

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8003S

5 V LOW DROPOUT VOLTAGE REGULATOR WITH ON / OFF SWITCH

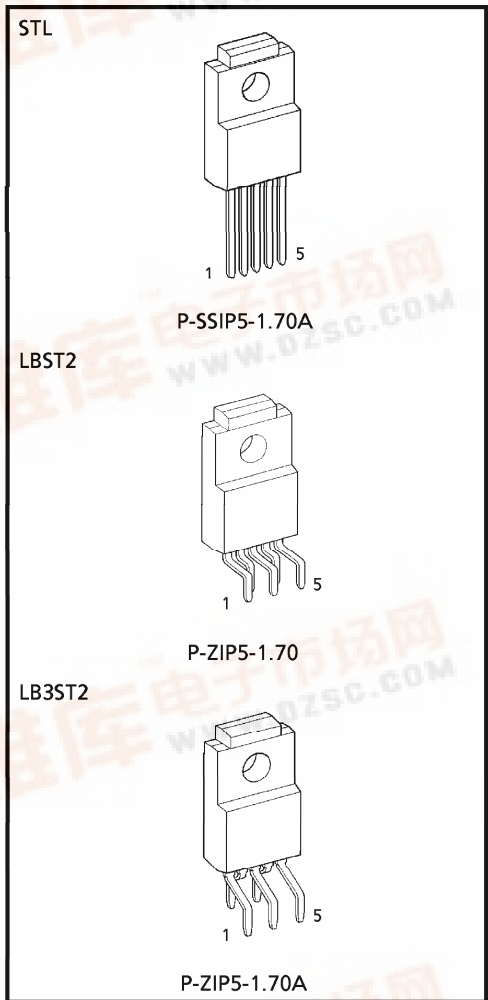
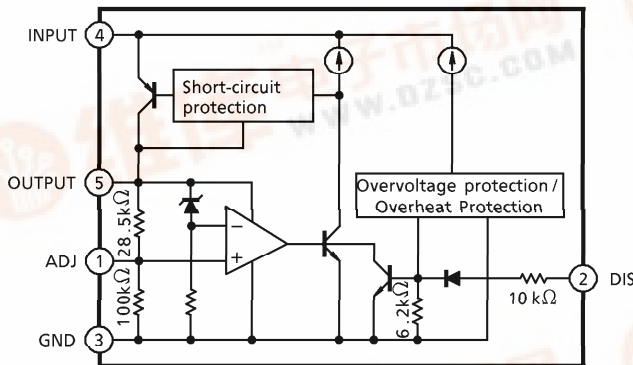
The TA8003S is a 5 V power IC with an ON/OFF output control pin. The TA8003S is also designed to provide a maximum output current of 400 mA.

In addition to low input-output voltage and standby current, this device has the following protective functions :

FEATURES

- Low standby current : 800 μ A (typ.)
- Maximum output current : 400 mA (max.)
- Low input-output dropout voltage: 0.6 V (max.)
- Multi-protection : power supply reverse connection / overvoltage protection / overheat protection / short-circuit protection / 60 V load dump
- Adjustable output voltage
- Controllable output ON/OFF
- TO-220 5-pin isolation package

BLOCK DIAGRAM



Weight
 P-SSIP5-1.70A : 2.2 g (Typ.)
 P-ZIP5-1.70 : 2.2 g (Typ.)
 P-ZIP5-1.70A : 2.2 g (Typ.)

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PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	ADJ	Output voltage adjusting terminal. Connect a resistor between ADJ and OUT to increase the output voltage. $V_{OUT} = V_{ref} \left\{ 1 + \frac{R_2 (R_1 + R_{adj})}{R_1 \cdot R_{adj}} \right\}$ $R_1 = 28.5 \text{ k}\Omega, R_2 = 100 \text{ k}\Omega, V_{ref} = 1.1 \text{ V}, R_{adj} : \text{Adjustment resistance}$
2	DIS	Output ON/OFF controll terminal. Output is ON when the pin is open or at the "L" level, and OFF when the pin is at the "H" level.
3	GND	Ground terminal
4	IN	Power supply terminal
5	OUT	The 5 V output terminal with maximum output current 400 mA

