

## BIDIRECTIONAL DC MOTOR DRIVER FOR DISK TRAY MOTION

### DESCRIPTION

The SA1582 is a monolithic IC of driving bi-directional DC motor with braking and speed control. It can be drove the loading motor driver of CDP, VCR, and TOY etc.

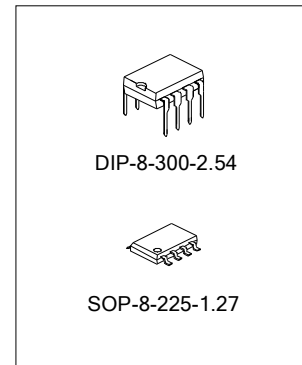
By changing the voltage of the two logic input pins, the chip can control the motor's forward/reverse and braking. And it is also easy to adjust the speed of motor by changing the voltage of the speed control pin.

### FEATURES

- \* Built-in brake functions for stable brake characteristics.
- \* Built-in element to absorb a surge current derived from changing motor direction and braking motor drive.
- \* Motor speed control by an external voltage.
- \* Stable motor direction change.
- \* Interfaces with CMOS devices.
- \* Built-in the thermal shut down circuit (165°C).
- \* Low standby current. (6.5mA)

### APPLICATIONS

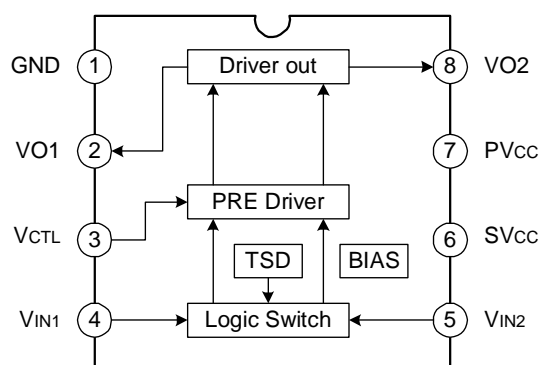
- \* Compact disk player (CDP) tray or changer
- \* Low current DC motor such as audio or video equipment.
- \* General DC motor



### ORDERING INFORMATION

Device	Package
SA1582	DIP-8-300-2.54
SA1582S	SOP-8-225-1.27

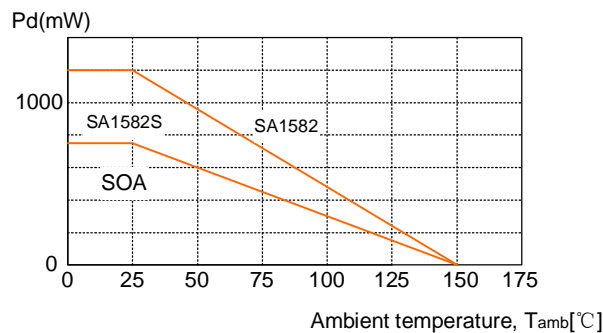
### BLOCK DIAGRAM



**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb}=25^{\circ}\text{C}$ )

Characteristic	Symbol	Value		Unit
Supply Voltage	VCC	16		V
Maximum Output Current	IO	1.6 (note1)		A
Power Dissipation(note2)	PD	SA1582	1.20	W
		SA1582S	0.75	
Operating Temperature	T <sub>opr</sub>	-25~+75		°C
Storage Temperature	T <sub>stg</sub>	-55~+125		°C

- Note: 1. Duty 1/100, pulse width 500 $\mu\text{s}$
2. 1) When mounted on glass epoxy PCB (76.2 x 114 x 1.57mm)
- 2) Power dissipation reduces 11.5mW/°C for SA1582 using above  $T_{amb}=25^{\circ}\text{C}$ .
- 3) Power dissipation reduces 7.2mW/°C for SA1582S using above  $T_{amb}=25^{\circ}\text{C}$ .
- 4) Do not exceed PD and SOA (Safe Operating Area).

