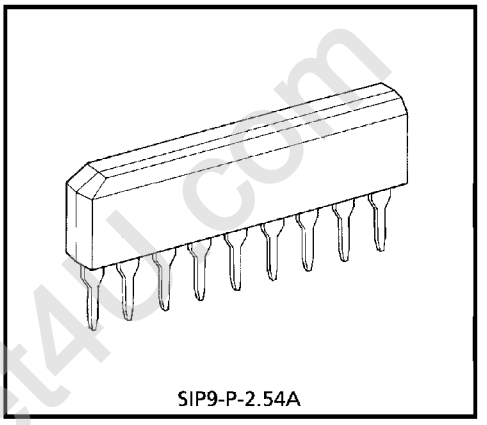
TENTATIVE TOSHIBA CMOS DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TC5081BP

## PHASE COMPARATOR

The TC5081BP is phase comparator for PLL frequency synthesizer type, and consists of a digital phase comparator and an amplifier for active low pass filter.



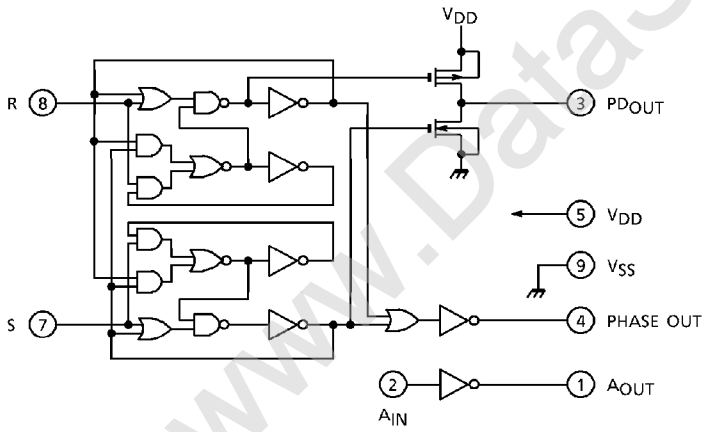
SIP9-P-2.54A

Weight : 0.92g (Typ.)

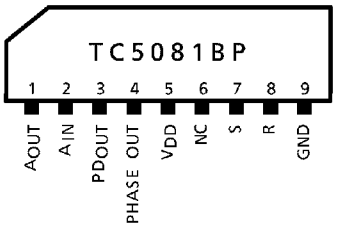
### FEATURES

- The phase comparator detects two input pulse phase differences and outputs proportionate positive or negative pulses to $PD_{OUT}$. When the input pulse phases are the same, $PD_{OUT}$ has high impedance.
- Because the IC is CMOS, the input impedance of the filter for the amp is extremely high and has excellent characteristics.
- TC5081BP comes in a SIP 9 PIN.

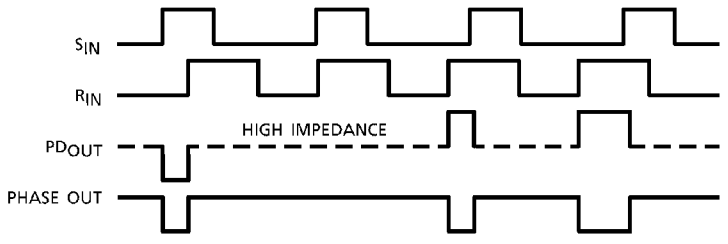
### LOGIC DIAGRAM




### PIN CONNECTION (SIDE VIEW)




### PHASE COMPARATOR TIMING CHART




961001EBA2

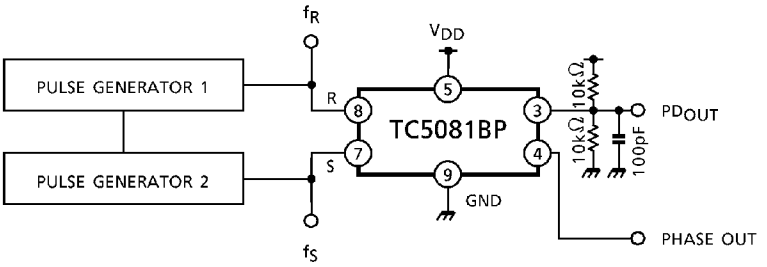
**MAXIMUM RATINGS** (Ta = 25°C)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Supply Voltage | $V_{DD}$ | 15 | V |
| Input Voltage | $V_{IN}$ | $-0.3 \sim V_{DD}+0.3$ | V |
| Operating Temperature | $T_{opr}$ | $-30 \sim 75$ | °C |
| Storage Temperature | $T_{stg}$ | $-55 \sim 125$ | °C |

