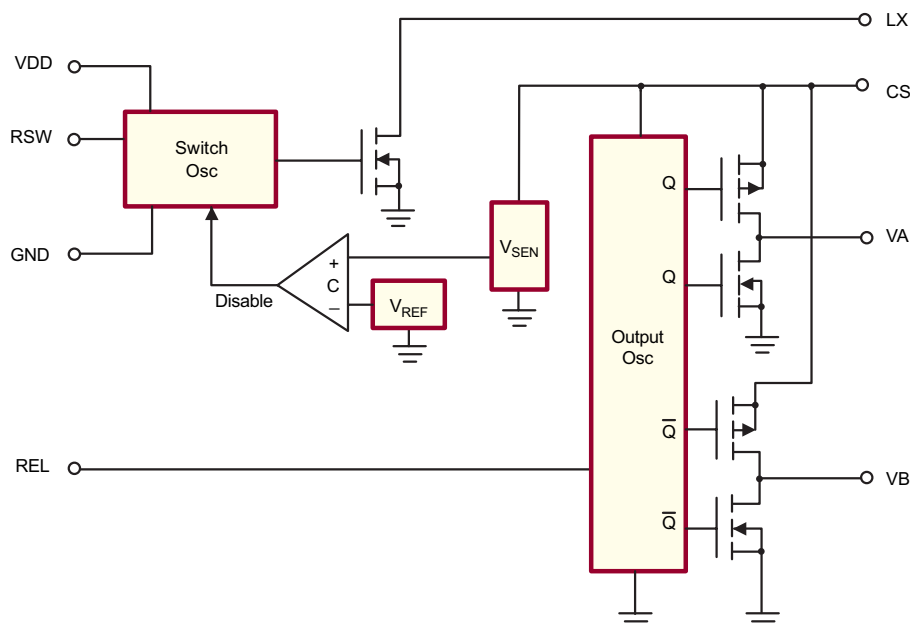
General Description

The Supertex HV826 is a high voltage driver designed for driving EL lamps. The input supply voltage range is from 1.8V to 3.5V. 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 the RSW-Osc pin to VDD/GND.

The HV826 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 RSW-Osc pin and the VDD supply pin. The EL lamp driver frequency is set by an external resistor connected between REL-Osc pin and the VDD pin. An external inductor is connected between the LX pin and VDD pin. A 0.01-0.1 μF capacitor is connected between the CS pin and GND. The EL lamp is connected between the VA pin and the VB pin.

The switching MOSFET charges the external inductor and discharges it into the capacitor at the CS pin. The voltage at CS will start to increase. Once the voltage at CS reaches a nominal value of 80V, the switching MOSFET is turned OFF to conserve power. The output pins VA and VB are configured as an H bridge and are switching in opposite states to achieve 160V peak-to-peak across the EL lamp.

HV826 Block Diagram



Ordering Information

Device	Package Options			
	8-Lead SO		8-Lead MSOP	
HV826	HV826LG	HV826LG-G	HV826MG	HV826MG-G

-G indicates package is RoHS compliant ('Green')

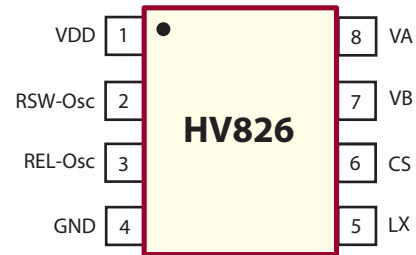


Absolute Maximum Ratings

Parameter	Value
Supply voltage, V_{DD}	-0.5V to +4.5V
Output voltage, V_{CS}	-0.5V to +100V
Operating Temperature Range	-25°C to +85°C
Storage Temperature Range	-65°C to +150°C
MSOP-8 Power Dissipation	250mW
SO-8 Power Dissipation	400mW

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied. Continuous operation of the device at the absolute rating level may affect device reliability. All voltages are referenced to device ground.

