

TA7257P

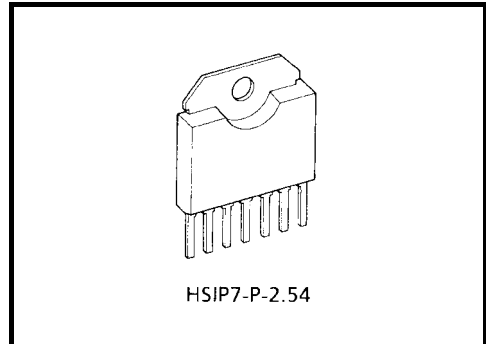
Full-Bridge Driver (H-Switch) For DC Motor (Driver for Switching between Forward and Reverse Rotation)

The TA7257P is a Full Bridge Driver for brushed DC Motor Rotation control.

Forward Rotation, Reverse Rotation, Stop and Braking operations are available.

It's designed for Loading and Reel Motor driver for VCR and Tape Deck, and any other consumer and industrial applications.

TA7257P have Operation Supply Voltage terminal and Motor Driving Supply Voltage terminal independently therefore Servo control operation is applicable.

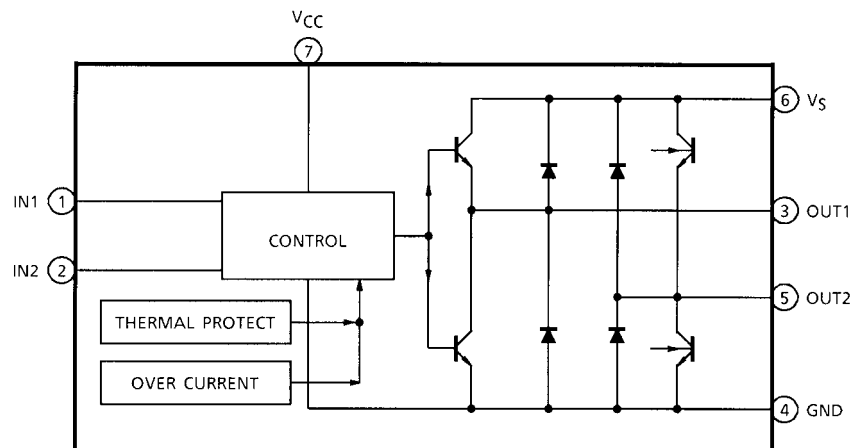


Weight: 1.88 g (typ.)

Features

- Output current up to 1.5 A (AVE.), and 4.5 A (PEAK)
- Four different modes (forward rotation, reverse rotation, stop, and brake) are supported.
- Built-in overcurrent protection and thermal shutdown circuit
- Operating voltage range: V_{CC} (opr.) = 6 to 18 V, V_S (opr.) = 0 to 18 V
- No malfunction occurs even if V_{CC} is higher than V_S or Vice versa.

Block Diagram



Pin Function

Pin No.	Symbol	Functional Description
1	IN1	Input terminal
2	IN2	Input terminal
3	OUT1	Output terminal
4	GND	GND terminal
5	OUT2	Output terminal
6	V _S	Supply voltage terminal for Motor drive
7	V _{CC}	Supply voltage terminal for Logic

Function

IN1	IN2	OUT1	OUT2	Mode
1	1	L	L	Brake
0	1	L	H	CW/CCW
1	0	H	L	CCW/CW
0	0	High impedance		Stop

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Supply voltage	Peak	V _{CC} (max)	25	V
	Operate	V _{CC} (opr.)	18	
Output current	PEAK	I _O (PEAK)	4.5	A
	AVE.	I _O (AVE.)	1.5	
Power dissipation		P _D	12.5 (Note)	W
Operating temperature		T _{opr}	-30 to 75	°C
Storage temperature		T _{stg}	-55 to 150	°C

