TENTATIVE TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

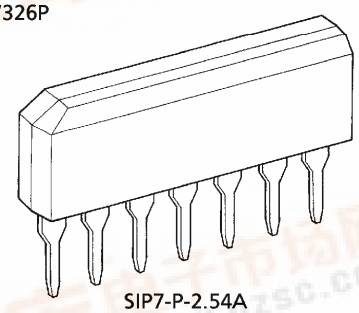
TA7326P, TA7326F, TA7327P

CR TIMER

FEATURES

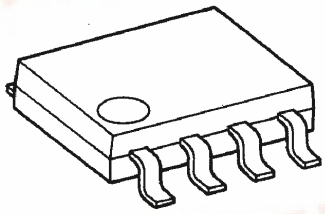
- I^2L IC with 12-stage binary counter.
- Built-in initialize circuit.
- Built-in Voltage regulator.
- Operates in both timer and oscillator modes.
- Excellent temperature stability.
- TA7327P has initial adjustment terminals of timing.

TA7326P



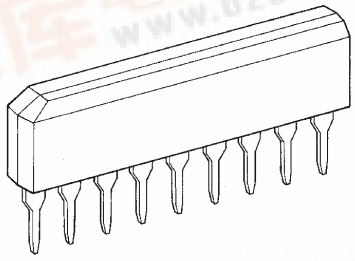
SIP7-P-2.54A

TA7326F



SOP8-P-225-1.27

TA7327P

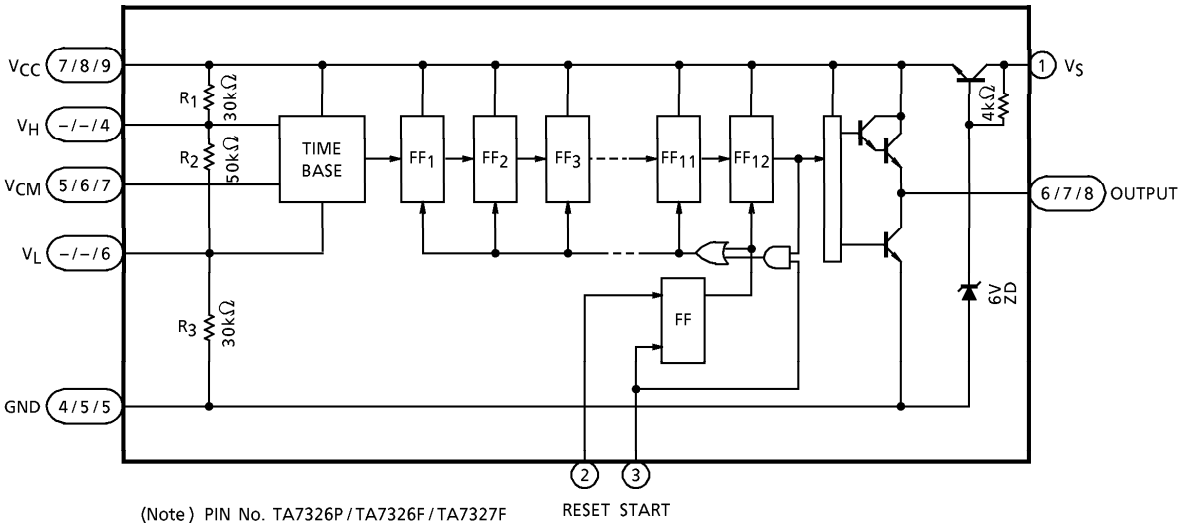


SIP9-P-2.54A

Weight
SIP7-P-2.54A : 0.7g (Typ.)
SOP8-P-225-1.27 : 0.1g (Typ.)
SIP9-P-2.54A : 0.9g (Typ.)

