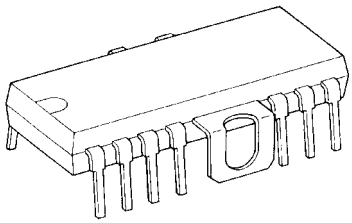
TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA7279P,TA7279AP

Dual-Bridge Drivers (for Switching between Forward and Reverse Rotation) for DC Motors

The TA7279P and TA7279AP can control a DC motor in four modes (forward rotation, reverse rotation, stop, and brake), using their bridge driver best suited for switching between forward and reverse rotation.
These ICs can deliver an output current of 1.0 A (AVE.) and 3.0 A (PEAK). They can adjust the motor voltage easily because they have a circuit configuration best suited for VCR front loading, tape loading, and reel rotation as well as power supply pins separately for two sections (output and control). In addition, they can be connected directly to CMOS devices because their input current is low.

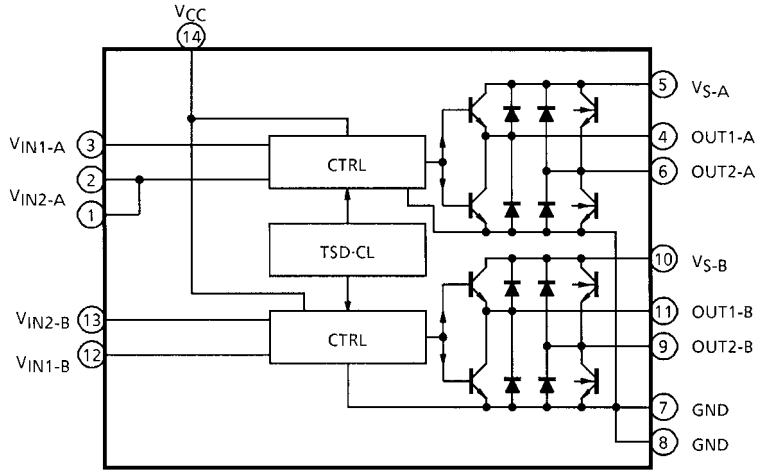


Weight: 3.00 g (typ.)

Features

- Wide range of operating voltage
  : V_{CC} (opr.) = 6 to 18 V (P, AP),
  V_S (opr.) = 0 to 16 V (P) / = 0 to 18 V (AP)
  No malfunction occurs even if V_{CC} is higher than V_S or vice versa. However, observe $V_{ref} \leq V_S$.
- Output current up to 1.0 A (AVE.), 3.0 A (PEAK)
- Built−in thermal shut down circuit
- Built-in back electromotive force absorber diode
- Built-in hysteresis circuit

Block Diagram

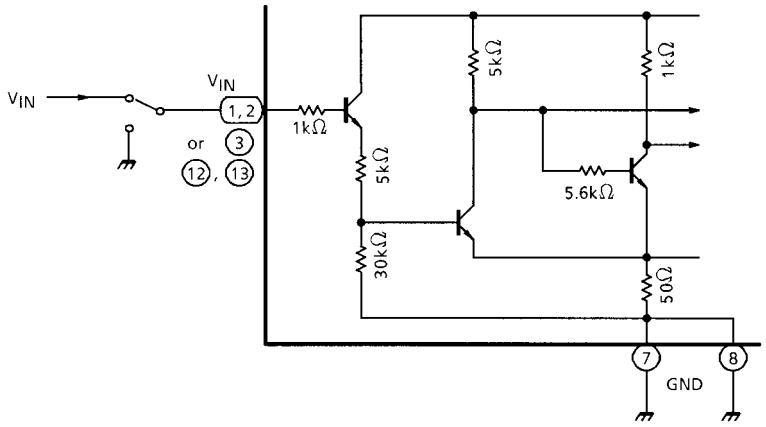


Pin Function

Pin No.	Symbol	Functional Description
1	V_{IN2-A}	A−ch input terminal
2	V_{IN2-A}	
3	$V_{I\ N1-A}$	A−ch input terminal
4	OUT1−A	A−ch output terminal
5	V_{S-A}	A−ch Motor drive power supply
6	OUT2−A	A−ch output terminal
7	GND	GND terminal
8	GND	
9	OUT2−B	B−ch output terminal
10	V_{S-B}	B−ch Moter drive power supply
11	OUT1−B	B−ch output terminal
12	V_{IN1-B}	B−ch input terminal
13	V_{IN2-B}	B−ch input terminal
14	V_{CC}	Logic power supply

