

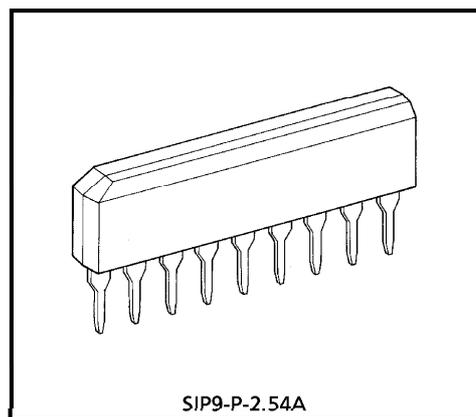
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8029S

FREQUENCY TO VOLTAGE CONVERTER

The TA8029S is a small 9-pin SIP IC incorporating an accurate frequency/voltage converter and two voltage comparators.

It has a Schmitt input circuit and becomes active on the positive edge of the input. Its F/V output is stable even when it is supplied with a high-frequency input. Since the V_{CC} pin connects to a shunt regulator, stable frequency detection is assured regardless of the battery voltage. In addition, its wide operating temperature range allows it to be used for a wide variety of applications.

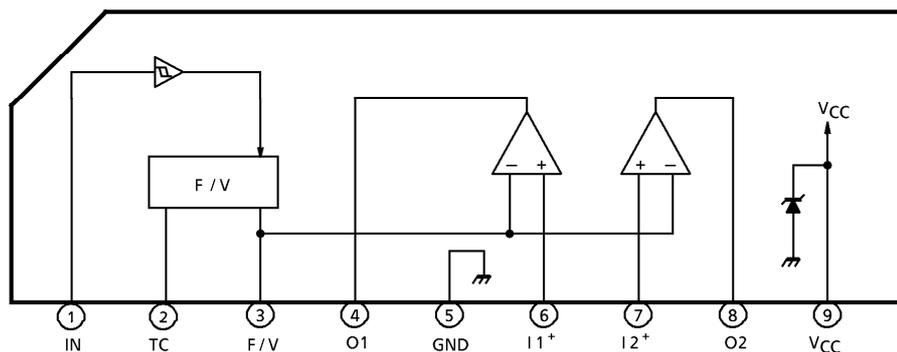


Weight : 0.92g (Typ.)

FEATURES

- Schmitt input circuit incorporated
- Stable F/V output in response to high-frequency input
- Two comparators served by single power supplies are incorporated.
- Shunt regulator incorporated
- Operating temperature range : from $-40\sim 85^{\circ}\text{C}$
- Small plastic SIP-9 pin

BLOCK DIAGRAM AND PIN LAYOUT



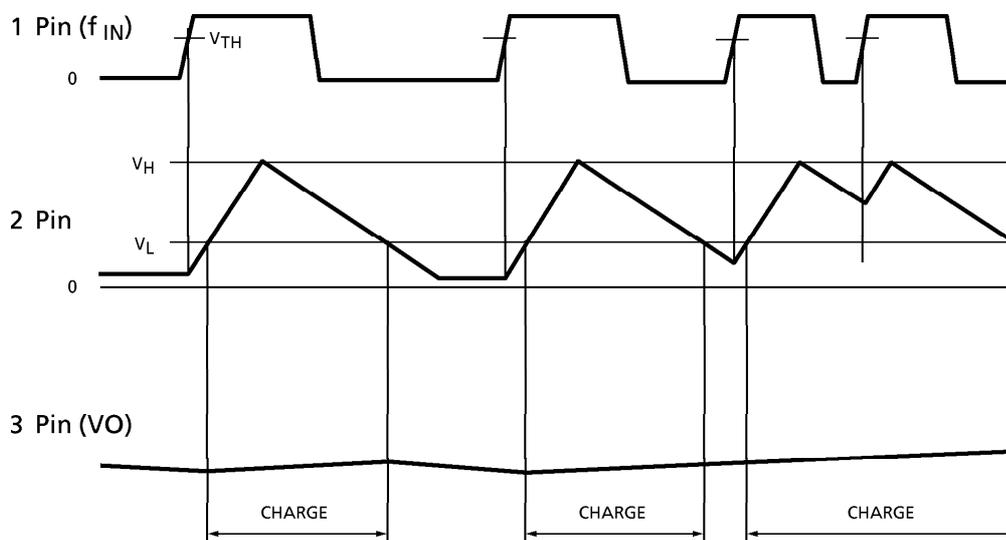
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PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	IN	Frequency input pin. The IC becomes active on the leading edge of the input.
2	TC	One-shot pulse setting pin which connects to a capacitor.
3	F/V	F/V conversion output pin which connects to an charging capacitor and resistor. The signal from this pin is also the input to the two built-in comparator.
4	O ₁	Comparator 1 output pin. This pin provides an NPN transistor open-collector output and has a current capacity of up to 30mA.
5	GND	Grounded
6	I ₁ ⁺	Non-inverted PNP input pin for comparator 1.
7	I ₂ ⁺	Non-inverted PNP input pin for comparator 2.
8	O ₂	Comparator 2 output pin. This pin provides an NPN transistor open-collector output and has a current capacity of up to 30mA.
9	V _{CC}	Power supply pin which connects to a 6V Zener diode.

