Advance Information

High Voltage EL Lamp Driver

Features

- ❑ Processed with HVCMOS® technology
- ❑ V_{DD} voltage range = 2.7 to 5.5V DC
- ❑ Output load up to 70nF (20 in^2 for 3.5nF/ in^2 lamp)
- ❑ Adjustable DC-DC converter frequency
- ❑ Continious output voltage regulation control (from 50V to 200V)

Application

- ❑ Electronic Organizers
- ❑ Handheld Portable Computers
- ❑ Display Signs
- ❑ Portable Instrumentation Equipment

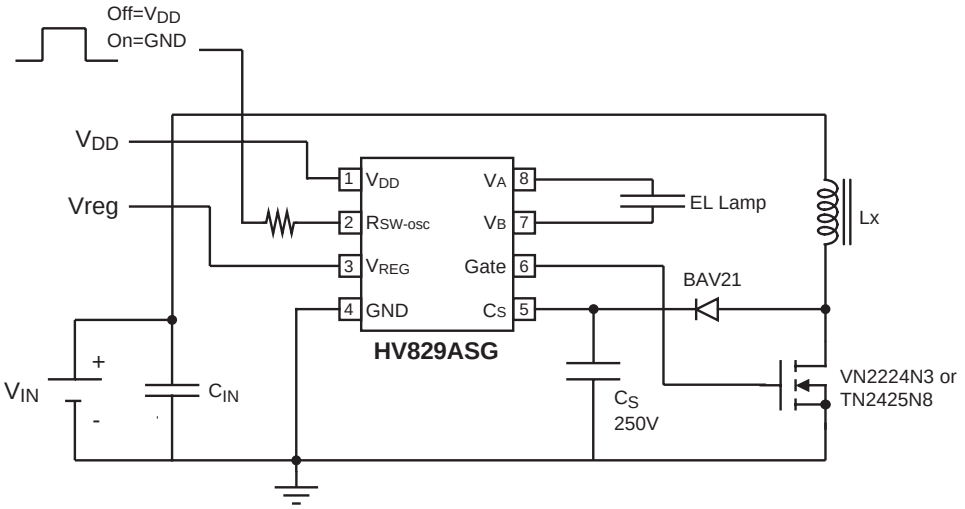
General Description

The Supertex HV829A/B are high voltage EL lamp driver integrated circuits designed for driving EL lamps of up to 70nF at 1000Hz. The input supply voltage range is from 2.7V to 5.5V. These devices use a single inductor, a high voltage switching FET and a minimum number of passive components. The HV829A/B will supply the EL lamp with an AC square wave with a peak-to-peak voltage of two times the set regulated DC voltage.

The HV829A/B has one internal oscillator and a high voltage EL lamp driver. The frequency for the external switching MOSFET is set by an external resistor connected between the R_{SW-osc} pin and GND. The EL frequency for the HV829A is equal to the switching frequency divided by 64 where the EL frequency for the HV829B is equal to the switching frequency divided by 128. Gate of the external MOSFET is connected to the Gate pin. An external inductor is connected between the Drain of external MOSFET and V_{DD} pin. A 0.01-2.5μF capacitor is connected between Cs and ground. The EL lamp is connected between V_A and V_B. The output voltage regulation level is controlled via the V_{REG} pin for dimming and/or conservation of power. The output voltage regulation can be controlled continuously between 50V and 200V depending on the voltage applied to V_{REG} pin (0.75V to 3V).

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 chosen by the user, 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 the AC voltage of +/- VREG voltage across the EL lamp.

Typical Application Circuit



09/05/02

Ordering Information

Device	Output EL Frequency	Package	
		SO-8 w/ Heat Slug	Die
HV829A	Sw oscillator / 64	HV829ASG	HV829AX
HV829B	Sw oscillator / 128	HV829BSG	HV829AX

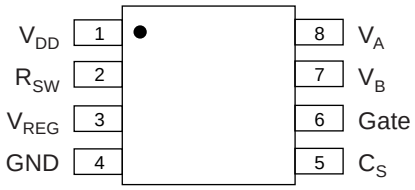
** Mounted on FR4 board, 25mm x 25mm x 1.57mm.

Absolute Maximum Ratings*

Input Voltage to the external Inductor	+18V
V_{DD}	+7.0V
Output voltage, V_{CS}	-.05V to +250V
Operating Temperature	-25°C to +85°C
Storage Temperature	-65°C to +150°C
Power Dissipation	1.5W

*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.

