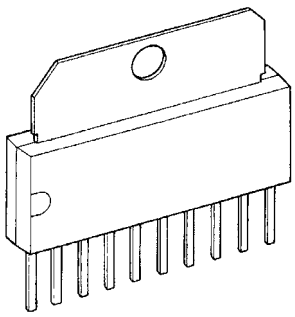
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7288P

DUAL BRIDGE DRIVER

The TA7288P is a bridge driver that is ideal for normal / reverse switching.
This circuit offers four modes: normal rotation, reverse rotation, stop, and brake.
The output current is 1.0 A (AVE.) and 2.0 A (PEAK). TA7288P has an ideal circuit configuration for VCR front tape loading and offers two types of power supply pins. One is for output, the other for control. The V_{ref} pin on the output side used to control the motor voltage facilitates motor voltage adjustment. The IC requires little input current, enabling direct connection with CMOS.



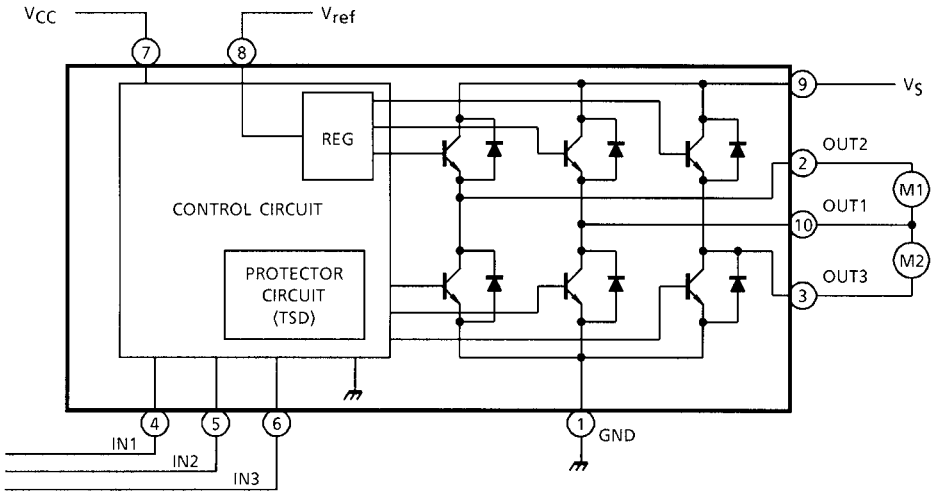
HSIP10-P-2.54

Weight: 2.47 g (Typ.)

FEATURES

- 4 Modes Available (CW / CCW / STOP / BRAKE)
- Output Current Up to 1.0 A (AVE.) and 2.0 A (PEAK)
- Wide Range of Operating Voltage: $V_{CC\ (opr.)}$ = 4.5~18 V
  $V_{S\ (opr.)}$ = 0~18 V
  $V_{ref\ (opr.)}$ = 0~18 V
- Build in Thermal Shutdown, Over Current Protector and Punch−Through Current Restriction Circuit.
- Hysteresis for All Inputs.

