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

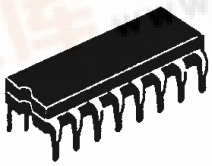
- Guaranteed minimum output breakdown of 60 V, and maximum output current of 0.7 A
- Low output collector-emitter saturation voltage
- Input compatible with TTL, LSTTL and 5 V CMOS.
- Integral transient suppression diodes for inductive loads
- Lower input current

Table 1 Truth Table

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

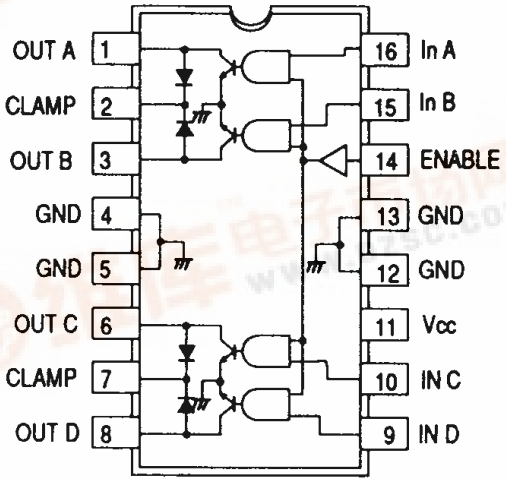
Note: H=High level: 2.0 V
L=Low level: 0.8 V
X=Don't care

HA13007



(DP-16C)

Pin Arrangement



(Top View)

Ordering Information

Type No.	Package
HA13007	DC-16C

HITACHI
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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		Tj	150	°C	
Operating junction temperature range		Tjop	–40 to +125	°C	
Storage temperature range		Tstg	–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:
$\theta_{j\text{-}a1} \leq 60$ °C/W(Soldered on a print circuit board)
$\theta_{j\text{-}a2} \leq 35$ °C/W(Soldered on a print circuit board with copper sufficiently)
$\theta_{j\text{-}a3} \leq 15$ °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, V_{IN}=2.0 V	I_C=0.4 A
		—	0.5	0.7			I_C=0.7 A
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		

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

Input high current	I_{IH}	—	0	±10	μA	Ic=0.7 Ax4	V_{IN}=2.0 V
		—	—	1.0	mA		V_{IN}=5.0 V
Supply current (all outputs on)	Is	—	50	65	mA	Ic=0.7 Ax4, V_{IN}=5.5 V(All Inputs)	
Supply current (all outputs off)	Iso	—	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		

