National Semiconductor

DH0069 High Voltage Octal Driver for Electrostatic Printers

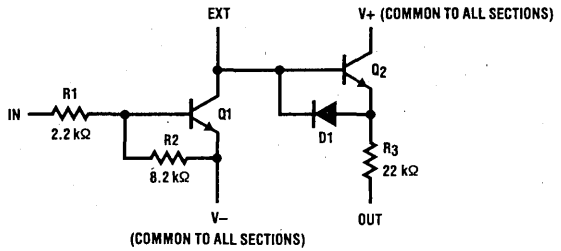
General Description

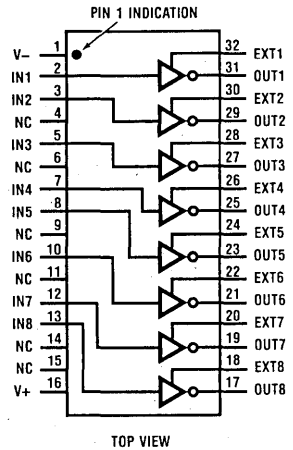
The DH0069 is an eight-channel, high-voltage driver capable of switching over 400V into capacitive loads such as stylus and segment drivers in electrostatic printers. Encased in a 32-pin dual-in-line package, the driver's inputs are TTL compatible and the output transistors are diode protected.

Features

- 8μs matched switching time
- 425V supply capability
- 8 drivers per package

Schematic and Connection Diagram





Order Number DH0069
See NS Package HY32A

Absolute Maximum Ratings (Note 1)

V^+	Supply Voltage	
	DH0069	425 V
V_{IN}	Input Voltage (Ref. V^-)	−6 to +18 V
P_D	Power Dissipation	
	$T_A \leq 25°C$	3.66 W
	Derate linearly at 35°C/W to 2.33W at 70°C	
	$T_C \leq 25°C$	6.25 W
	Derate linearly at 20°C/W to 4.0W at 70°C	
I_{OPK}	Peak Output Current	20 mA
	Short Circuit Duration	
	(R_{EXT} = 470 kΩ, V^+ = 425V, T_C = 25°C)	
	Any Single Output	10 Sec.
	All Outputs Simultaneously (1% Duty Cycle)	50 mS
T_A	Operating Temperature Range	0°C to 70°C
T_{STG}	Storage Temperature Range	−65°C to +150°C
	Lead Temperature (Soldering, 10 Sec.)	300°C

Electrical Characteristics R_{EXT} = 470 kΩ, T_A = 0°C to 70°C, V^+ = 400 V

DC Characteristics

Parameter		Conditions	Min.	Typ.	Max.	Units
V_{IH}	High Level Input Voltage		2.0			V
V_{IL}	Low Level Input Voltage				0.4	V
V_{OH}	High Level Output Voltage	V_{IN} = 0.4 V, R_L = 10 MΩ	380			V
V_{XSAT}	Saturation Voltage (All EXT Pins)	V_{IN} = 2.0 V, I_{EXT} = 2.0 mA (See Fig. 3)			2.0	V
	R_1		1.98	2.20	2.42	kΩ
	R_2		7.38	8.20	9.02	kΩ
	R_3		19.8	22.0	24.2	kΩ

AC Characteristics T_A = 25°C

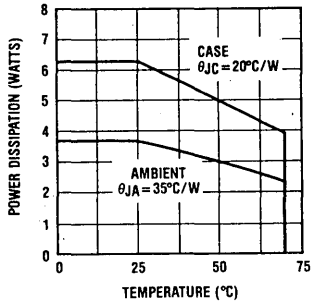
Parameter		Conditions (Note 2)		Min.	Typ.	Max.	Units
t_{PHL}	Propagation Delay High to Low Output	V_{IN} = 0.4 V to 2.0 V	C_L = 50 pF		4.0	10	μs
			C_L = 15 pF, R_L = 1 MΩ		1.8		μs
t_{PLH}	Propagation Delay Low to High Output	V_{IN} = 2.0 V to 0.4 V	C_L = 50 pF		14	24	μs
			C_L = 15 pF, R_L = 1 MΩ		12		μs
Δt_{PLH}	Differential Propagation Delay (Matching Between Sections)	C_L = 50 pF				8.0	μs

Note 1: Absolute maximum ratings are those values beyond which reliable operation cannot be guaranteed.