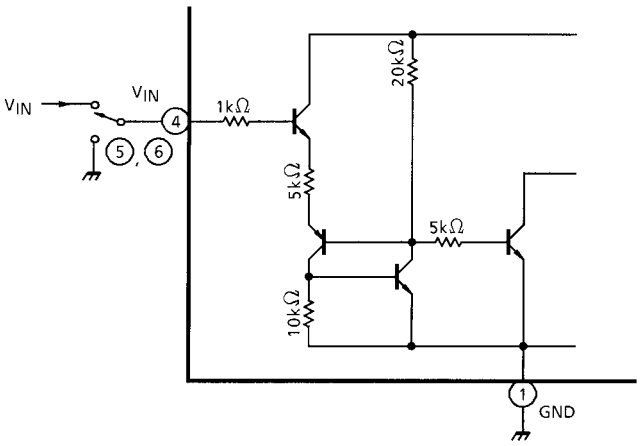
BLOCK DIAGRAM



PIN FUNCTION

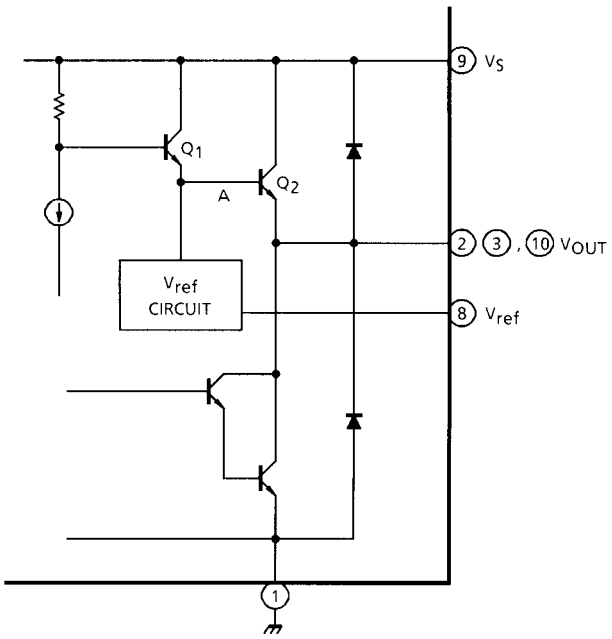
PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	GND	GND terminal
2	OUT2	Output terminal
3	OUT3	Output terminal
4	IN1	Input terminal
5	IN2	Input terminal
6	IN3	Input terminal
7	V_{CC}	Supply voltage terminal for Logic
8	V_{ref}	Supply voltage terminal for control
9	V_S	Supply voltage terminal for Motor drive
10	OUT1	Output terminal

INPUT CIRCUIT



Input terminals of pin (4), (5) and pin (6) are all high active type and have a hysteresis of 0.7 V (Typ.) 5 μA type of source mode input current is required.

OUTPUT CIRCUIT



Output voltage is controlled by V_{ref} voltage. Relationship between V_{OUT} and V_{ref} is

$V_{OUT} = V_{BE} (\approx 0.7) + V_{ref}$

V_{ref} terminal required to connect to V_S terminal for stable operation in case of no requirement of V_{OUT} control.

FUNCTION

INPUT			OUTPUT			MODE	
IN1	IN2	IN3	OUT1	OUT2	OUT3	M1	M2
0	0	1 / 0	L	L	L	BRAKE	BRAKE
1	0	0	H	L	∞	CW / CCW	STOP
1	0	1	L	H	∞	CCW / CW	STOP
0	1	0	H	∞	L	STOP	CW / CCW
0	1	1	L	∞	H	STOP	CCW / CW
1	1	1 / 0	L	L	L	BRAKE	BRAKE

∞: High impedance

Note: Inputs are all high active type.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	25	V
Motor Drive Voltage		V_S	25	V
Reference Voltage		V_{ref}	25	V
Output Current	PEAK	$I_{O\ (PEAK)}$	2.0 (Note 1)	A
	AVE.	$I_{O\ (AVE.)}$	1.0	A
Power Dissipation		P_D	12.5 (Note 2)	W
Operating Temperature		T_{opr}	−30~75	°C
Storage Temperature		T_{stg}	−5~150	°C

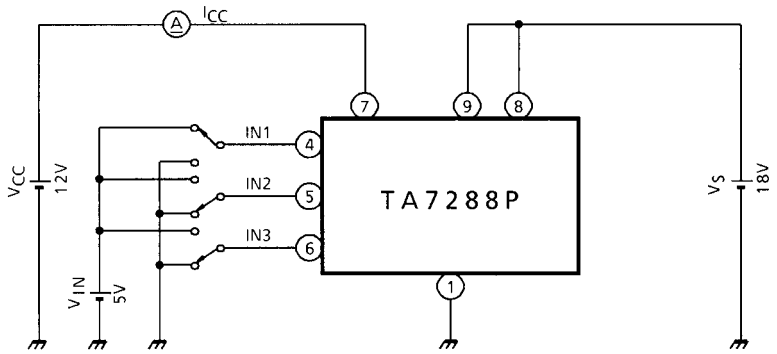
Note 1: Duty 1 / 10, 100 ms
Note 2: Tc = 25°C