TIMING CHART



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Current	I _{CC}	30	mA
Input Voltage	V _{IN}	-0.3~30	V
Output Voltage	V _{OUT}	-0.3~30	V
Output Current	I _{OUT}	30	mA
Power Dissipation	P _D	350 (Note)	mW
Operating Temperature	T _{opr}	-40~85	°C
Storage Temperature	T _{stg}	-55~150	°C

(Note) Ta ≤ 85°C

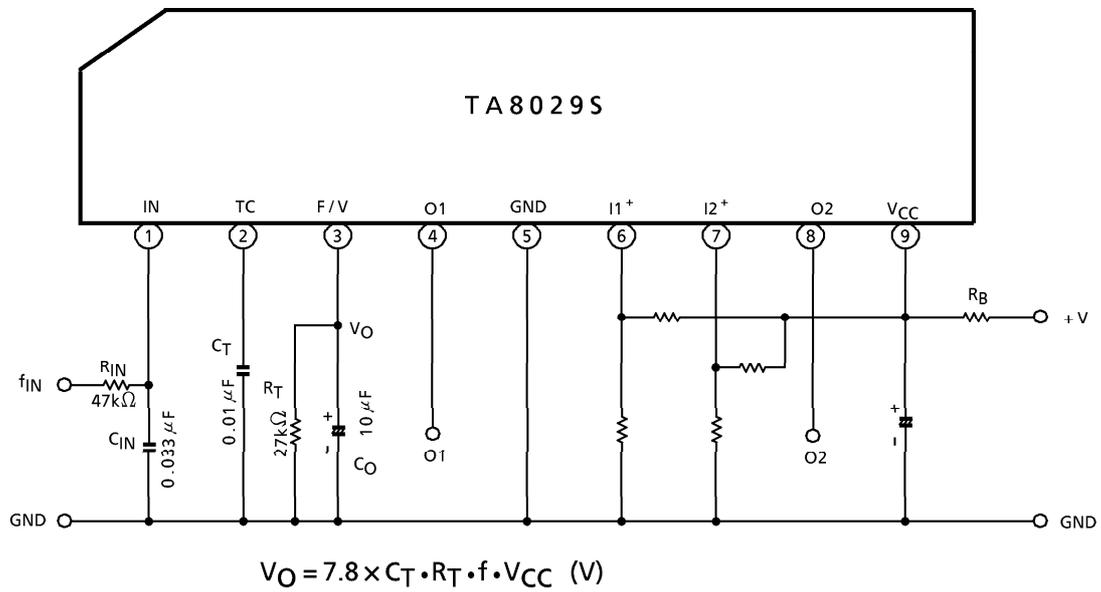
ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 5V)