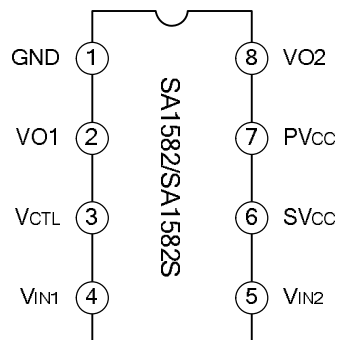
**POWER DISSIPATION CURVE**

**RECOMMEND OPERATING CONDITIONS** ( $T_{amb}=25^{\circ}\text{C}$ )

Characteristic	Symbol	Value	Unit
Operating supply voltage note	SVCC, PVCC	7~16	V

- Note: Caution 1)  $PVCC \leq SVCC$ .
- Caution 2) When PVCC is above 16V, the VCTL must be opened or  $8.5 \leq V_{CTL} \leq PVCC$ .

**ELECTRICAL CHARACTERISTICS** ( $T_{amb}=25^{\circ}C$ ,  $SV_{CC}=12V$ ,  $PV_{CC}=9V$ )

Characteristics	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Quiescent Current	ICC	Pin4 & 5=GND, $R_L=\infty$	4	6.5	9.5	mA
Min. Input-on Current 1	IIN1	$R_L=\infty$ , pin4=IIN1, Pin5=L	--	10	30	$\mu A$
Min. Input-on Current 2	IIN2	$R_L=\infty$ , pin4=L, pin5=IIN	--	10	30	$\mu A$
Input Threshold Voltage 1	VITH1	$R_L=\infty$ , pin4=VIN, pin5=L	1.0	1.3	1.6	V
Input Threshold Voltage 2	VITH2	$R_L=\infty$ , pin4=L, pin5=VIN	1.0	1.3	1.6	V
Output Leakage Current 1	IOL1	$R_L=\infty$ , pin4 & 5=GND	--	0.01	1	mA
Output Leakage Current 2	IOL2	$R_L=\infty$ , pin4 & 5=GND	--	0.01	1	mA
Zener Current 1	Iz1	$R_L=\infty$ , pin4=H, pin5=L	--	0.85	1.5	mA
Zener Current 2	Iz2	$R_L=\infty$ , pin4=L, pin5=H	--	0.85	1.5	mA
Output Voltage 1	VO1	$R_L=60\Omega$ , pin4=H, pin5=L	6.6	7.6	7.8	V
Output Voltage 2	VO2	$R_L=60\Omega$ , pin4=L, pin5=H	6.6	7.6	7.8	V
Saturation Voltage 1 (Upper)	VSAT1	$I_O=300mA$	--	1.9	2.3	V
Saturation Voltage 2 (Upper)	VSAT2	$I_O=500mA$	--	1.9	2.3	V
Saturation Voltage 1 (Lower)	VSAT3	$I_O=300mA$	--	0.25	0.5	V
Saturation Voltage 2 (Lower)	VSAT4	$I_O=500mA$	--	0.4	0.65	V

**PIN CONFIGURATION**

**PIN DESCRIPTION**

Pin No.	Symbol	I/O	Pin Function Description
1	GND	--	Ground
2	VO1	O	Output 1
3	VCTL	I	Motor speed control
4	VIN1	I	Input 1
5	VIN2	I	Input 2
6	SVCC	--	Supply voltage (signal)
7	PVCC	--	Supply voltage (Power)
8	VO2	O	Output 2

## FUNCTION DESCRIPTION

### 1. LOGIC INPUT & OUTPUT TABLE

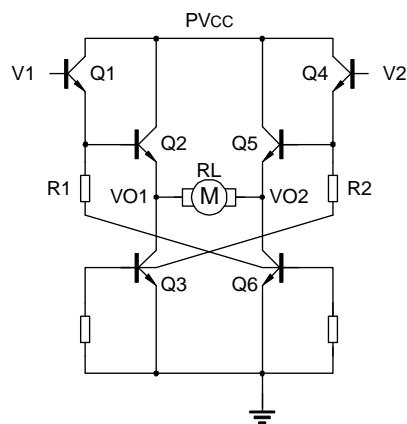
Input		Output		Motor
Pin4	Pin5	Pin2	Pin8	
Low	Low	*Low	*Low	Brake
High	Low	High	Low	Forward
Low	High	Low	High	Reverse
High	High	*Low	*Low	Brake

INPUT High is above 2.0V.