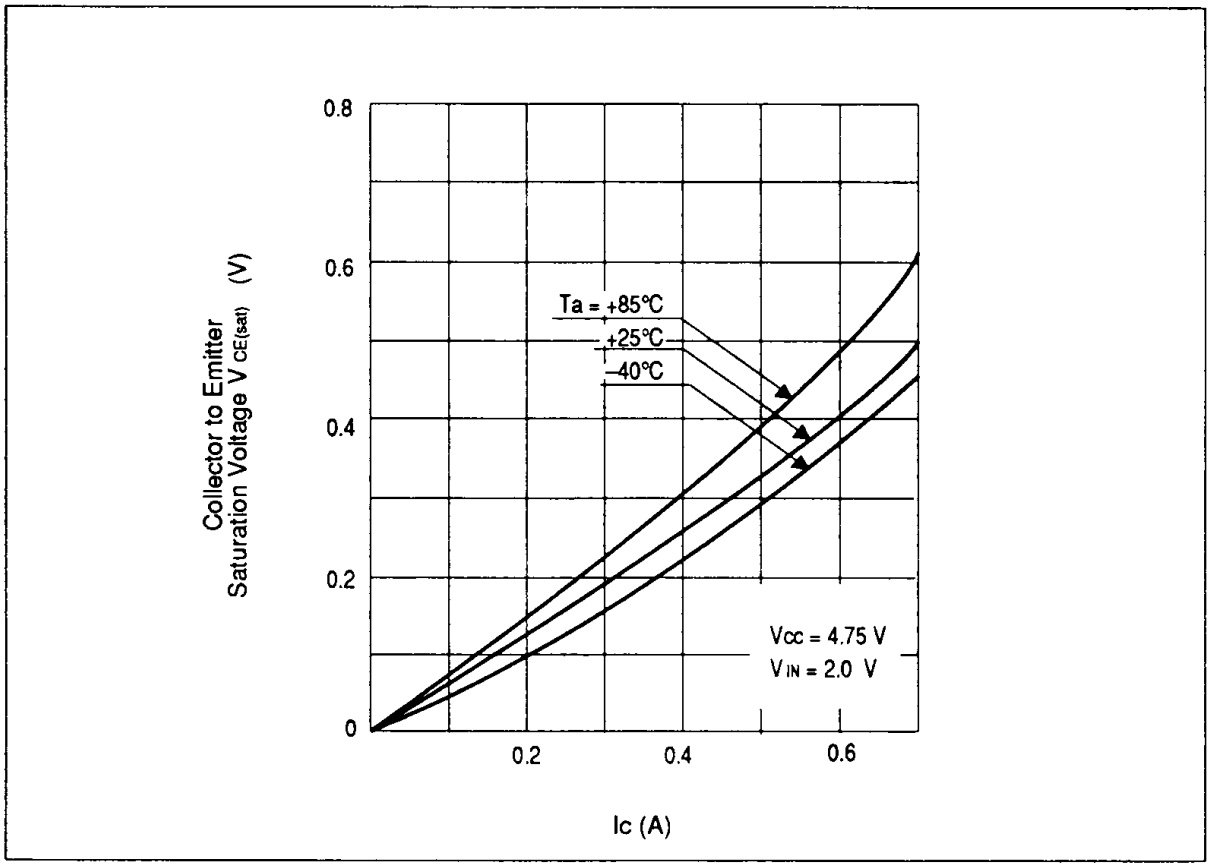

Figure 1 Output Saturation Voltage vs Output Current

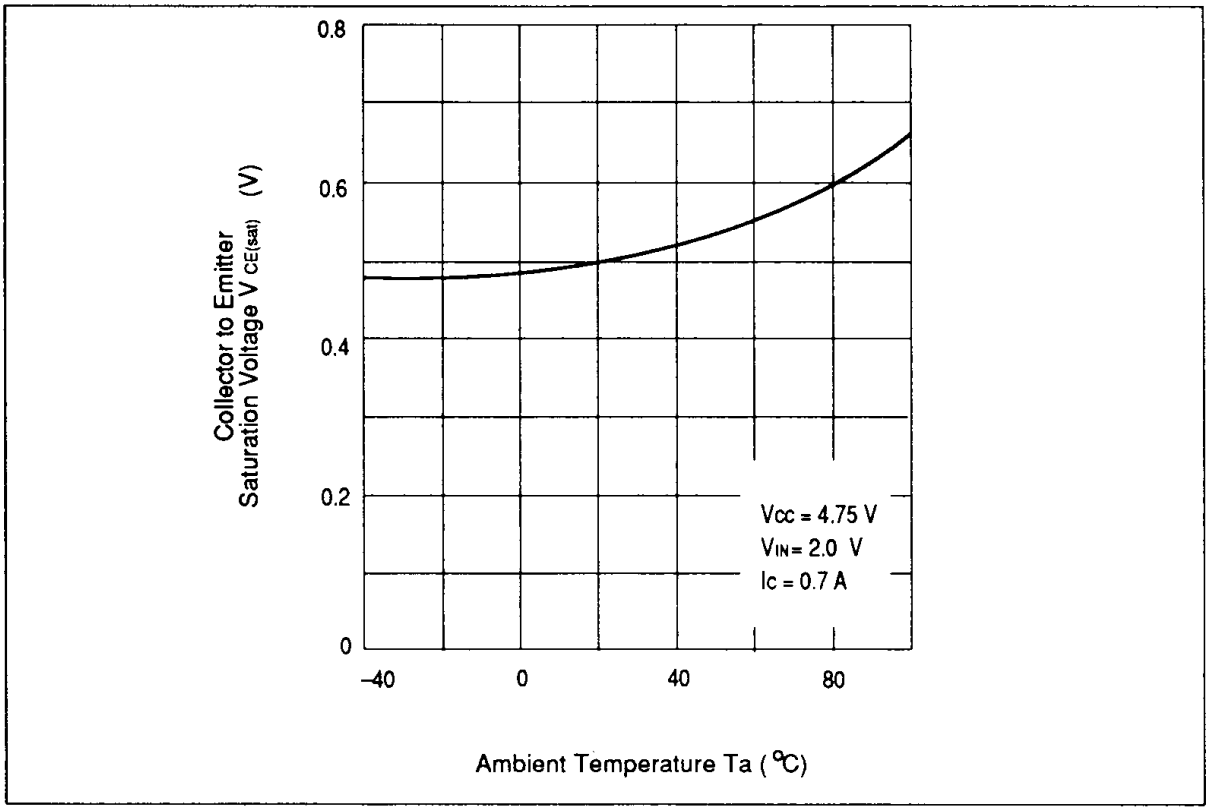