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V _{IN}	-26~60	V
Operating Input Voltage	V _{IN}	29	V
Power Dissipation	P _D	(Ta = 25°C)	2
		(Tc = 25°C)	20
Operating Temperature	T _{opr}	-40~85	°C
Storage Temperature	T _{stg}	-55~150	°C
Operating Junction Temperature	T _j	-40~150	°C
Thermal Resistance	R _{th(j-c)}	6.25	°C/W
	R _{th(j-a)}	62.5	
Lead Temperature·Time	T _{sol}	260 (10 s)	°C

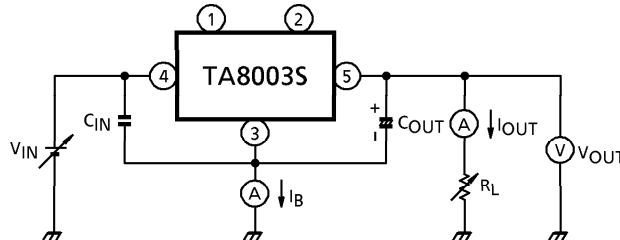
ELECTRICAL CHARACTERISTICS (Unless otherwise specified, $V_{IN} = 14\text{ V}$, $I_{OUT} = 10\text{ mA}$, $T_j = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	1	$5.35\text{ V} \leq V_{IN} \leq 26\text{ V}$, $T_a = 25^\circ\text{C}$	4.8	5.0	5.2	V
			$5.35\text{ V} \leq V_{IN} \leq 26\text{ V}$, $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	4.5	—	5.5	
Line Regulation	Reg-Line	1	$10\text{ V} \leq V_{IN} \leq 17\text{ V}$	—	1	10	mV
			$7\text{ V} \leq V_{IN} \leq 26\text{ V}$	—	2	30	
Load Regulation	Reg-Load	1	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	30	60	mV
Quiescent Current	I_B	1	$6\text{ V} \leq V_{IN} \leq 26\text{ V}$, $I_{OUT} \leq 10\text{ mA}$	—	1.0	2.0	mA
			$V_{IN} = 14\text{ V}$, $I_{OUT} = 200\text{ mA}$	—	17	30	
Dropout Voltage	V_{DROP}	1	$I_{OUT} = 50\text{ mA}$	—	0.1	0.3	V
			$I_{OUT} = 200\text{ mA}$	—	0.3	0.6	
Maximum Operating Input Voltage	V_{IN}	1	—	29	33	—	V
Output Control Voltage (ON) (Note)	$V_{DIS(ON)}$	2	—	—	—	1	V
Output Control Current (ON)	$I_{DIS(ON)}$	2	$V_{DIS} = 0.5\text{ V}$	—	—	10	μA
Output Control Voltage (OFF)	$V_{DIS(OFF)}$	2	—	3	—	—	V
Output Control Current (OFF)	$I_{DIS(OFF)}$	2	$V_{DIS} = 5\text{ V}$	—	0.3	0.7	mA
Adjustable Range of Output	V_{OUT}	—	—	4.5	—	7.0	V
Short Circuit Current Limit	I_{SC}	1	$V_{IN} = 14\text{ V}$	—	560	—	mA

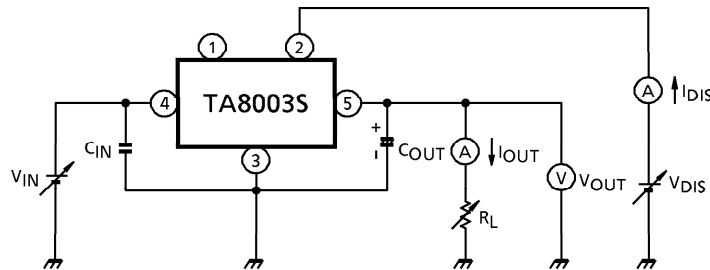
(Note) : Output is turned ON when DIS terminal is opened.

