

TOSHIBA Bipolar Linear Integrated Circuit Silicon Monolithic

TA8004SA

5 V Low Dropout Regulator with Reset Timer

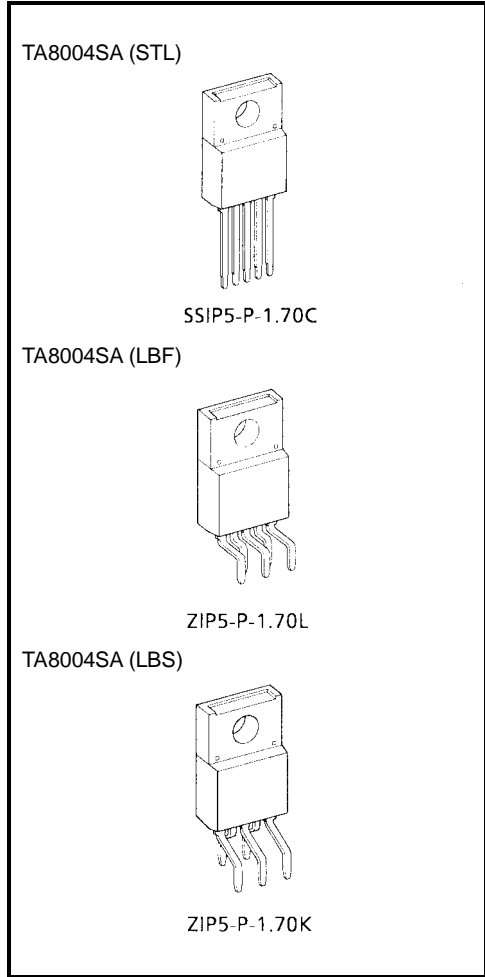
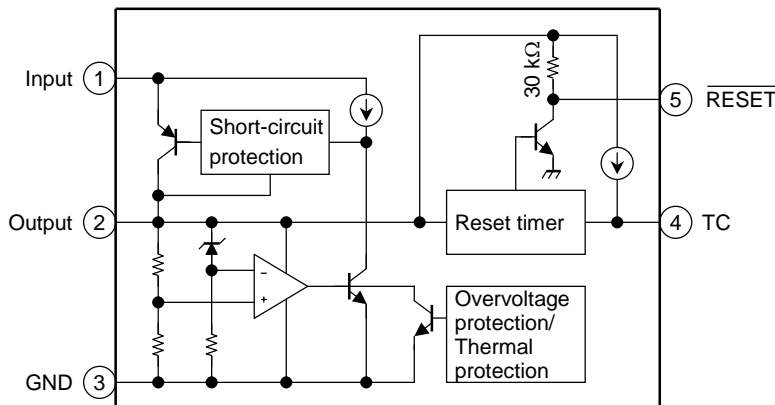
The TA8004SA is a 5 V regulator which handles 400 mA (max) of output current.

This IC generates a reset signal to reset the system when power is supplied or the 5 V output voltage lowers to 85% or less of normal output voltage due to the external disturbances.

Features

- Maximum output current: 400 mA (max)
- Low dropout voltage: 0.6 V (max)
- Multi protection
 - Power supply reverse connection
 - Function for overvoltage
 - Thermal protection
 - Short-circuit protection
- Internal power ON reset timer
- TO-220N (IS) 5 pin package

Block Diagram

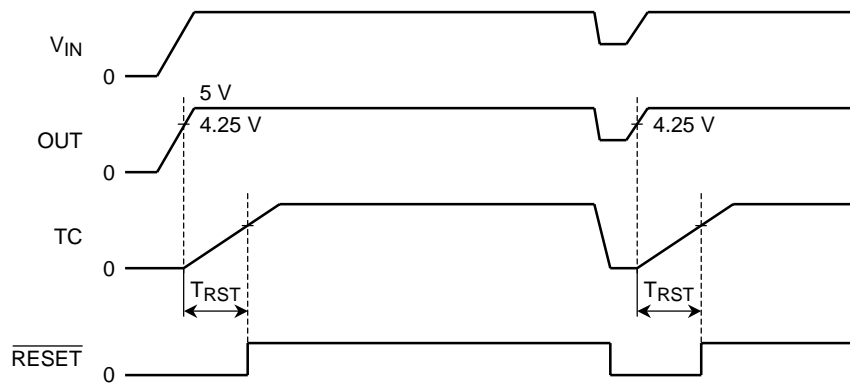


Weight
 SSIP5-P-1.70C : 2.1 g (typ.)
 ZIP5-P-1.70L : 2.1 g (typ.)
 ZIP5-P-1.70K : 2.1 g (typ.)