Figure 2 Output Saturation Voltage vs Ambient Temperature

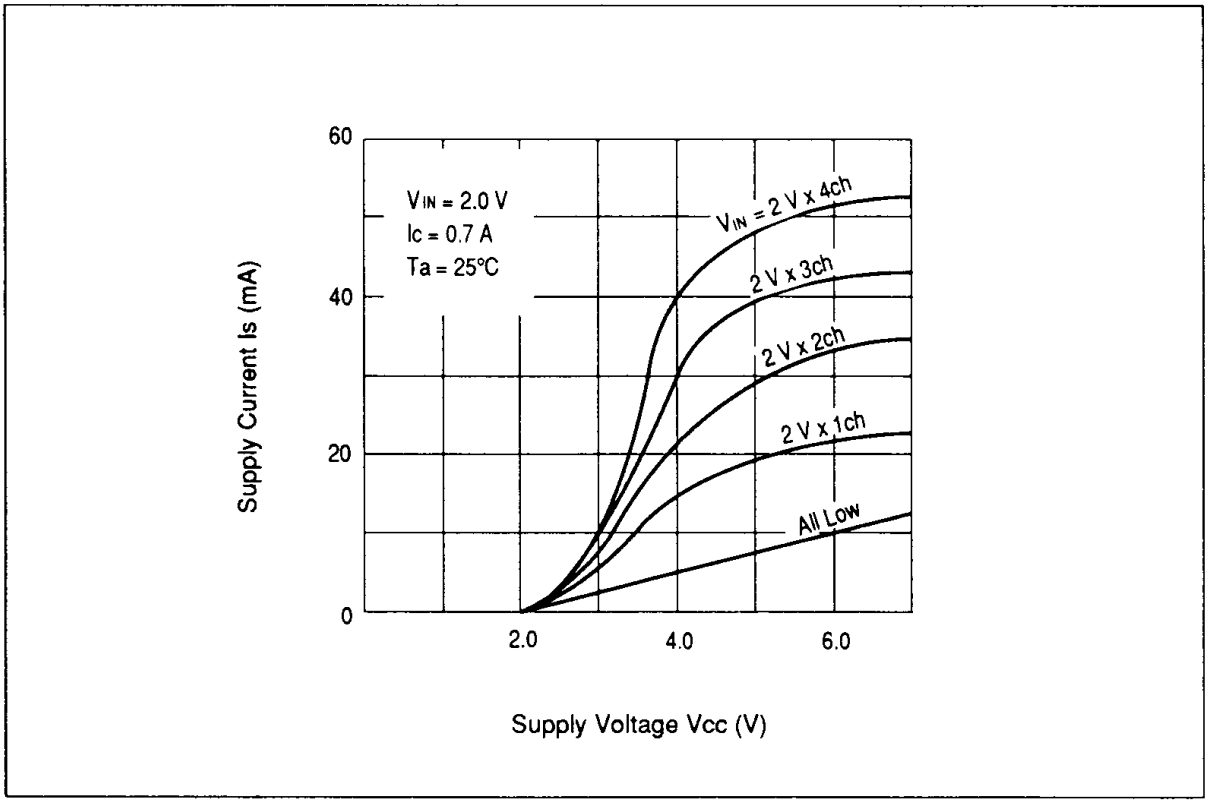

