HA13007

Quad Driver

HITACHI

ADE-207-205 (Z)
1st Edition
July 1, 1996

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

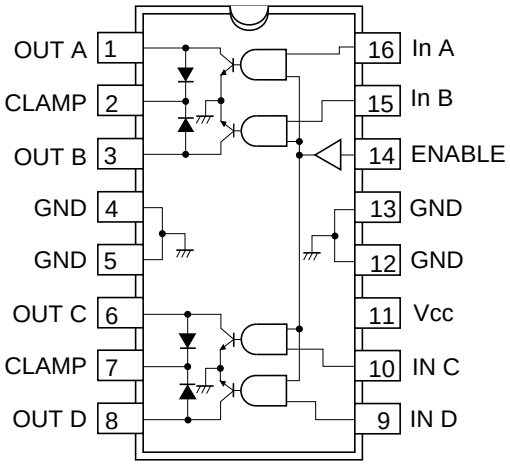
- Guaranteed minimum output breakdown of 60 V, and maximum output current of 0.7 A
- Low output collector-emitter saturation voltage
- Input compatible with TTL, LSTTL and 5 V CMOS.
- Integral transient suppression diodes for inductive loads
- Lower input current

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

Pin Arrangement



(Top View)

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Rating	Unit	Notes
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	
Thermal resistance/Junction-case	θjc	15	°C/W	2
Thermal resistance/Junction-ambient	θja	60	°C/W	2
Junction temperature	Tj	150	°C	
Operating junction temperature range	Tjop	–40 to +125	°C	
Storage temperature range	Tstg	–55 to +125	°C	

Notes: 1. Recommended operating voltage V_{CC} = 4.75 to 5.5 V

2. Thermal resistances are as follows:

θj-a1 ≤ 60°C/W (Soldered on a print circuit board)

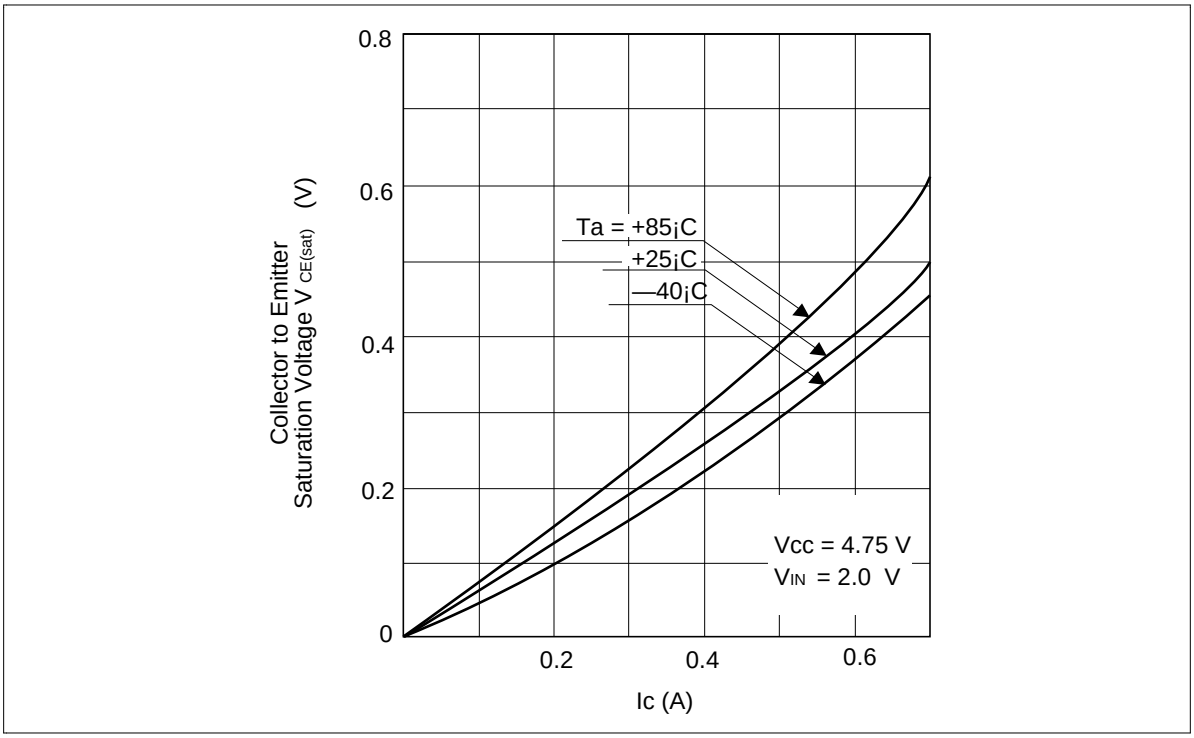
θ -a2 ≤ 35°C/W (Soldered on a print circuit board with copper sufficiently)