Pin Configuration



Top View
8-Lead SOIC/ 8-Lead MSOP

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	-	-	6.0	Ω	$I = 100\text{mA}$
I_{IN}	V_{DD} supply current (including inductor current)	-	35	45	mA	$V_{IN} = 1.5\text{V}$. See Fig.1
I_{DDQ}	Quiescent V_{DD} supply current	-	-	100	nA	$R_{SW-Osc} = \text{LOW}$
V_{CS}	Output voltage on V_{CS}	75	80	85	V	$V_{DD} = 1.8\text{V}$
V_{A-B}	Differential output voltage across lamp	150	160	170	V	$V_{DD} = 1.8\text{V} - 3.5\text{V}$
f_{EL}	V_{A-B} output drive frequency	300	375	450	Hz	$V_{IN} = 1.5\text{V}$. See Fig.1
f_{SW}	Switching transistor frequency	-	80	-	kHz	$V_{IN} = 1.5\text{V}$. See Fig.1
D	Switching transistor duty cycle	-	88	-	%	See Fig.1

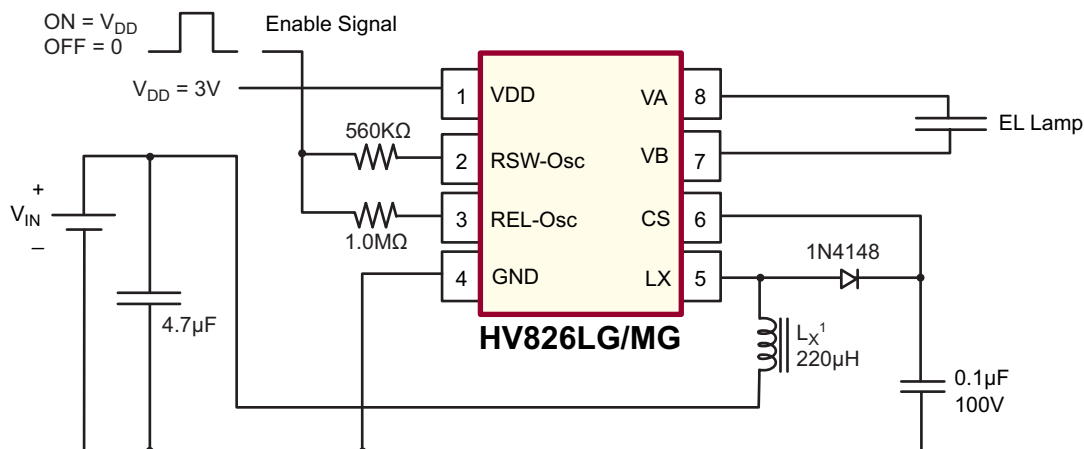
Recommended Operating Conditions

V_{DD}	Supply voltage	1.8	-	3.5	V	---
f_{EL}	V_{A-B} output drive frequency	60	-	1000	Hz	---
T_A	Operating temperature	-25	-	+85	$^\circ\text{C}$	---

Enable/Disable Function Table

EN-L	Logic input low voltage	0	-	0.5	V	$V_{DD} = 1.8\text{V} - 3.5\text{V}$
EN-H	Logic input high voltage	$V_{DD} - 0.5$	-	V_{DD}	V	$V_{DD} = 1.0\text{V} - 3.5\text{V}$

Fig.1: Typical Application



Typical Performance

Lamp Size	V _{IN}	I _{DD}	V _{CS}	f _{EL}	Brightness
1.6in ²	1.5V	35mA	66V	345Hz	5.00ft-Im

Notes:

1. Murata part # LQH4N221K04 (DC resistance < 14.5Ω)

Typical Performance Curves for Fig.1 (1.6in² Lamp)