Figure 3 Output Current vs Supply Voltage

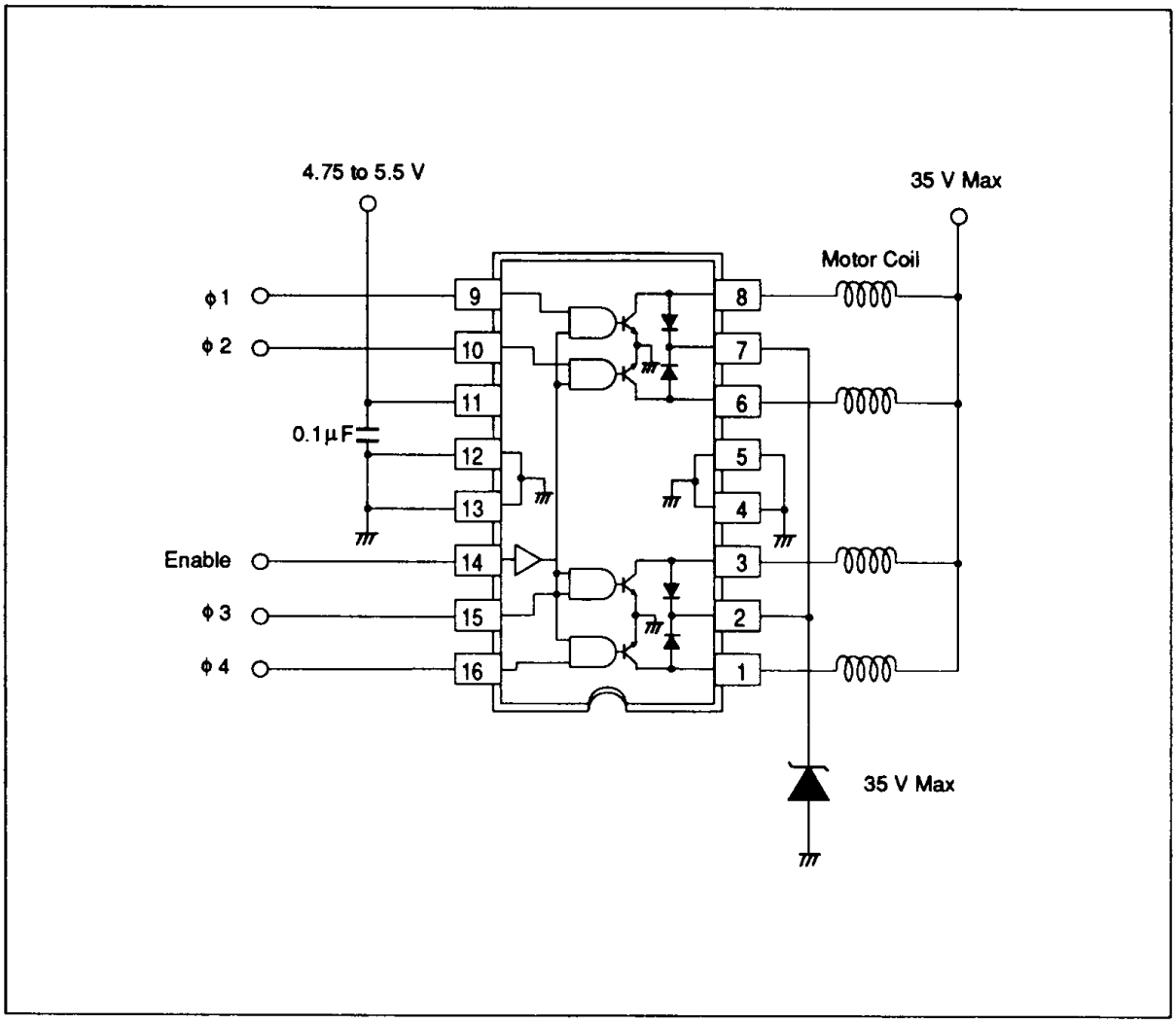

Figure 4 Stepping Motor Drive Application