Pin Descriptions

Pin No.	Symbol	Description
1	IN	Power supply pin
2	OUT	The 5 V output pin with maximum output current 400 mA
3	GND	Ground pin
4	TC	Terminal to set the reset timer. A capacitor is connected between this pin and GND.
5	RESET	Collector output of an NPN transistor with built-in pull-up resistor. This pin is put at LOW level at output voltage below 85% of a prescribed level and after output voltage becomes above 85% of a prescribed level, a reset signal for the time set at the TC pin.

Timing Chart

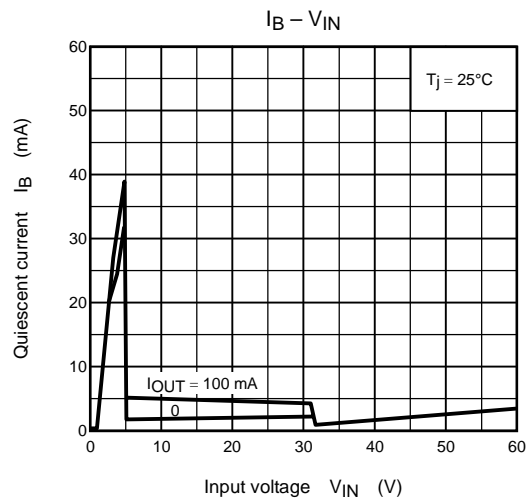
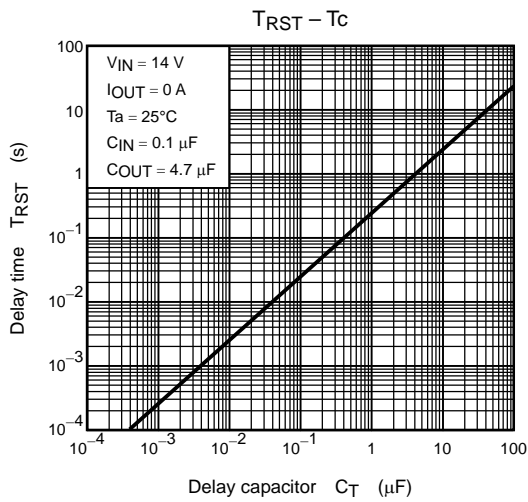
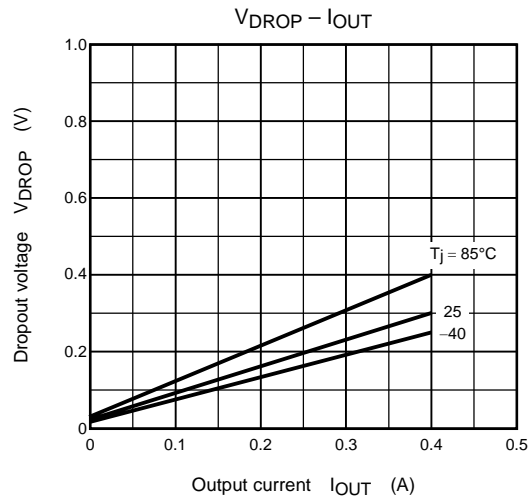
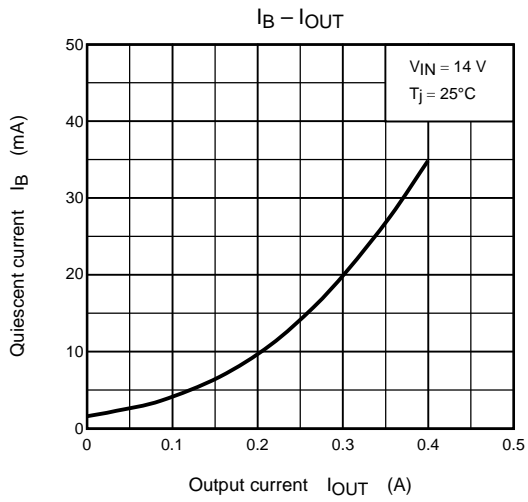
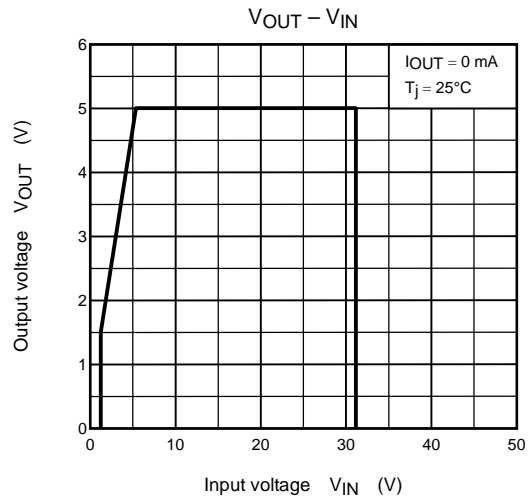
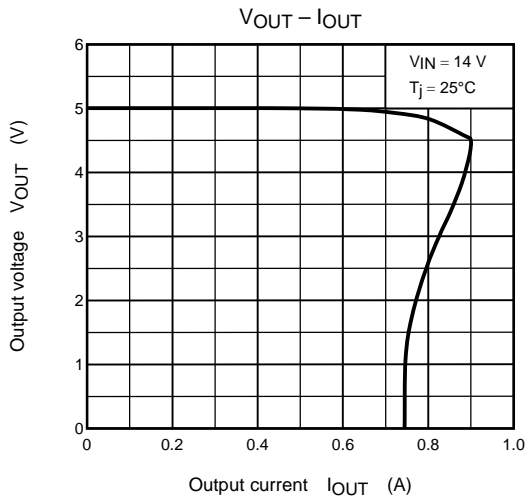