**ELECTRICAL CHARACTERISTICS** ($V_{DD}$ = 7.5V, Ta = −30~75°C)

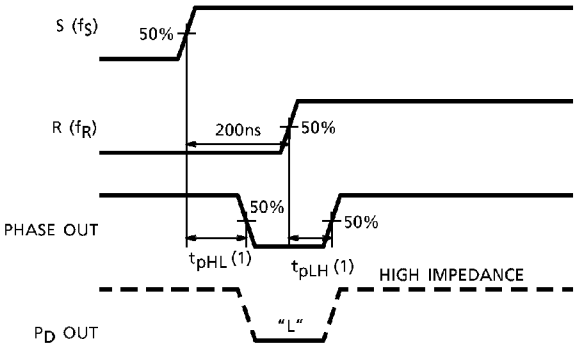
| CHARACTERISTIC | | SYMBOL | TEST CIR-CUIT | TEST CONDITION | | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|---|---|---|
| Operating Supply Voltage | | $V_{DD}$ | — | — | | 4.5 | — | 12 | V |
| Output Voltage | "H" Level | $V_{OH}$ | — | $V_{IH}$ = 6.6V, $V_{IL}$ = 1.6V | $I_{OH} = -50\mu A$ | 7.3 | — | — | V |
| | "L" Level | $V_{OL}$ | | | $I_{OL} = 50\mu A$ | — | — | 0.2 | V |
| Quiescent Current | | $I_{DD}$ | — | $V_{IH}$ = 7.5V, $V_{IL}$ = 0V | | — | — | 200 | $\mu A$ |
| 3 State Leak Current | "H" Level | $I_{TLH}$ | — | — | | — | — | 500 | nA |
| | "L" Level | $I_{TLL}$ | | | | — | — | −500 | nA |
| Filter Amp. Voltage Gain | | $G_V$ | 3 | $R_{①-②}$ = 1MΩ, $f_{IN}$ = 1kHz<br>$R_g$ = 600Ω | | — | 30 | — | dB |

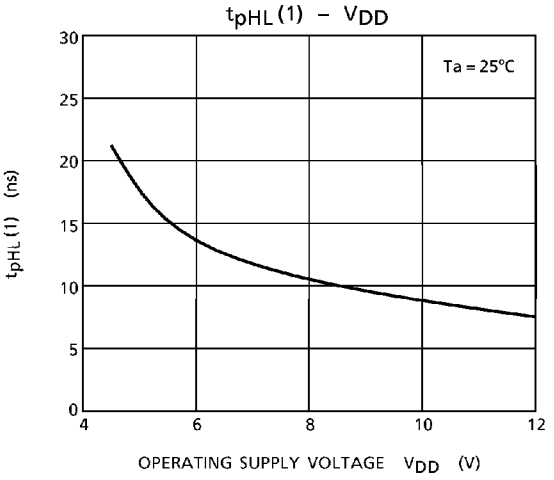
**TEST CIRCUIT 1**

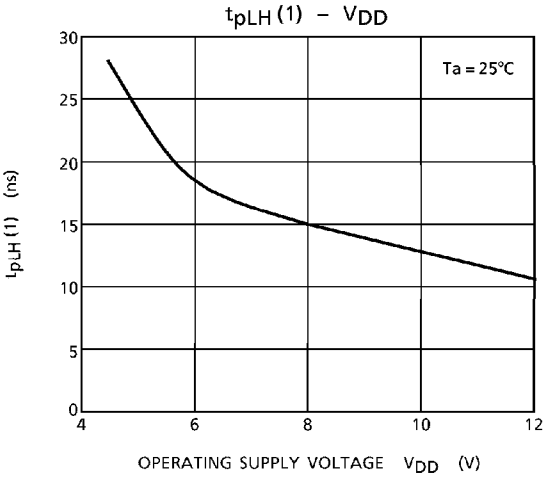



The pulse generator-1 is synchronized with the pulse generator-2.
Then, the phase of $f_R$ and $f_S$ is variable.