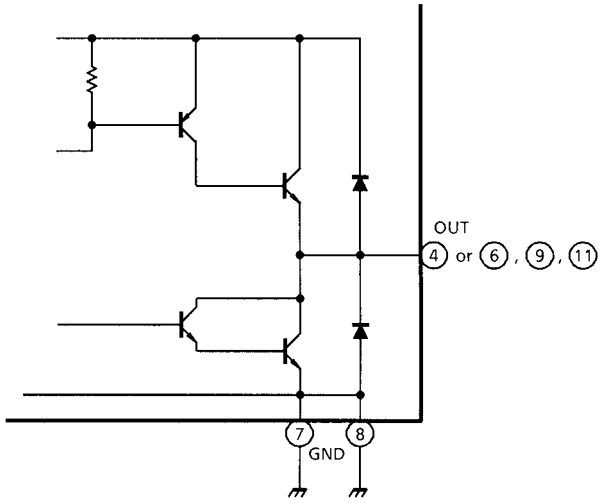
Application Note

(1) Input circuit



The input circuit is an active high type, as shown in the diagram. When voltage higher than the specified $V_{IN\ (H)}$ is applied, the output is logic "H". When voltage lower than the specified $V_{IN\ (L)}$ is applied or if the input is grounded, the output is logic "L". Since the input current IN flows to the input when logic "H", be careful with the output impedance at the previous step.

(2) Output circuit



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	AP	V_{CC} (max)	25	V
	P		20	
Motor drive voltage	AP	V_S (max)	25	V
	P		18	
Output current	PEAK	I_O (PEAK)	3.0	A
	AVE.	I_O (AVE.)	1.0	
Power dissipation		P_D (Note)	2.3	W
Operating temperature		T_{opr}	−30 to 75	°C
Storage temperature		T_{stg}	−55 to 150	°C

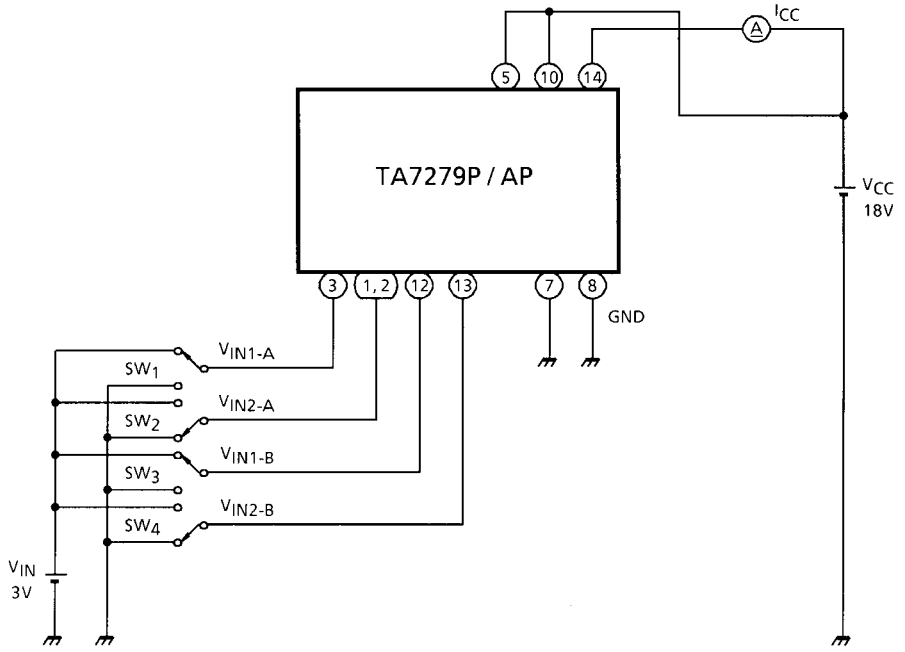
Note: No heat sink.