ELECTRICAL CHARACTERISTICS
(Unless otherwise noted, Ta = 25°C, V_{CC} = 12 V, V_S = 18 V)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Supply Current		I_{CC1}	1	Output OFF CW / CCW mode	—	17	30	mA
		I_{CC2}	1	Output OFF Brake mode	—	13	25	
Input Voltage	1 (High)	$V_{IN\ (H)}$	2	T_j = 25°C pin (4), (5), (6)	3.5	—	5.5	V
	2 (Low)	$V_{IN\ (L)}$	2	T_j = 25°C pin (4), (5), (6)	GND	—	0.8	
Input Current		I_{IN}	2	V_{IN} = 3.5 V, Sink mode	—	5	20	μA
Input Hysteresis Voltage		ΔV_T	2	—	—	0.7	—	V
Saturation Voltage	Upper	V_{SATU-1}	3	$V_{ref} = V_S$, $V_S - V_{out}$, I_O = 0.2 A	—	0.9	1.2	V
	Lower	V_{SATL-1}	3	$V_{ref} = V_S$, V_{out}−GND, I_O = 0.2 A	—	1.0	1.3	V
	Upper	V_{SATU-2}	3	$V_{ref} = V_S$, $V_S - V_{out}$, I_O = 1.0 A	—	1.3	1.6	V
	Lower	V_{SATL-2}	3	$V_{ref} = V_S$, V_{out}−GND I_O = 1.0 A	—	1.8	2.5	V
Output Voltage		$V_{SATU-1'}$	3	V_{ref} = 10 V, V_{out}−GND I_O = 0.5 A	10.7	11.0	11.8	V
		$V_{SATU-2'}$	3	V_{ref} = 10 V, V_{out}−GND I_O = 1.0 A	10.4	10.7	11.5	V
Leakage Current	Upper	$I_{L\ U}$	—	V_S = 25 V	—	—	50	μA
	Lower	$I_{L\ L}$	—	V_S = 25 V	—	—	50	
Diode Forward Voltage	Upper	$V_{F\ U}$	4	I_F = 1 A	—	2.2	—	V
	Lower	$V_{F\ L}$	4	I_F = 1 A	—	1.4	—	
Reference Current		I_{ref}	2	V_{ref} = 10 V, Source mode	—	5	30	μA

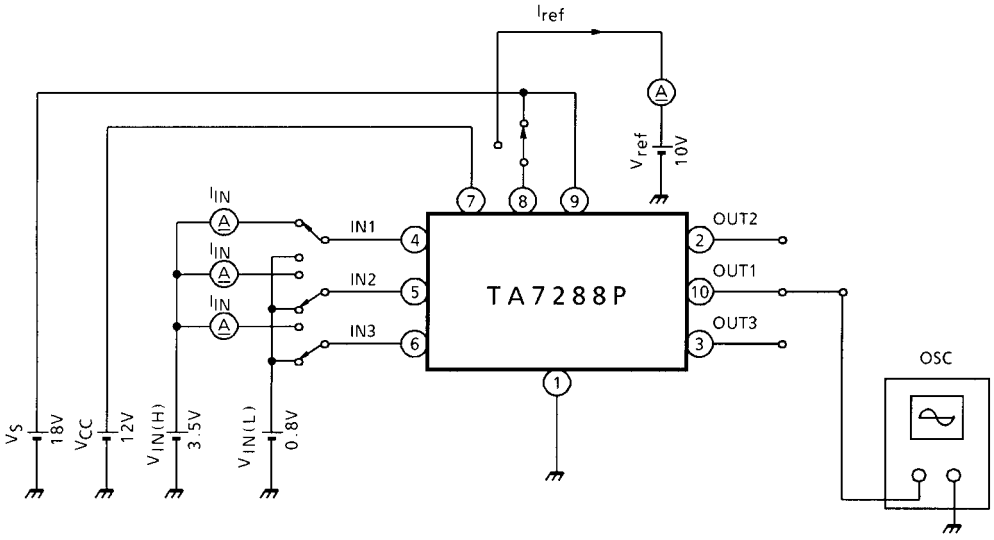
TEST CIRCUIT 1.

