

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA8003SA

5 V Low Dropout Voltage Regulator with ON/OFF Switch

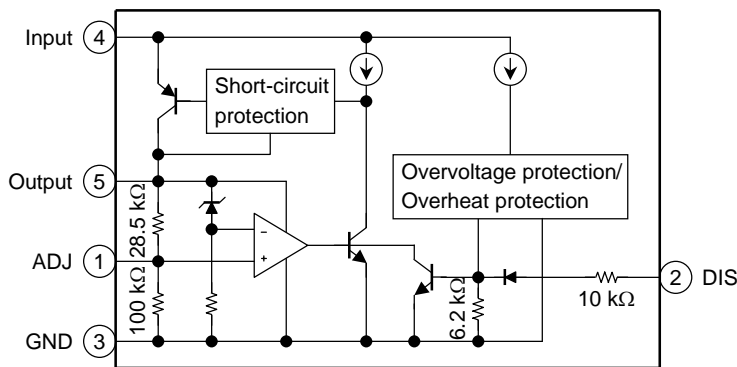
The TA8003SA is a 5 V power IC with an ON/OFF output control pin. The TA8003SA is also designed to provide a maximum output current of 400 mA.

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

Features

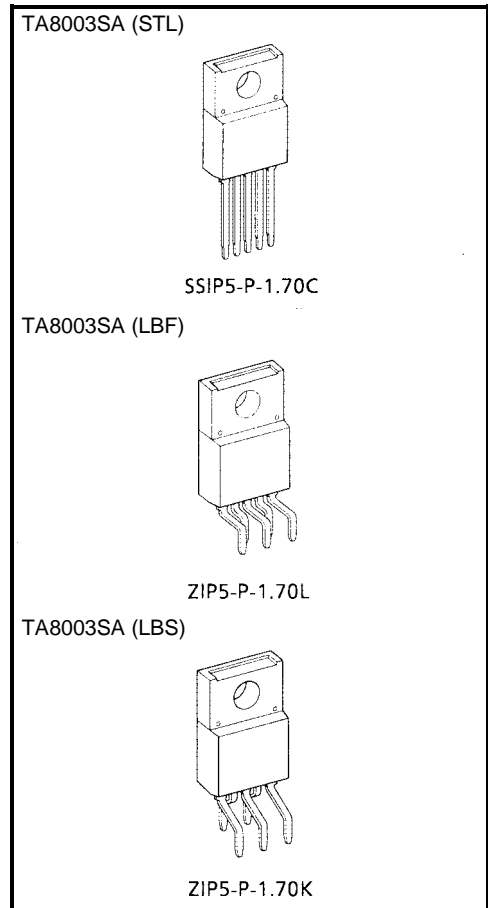
- Low standby current: 800 μ A (typ.)
- Maximum output current: 400 mA (max)
- Low dropout voltage: 0.6 V (max)
- Multi-protection:
 - Power supply reverse connection/
 - Overvoltage protection/Overheat protection/
 - Short-circuit protection/60 V load dump
- Adjustable output voltage
- Controllable output ON/OFF
- TO-220N (IS) 5-pin isolation package

Block Diagram



Pin Description

Pin No.	Symbol	Description
1	ADJ	Output voltage adjusting pin. Connect a resistor between ADJ and OUT to increase the output voltage. $V_{OUT} = V_{ref} \left\{ 1 + \frac{R_2(R_1 + R_{adj})}{R_1 \cdot R_{adj}} \right\}$ $R_1 = 28.5 \text{ k}\Omega, R_2 = 100 \text{ k}\Omega, V_{ref} = 1.1 \text{ V}, R_{adj}$: Adjustment resistance
2	DIS	Output ON/OFF control pin. 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 pin
4	IN	Power supply pin
5	OUT	The 5 V output pin with maximum output current 400 mA



Weight
 SSIP5-P-1.70C: 2.1 g (typ.)
 ZIP5-P-1.70L: 2.1 g (typ.)
 ZIP5-P-1.70K: 2.1 g (typ.)

Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Input voltage	V _{IN}	-26~60	V
Operating input voltage	V _{IN}	29	V
Power dissipation	(Ta = 25°C)	2	W
	(Tc = 25°C)	20	
Operating temperature	T _{opr}	-40~85	°C
Storage temperature	T _{stg}	-55~150	°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

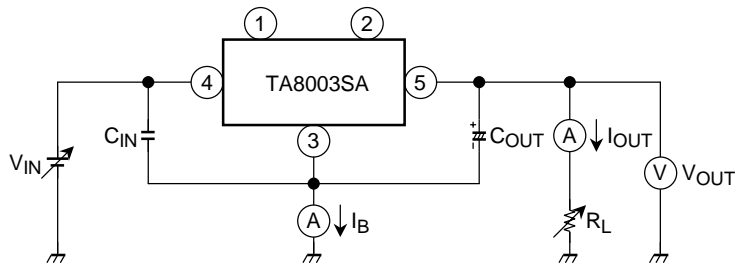
Electrical Characteristics (unless otherwise specified, V_{IN} = 14 V, I_{OUT} = 10 mA, T_j = 25°C)

Characteristics	Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V _{OUT}	1	5.35 V ≤ V _{IN} ≤ 26 V, Ta = 25°C	4.8	5.0	5.2	V
			5.35 V ≤ V _{IN} ≤ 26 V, -40°C ≤ Ta ≤ 85°C	4.5	—	5.5	
Line regulation	Reg-Line	1	10 V ≤ V _{IN} ≤ 17 V	—	1	10	mV
			7 V ≤ V _{IN} ≤ 26 V	—	2	30	
Load regulation	Reg-Load	1	10 mA ≤ I _{OUT} ≤ 200 mA	—	30	60	mV
Quiescent current	I _B	1	6 V ≤ V _{IN} ≤ 26 V, I _{OUT} ≤ 10 mA	—	1.0	2.0	mA
			V _{IN} = 14 V, I _{OUT} = 200 mA	—	17	30	
Dropout voltage	V _{DROP}	1	I _{OUT} = 50 mA	—	0.1	0.3	V
			I _{OUT} = 200 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 V	—	—	10	μA
Output control voltage (OFF)	V _{DIS(OFF)}	2	—	3	—	—	V
Output control current (OFF)	I _{DIS(OFF)}	2	V _{DIS} = 5 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 V	—	560	—	mA

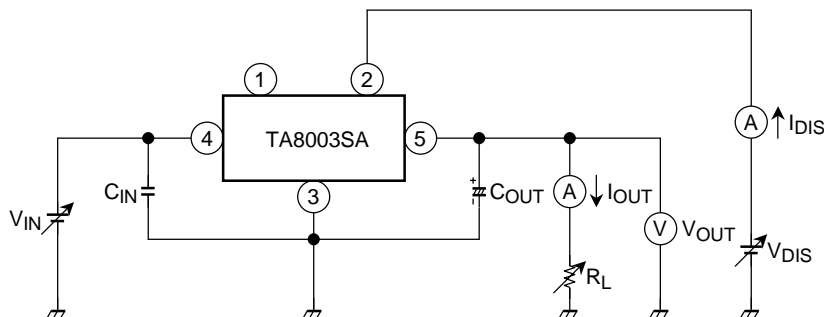
Note: Output is turned ON when DIS pin is opened.

Test Circuit

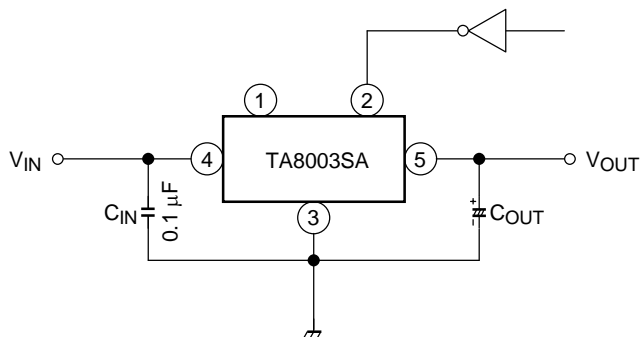
1. V_{OUT} , Reg-Line, Reg-Load, I_B , V_{DROP} , V_{IN} , I_{SC}