Suggested Pin Configuration



MSOP-8
Top View

Electrical Characteristics

DC Characteristics (Over recommended operating conditions unless otherwise specified, T_A=25°C).

Symbol	Parameter	Min	Typ	Max	Units	Conditions
V_{CS}	Max. output regulation voltage (V_{DD}=2.7 to 5.5V, No load)	42	50	58	V	V_{REG} = 0.75V
		90	100	110		V_{REG} = 1.5V
		135	150	165		V_{REG} = 2.25V
		180	200	220		V_{REG} = 3.0V
f_{sw}	Inductor switching frequency	20	25	30	KHz	V_{CS} = 150V, C_L = 57nF, R_{SW-OSC} = 1M , See Figure 1.
I_{DDQ}	Quiescent V_{DD} supply current			400	nA	
I_{DD}	Input current going into the V_{DD} pin			400	µA	
I_{IN}	Input current including inductor current			195	mA	
I_{INQ}	Quiescent supply current (no load)			200	µA	V_{CS} = 150V, R_{SW-OSC}=1M
				100	µA	
$V_A - V_B$	Differential output voltage across the lamp	84	100	116	V	V_{REG} = 0.75V
		180	200	220		V_{REG} = 1.5V
		270	300	330		V_{REG} = 2.25V
		380	400	440		V_{REG} = 3.0V

Recommended Operating Conditions

f_{SW}	Inductor switching frequency	51.2	64	76.8	KHz	R_{SW-osc}=400 , C_L=70nF
f_{EL}	Output drive frequency	0.8	1.0	1.2		
t_R	Output rise time	235	300	365	µs	V_{CS}=200V, R_{SW-osc}=400 , C_L=70nF, f_{EL}=1KHz
t_F	Output fall time	235	300	365		
t_{r-Gate}	Gate rise time		150		ns	C_G=2500pF Gate to GND
t_{f-Gate}	Gate fall time		50			

Enable/Disable Function Table

V_{IN}	Inductor voltage	3.0		12		
V_{DD}	device supply voltage	2.7		5.5	V	
V_{GATE}	Internal supply voltage	10	12	14		
C_L				70	nF	
T_A	Operating temperature	-25		85	° C	

* No L_X or C_S current when V_{DD}=0V or Hi-Z

Description	Input Voltage (V_{DD})	R_{SW-osc}	Outputs V_A and V_B	Gate
Output Disabled	Hi	V_{DD}	Hi-Z	0V
Output Enabled	Hi	GND	Oscillating	Oscillating
IC off	0V	—	Hi-Z	0V

