

HA13007

Quad Driver

Description

The HA13007 monolithic, bipolar, high-voltage, high-current quad driver is especially designed for switching applications. This device is recommended for interfacing low-level logic to peripheral loads such as relays, solenoids, stepping motors, LED, heaters, and other similar high-voltage, high-current loads.

Features

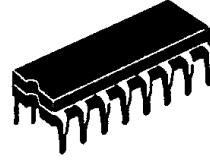
- Guaranteed minimum output breakdown of 60 V, and maximum output current of 0.7 A
- Low output collector-emitter saturation voltage
- Input compatible with TTL, LSTTL and 5 V CMOS.
- Integral transient suppression diodes for inductive loads
- Lower input current

Table 1 Truth Table

ENABLE	IN	OUT
H	H	L
H	L	H
L	X	H

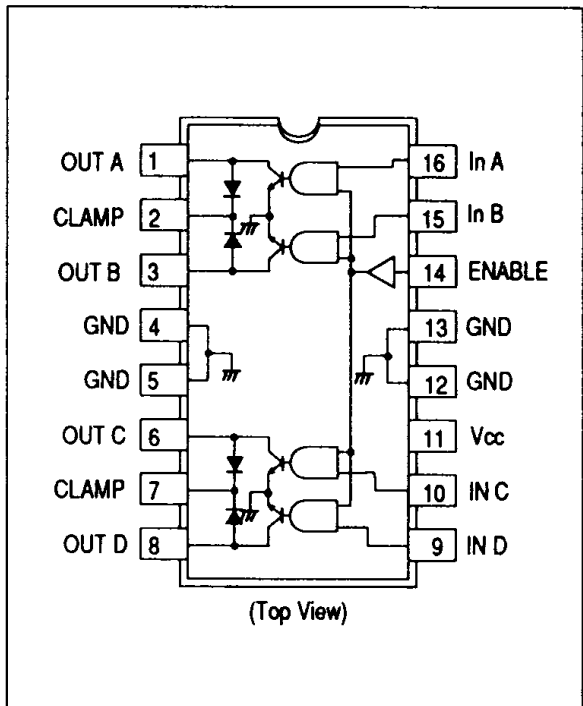
Note: H=High level: 2.0 V
L=Low level: 0.8 V
X=Don't care

HA13007



(DP-16C)

Pin Arrangement



Ordering Information

Type No.	Package
HA13007	DC-16C



Table 2 Absolute Maximum Ratings (Ta=25 °C)

Item	Symbol	Rating	Unit	Note
Supply voltage	V _{CC}	7.0	V	1
Input voltage	V _{IN}	0 to V _{CC}	V	
Output voltage	V _{CEX}	60	V	
Output current	I _{OUT}	0.7	A	
Power dissipation	P _T	1.85	W	2
Thermal resistance	Junction-case	θ _{jc}	15	°C/W
	Junction-ambient	θ _{ja}	60	°C/W
Junction temperature	T _j	150	°C	
Operating junction temperature range	T _{jop}	-40 to +125	°C	
Storage temperature range	T _{stg}	-55 to +125	°C	

The absolute maximum ratings are limiting values, to be applied individually, beyond which the device may be permanently damaged. Functional operation under any of these conditions is not guaranteed. Exposing a circuit to its absolute maximum rating for extended periods of time may affect the device's reliability.