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



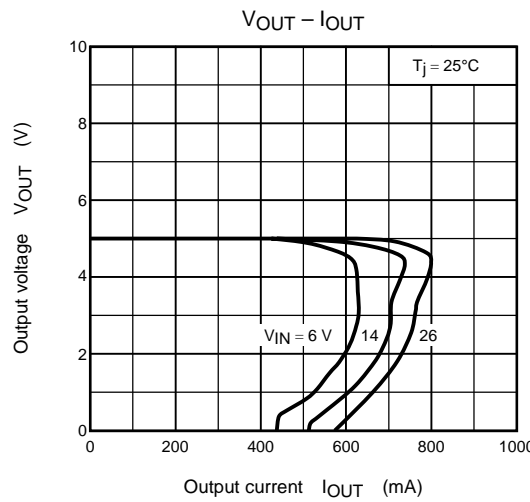
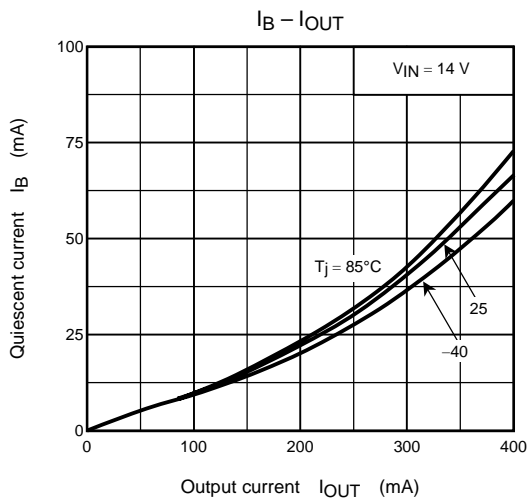
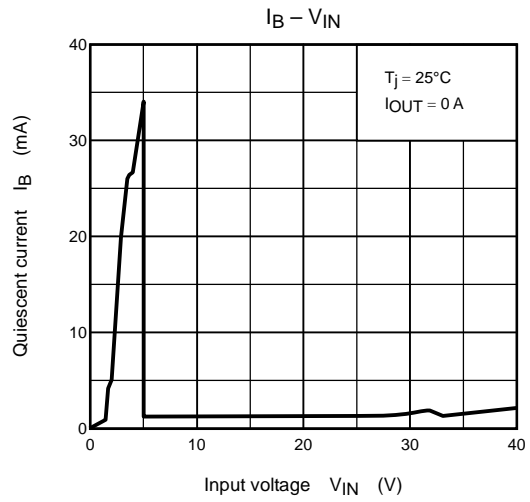
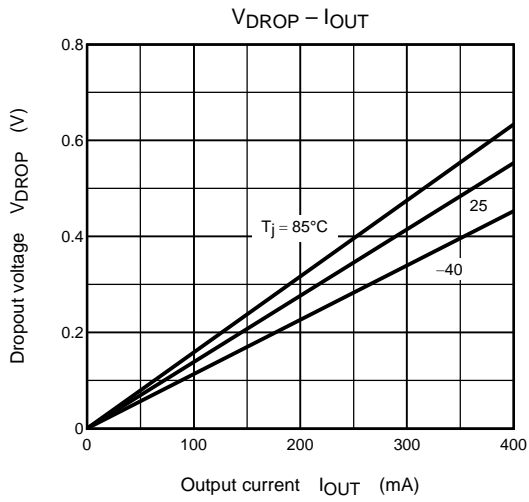
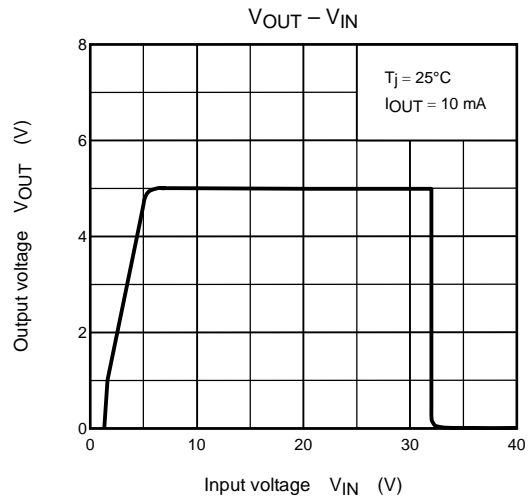
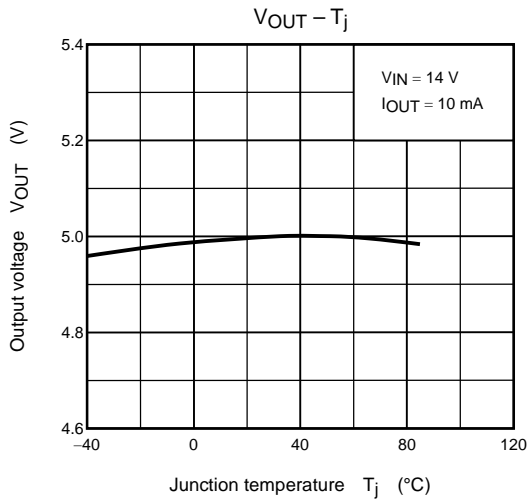
Application Circuit