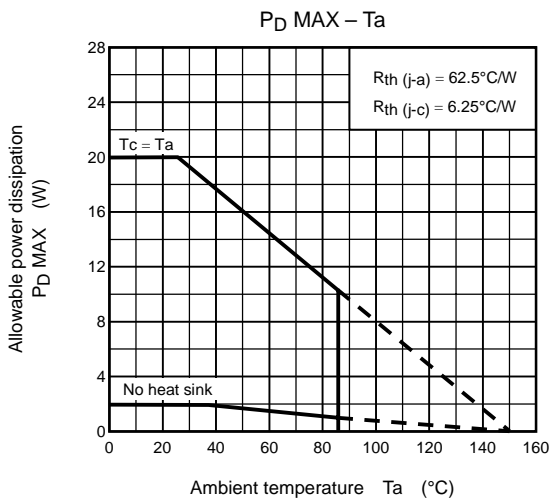
Maximum Ratings ($T_a = 25^\circ\text{C}$)

Characteristics	Symbol	Rating	Unit
Input voltage	V_{IN}	-20~60	V
Power dissipation	P_D	($T_a = 25^\circ\text{C}$)	2
		($T_c = 25^\circ\text{C}$)	20
Operating temperature	T_{opr}	-40~85	$^\circ\text{C}$
Storage temperature	T_{stg}	-55~150	$^\circ\text{C}$
Soldering temperature • time	T_{sol}	260 (10 s)	$^\circ\text{C}$
Thermal resistance	$R_{th(j-c)}$	6.25	$^\circ\text{C/W}$
	$R_{th(j-a)}$	62.5	

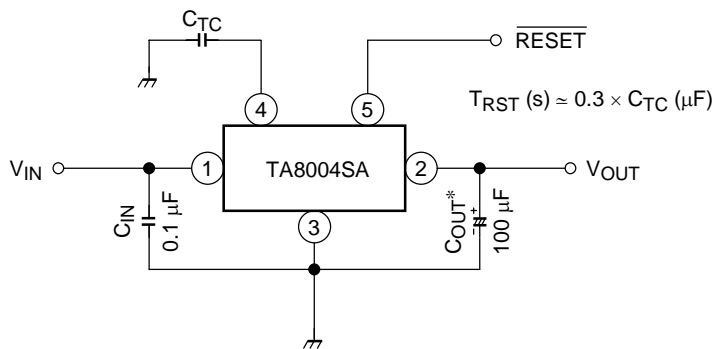
Electrical Characteristics (unless otherwise specified, $V_{IN} = 14\text{ V}$, $I_{OUT} = 10\text{ mA}$, $T_j = 25^\circ\text{C}$)