TEST CIRCUIT

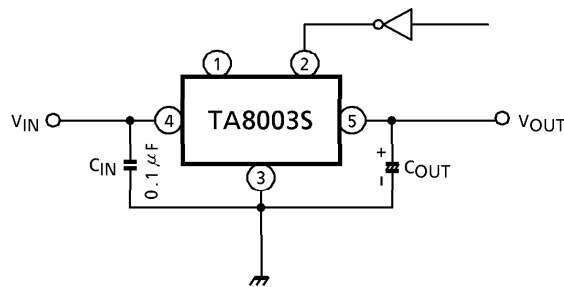
1. V_{OUT} , Reg-Line, Reg-Load, I_B , V_{DROP} , V_{IN} , I_{SC}



2. $V_{DIS(ON)}$, $I_{DIS(ON)}$, $V_{DIS(OFF)}$, $I_{DIS(OFF)}$



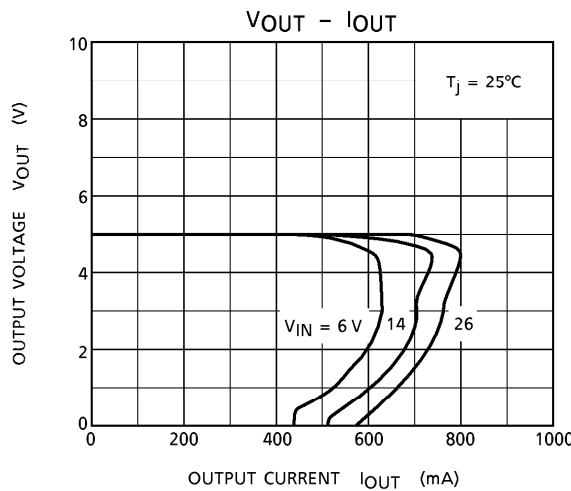
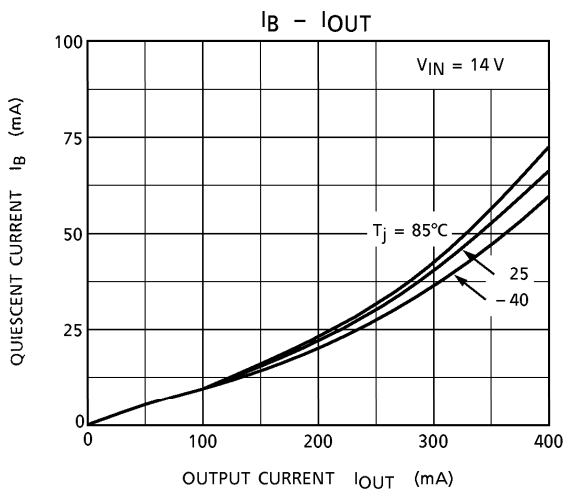
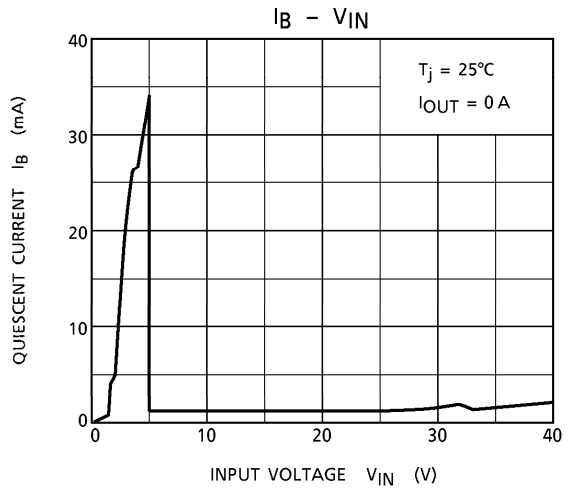
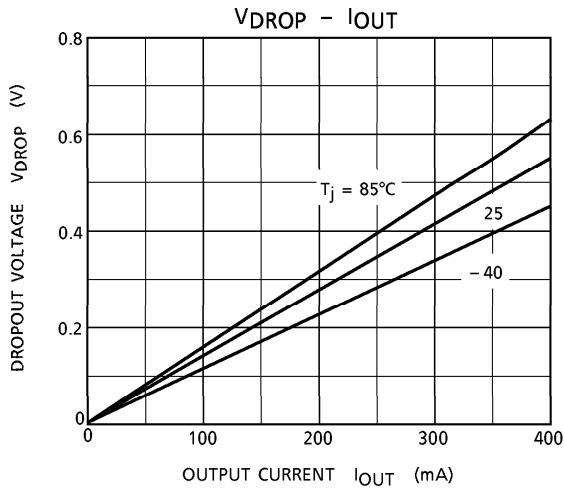
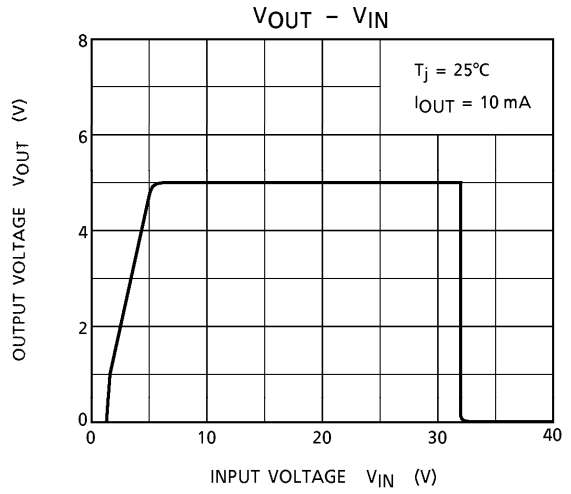
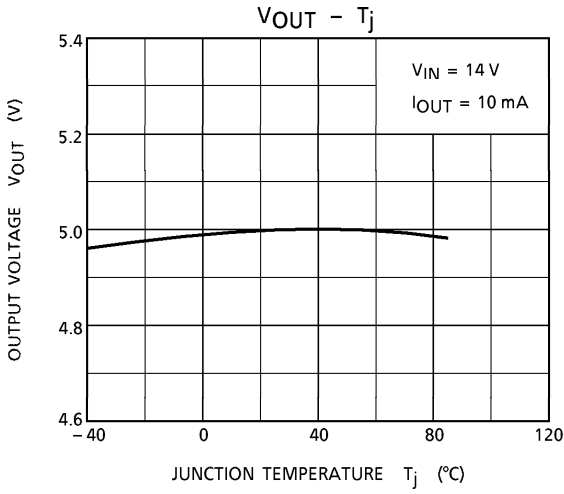
APPLICATION CIRCUIT

