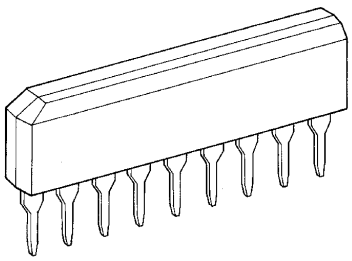
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8021S

TRIPLE VOLTAGE SENSOR

The TA8021S is an IC designed for automotive 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 three circuits which are supplied with power from separate pins.



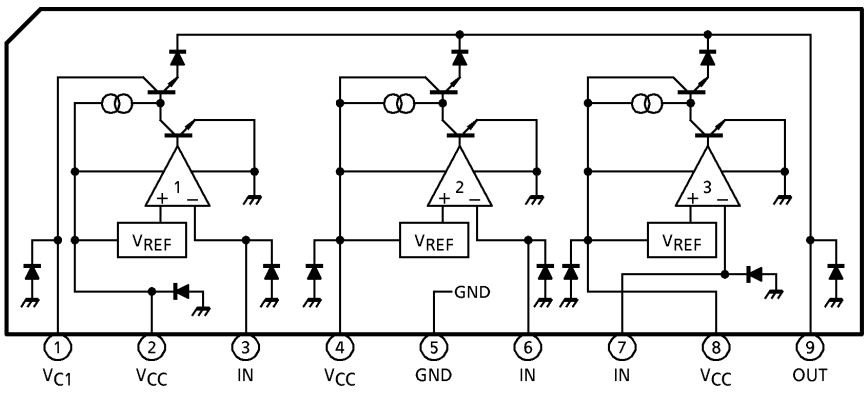
SIP9-P-2.54A

Weight : 0.92g (Typ.)

FEATURES

- Three 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 : −40 to 85°C
- Plastic SIP-9 pin

BLOCK DIAGRAM AND PIN LAYOUT



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PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	V_{C1}	Power supply pin dedicated to the output transistor in circuit 1. Since it is connected to V_{CC} outside the IC, influence of output on / off on the detection voltage is low so that failure involving four lamps and other failures can be accurately detected.
2, 4, 8	V_{CC}	Power supply pin for the IC. High accuracy is assured under the condition of V_{CC} = 8 to 16V.
3, 6, 7	IN	Detection pin which leads to a differential input circuit consisting of an NPN transistor.
9	OUT	NPN source output pin. The output is the wired OR of three circuits. This means that the output is used in common to the three circuits.
5	GND	Grounded

(Note : Operation mode)

Input Voltage	Output Mode
$V_{IN} > V_{TH}$	LOW
$V_{IN} < V_{TH}$	HIGH

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	30	V
Power Dissipation	P_D	500	mW
Output Current	I_{OUT}	− 20	mA
Input Voltage	V_{IN}	V_{CC}	V
Operating Temperature	T_{opr}	− 40~85	°C
Storage Temperature	T_{stg}	− 55~150	°C
Lead Temperature-time	T_{sol}	260 (10s)	°C

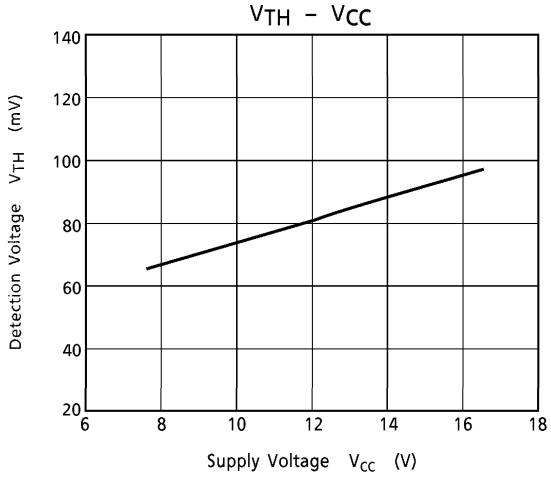
ELECTRICAL CHARACTERISTICS (V_{CC} = 12V, Ta = − 40 to 85°C)

CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V_{CC}	—	—	—	8	—	16	V
Current Consumption	I_{CC}	V_{C1}, V_{CC}	—	V_{CC} = 12V, V_{IN} = 12V	—	—	10	mA
Output Voltage	V_{OUT}	OUT	—	R_L = 1kΩ (Note)	—	—	2.5	V
Leakage Current	I_{LEAK}	OUT	—	V_{OUT} = 0V	− 10	—	—	μA
Input Current	I_{IN}	IN	—	V_{CC} = 12V, V_{IN} = 12V	—	—	10	μA
Detection Voltage	V_{TH}	IN	—	V_{CC} = 9V	60	70	80	mV
	ΔV_{TH}		—	V_{TH} (V_{CC} = 16V) / V_{TH} (V_{CC} = 9V)	1.32	1.36	1.40	—
	$\Delta V_{TH} / \Delta T$		—	—	− 40	—	40	μV / °C