- Notes: 1. Recommended operating voltage V_{CC} = 4.75 to 5.5 V
 2. Thermal resistances are as follows:
 θ_{j-a1} ≤ 60 °C/W (Soldered on a print circuit board)
 θ_{j-a2} ≤ 35 °C/W (Soldered on a print circuit board with copper sufficiently)
 θ_{j-a3} ≤ 15 °C/W (Soldered on pins 4, 5, 12, and 13 with an infinite heat sink)

Table 3 Electrical Characteristics (Ta=25 °C, V_{CC}=5.5 V)

Item	Symbol	Min	Typ	Max	Unit	Test Condition
Output leakage current	I _{CEX}	—	—	100	μA	V _{CE} =60 V, V _{IN} =0.8 V
Output sustaining voltage	V _{CE(sus)}	60	—	—	V	V _{IN} =0.8 V, I _c =10 mA
Output saturation voltage	V _{CE(sat)}	—	0.3	0.5	V	V _{CC} =4.75 V, I _c =0.4 A V _{IN} =2.0 V
		—	0.5	0.7		
Input low voltage	V _{IL}	—	—	0.8	V	
Input low current	I _{IL}	—	-1	±10	μA	V _{IN} =0.8 V, I _c =0
Input high voltage	V _{IH}	2.0	—	—	V	



HA13007

Electrical Characteristics (Ta=25 °C, Vcc=5.5 V) (cont)

Input high current	I _{IH}	—	0	±10	μA	I _C =0.7 A x 4	V _{IN} =2.0 V
		—	—	1.0	mA		V _{IN} =5.0 V
Supply current (all outputs on)	I _S	—	50	65	mA	I _C =0.7 A x 4, V _{IN} =5.5 V (All Inputs)	
Supply current (all outputs off)	I _{SO}	—	8.0	—	mA	V _{IN} =0.8 V (All Inputs)	
Clamp diode leakage current	I _R	—	—	100	μA	V _R =60 V	
Clamp diode forward voltage	V _F	—	1.2	1.6	V	V _{IN} =0.8 V	I _F =1.0 A
		—	1.3	2.0	V		I _F =1.5 A
Turn-on delay	t _{PLH}	—	1.0	—	μs		
Turn-off delay	t _{PHL}	—	0.3	—	μs		