Characteristics	Symbol	Pin	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output voltage	V_{OUT}	OUT	—	$5.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ $I_{OUT} = 10\text{ mA}$	4.8	5.0	5.2	V
				$5.35\text{ V} \leq V_{IN} \leq 26\text{ V}$ $I_{OUT} = 10\text{ mA}$ $-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$	4.5	5.0	5.5	
Line regulation	Reg-Line	OUT	—	$10\text{ V} \leq V_{IN} \leq 17\text{ V}$ $I_{OUT} = 200\text{ mA}$	—	4	50	mV
				$7\text{ V} \leq V_{IN} \leq 26\text{ V}$ $I_{OUT} = 200\text{ mA}$	—	10	70	
Load regulation	Reg-Load	OUT	—	$10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$	—	35	150	mV
Quiescent current	I_B	GND	—	$6\text{ V} \leq V_{IN} \leq 26\text{ V}$, $I_{OUT} = 0$	—	1.7	3	mA
				$V_{IN} = 14\text{ V}$, $I_{OUT} = 200\text{ mA}$	—	10	—	
Dropout voltage	V_{DROP}	IN/OUT	—	$I_{OUT} = 50\text{ mA}$	—	0.08	0.2	V
				$I_{OUT} = 400\text{ mA}$	—	0.3	0.6	
Maximum operating input voltage	V_{IN}	IN	—	—	29	32	—	V
Reset voltage (H)	$V_{RST(H)}$	RST	—	—	4.5	5	5.5	V
Reset voltage (L)	$V_{RST(L)}$	RST	—	$I_{SINK} = 2.5\text{ mA}$	—	0.15	0.4	V
Delay time	T_{RST}	RST	—	—	—	$0.3 \times C_{TC}$ (μF)	—	s
TC threshold	V_{TH}	TC	—	—	—	$V_{OUT} \times 60\%$	—	V
Delay current	I_{TC}	TC	—	—	5	12	25	μA
V_{OUT} threshold	V_{TH}	OUT	—	—	—	$V_{OUT} \times 85\%$	—	V





Application Circuit

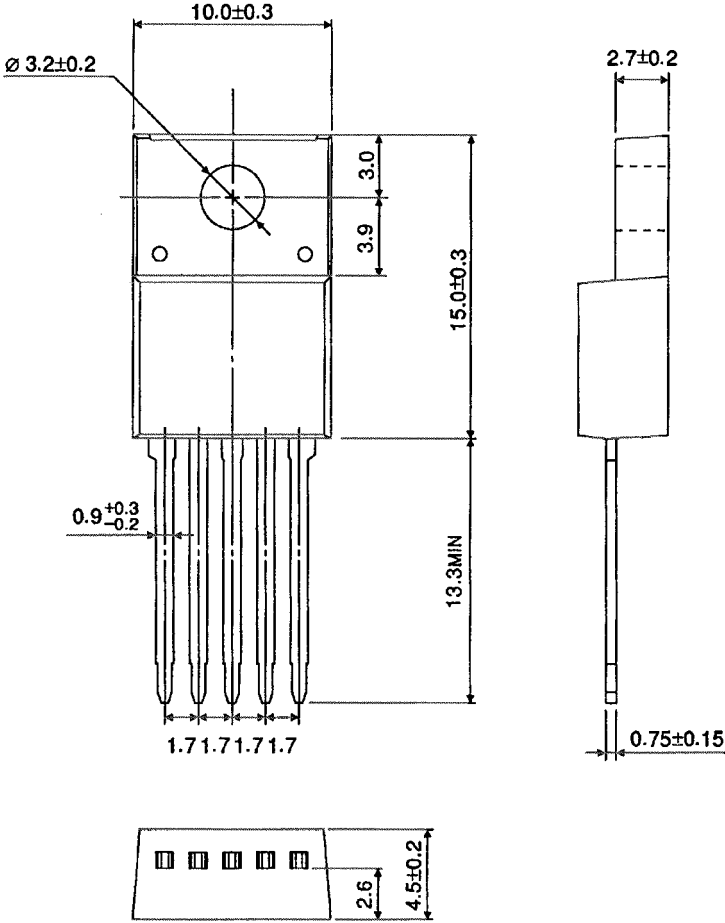


*: Capacitor C_{OUT} must be guaranteed to operate of the temperature range that the regulator should be operated correctly.
 The equivalent series resistance (ESR) of C_{OUT} must be less than 1Ω in operating temperature range.