Electrical Characteristics (Ta = 25°C)

Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Supply current		I_{CC1}	1	V_{CC} = 18 V, Output Off, Stop mode	14	28	41	mA
		I_{CC2}	1	V_{CC} = 18 V, Output Off, CW/CCW mode	10	29	38	
		I_{CC3}	1	V_{CC} = 18 V, Output Off, Brake mode	8	20	35	
Input operating voltage	1 (High)	$V_{IN\ (H)}$	—	T_j = 25°C	3.0	—	V_{CC}	V
	2 (Low)	$V_{IN\ (L)}$	—	T_j = 25°C	—	—	0.8	
Input current		I_{IN}	2	Sink, V_{IN} = 3 V	—	3	10	μA
Output saturation voltage	Upper	V_{SATU-1}	3	I_O = 0.1 A, V_{CC} = V_S = 18 V	—	—	1.1	V
	Lower	V_{SATL-1}	3	I_O = 0.1 A, V_{CC} = V_S = 18 V	—	—	1.0	
	Upper	V_{SATU-2}	3	I_O = 1.0 A, V_{CC} = V_S = 18 V	—	1.2	1.5	
	Lower	V_{SATL-2}	3	I_O = 1.0 A, V_{CC} = V_S = 18 V	—	1.05	1.4	
Leakage current	Upper	I_{LU}	—	V_S = 25 V	—	—	50	μA
	Lower	I_{LL}	—	V_S = 25 V	—	—	50	
Diode forward drop	Upper	V_{FU}	4	I_F = 1 A	—	2.5	—	V
	Lower	V_{FL}	4	I_F = 1 A	—	1.3	—	