Functional Block Diagram

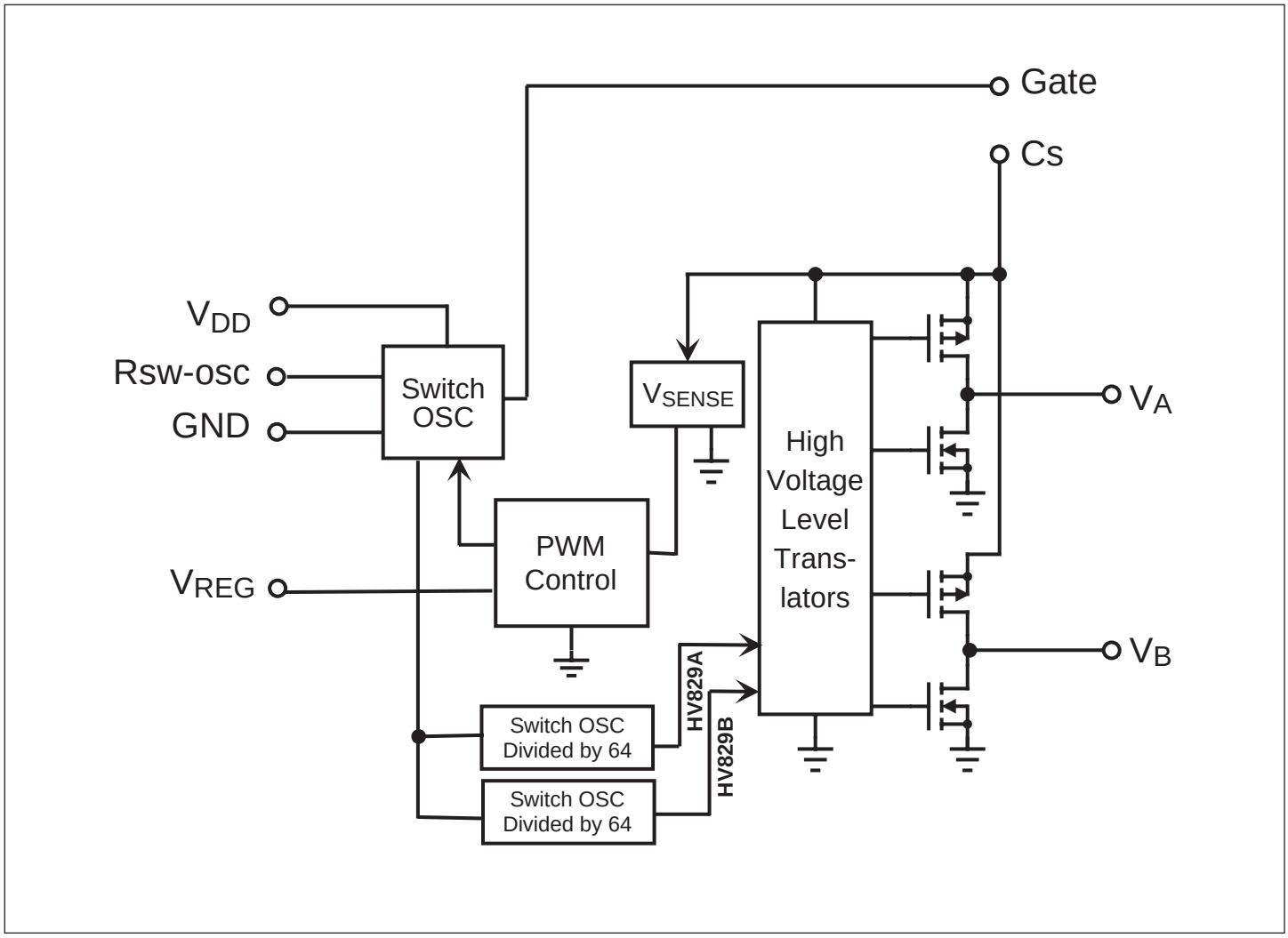
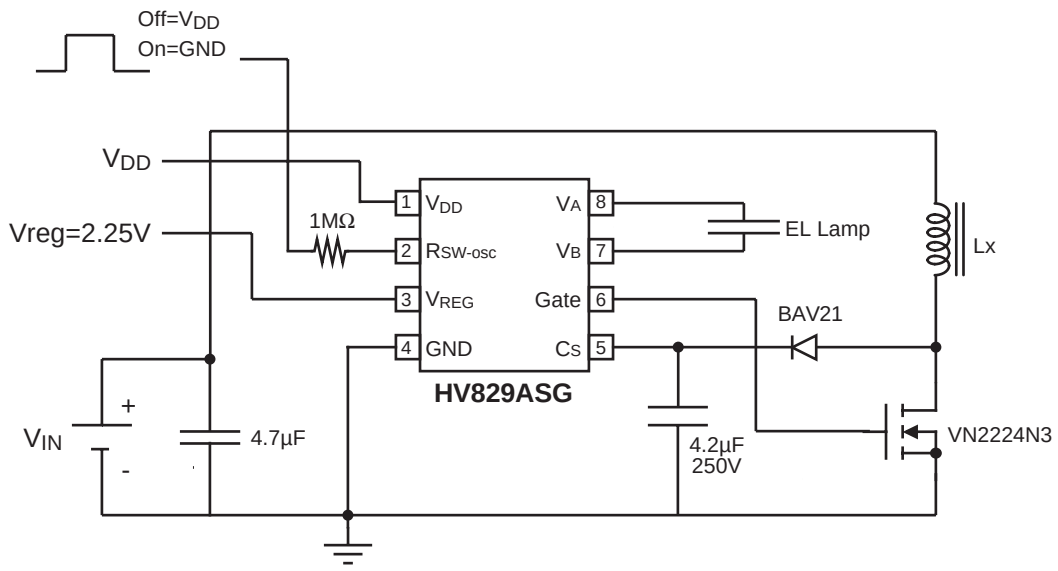


Figure 1: Typical Application/Test Circuit



Typical Performance

Device	Lamp Size	V_{IN}	I_{DD}	V_{CS}	f_{SW}	f_{EL}	Brightness
HV829A/BSG	20 in^2	9.0V	195mA	153V	25KHz	390Hz	18.5ft-lm

* The inductor used is a 330µH J.W. Miller, max. DC resistance of 1.15Ω, part #PM105-331K.

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