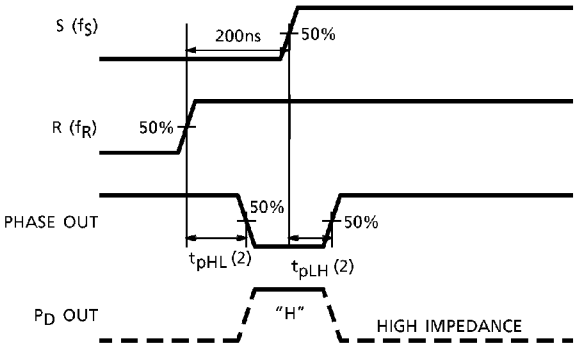
**WAVE FORM 1** (The leading phase, $f_S > f_R$)

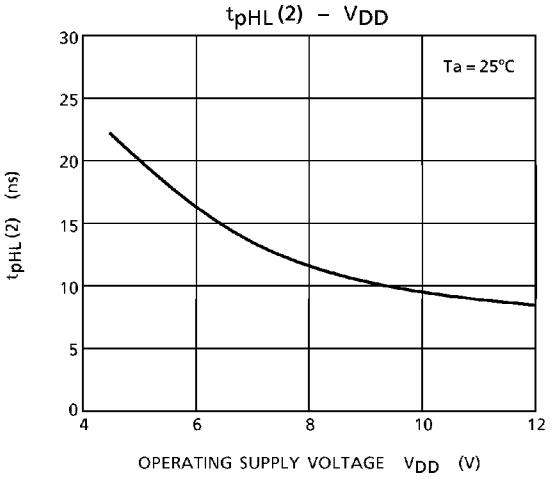


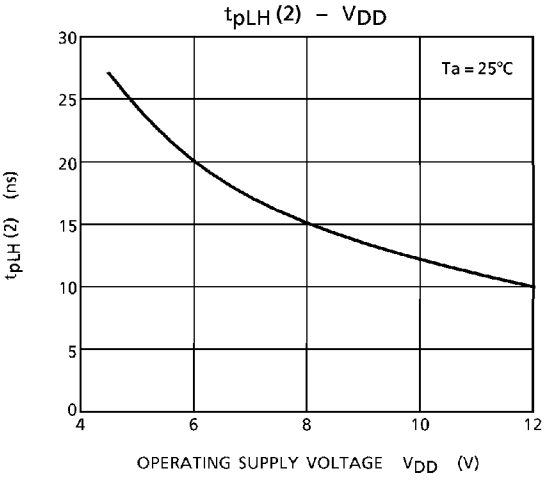



**WAVE FORM 2** (The lagging phase, $f_S < f_R$)

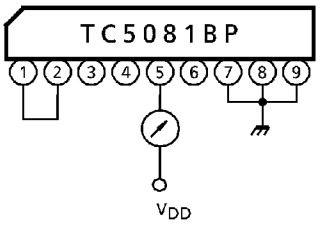


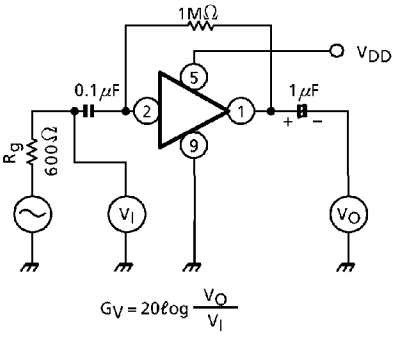