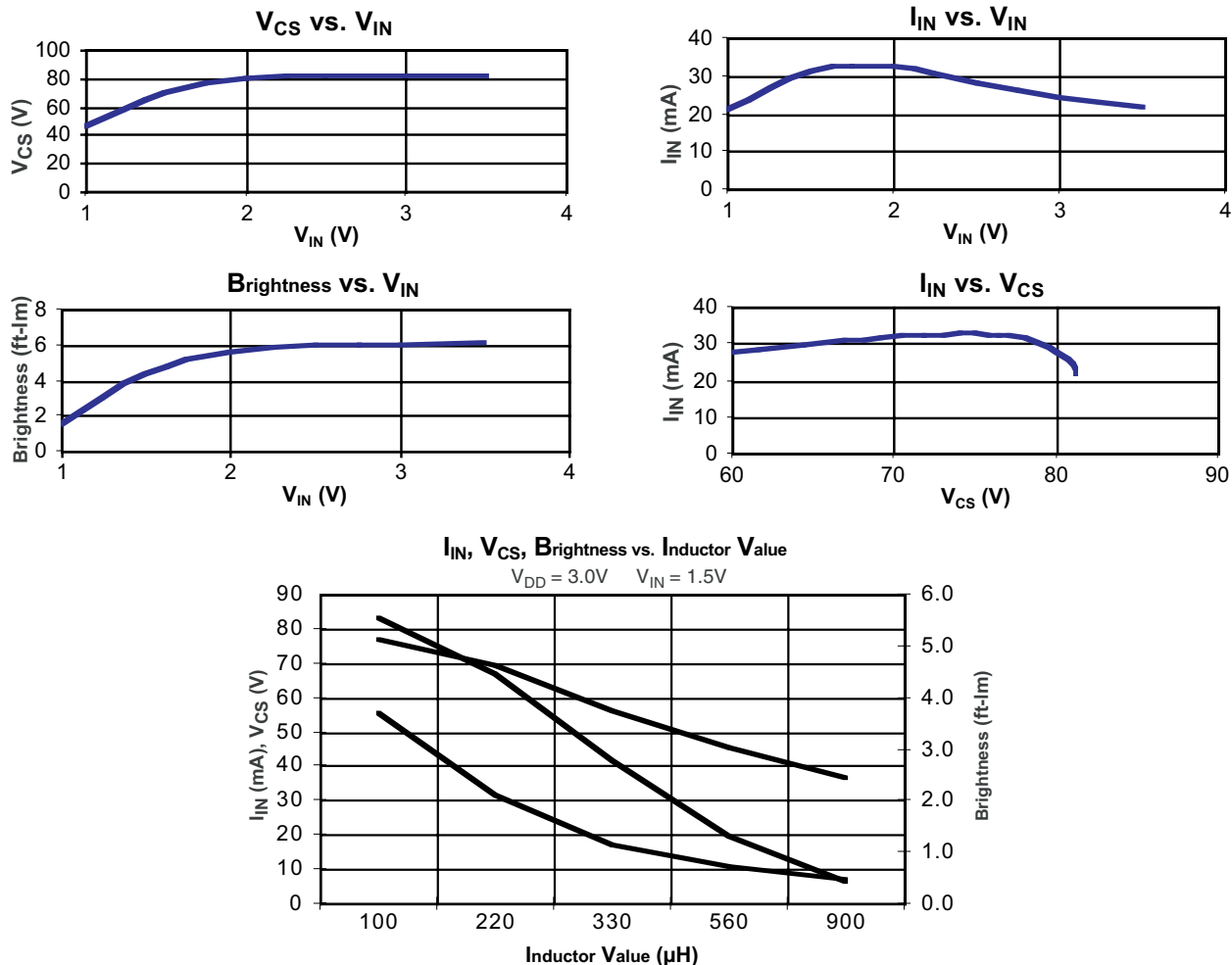
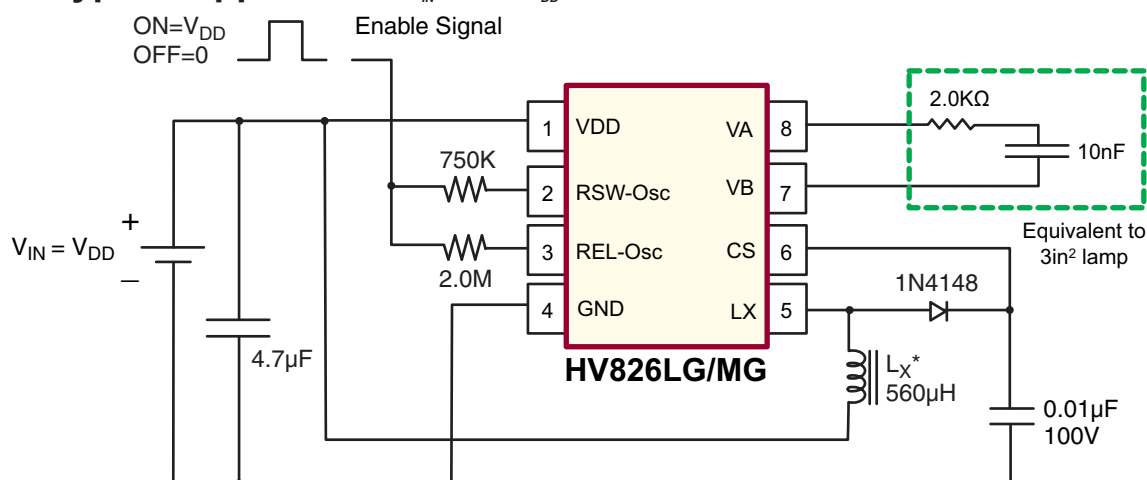


Fig.2: Typical Application ($V_{IN} = 3.0V = V_{DD}$)



