

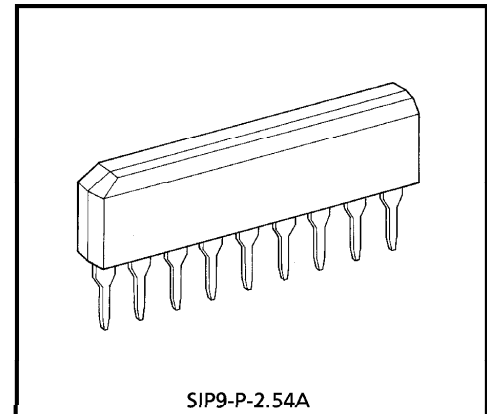
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA8020AS

## DUAL VOLTAGE SENSOR

The TA8020AS is an IC designed for lamp failure detection. When a lamp failure occurs, it detects the resulting lamp current change from the voltage across the detection resistor  $R_S$ .

It has a reference voltage characterized by high accuracy and small temperature drift as well as a voltage comparator. It is also designed to compensate for lamp current changes due to supply voltage variations. It consists of two circuits which are supplied with power from separate pins.

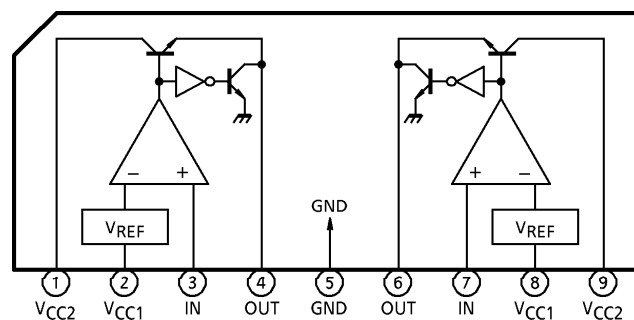


Weight : 0.92g (Typ.)

### FEATURES

- Two circuits served by separate power supplies
- High-performance input amplifier incorporated
- Reference voltage characterized by small temperature drift
- Built-in circuit which compensates for lamp voltage characteristic variations
- Operating temperature range : from  $-40$  to  $85^{\circ}\text{C}$
- Plastic SIP-9 pin

### BLOCK DIAGRAM AND PIN LAYOUT



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## PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1, 9	V <sub>CC2</sub>	Power supply pin dedicated to the output transistor. Since it is connected to V <sub>CC1</sub> outside the IC, influence of output on/off on the detection voltage is low so that accurate detection is assured.
2, 8	V <sub>CC1</sub>	Power supply pin for the IC. High accuracy is assured under the condition of V <sub>CC</sub> =8 to 16V.
3, 7	IN	Detection pin which leads to a differential input circuit consisting of a PNP transistor. The detected voltage is amplified ten times within the IC. The resulting voltage is fed to the differential-input PNP-transistor comparator.
4, 6	OUT	Push-pull output pin which connects to an NPN transistor. When a lamp failure is detected, this signal goes high to flow out a current for driving the external output circuit.
5	GND	Grounded

(Note : Operation mode)

Input Voltage	Output Mode
V <sub>IN</sub> >V <sub>TH</sub>	LOW
V <sub>IN</sub> <V <sub>TH</sub>	HIGH

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	30	V
Power Dissipation	P <sub>D</sub>	500	mW
Output Current	I <sub>OUT</sub>	- 20	mA
Input Voltage	V <sub>IN</sub>	- 0.3~V <sub>CC</sub>	V
Operating Temperature	T <sub>opr</sub>	- 40~85	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C
Lead Temperature-time	T <sub>sol</sub>	260 (10s)	°C