**TEST CIRCUIT 2**

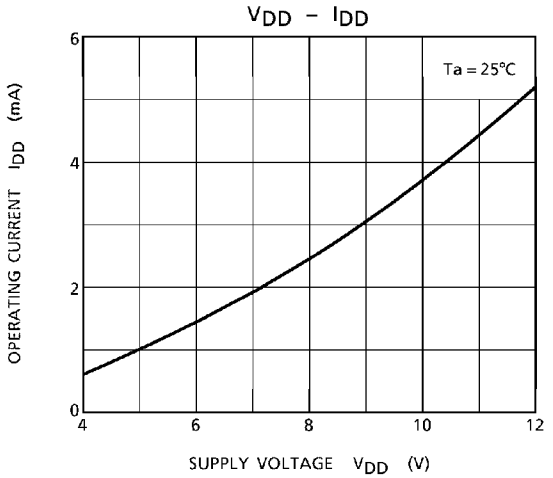
$V_{DD}$-$I_{DD}$

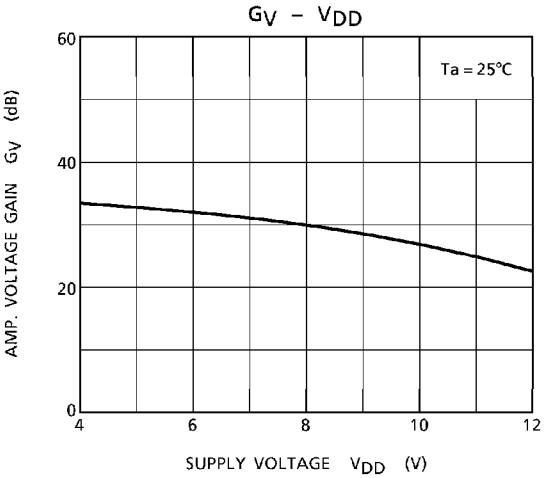



**TEST CIRCUIT 3**

$G_V$-$V_{DD}$



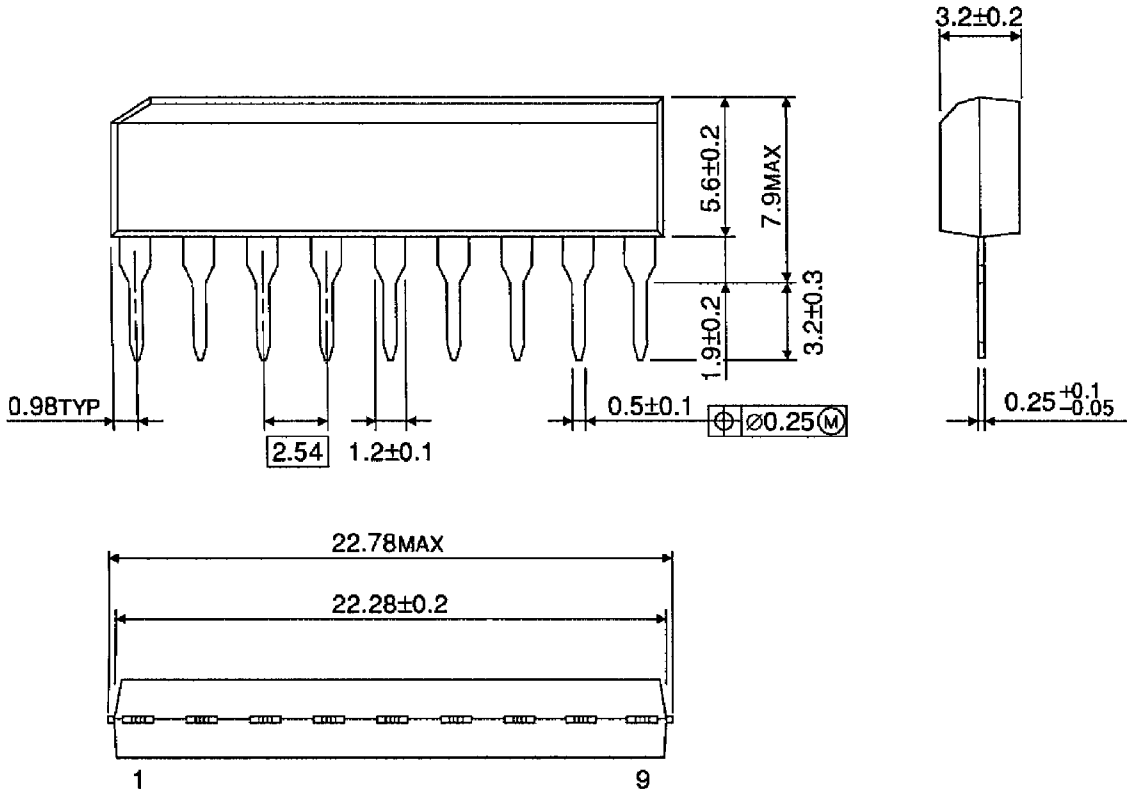



**OUTLINE DRAWING**

SIP9-P-2.54A

Unit : mm

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