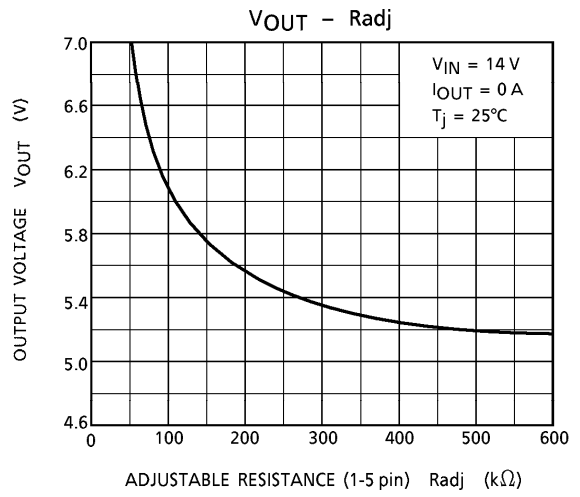
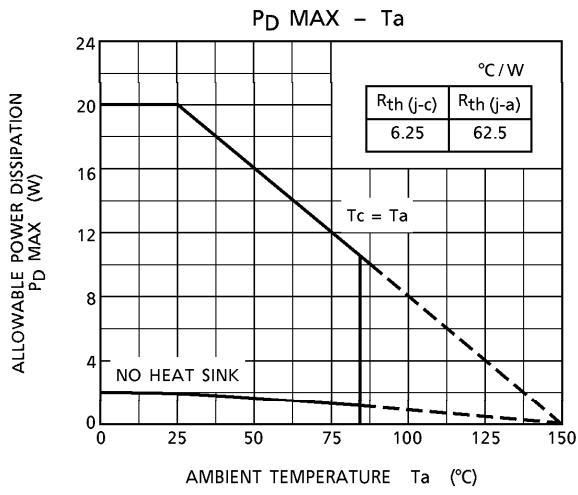


* The equivalent series resistance (ESR) of C_{OUT} must be less than $1\ \Omega$ in operating temperature range.