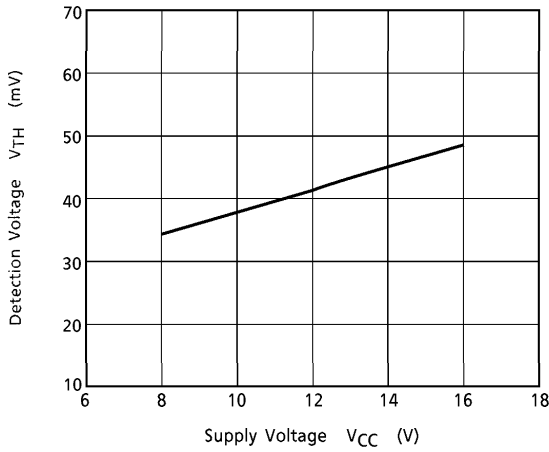
**ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 12V, Ta = - 40 to 85°C)**

CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V <sub>CC</sub>	—	—	—	8	—	16	V
Current Consumption	I <sub>CC</sub>	V <sub>CC1</sub> V <sub>CC2</sub>	—	V <sub>CC</sub> = 12V	—	—	7	mA
Output Voltage	V <sub>OUT</sub>	OUT	—	R <sub>L</sub> = 1kΩ (Note)	—	—	1.5	V
Leakage Current	I <sub>LEAK</sub>	OUT	—	V <sub>OUT</sub> = 0V	10	—	—	μA
Input Current	I <sub>IN</sub>	IN	—	V <sub>CC</sub> = 12V, V <sub>IN</sub> = 12V	20	50	100	μA
Detection Voltage	V <sub>TH</sub>	IN	—	V <sub>CC</sub> = 9V	27	35	43	mV
	ΔV <sub>TH</sub>		—	V <sub>TH</sub> (V <sub>CC</sub> = 16V) / V <sub>TH</sub> (V <sub>CC</sub> = 9V)	1.32	1.36	1.40	—
	ΔV <sub>TH</sub> / ΔT		—	V <sub>CC</sub> = 9V	- 40	—	40	μV / °C

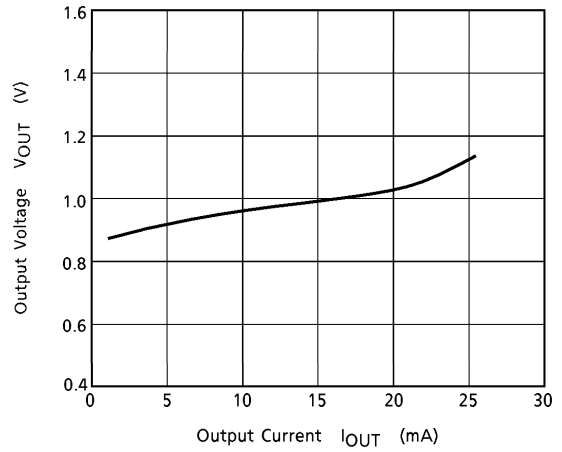
(Note) : V<sub>CC</sub>-V<sub>OUT</sub>

**TYPICAL CHARACTERISTICS**

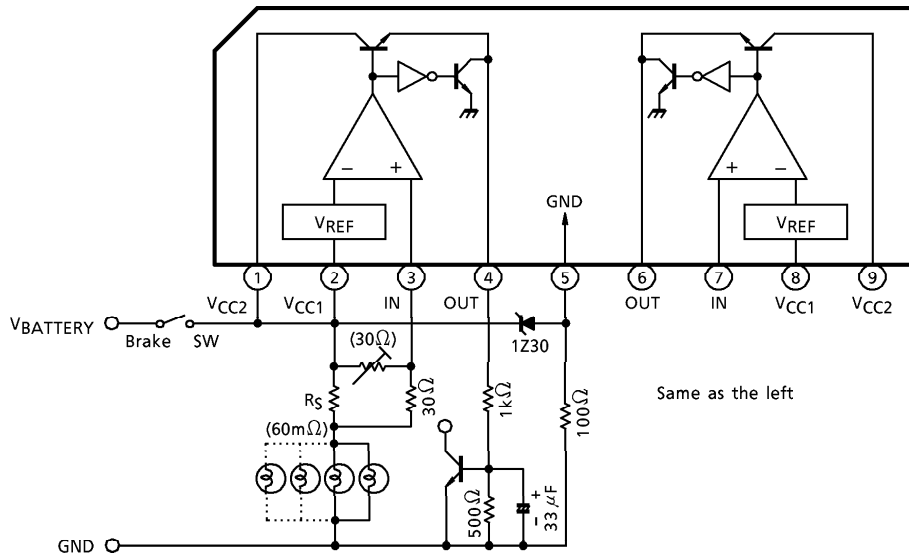
(1) Detection Voltage Characteristic ( $V_{TH}$ )