INPUT Low is below 0.7V.

\* Low: all power TRs are off-state. But internal bias makes output voltage low state.

### 2. DRIVE OUTPUT CIRCUIT



When one input pin is "H" and another is "L", and pin3 connect to GND with a zener diode; Vz<sub>d</sub> is the voltage between pin3 and GND.

$$V1 = Vz_d + 2V_{be} \approx 7.4V + 2 * 0.7V = 8.8V$$

$$V2 = V_{be} + V_{sat} \approx 0.2V + 0.7V = 0.9V$$

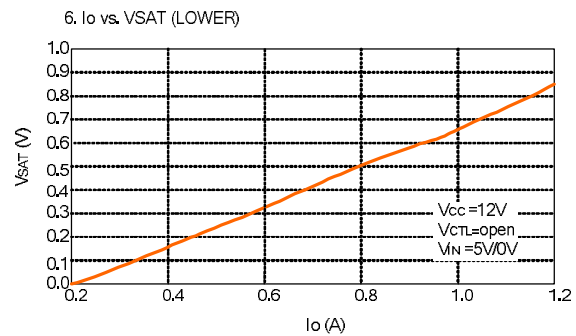
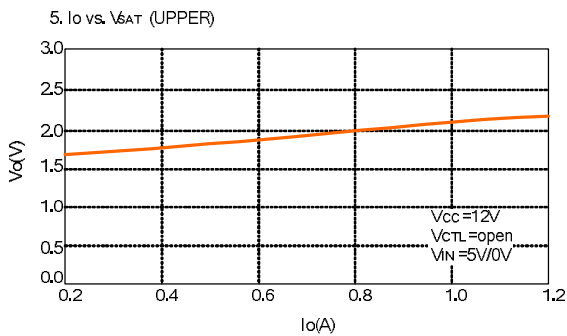
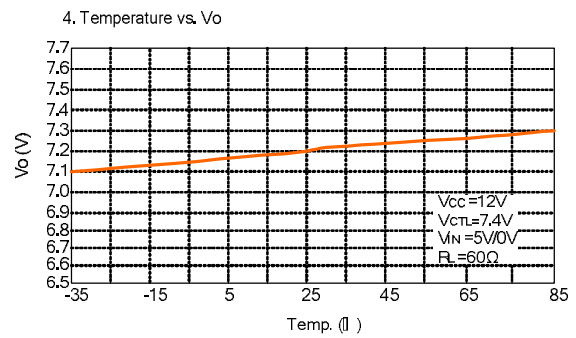
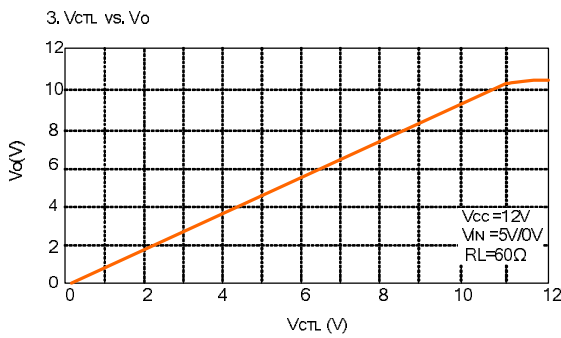
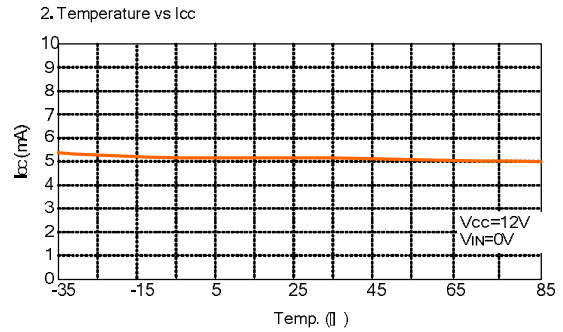
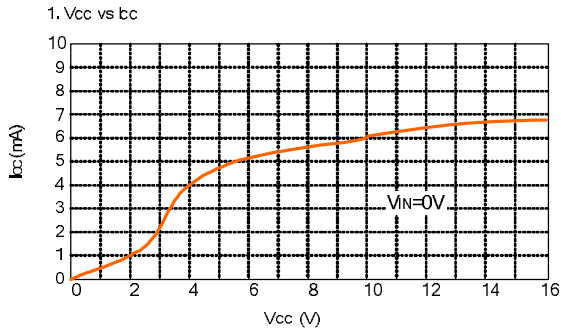
$$VO1 = V1 - V_{BEQ1} - V_{BEQ2}$$