θj-a3 ≤ 15°C/W (Soldered on pins 4, 5, 12, and 13 with an infinite heat sink)

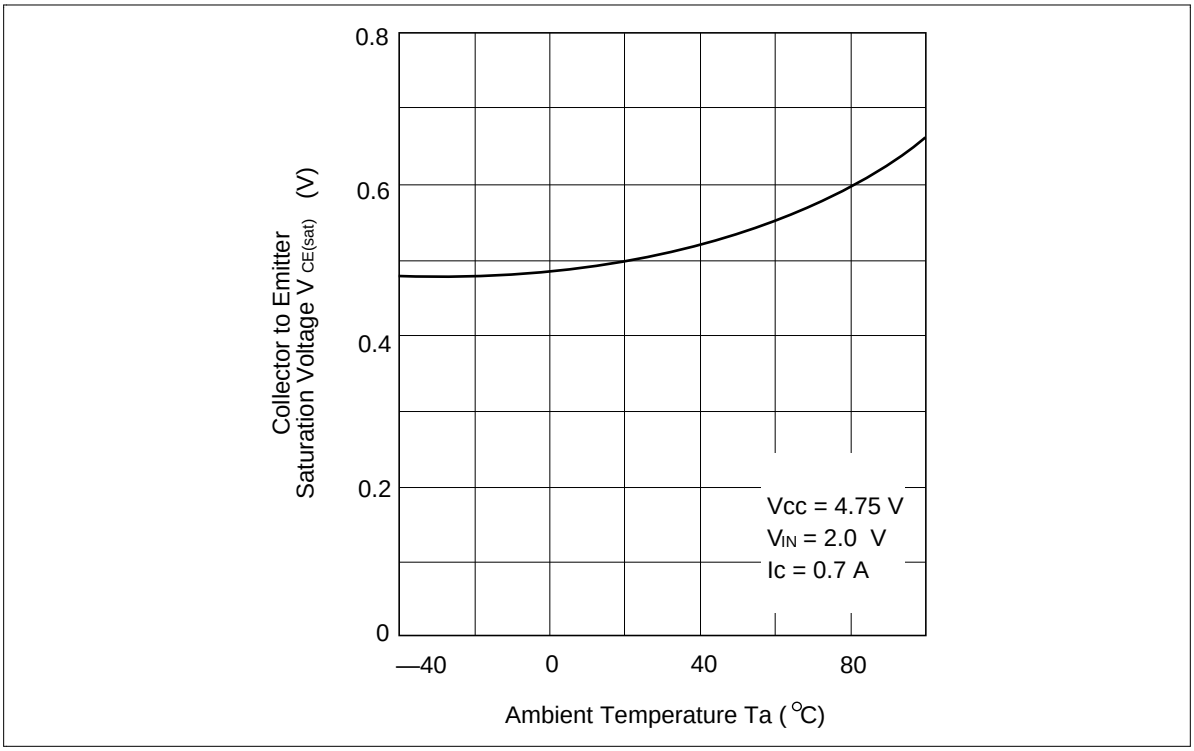
Electrical Characteristics (Ta = 25°C, V_{CC} = 5.5 V)