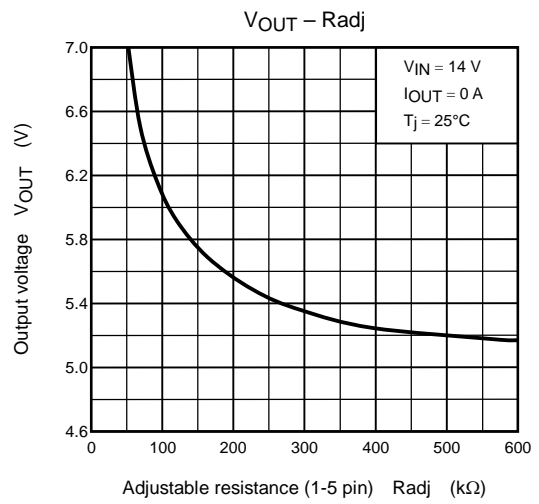
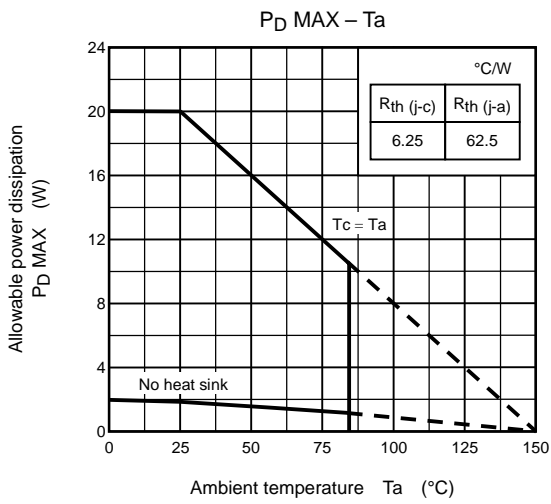


*: The equivalent series resistance (ESR) of C_{OUT} must be less than 1Ω in operating temperature range.

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.