980910EBA2

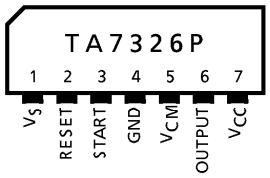
BLOCK DIAGRAM

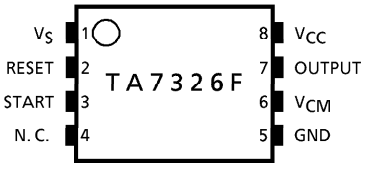


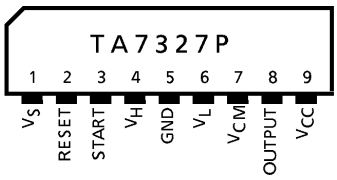
(Note) PIN No. TA7326P / TA7326F / TA7327F

PIN CONNECTION

PIN No.	CONNECTION		
	TA7326P	TA7326F	TA7327F
1	V_S	V_S	V_S
2	RESET	RESET	RESET
3	START	START	START
4	GND	N.C.	V_H
5	V_{CM}	GND	GND
6	OUTPUT	V_{CM}	V_L
7	V_{CC}	OUTPUT	V_{CM}
8	—	V_{CC}	OUTPUT
9	—	—	V_{CC}







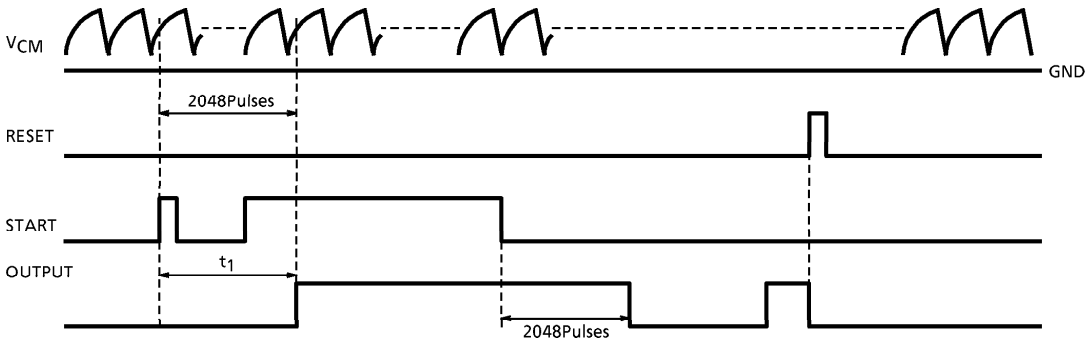
TRUTH TABLE

MODE	INPUTS		OUTPUT
	RESET	START	
1	H	(*)	L
2	L	H	COUNT, OSCILLATOR MODE
3	L	H	HOLD"H", TIMER MODE
4	L	L	HOLD LAST STATE

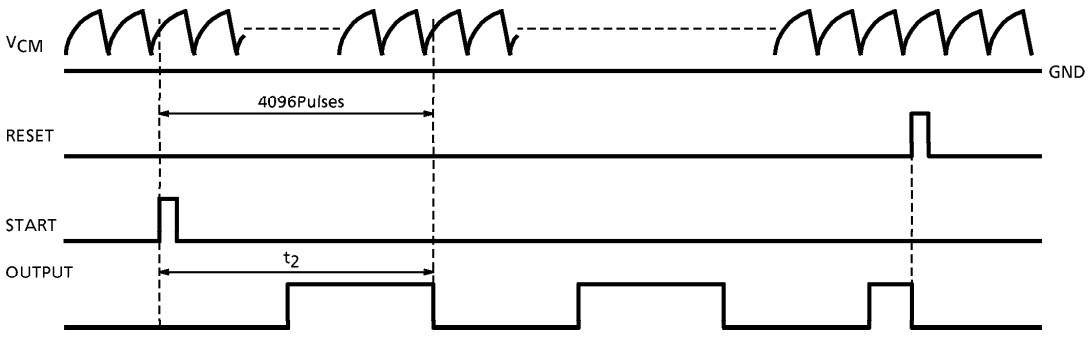
(*) H or L
Output equal "L" when power on.