Note: T_c = 75°C

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Supply current		I _{CC1}	—	V _{CC} = 18 V Output OFF stop mode	—	6.5	13	mA
		I _{CC2}		V _{CC} = 18 V Output OFF CW/CCW mode	—	10	20	
Saturation voltage	Upper	V _{S1U}	—	V _{CC} = 18 V, I _O = 0.1 A	—	0.7	1.0	V
	Lower	V _{S1L}			—	0.6	0.9	
	Upper	V _{S2U}		V _{CC} = 18 V, I _O = 1.1 A	—	1.0	1.4	
	Lower	V _{S2L}			—	0.9	1.3	
Output transistor leakage current	Upper	I _{LU}	—	V _S = 18	—	—	100	μA
	Lower	I _{LL}			—	—	100	
Input voltage 1, 2		V _{IN (H)}	—	T _j = 25°C, pin (1) and pin (2)	3.0	—	—	V
		V _{IN (L)}			—	—	0.8	
Diode forward voltage		V _{F U}	—	I _F = 1.0 A	—	2.0	—	V
		V _{F L}			—	1.25	—	
Limiting current		I _{SC}	—	—	—	3.5	—	A
Input current		I _{IN}	—	—	—	1	10	μA

Application Note

(1) Input circuit

Input circuit is shown in Figure 1. It's a "Low active" type voltage comparator that's one input connect to Input terminal (pin (1), or (2)) and the other to built-in temperature compensated voltage reference ($V_{TH} = 1.4 \text{ V Typ.}$)

If a voltage above $V_{IN(H)}$ fed into the Input Terminal that means "Logic 1" and less than $V_{IN(L)}$ or connect to GND means "Logic 0".

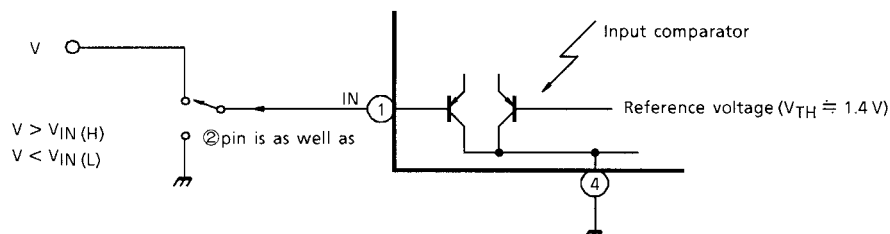


Figure 1

(2) Basic application circuit

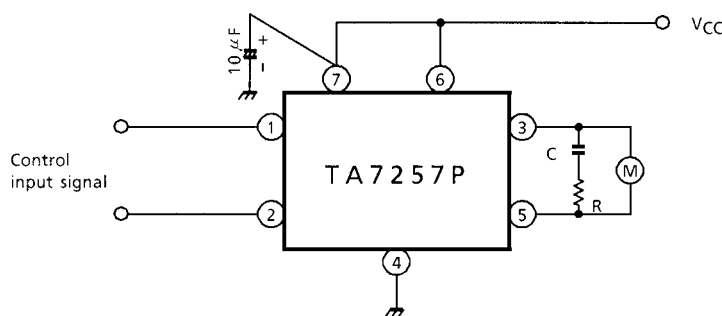


Figure 2

Note 1: An optimum C or R value varies depending on what type of motor is in use. Select each optimum value by experiment.

Note 2: Do not use silicone rubber to mount a heat radiation panel.

Note 3: Utmost care is necessary in the design of the output line, V_{CC} (V_M , V_S , V_{EE}) and GND line since IC may be destroyed due to short-circuit between outputs, to supply, or to ground.

Note 4: Switching the inputs may allow a punch-through current to flow. Keep the IC device in the STOP mode (for at least 100 μs) during the switching. Alternatively, insert a current limiting resistor R.

Note 5: When the power is rising or falling, the IC device may not able to function normally. Before employing it, make sure that this nature of the IC device raises no problem to your application.

Note 6: When turning on the power for the IC device, apply V_S after V_{CC} (or V_{CC} and V_S simultaneously). When shutting off the power, drop V_S before V_{CC} (or V_S and V_{CC} simultaneously).

Note 7: The thermal shutdown or overcurrent protection circuit cannot protect the IC device in every case. If the maximum rating is exceeded instantaneously, the IC device may break down before the protection circuits start operating.