(2) Output Voltage Characteristic ( $V_{OUT}$ )

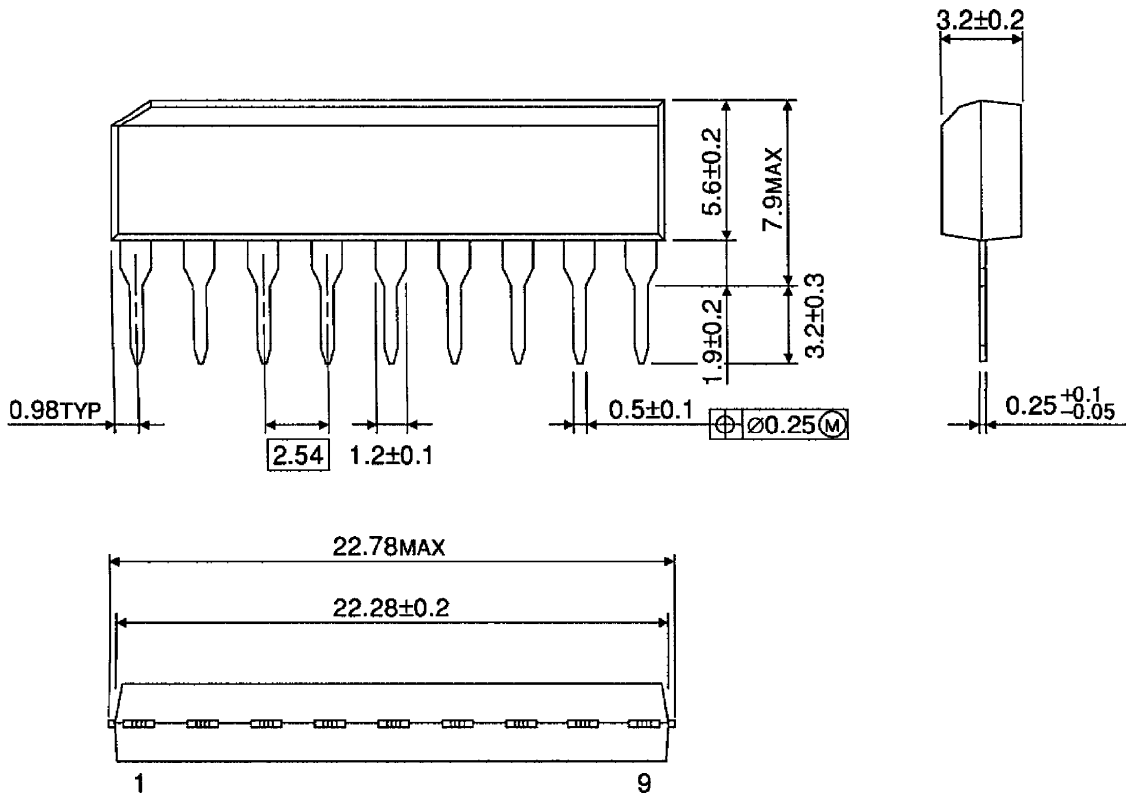


**EXAMPLE OF APPLICATION CIRCUIT (120 Vpeak 200ms LOAD DUMP)**



OUTLINE DRAWING  
SIP9-P-2.54A

Unit : mm



Weight : 0.92g (Typ.)