$I_{CC1, 2}$



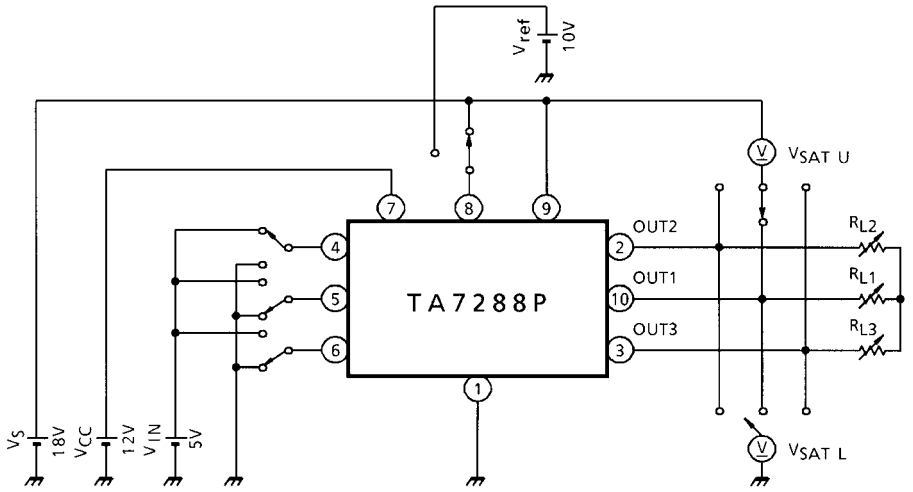
TEST CIRCUIT 2.

$V_{IN\ (H)}$, $V_{IN\ (L)}$, I_{IN}, ΔV_T, I_{ref}



TEST CIRCUIT 3.

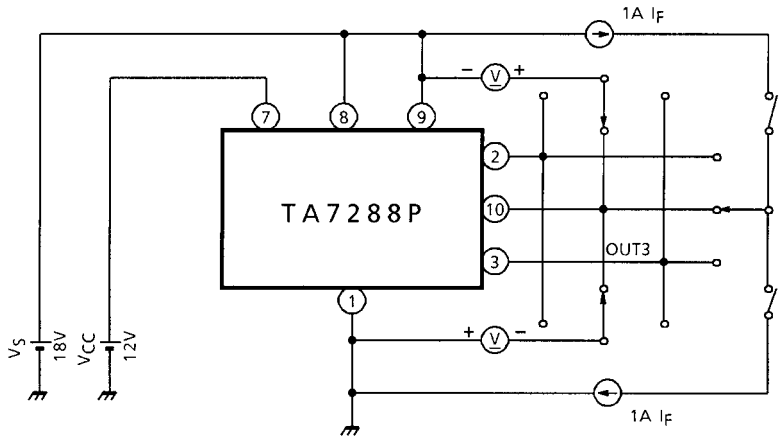
$V_{SAT\ U-1,\ L-1,\ U-2,\ L-2,\ U-1',\ U-2'}$

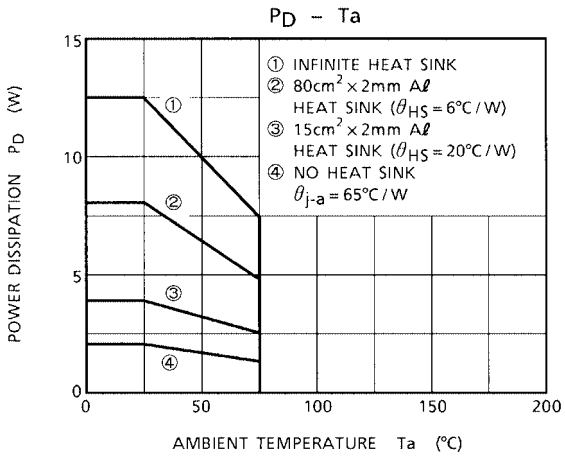


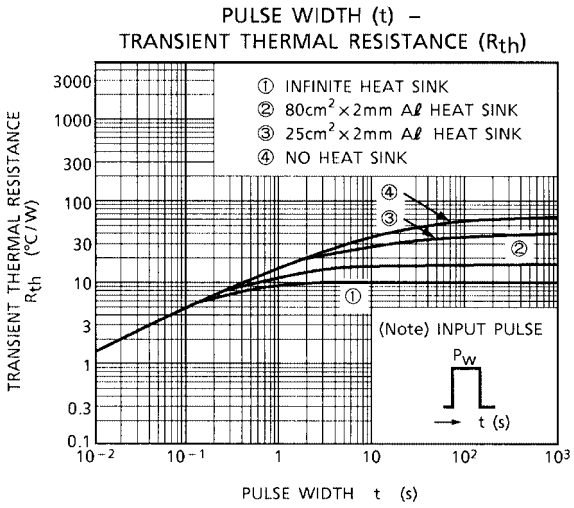
I_O calibration is required to adjust specified values of test conditions by R_{L1}~R_{L3}.

TEST CIRCUIT 4.