TIMING CHART

- Timer mode



- Oscillator mode



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_S	12	V
Supply Voltage		V_{CC}	7	V
Input Voltage		V_{IH}	20	V
Output Current		I_{OH}	− 30	mA
		I_{OL}	2	
Power Dissipation (Note)	TA7326P, TA7326F	P_D	400	mW
	TA7327P		600	
Operating Temperature		T_{opr}	− 20 ~ 75	°C
Storage Temperature		T_{stg}	− 55 ~ 125	°C

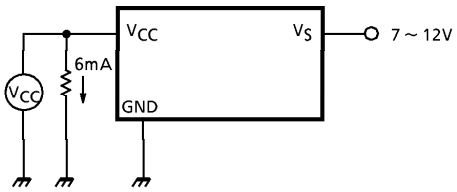
(Note) Derated above Ta = 25°C in the propotion of 4mW / °C for TA7326P and 6mW / °C for TA7327P.

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

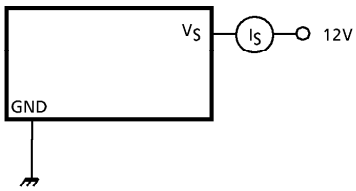
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage		V_S	—	Ta = − 20 ~ 75°C	7	—	12	V
Supply Voltage		V_{CC}	1	V_S = 7 ~ 12V, I_{CC} = 6mA	5.0	—	6.3	V
Supply Current		I_S	2	V_S = 12V	—	2	5	mA
Input Bias Current		I_I	3	V_{CC} = 5.7V	—	—	0.35	μA
Input Voltage	"H" Level	V_{IH}	4	V_{CC} = 5.7V	2.5	—	—	V
	"L" Level	V_{IL}	4	V_{CC} = 5.7V	—	—	1.5	V
Input Current	"H" Level	I_{IH}	4	V_{CC} = 5.7V, V_{IH} = 2.5V	—	—	0.25	mA
	"L" Level	I_{IL}	4	V_{CC} = 5.7V, V_{IL} = 0V	—	—	− 1	μA
Output Voltage	"H" Level	V_{OH}	5	V_{CC} = 5.7V, I_{OH} = − 30mA	3.5	—	—	V
	"L" Level	V_{OL}	6	V_{CC} = 5.7V, I_{OH} = 1mA	—	—	0.3	V
Temperature Coefficient of V_{CC}		$\Delta V_{CC} / \Delta Ta$	—	V_S = 10V, Ta = − 20~75°C	—	5	—	mV / °C
Temperature Coefficient of Timing		$\Delta t / \Delta Ta$	—	V_{CC} = 5.7V, Ta = − 20~75°C, C_t = 100μF, R_t = 10kΩ	—	200	—	ppm / °C
Timing Drift with Supply Voltage Ratio		$\Delta t / \Delta V_{CC}$	—	V_{CC} = 5.0~6.3V, C_t = 100μF, R_t = 10kΩ	—	0.5	—	% / V
Timing Resistance		R_t	—	—	1	—	1000	kΩ