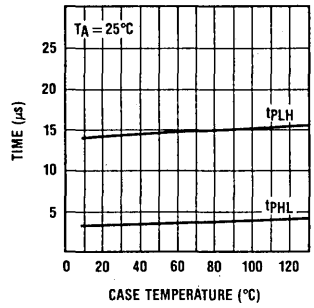
Note 2: C_L includes oscilloscope probe capacitance.

Typical Performance Characteristics and Applications

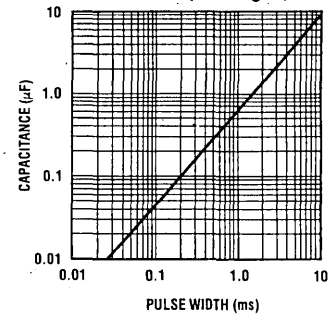
Maximum Power Dissipation



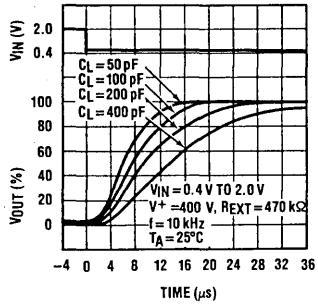
Switching Time Versus Temperature



Recommended Coupling Capacitance Versus Pulse Width (See Fig. 1)



Response to Capacitive Loads (t_{PLH})



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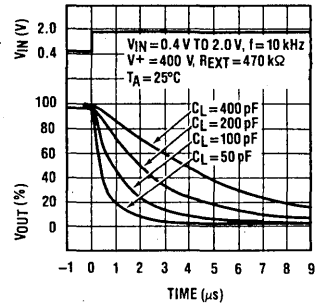


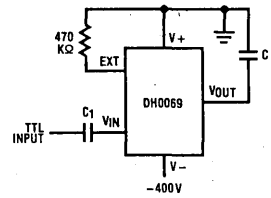
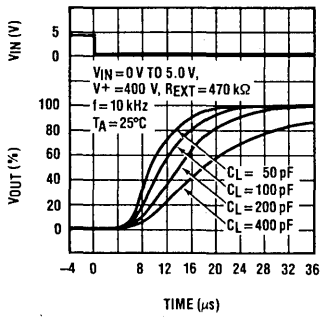


Figure 1. Capacitor Coupling Using a Negative Supply

Response to Capacitive Loads (t_{PLH})



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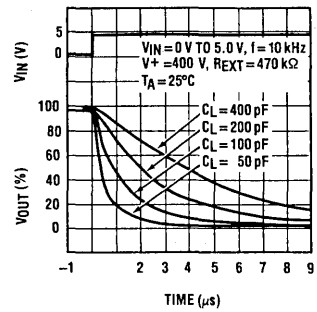

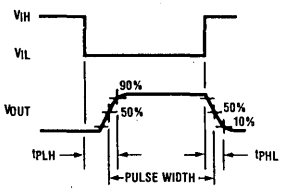

Figure 2. Waveforms

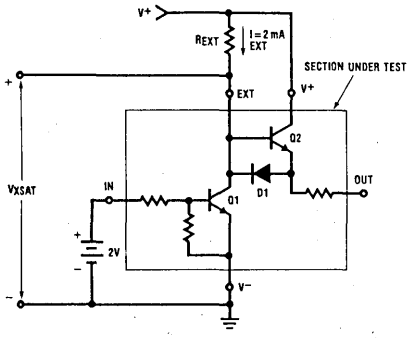

Figure 3. V_{XSAT} Test Circuit

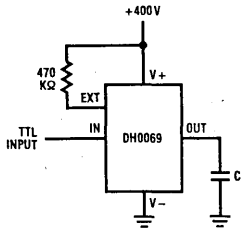

Figure 4. DH0069 Driving Capacitive Load

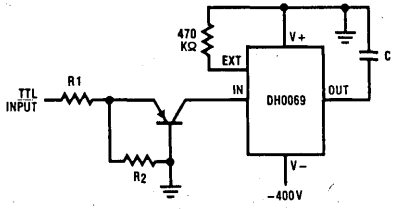

Figure 5. D.C. Coupled Driver Using a Negative Supply