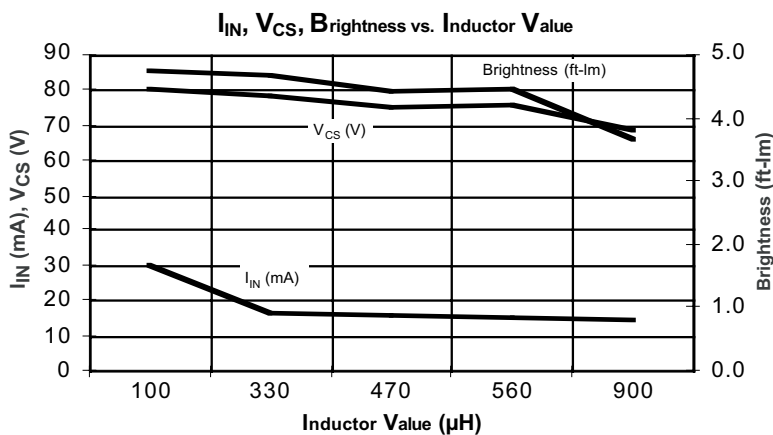
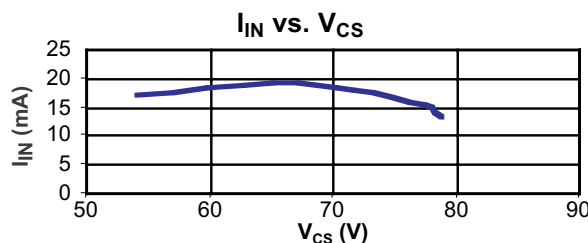
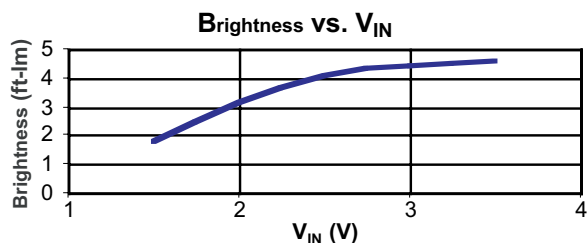
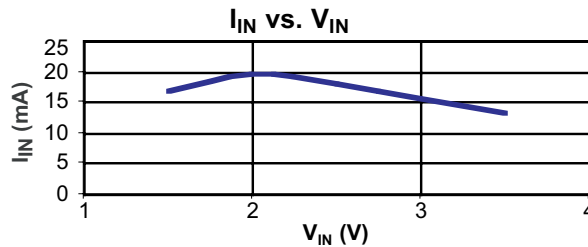
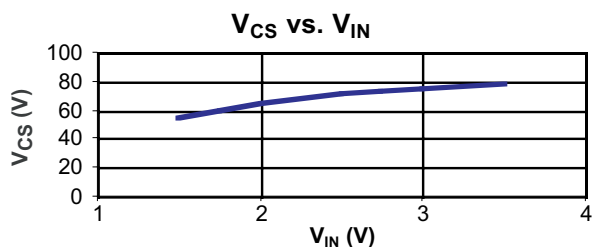
Typical Performance

Lamp Size	V_{IN}	I_{DD}	V_{CS}	f_{EL}	Brightness
3.0in ²	3.0V	23mA	80V	195Hz	4.0ft-Im

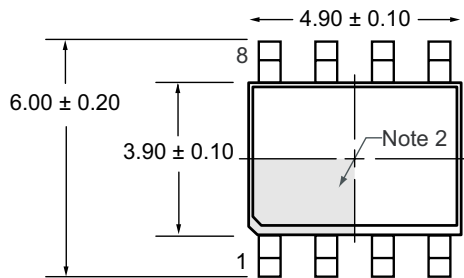
Notes:

- Murata part # LQH4N561K04

Typical Performance Curves for Fig.2 (3.0in² Lamp)



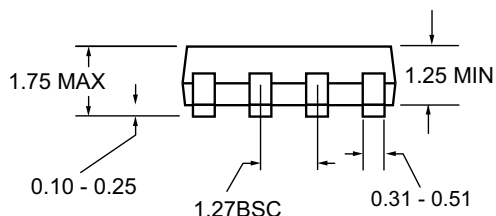
8-Lead SOIC (Narrow Body) Package (LG)



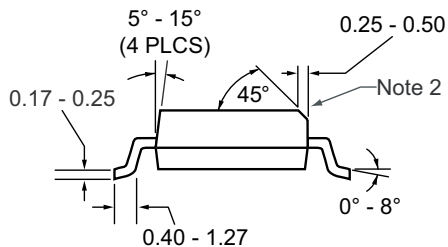
Top View

Notes:

1. All dimensions in millimeters. Angles in degrees.
2. If the corner is not chamfered, then a Pin 1 identifier must be located within the area indicated.