TEST CIRCUIT

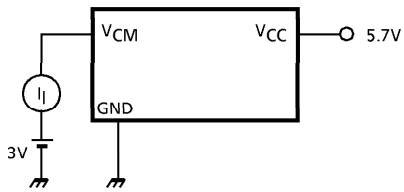
1. V_{CC}



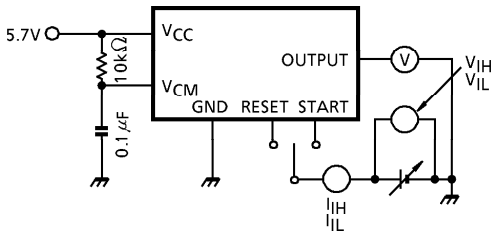
2. I_S



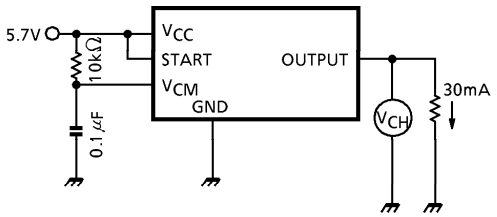
3. I_I



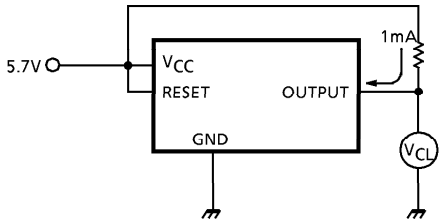
4. V_{IH}, V_{IL}, I_{IH}, I_{IL}



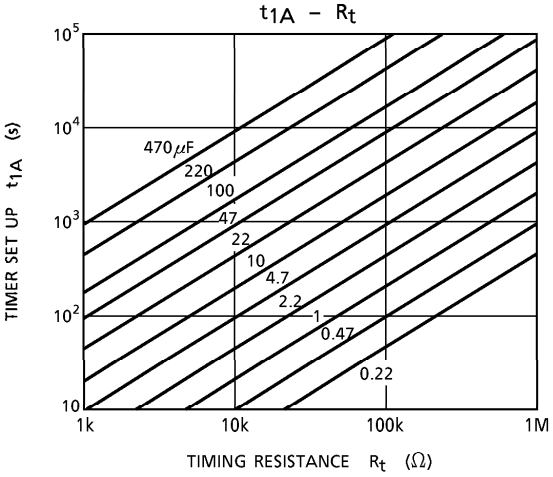
5. V_{OH}



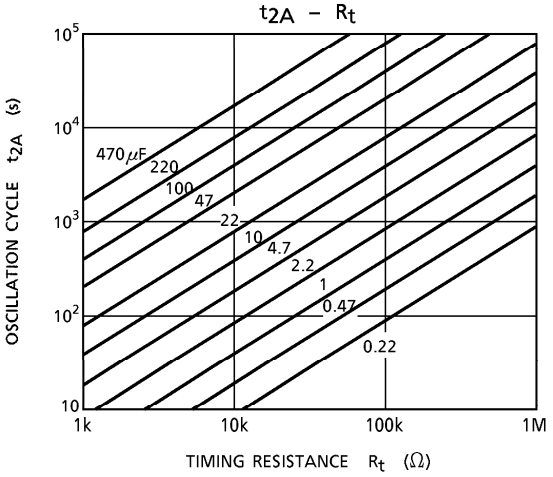
6. V_{OL}



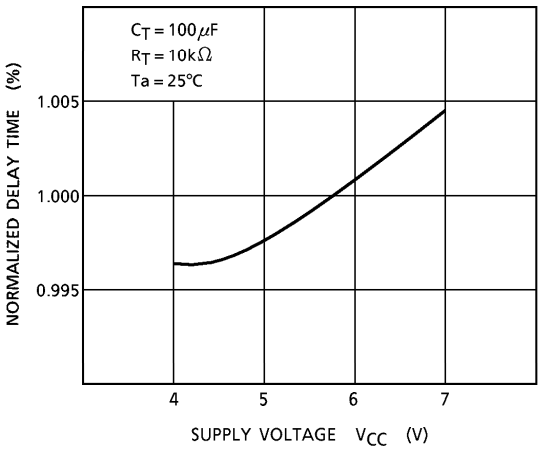
t_{1A} – R_t



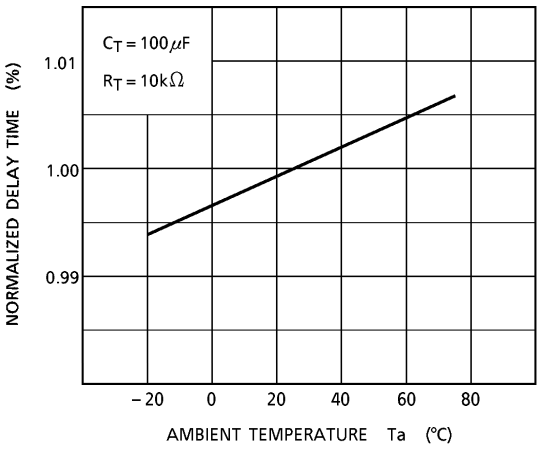
t_{2A} – R_t



