

High-Voltage EL Lamp Driver

Ordering Information

Device	Input Voltage	Package Options		
		8-Lead SO	14-Lead SO	Die
HV8061	1.0V to 1.6V	HV8061LG	HV8061NG	HV8061X
HV8063	2.4V to 3.5V	HV8063LG	HV8063NG	HV8063X

Features

- Processed with HVCMOS® technology
- 0.9V to 3.5V supply voltage
- DC to AC conversion
- Output load range from 0 to 6nF
- Adjustable output lamp frequency
- Adjustable converter frequency
- Remote enable function

Applications

- Pagers
- Cellular phones
- Watches
- Remote control units
- Calculators

Absolute Maximum Ratings

Supply Voltage, V_{DD}	-0.5V to +4.5V
Operating Temperature Range	-40°C to +85°C
Storage Temperature Range	-65°C to +150°C

Note:

*All voltages are referenced to GND.

General Description

The Supertex HV8061 and HV8063 are high-voltage drivers designed for driving EL lamps of up to 3nF (6nF) for a 1V (3V) operation. The input supply voltage ranges are from 1.0V to 1.6V for HV8061 and 2.4V to 3.5V for HV8063. The devices use a single inductor and a minimum number of passive components. The maximum output voltage that can be applied to the EL lamp is $\pm 55V$. The 14-pin package has an ENABLE pin which activates the IC when ENABLE is high.

The HV8061/HV8063 has two internal oscillators, a switching bipolar junction transistor (BJT), and a high-voltage EL lamp driver. The frequency for the switching BJT 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. An external fast recovery diode is connected between the L_x and C_s pins with the anode connected to L_x . A 0.1 μ F storage capacitor is connected between C_s and ground. The EL lamp is connected between V_A and V_B .

The switching BJT charges the external inductor and discharges it into the 0.1 μ 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 50V, the switching BJT 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 100V peak-to-peak across the EL lamp.

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			10	12	Ω	$I = 50\text{mA}$
I_{DD}	V_{DD} supply current (excluding inductor current)	HV8061			2	mA	$V_{DD} = 1.0\text{V to } 1.6\text{V}$
		HV8063			3.5	mA	$V_{DD} = 2.4\text{V to } 3.5\text{V}$
I_{DDQ}	Quiescent V_{DD} supply current	HV8061			2	μA	$V_{DD} = 1.0\text{V to } 1.6\text{V}, \text{ENABLE} = \text{LOW}$
		HV8063			50	μA	$V_{DD} = 2.4\text{V to } 3.5\text{V}, \text{ENABLE} = \text{LOW}$
V_{C_s}	Max. output regulation voltage		45	50	55	V	
V_{A-B}	Max. differential output voltage across lamp		90	100	110	V	

AC Characteristics ($T_A = 25^\circ\text{C}$)

Symbol	Parameter		Min	Typ	Max	Units	Conditions
f_{EL}	V_{A-B} output drive frequency	HV8061		160		Hz	$V_{DD} = 1.0\text{V to } 1.6\text{V}, R_{sw-osc}^1 = 470\text{k}\Omega, R_{EL-osc}^2 = 20\text{M}\Omega$
		HV8063		750		Hz	$V_{DD} = 2.4\text{V to } 3.5\text{V}, R_{sw-osc} = 330\text{k}\Omega, R_{EL-osc} = 10\text{M}\Omega$
f_{sw}	Switching transistor frequency	HV8061		50		kHz	$V_{DD} = 1.0\text{V to } 1.6\text{V}, R_{sw-osc} = 470\text{k}\Omega, R_{EL-osc} = 20\text{M}\Omega$
		HV8063		120		kHz	$V_{DD} = 2.4\text{V to } 3.5\text{V}, R_{sw-osc} = 330\text{k}\Omega, R_{EL-osc} = 10\text{M}\Omega$
D^3	Switching transistor duty cycle			85		%	$V_{DD} = 1.0\text{V to } 3.5\text{V}$