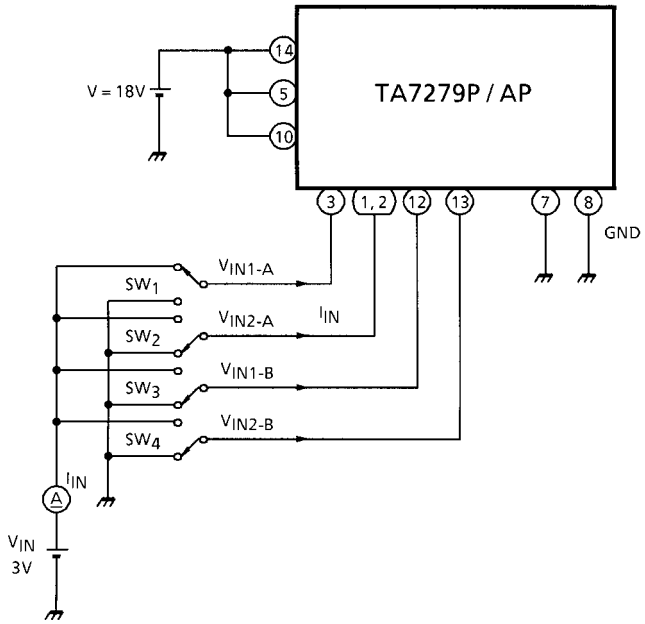
Test Circuit 1

$I_{CC1, 2, 3}$



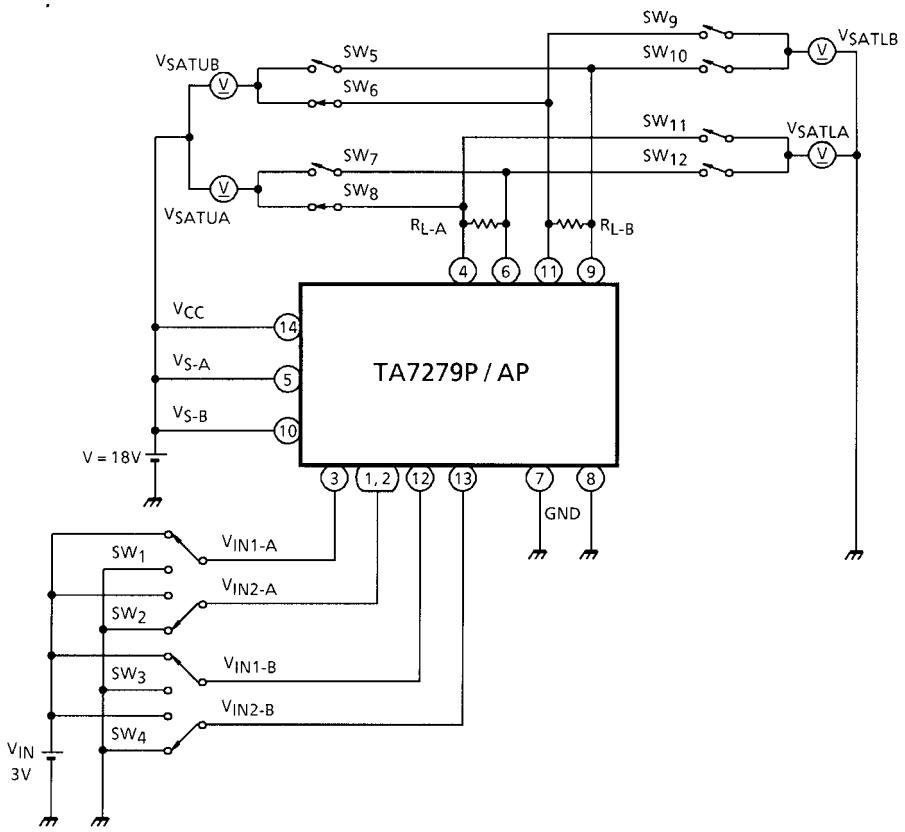
Test Circuit 2

I_{IN} (H), (L)



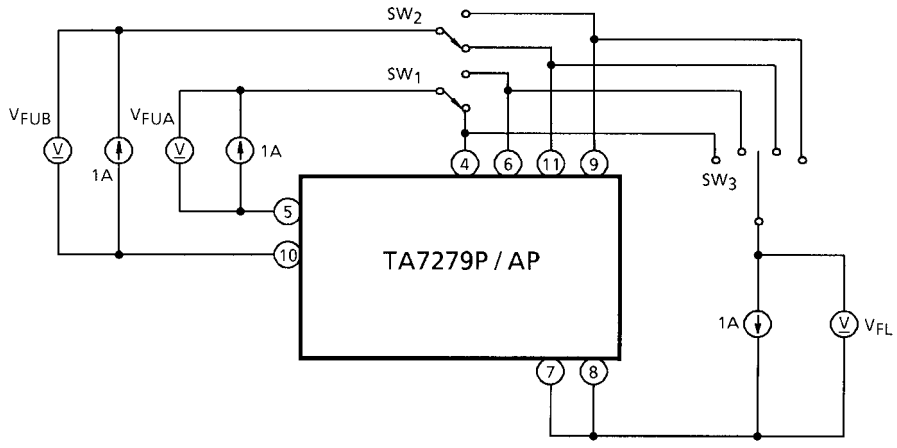
Test Circuit 3

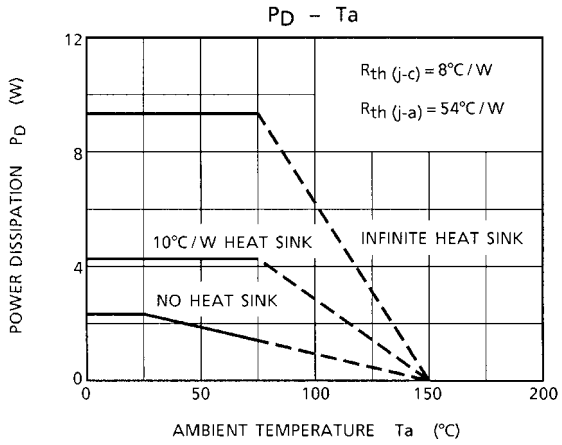
$V_{SATU-1, 2}$ / $V_{SATL-1, 2}$



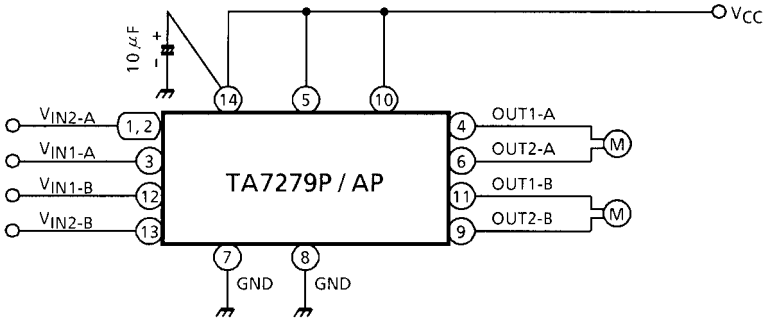
Test Circuit 4

$V_{FU, L}$

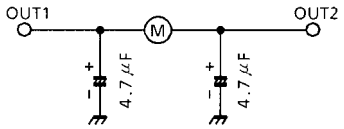




Application Circuit



Problems may result if a capacitor is inserted in parallel to the motor.
If measures against noise are necessary, connect capacitors as shown in the diagram below.
A larger bypass capacitor between V_{CC} and GND is effective against noise and other problems.
(A capacitance higher than 100 μF is recommended.)