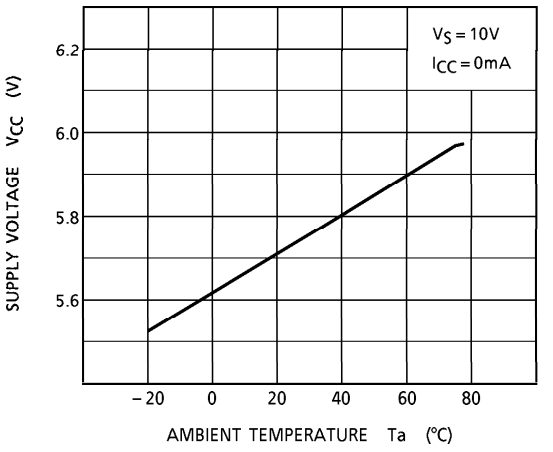
DELAY TIME – V_{CC}



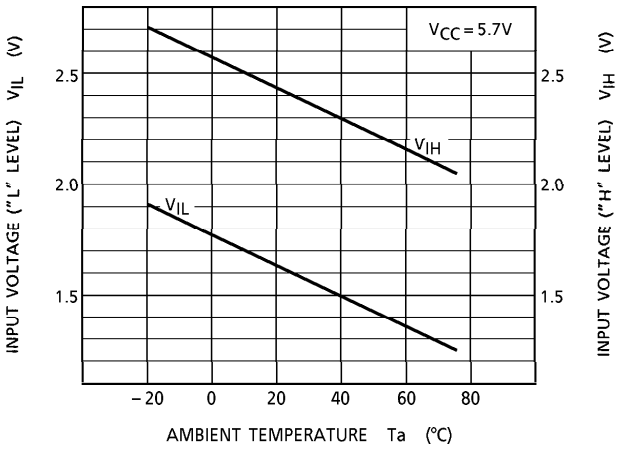
DELAY TIME – Ta



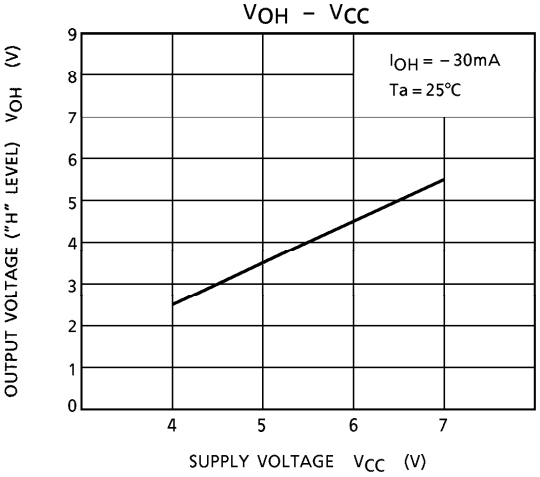
V_{CC} – Ta



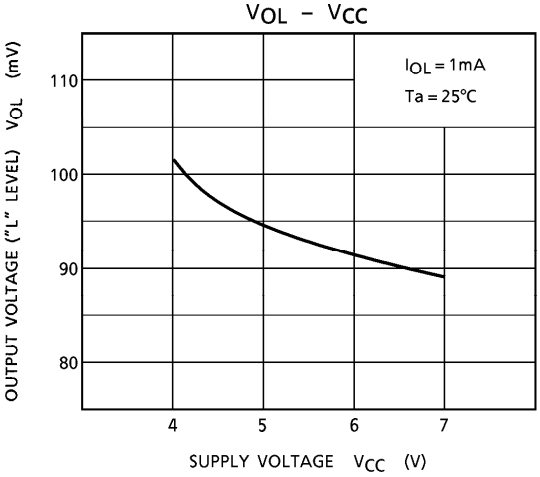
V_{IL}, V_{IH} – Ta



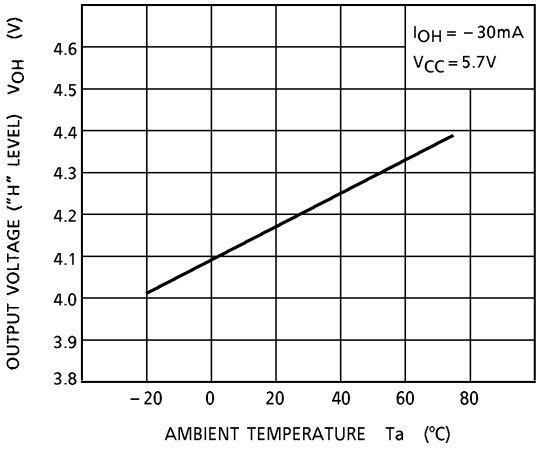
V_{OH} – V_{CC}



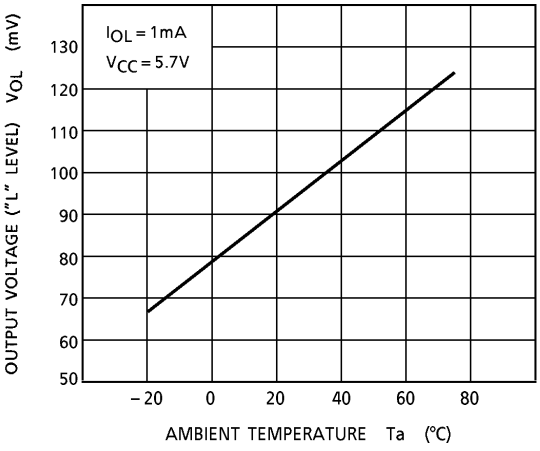
V_{OL} – V_{CC}



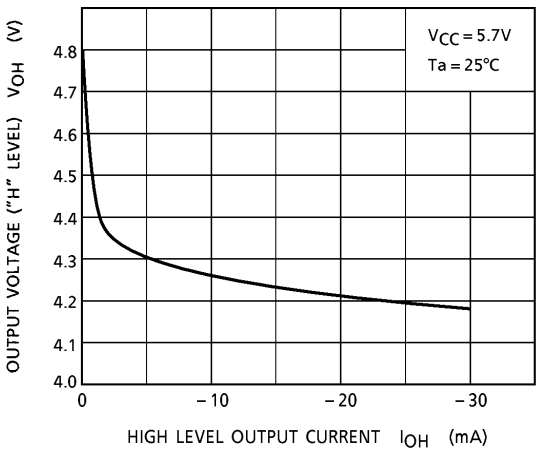
V_{OH} – Ta



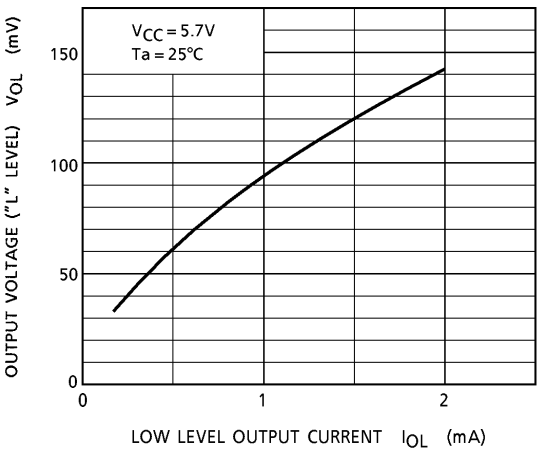