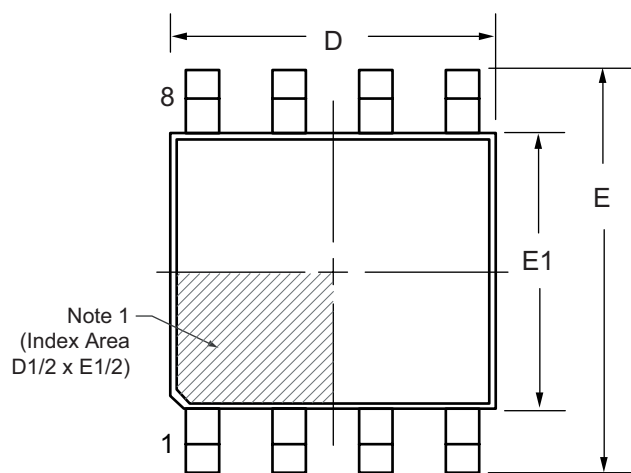
Side View



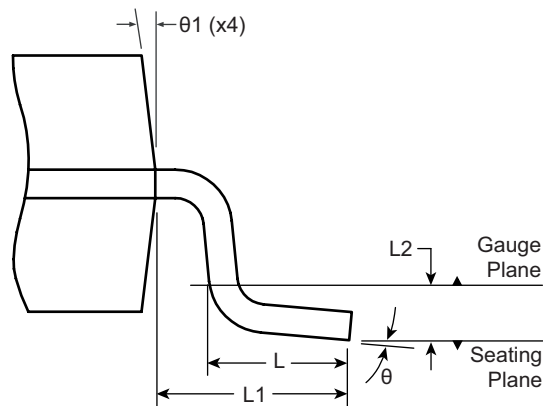
End View

8-Lead MSOP Package Outline (MG)

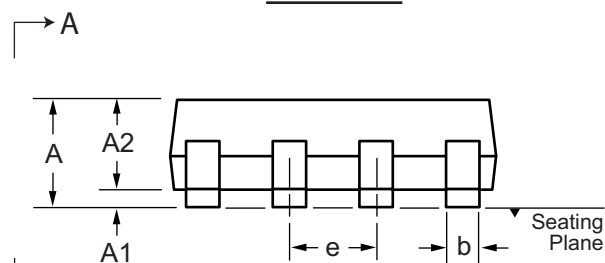
3x3mm body, 1.10mm height (max), 0.65mm pitch



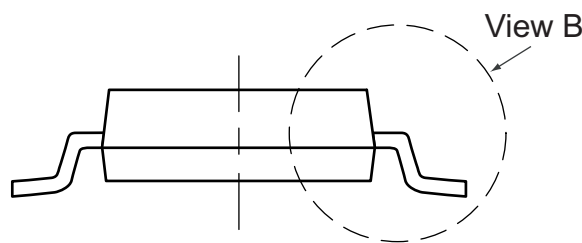
Top View



View B



Side View



View A-A

Note 1:

A Pin 1 identifier must be located in the index area indicated. The Pin 1 identifier may be either a mold, or an embedded metal or marked feature.

Symbol		A	A1	A2	b	D	E	E1	e	L	L1	L2	θ	$\theta 1$
Dimension (mm)	MIN	0.75	0.00	0.75	0.22	2.80	4.65	2.80	0.65 BSC	0.40	0.95 REF	0.25 BSC	0°	5°
	NOM	-	-	0.85	-	3.00	4.90	3.00		0.60			-	-
	MAX	1.10	0.15	0.95	0.38	3.20	5.15	3.20		0.80			8°	15°

JEDEC Registration MO-187, Variation AA, Issue E, Dec. 2004.

Drawings not to scale.

(The package drawing(s) in this data sheet may not reflect the most current specifications. For the latest package outline information go to <http://www.supertex.com/packaging.html>.)

Supertex inc. does not recommend the use of its products in life support applications, and will not knowingly sell its products for use in such applications, unless it receives an adequate "product liability indemnification insurance agreement". **Supertex** does not assume responsibility for use of devices described and limits its liability to the replacement of the devices determined defective due to workmanship. No responsibility is assumed for possible omissions or inaccuracies. Circuitry and specifications are subject to change without notice. For the latest product specifications, refer to the **Supertex** website: <http://www.supertex.com>.

©2007 **Supertex inc.** All rights reserved. Unauthorized use or reproduction is prohibited.

Supertex inc.
 1235 Bordeaux Drive, Sunnyvale, CA 94089
 TEL: (408) 222-8888 / FAX: (408) 222-4895
www.supertex.com