Note on use :

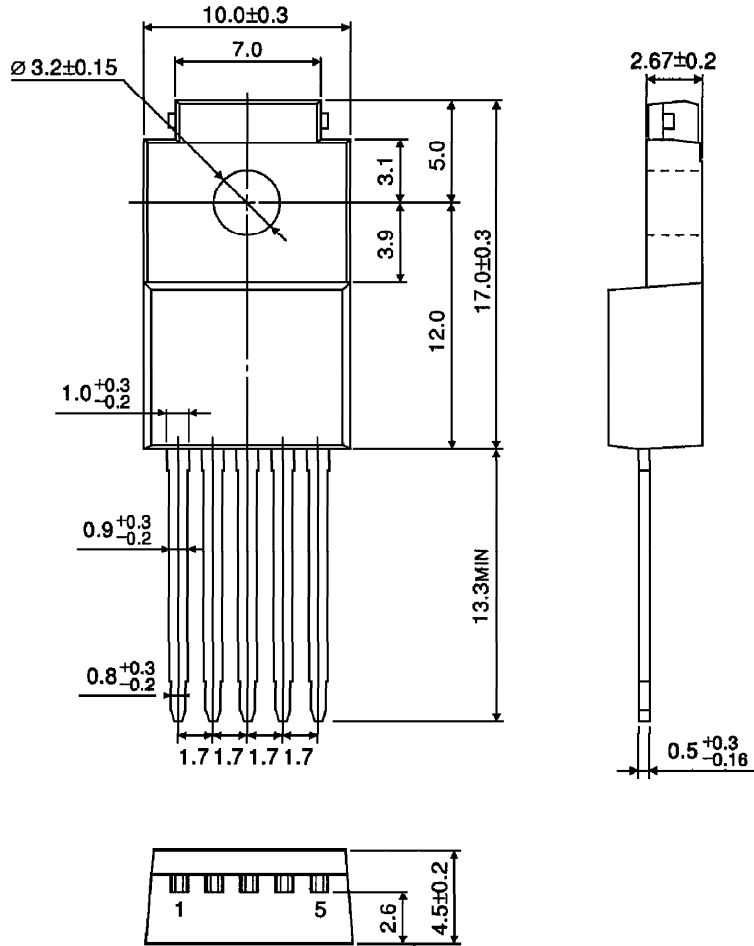
1. Connect the input and output capacitors close to the pins of the regulator. If the output voltage oscillates, increase the C_{OUT} capacity and decrease the ESR. Make sure that the output voltage does not oscillate over the full range of the operating temperature.
2. When the output voltage exceeds the variable range, malfunction may arise.





PACKAGE DIMENSIONS
P-SSIP5-1.70A (STL)