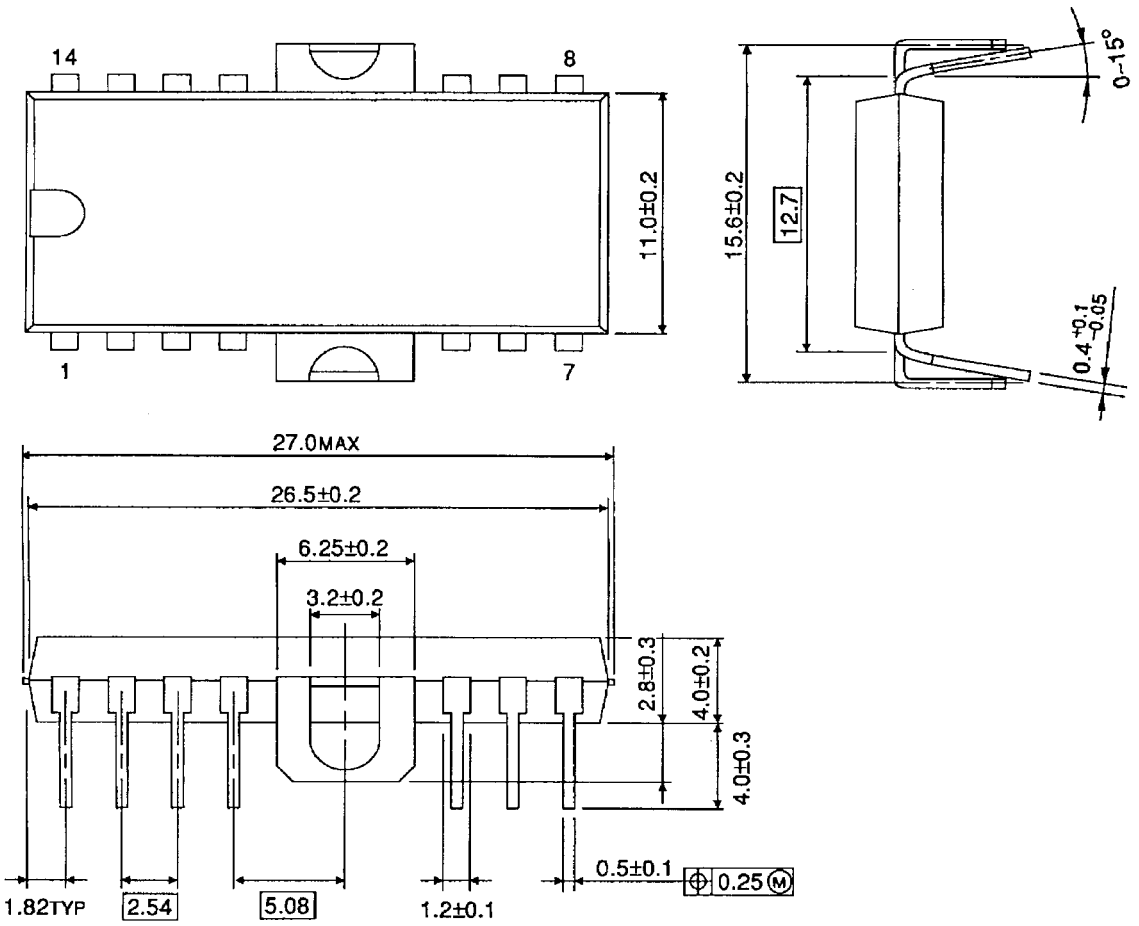
Note 1: Be sure to connect the V_S pins (pins 5 and 10) directly to each other.

Note 2: A short-circuit between outputs, an output voltage fault, and a ground fault may break down the ICs and supply an overvoltage and overcurrent to components around the them. Be very careful when designing the output, V_{CC}, V_S, and ground lines.
Note in mind that mounting the IC in the reverse orientation may also cause a breakdown.

Note 3: When turning on the power for the ICs, 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).
When turning on the power (V_{CC}), keep both the inputs (IN1 and IN2) on a low level.

Package Dimensions

HDIP14-P-500-2.54A Unit : mm



Weight: 3.00 g (typ.)

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