$$VO2 = V_{Q6SAT}$$

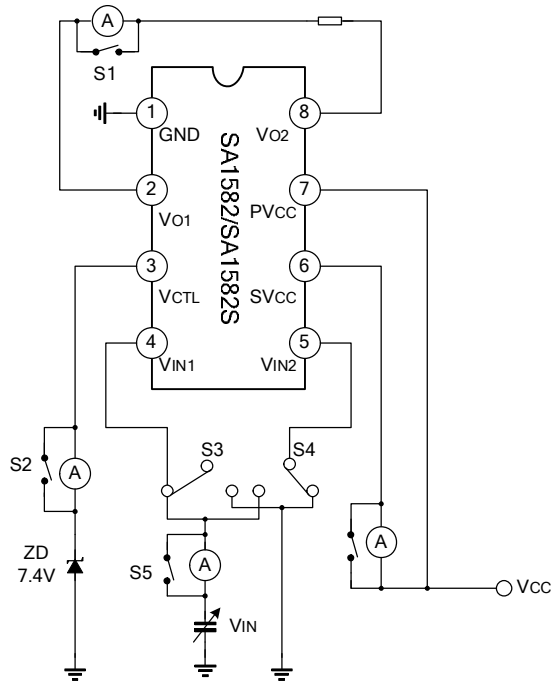
$$VO = VO1 - VO2 = V1 - V_{BEQ1} - V_{BEQ2} - V_{Q6SAT}$$