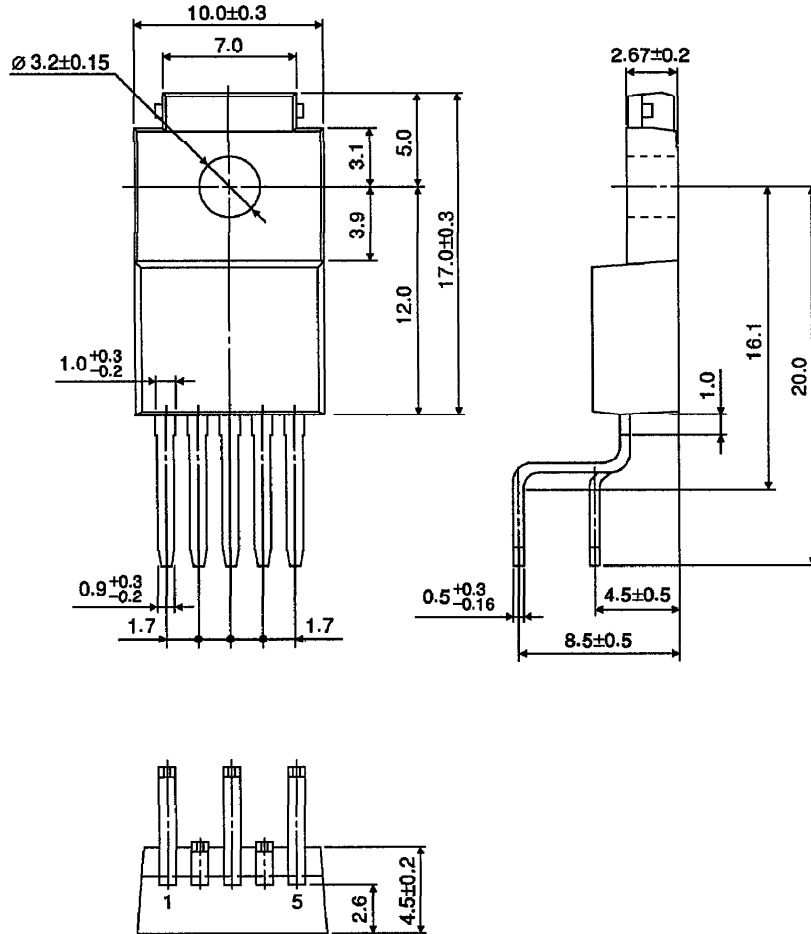
Unit : mm



Weight : 2.2 g (Typ.)

PACKAGE DIMENSIONS
P-ZIP5-1.70 (LBST2)

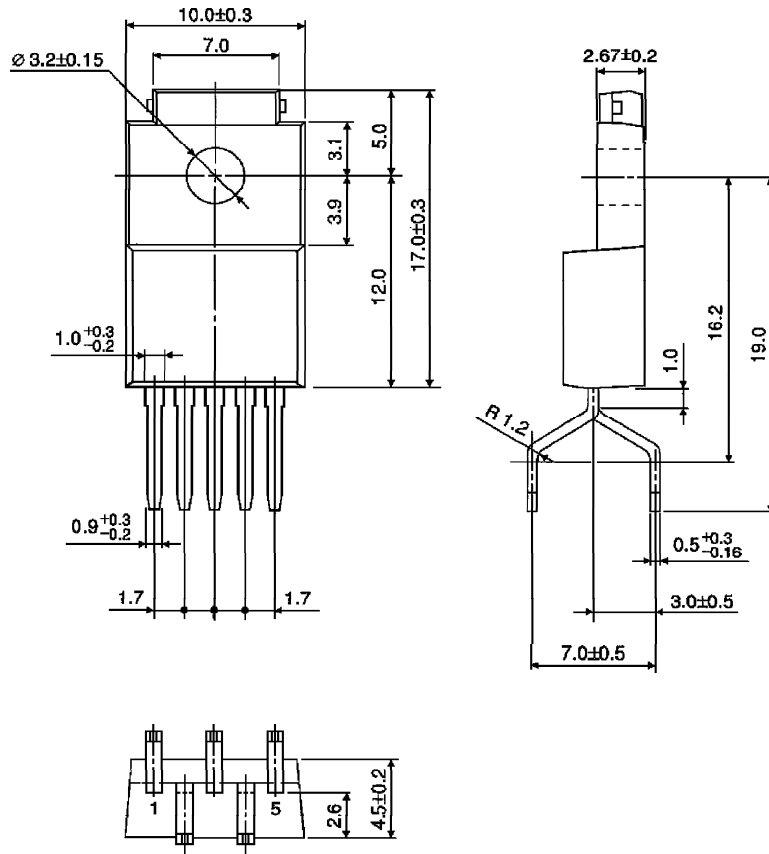
Unit : mm



Weight : 2.2 g (Typ.)

PACKAGE DIMENSIONS
P-ZIP5-1.70A (LB3ST2)

Unit : mm



Weight : 2.2 g (Typ.)