V_{OL} – Ta

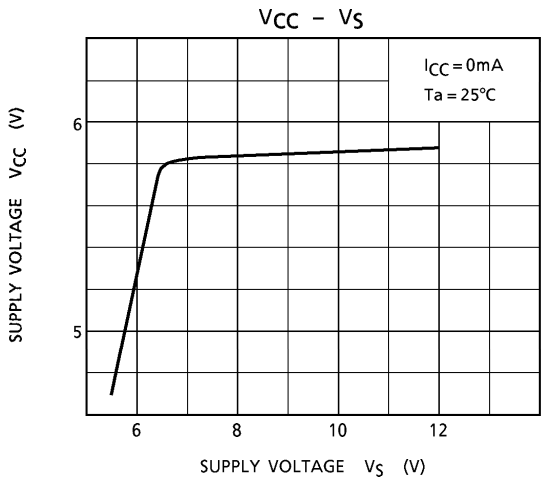


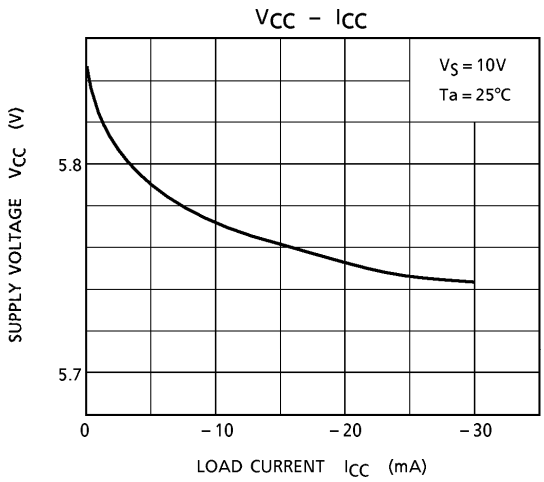
V_{OH} – I_{OH}



V_{OL} – I_{OL}



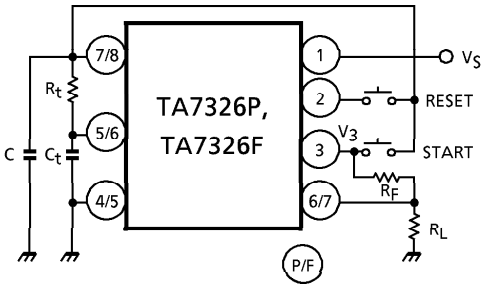

V_{CC} – V_S
I_{CC} = 0mA
Ta = 25°C
SUPPLY VOLTAGE V_{CC} (V)
6
5
6
8
10
12
SUPPLY VOLTAGE V_S (V)


V_{CC} – I_{CC}
V_S = 10V
Ta = 25°C
SUPPLY VOLTAGE V_{CC} (V)
5.8
5.7
0
– 10
– 20
– 30
LOAD CURRENT I_{CC} (mA)

APPLICATION CIRCUIT (Ta = 25°C)

Timer mode

(A)



$C = 1 \sim 10 \mu F$