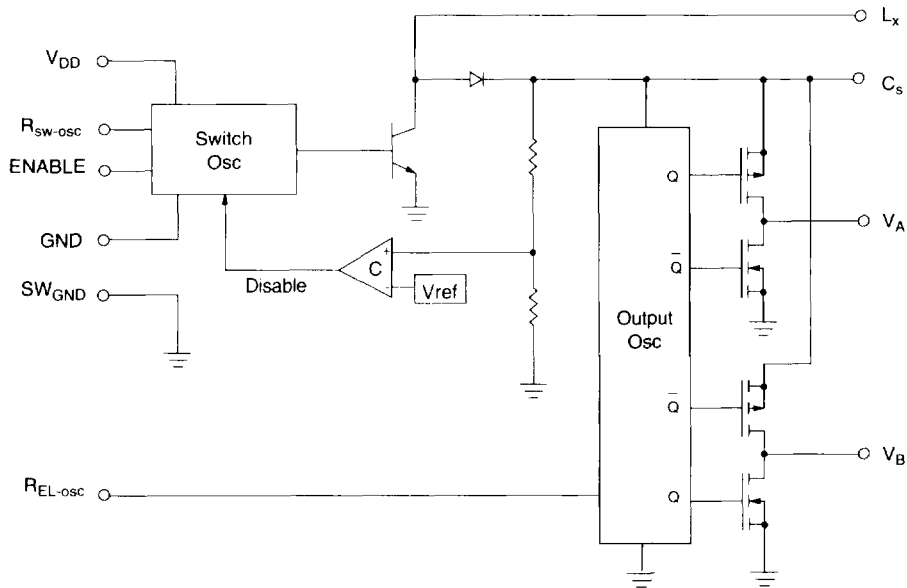
Recommended Operating Conditions

Symbol	Parameter		Min	Typ	Max	Units	Conditions
V_{DD}	Supply voltage	HV8061	1.0		1.6	V	
		HV8063	2.4		3.5		
EN-L	Logic input low voltage	HV8061	0		0.3	V	$V_{DD} = 1.0\text{V to } 1.6\text{V}$
		HV8063	0		0.5	V	$V_{DD} = 2.4\text{V to } 3.5\text{V}$
EN-H	Logic input high voltage	HV8061	0.6		2.1	V	$V_{DD} = 1.0\text{V to } 1.6\text{V}$
		HV8063	$V_{DD} - 0.5$		V_{DD}	V	$V_{DD} = 2.4\text{V to } 3.5\text{V}$
C_L	Load capacitance	HV8061	0		3	nF	$V_{DD} = 1.0\text{V to } 1.6\text{V}$
		HV8063	0		6	nF	$V_{DD} = 2.4\text{V to } 3.5\text{V}$
T_A	Operating temperature		0		70	$^\circ\text{C}$	

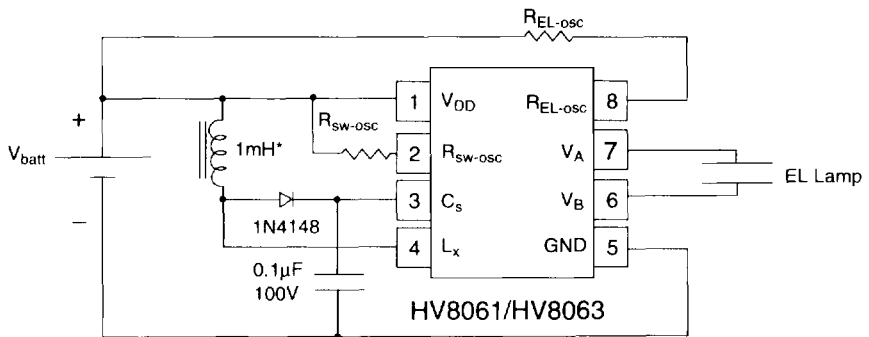
Notes:

1. R_{sw-osc} determines the converter switching frequency.
2. R_{EL-osc} determines the lamp frequency.
3. Guaranteed by design.

Block Diagram



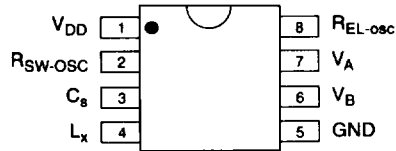
Typical Application



Device	V_{batt}	R_{sw-osc}	R_{EL-osc}
HV8061	1V	470K Ω	20M Ω
HV8063	3V	330K Ω	10M Ω

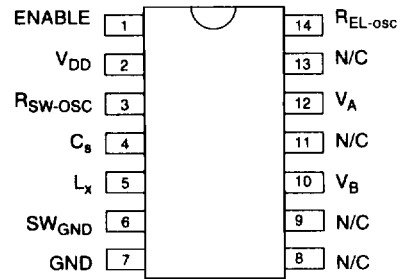
* Suggested inductor manufacturer:
 MuRata Erie part # LQH4N102K04M00 (DC resistance < 25 Ω).

Pin Configurations



top view

SO-8



top view

SO-14