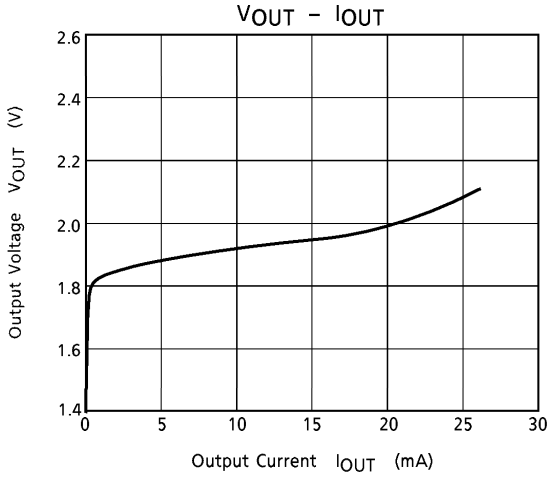
(Note) : V_{CC}-V_{OUT}

TYPICAL CHARACTERISTICS

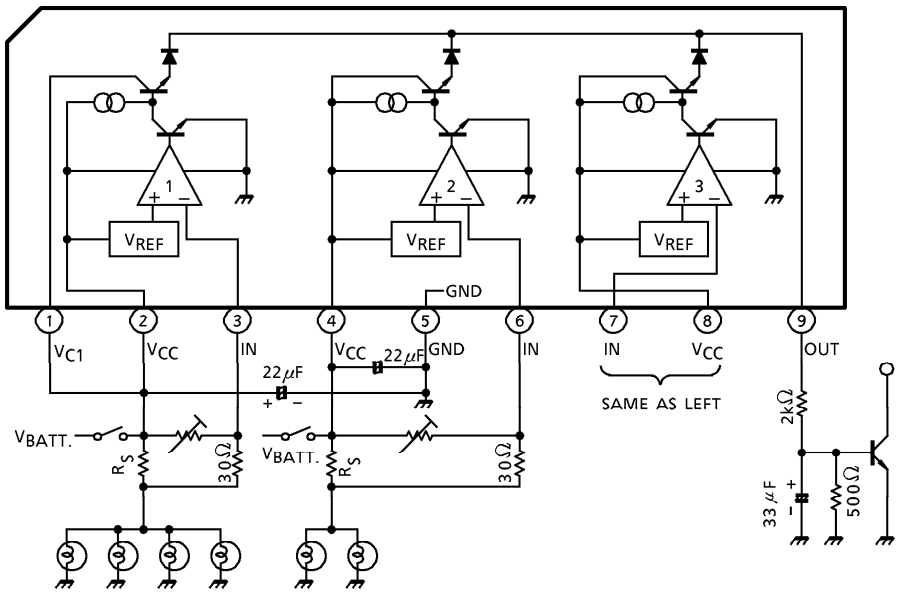
(1) Detection Voltage Characteristic (V_{TH})



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



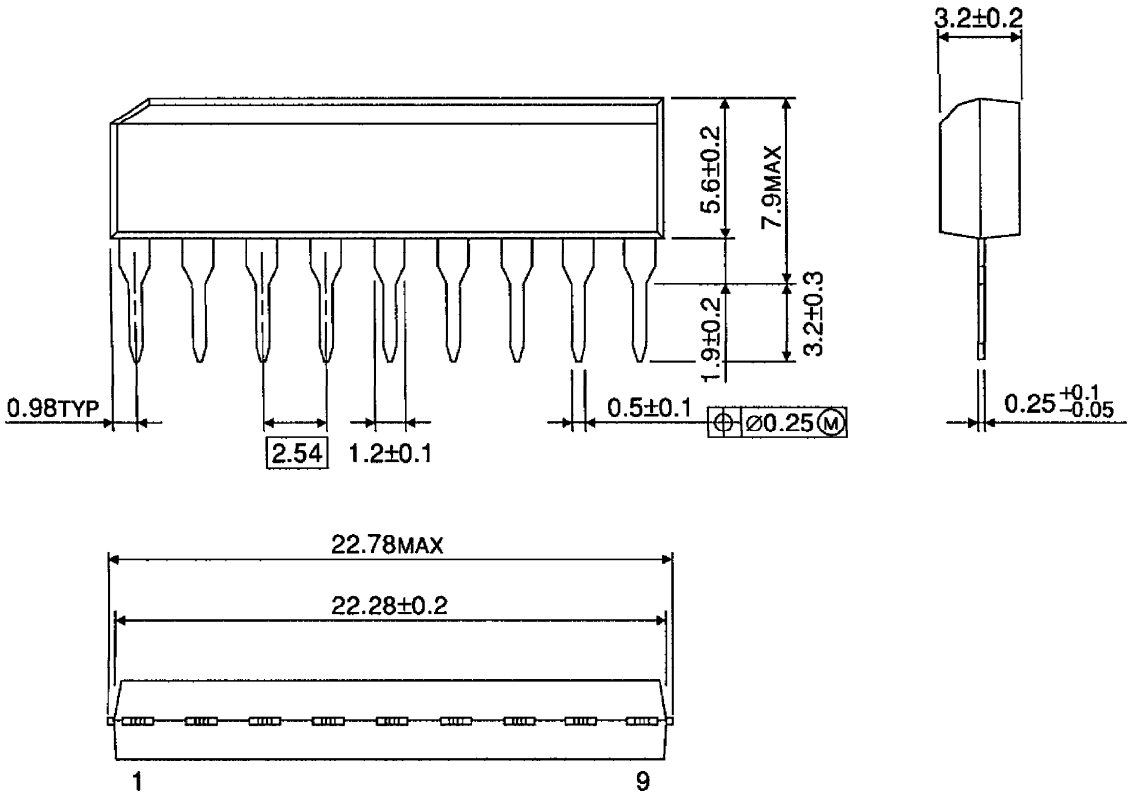
EXAMPLE OF APPLICATION CIRCUIT



OUTLINE DRAWING

SIP9-P-2.54A

Unit : mm



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