CHARACTERISTIC	SYMBOL	PIN	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Consumption	I _{CC}	V _{CC}	—	—	—	3.0	5	mA
Regulated Voltage	V _R	V _{CC}	—	I _{CC} = 12mA	5.5	6.0	6.5	V
Input Current	I _{IN}	IN	—	V _{IN} = 0~20V	-10	—	10	μA
Input Voltage	V _{IH}	IN	—	—	2.8	—	—	V
	V _{IL}		—	—	—	—	0.8	
Input Rise Rate	V _{LH}	IN	—	—	0.5	—	—	V/ms
Input Fall Rate	V _{HL}	IN	—	—	0.1	—	—	V/ms
Output Current	I _{OL}	TC	—	V _{TC} = 2.5V	—	4.3	—	μA
	I _{OH}		—	V _{TC} = 2.5V	—	-73	—	
	I _{OH}	F/V	—	—	-250	-350	-500	
F/V Conversion Coefficient	K	F/V	—	C _T = 0.01μF, R _T = 27kΩ f = 100Hz (Note 1)	—	7.8	—	—
Linearity	—	—	—	C _T = 0.01μF, R _T = 27kΩ (Note 2)	—	±3.0	—	%
Input Offset Voltage	V _{IO}	I ₁ ⁺ / I ₂ ⁺	—	—	—	2	10	mV
Input Current	I _{IN}	I ₁ ⁺ / I ₂ ⁺	—	—	—	-0.2	-1	μA
Common-mode Input Voltage	V _{CM}	I ₁ ⁺ / I ₂ ⁺	—	—	0	—	V _{CC} -1.5	V
Voltage Gain	A _V	—	—	—	—	100	—	dB
Output Voltage	V _{OL}	O ₁ / O ₂	—	I _{OL} = 10mA	—	—	0.5	V
Output Leakage Current	I _{LEAK}	O ₁ / O ₂	—	V _O = 16V	—	—	5	μA

Notes :

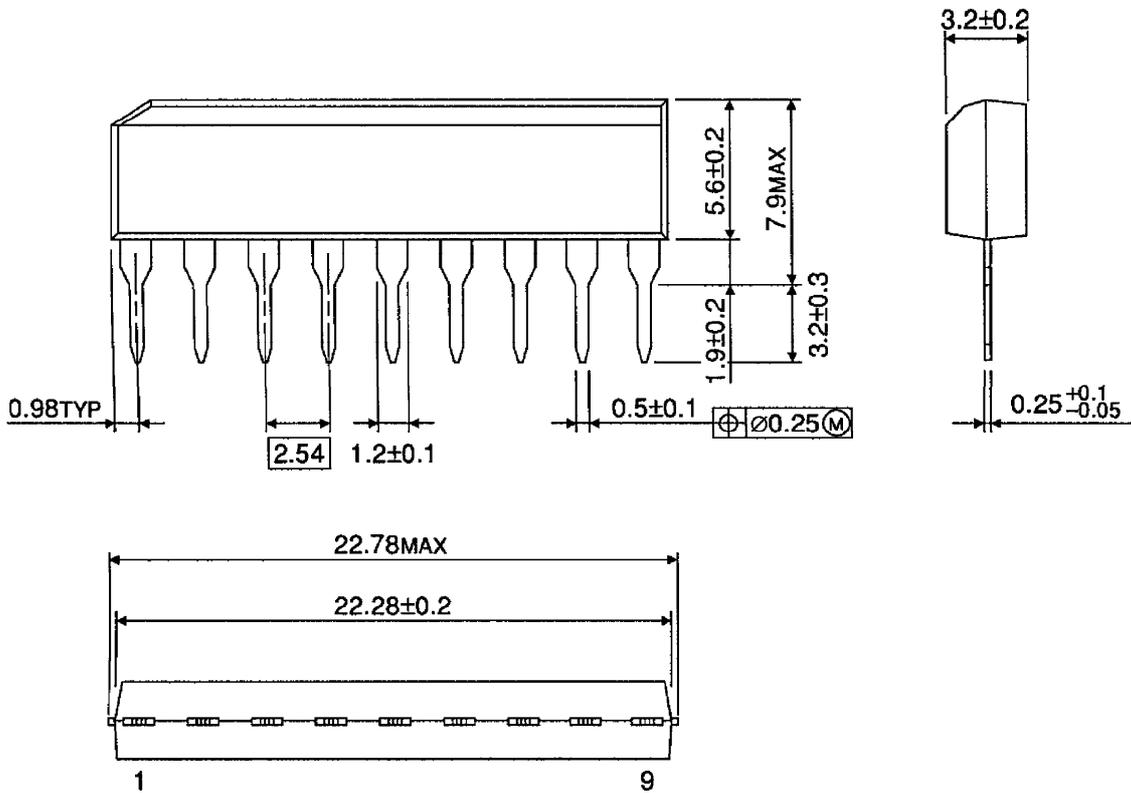
1. Calculated from $V_O = K \cdot V_{CC} \cdot C_T \cdot R_T \cdot f$
2. Straight line deviation at f = 50Hz and f = 150Hz relative to that at f = 100Hz

EXAMPLE OF APPLICATION CIRCUIT



OUTLINE DRAWING
SIP9-P-2.54A

Unit : mm



Weight : 0.92g (Typ.)