Item	Symbol	Min	Typ	Max	Unit	Test Conditions
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, Ic = 100 mA
Output saturation voltage	$V_{CE(sat)}$	—	0.3	0.5	V	V_{CC} = 4.75 V, V_{IN} = 2.0 V, Ic = 0.4 A
		—	0.5	0.7	V	V_{CC} = 4.75 V, V_{IN} = 2.0 V, Ic = 0.7 A
Input low voltage	V_{IL}	—	—	0.8	V	
Input low current	I_{IL}	—	–1	±10	µA	V_{IN} = 0.8 V, Ic = 0
Input high voltage	V_{IH}	2.0	—	—	V	
Input high current	I_{IH}	—	0	±10	µA	Ic = 0.7 Ax4, V_{IN} = 2.0 V
		—	—	1.0	mA	Ic = 0.7 Ax4, 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	V_{IN} = 0.8 V, I_F =1 .5 A
Turn-on delay	t_{PLH}	—	1.0	—	µs	
Turn-off delay	t_{PHL}	—	0.3	—	µs	

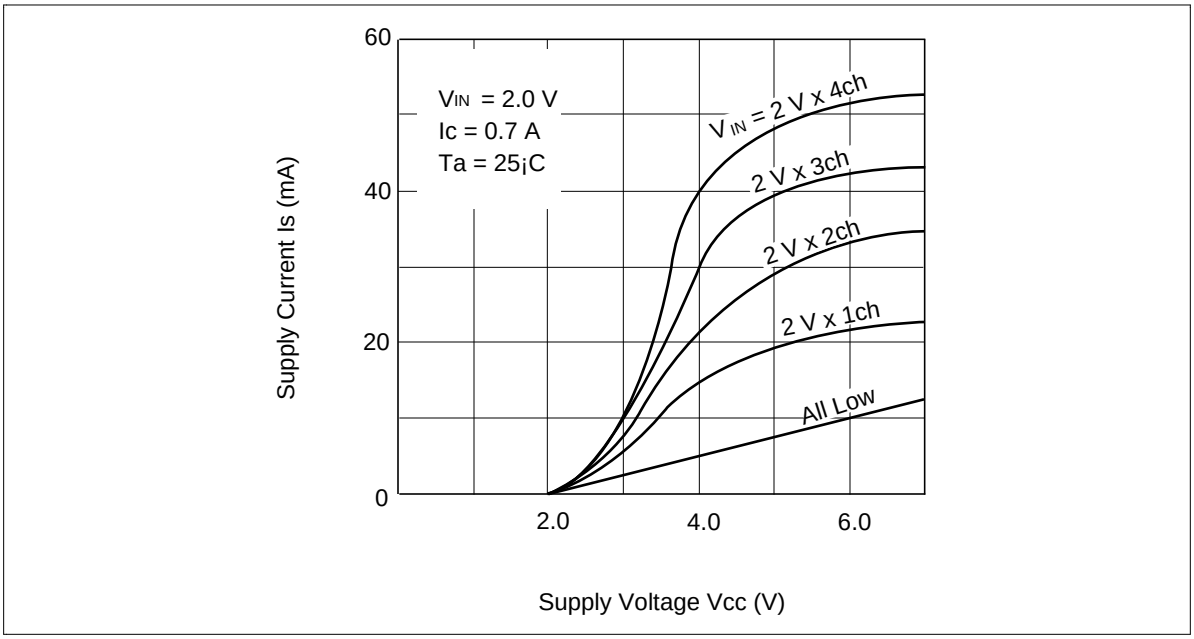
Output Saturation Voltage vs. Output Current