$$I_{RL} = (VO1 - VO2) / R_L$$

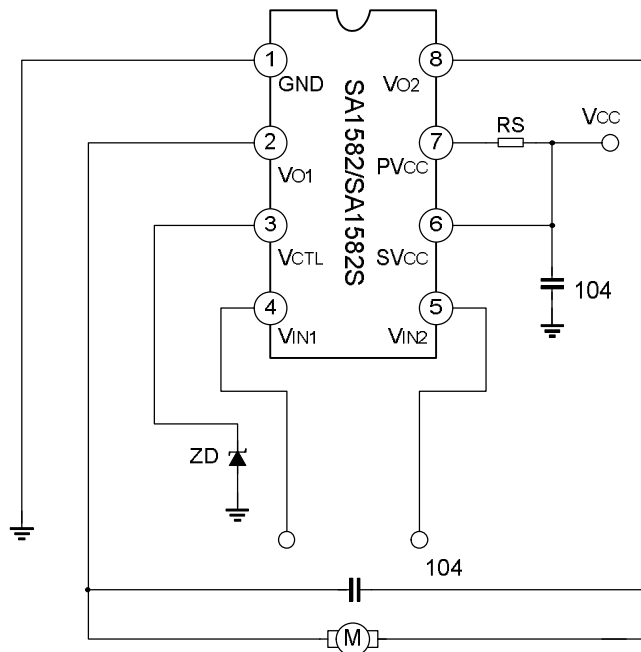
**ELECTRICAL CHARACTERISTICS CURVES**



**TEST CIRCUIT**



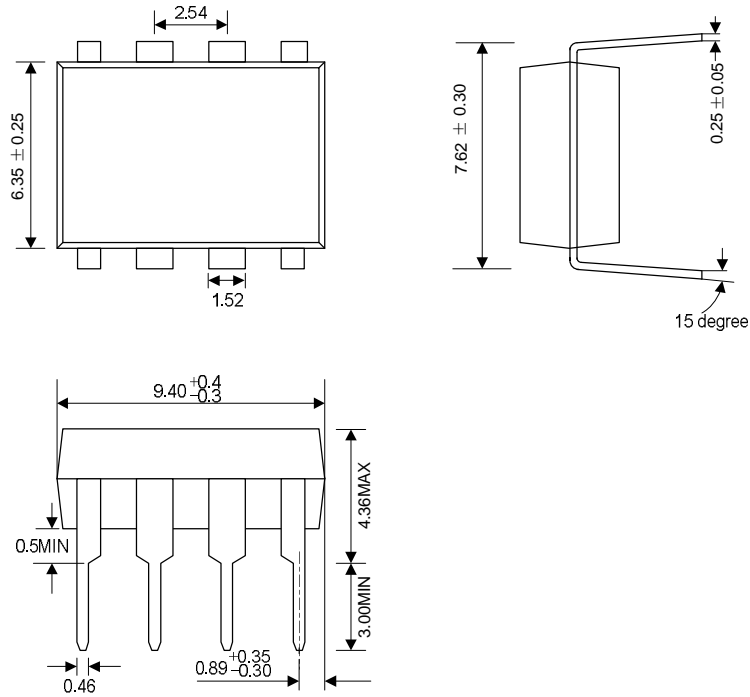
**TYPICAL APPLICATION CIRCUIT**



PACKAGE OUTLINE

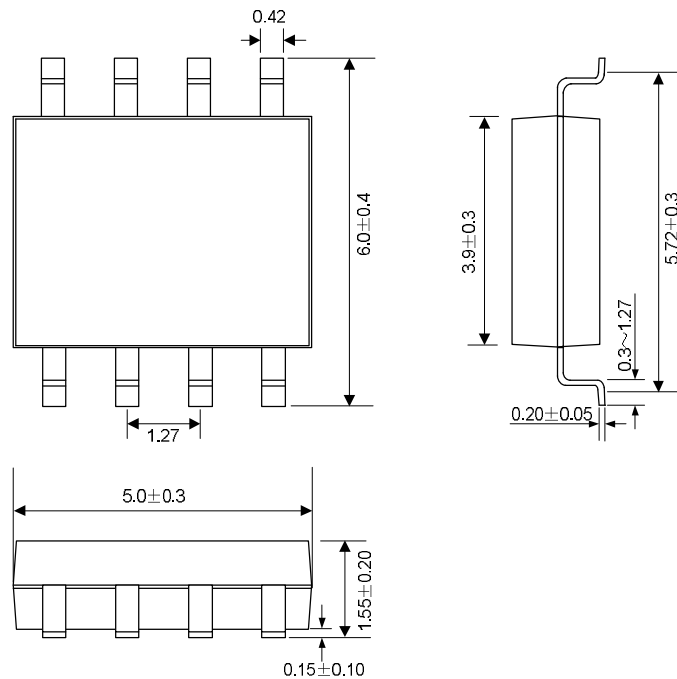
DIP-8-300-2.54

UNIT: mm



SOP-8-225-1.27

UNIT: mm





Attach

### Revision History

Data	REV	Description	Page
2003.04.23	1.0	Original	
2006.04.25	1.1	Add the package.	
2006.06.26	1.2	Modify the parameter	