(3) Additional diode

- i) If the braking operation is so loose, connect a additional diode between each output to GND, (See Figure 3)
- ii) If the back electromotive pulse generated in output coil is so strong.
Internally connected back electromotive suppression diode may be damaged by this pulse.
In such a case connect a additional diode between each output to VCC. (See Figure 4)
- iii) In case of mounted on radiators, do not use silicon rubber.

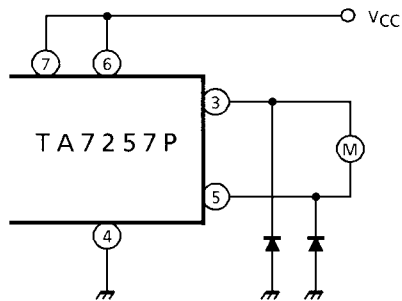


Figure 3

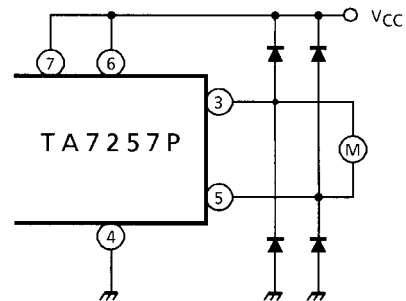
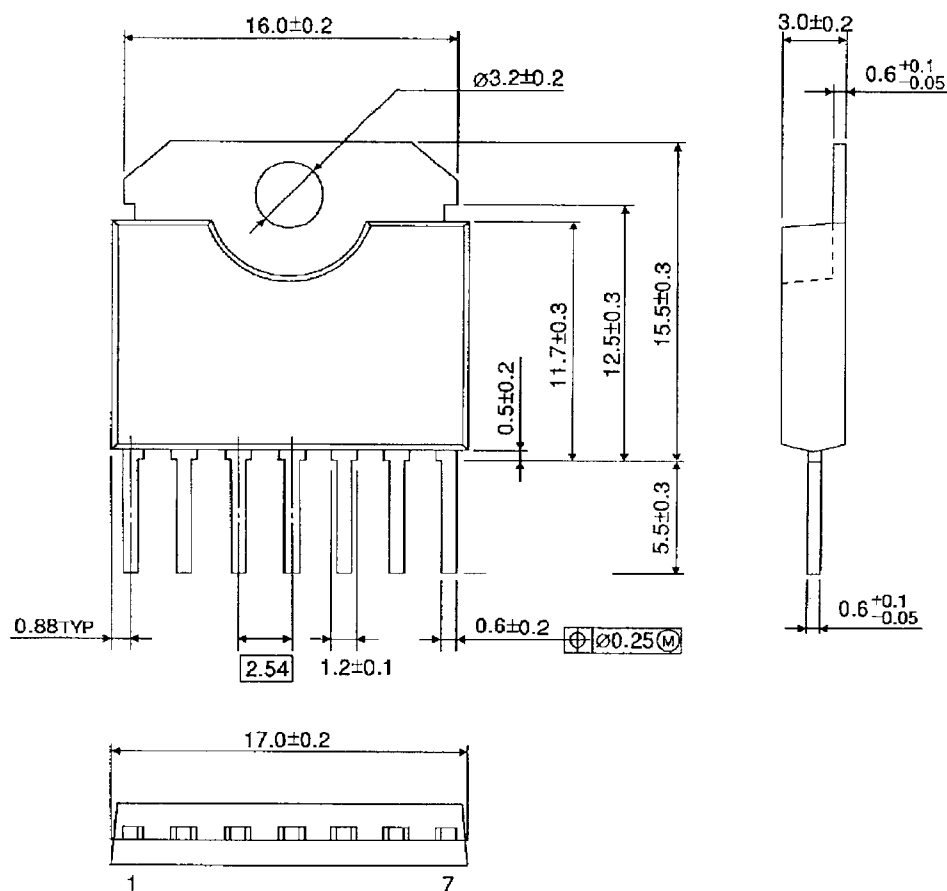


Figure 4

Package Dimensions

HSIP7-P-2.54

Unit : mm



Weight: 1.88 g (typ.)

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