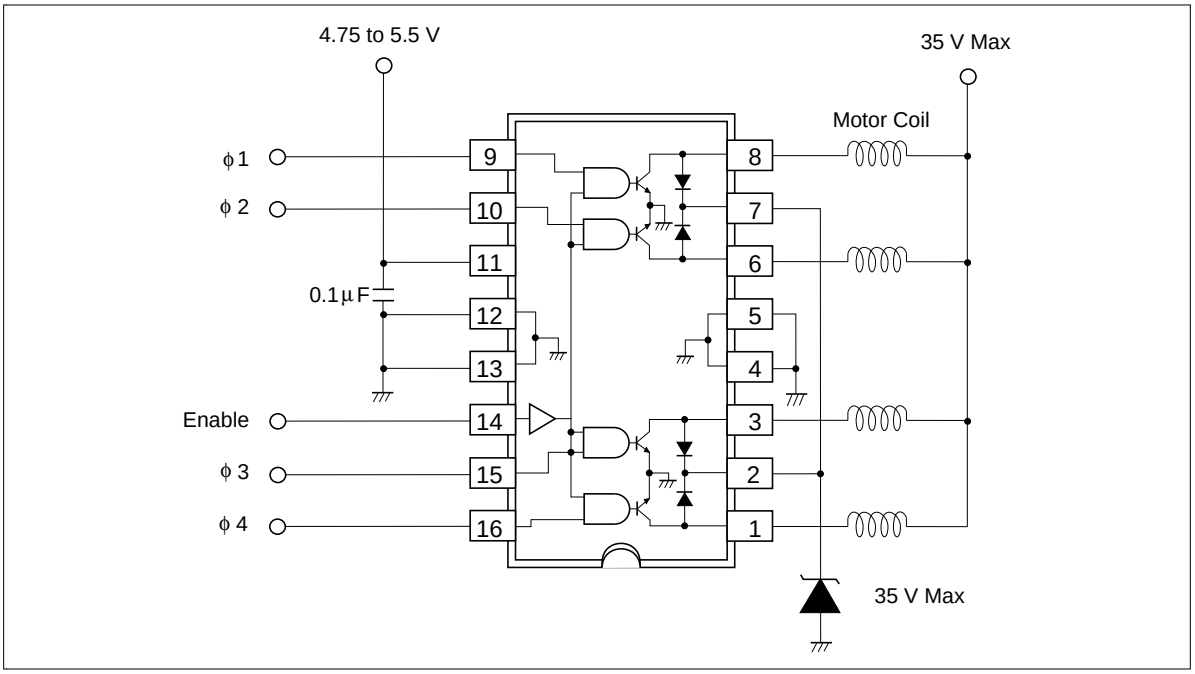
Output Saturation Voltage vs. Ambient Temperature



Output Current vs. Supply Voltage

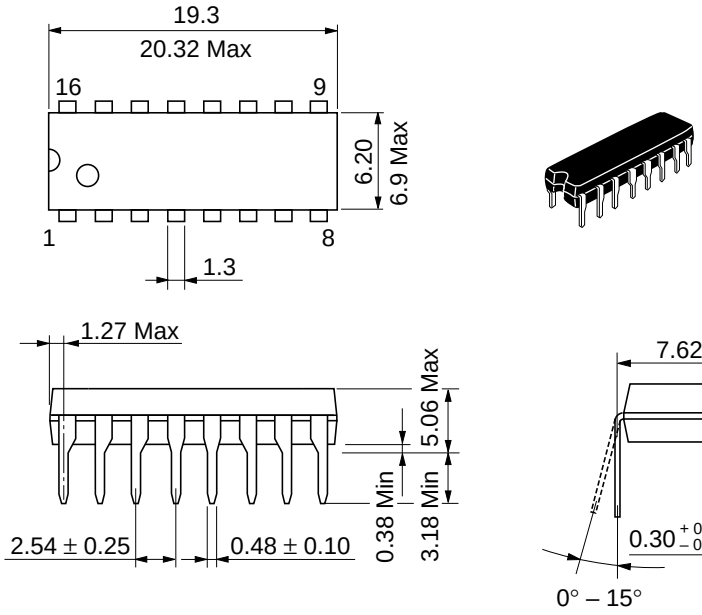


Stepping Motor Driver Application


4.75 to 5.5 V
35 V Max
Motor Coil
ϕ1
ϕ2
0.1µF
Enable
ϕ3
ϕ4
9
10
11
12
13
14
15
16
8
7
6
5
4
3
2
1
35 V Max

Package Dimensions

Unit: mm



Hitachi Code	DP-16C
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.90 g

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