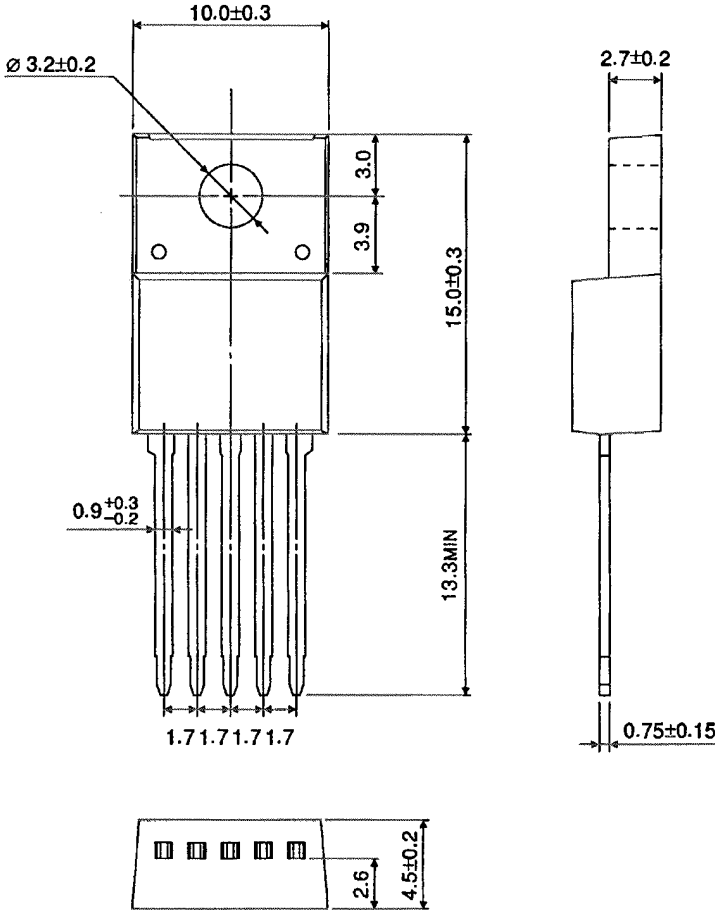




Package Dimensions

SSIP5-P-1.70C

Unit : mm

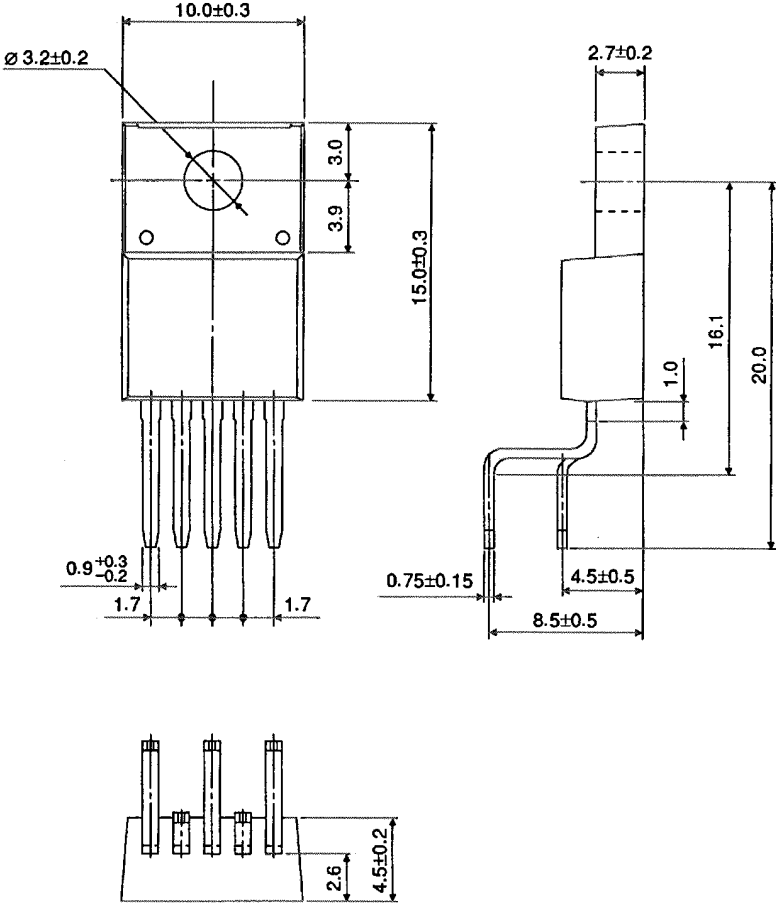


Weight: 2.1 g (typ.)

Package Dimensions

ZIP5-P-1.70L

Unit : mm

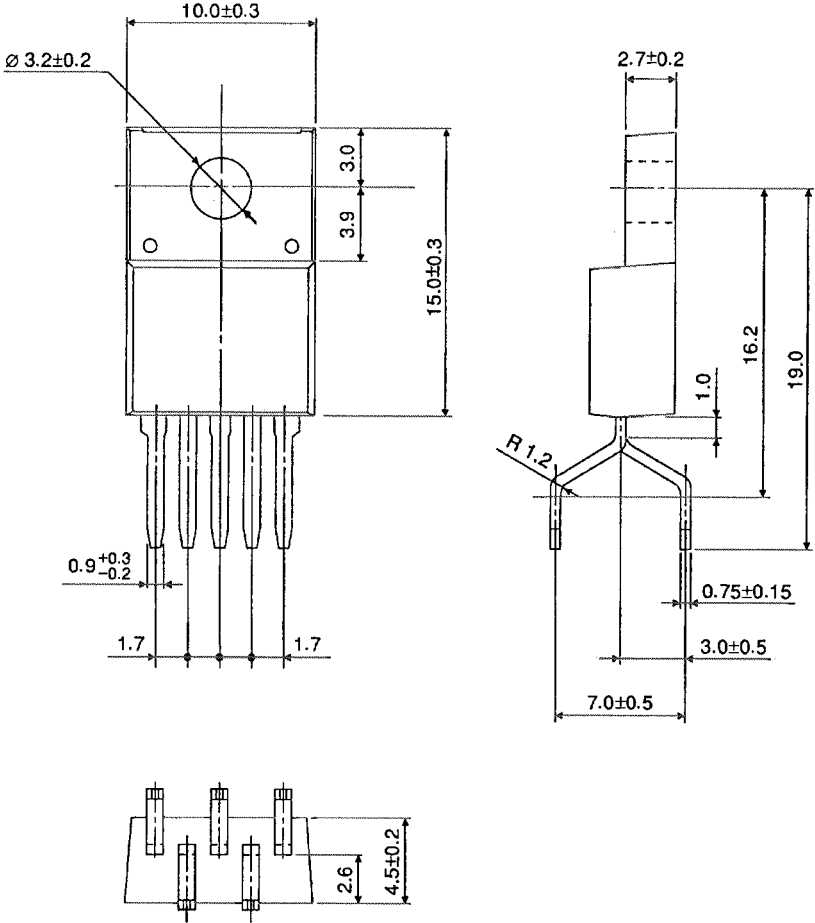


Weight: 2.1 g (typ.)

Package Dimensions

ZIP5-P-1.70K

Unit : mm



Weight: 2.1 g (typ.)

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