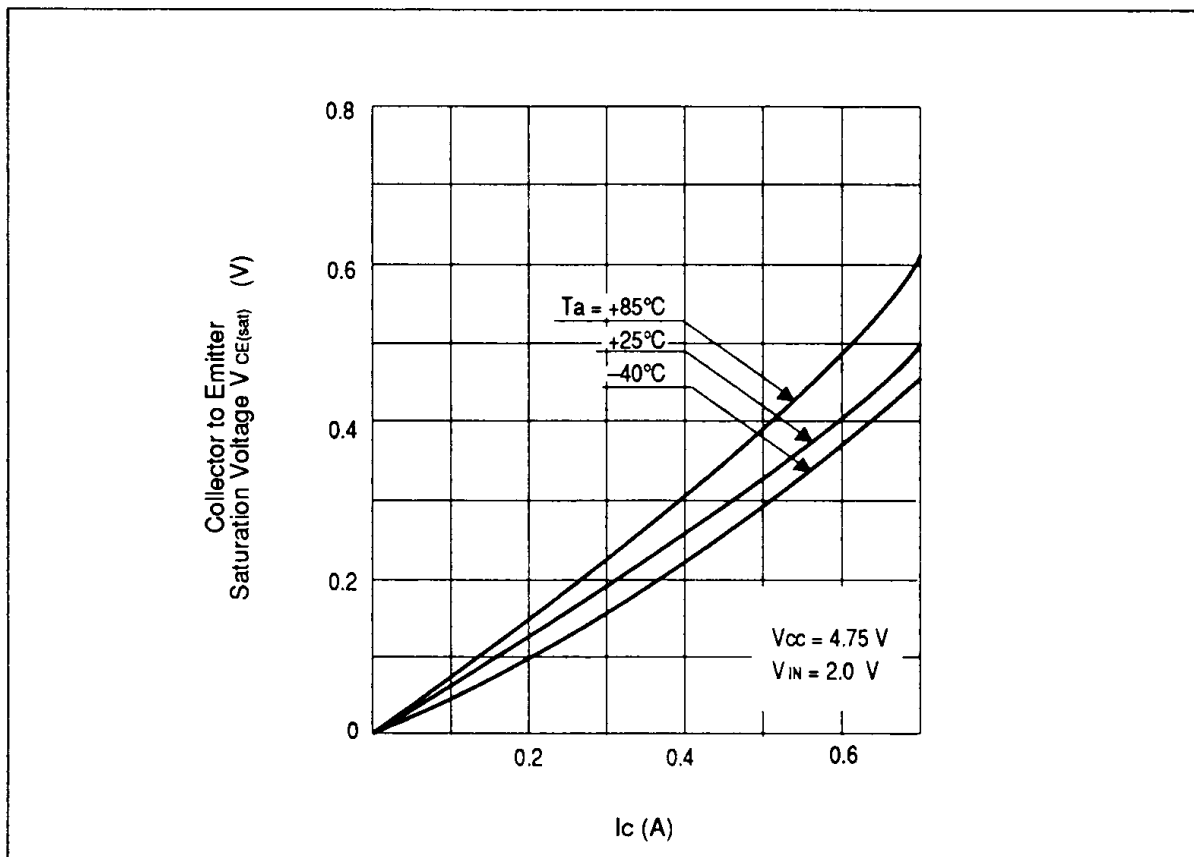


Figure 1 Output Saturation Voltage vs Output Current



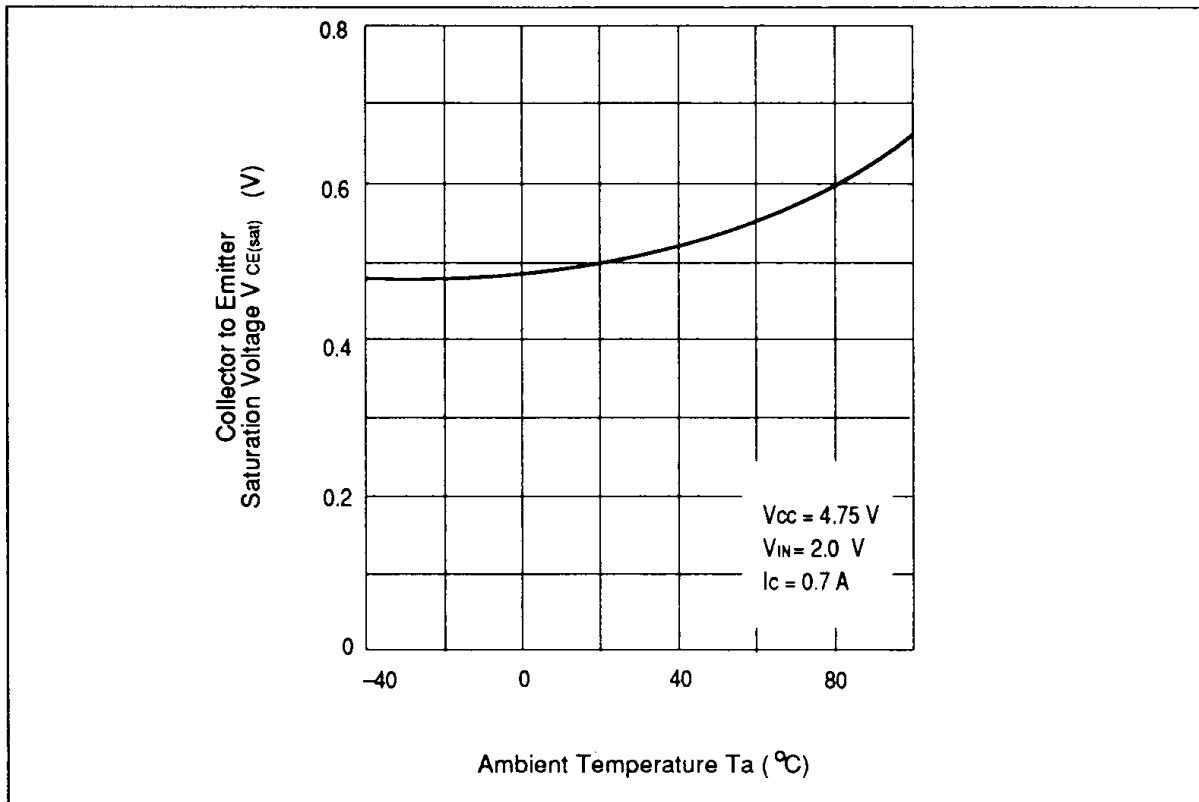