Package Dimensions

SSIP5-P-1.70C

Unit : mm

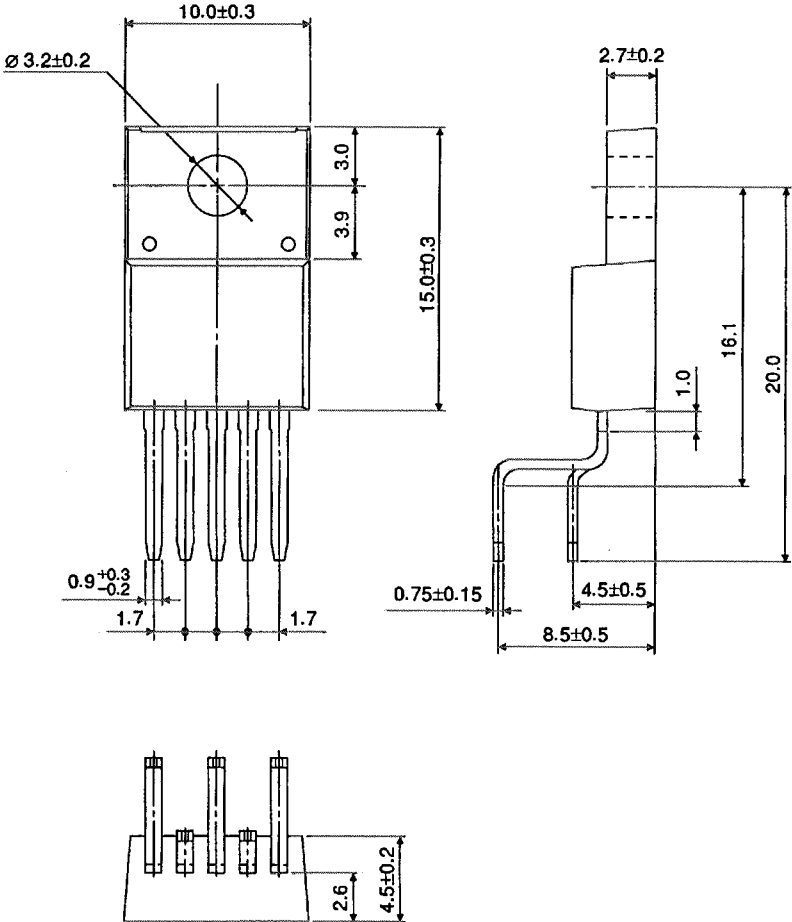


Weight: 2.1 g (typ.)

Package Dimensions

ZIP5-P-1.70L

Unit : mm

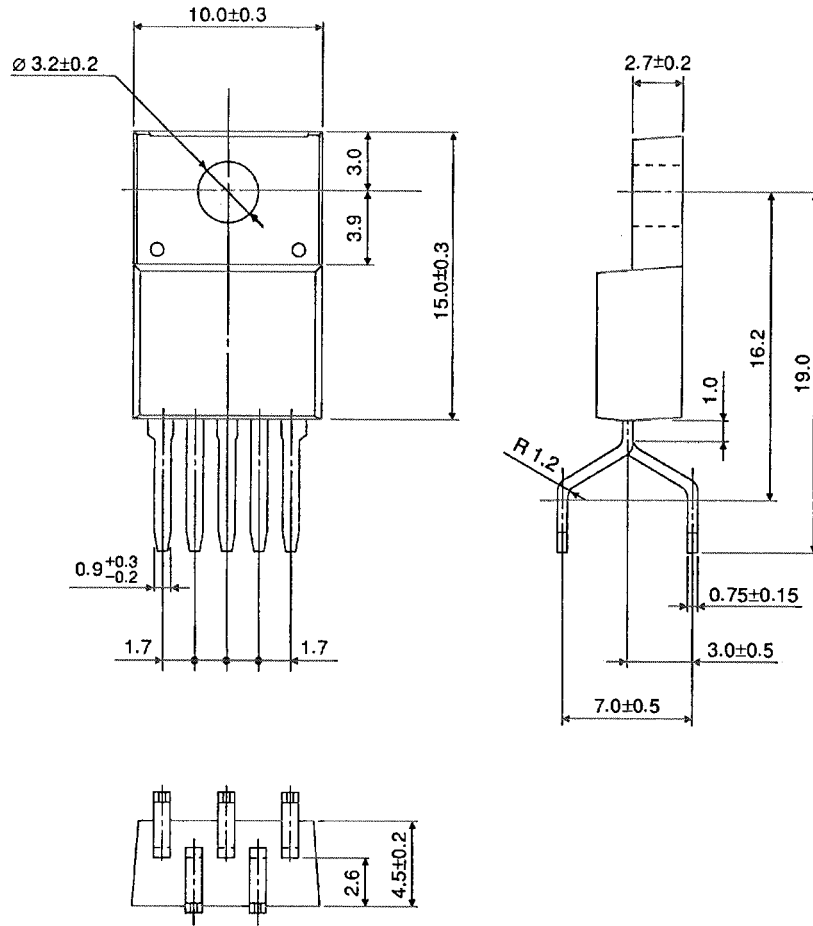


Weight: 2.1 g (typ.)

Package Dimensions

ZIP5-P-1.70K

Unit : mm



Weight: 2.1 g (typ.)

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