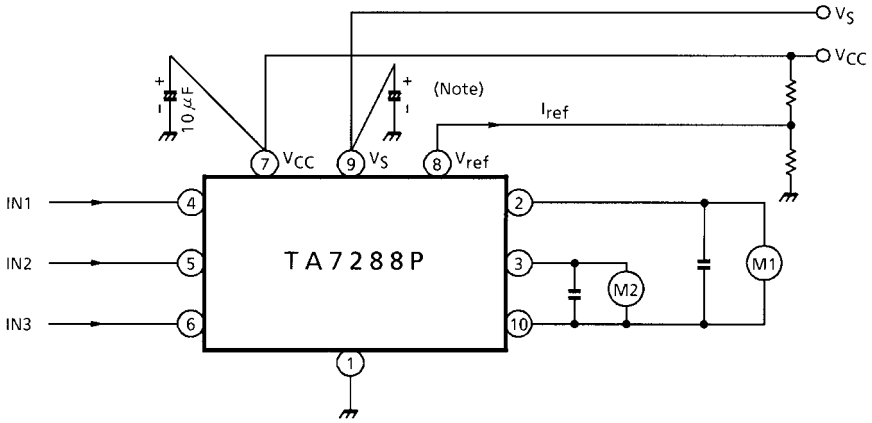
$V_{F\ U,\ L}$







APPLICATION CIRCUIT

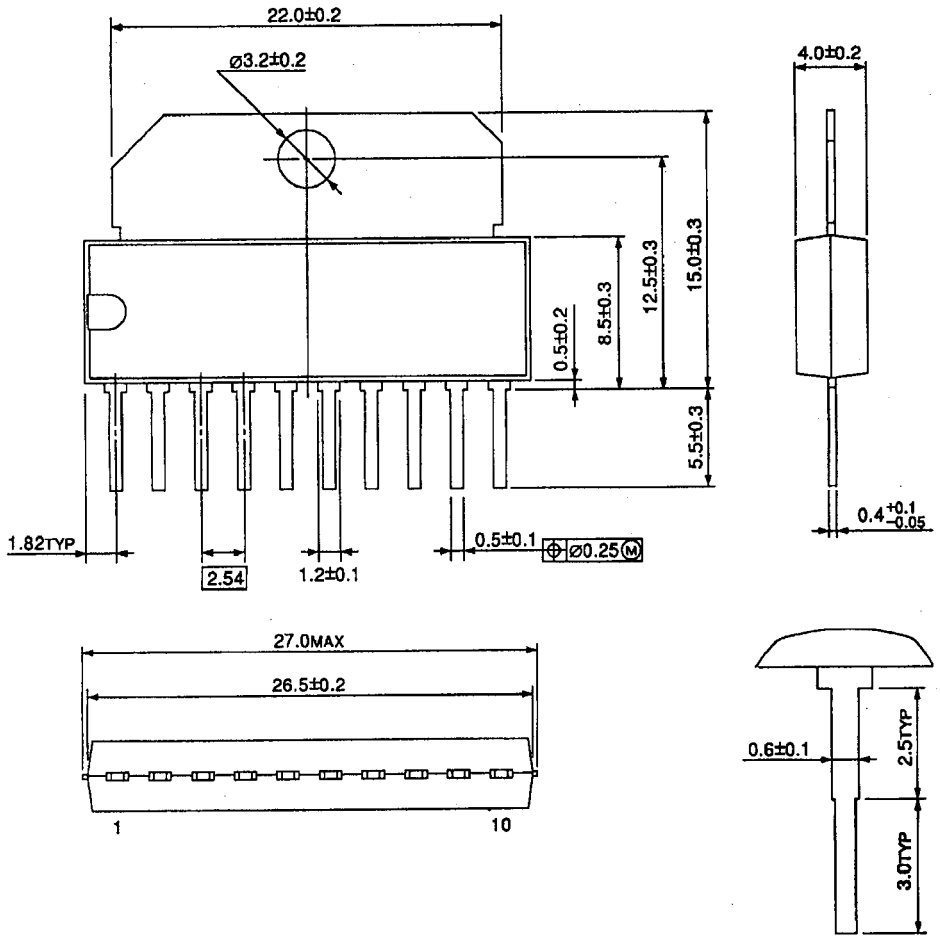


Note 1: Connect if required

Note 2: Utmost care is necessary in the design of the output line, V_S and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

PACKAGE DIMENSIONS

HSIP10−P−2.54 Unit: mm



Weight: 2.47 g (Typ.)

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