Figure 2 Output Saturation Voltage vs Ambient Temperature

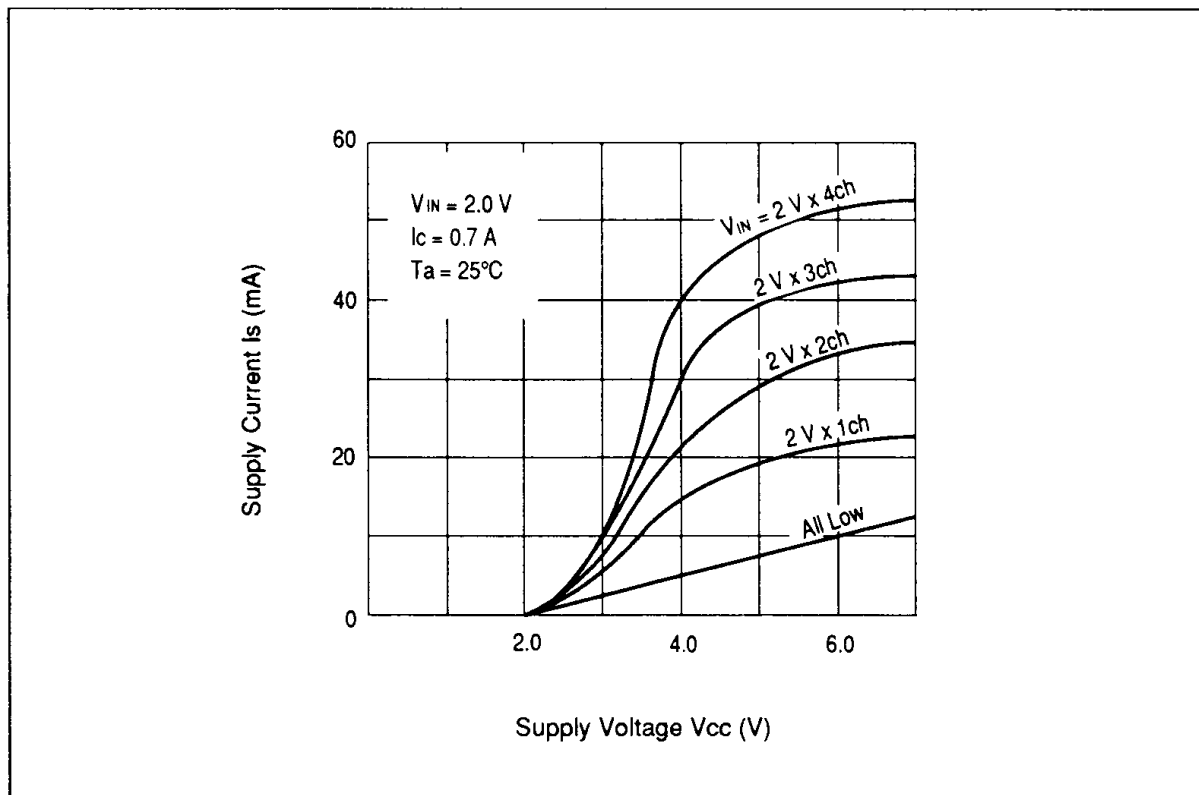


Figure 3 Output Current vs Supply Voltage

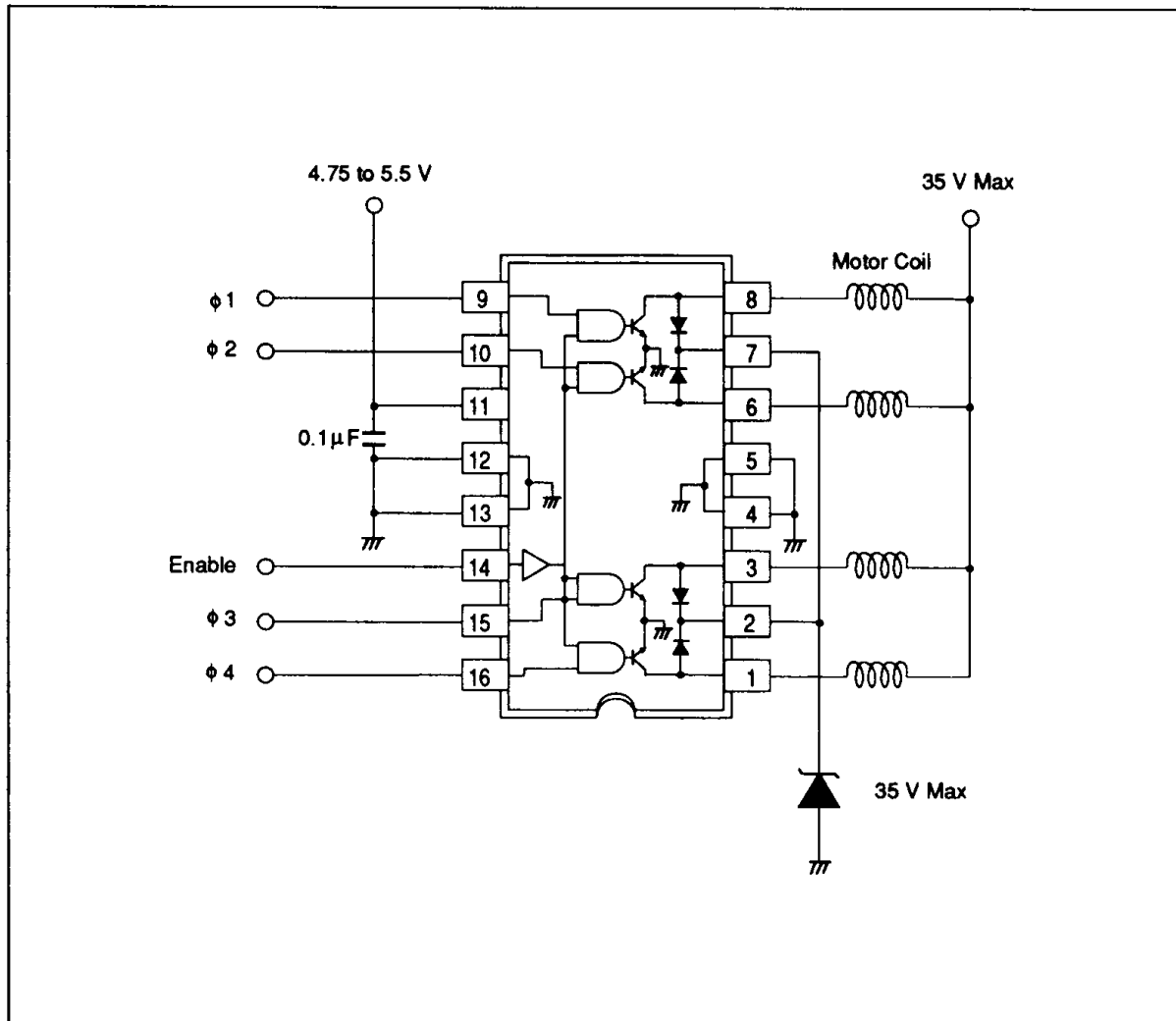


Figure 4 Stepping Motor Drive Application