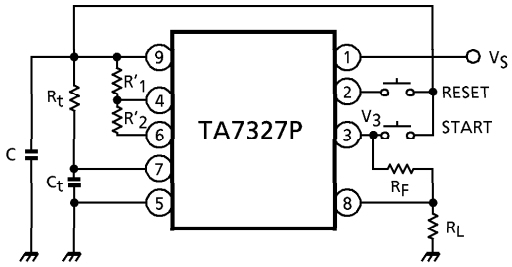
$V_3 > V_{IH}$

$t_{1A} \fallingdotseq 2048 C_t \cdot R_t$ (s)

C_t : (F)

R_t : (Ω)

(B)



$C = 1 \sim 10 \mu F$

$V_3 > V_{IH}$, $V_H < V_{CC} - 1V$, $V_L > 1.2V$

$$t_{1B} = 2048\ C_t \cdot R_t \left| \ell n \frac{r_1}{r_1 + r_2} \right| \text{ (s)}$$

C_t : (F)

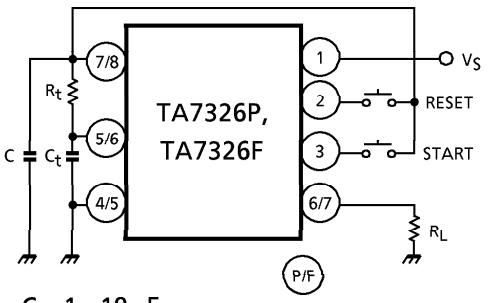
R_t : (Ω)

$r_1 = R_1 // R'_1$, $R_1 = 30k\Omega$

$r_2 = R_2 // R'_2$, $R_2 = 50k\Omega$

Oscillator mode

(A)



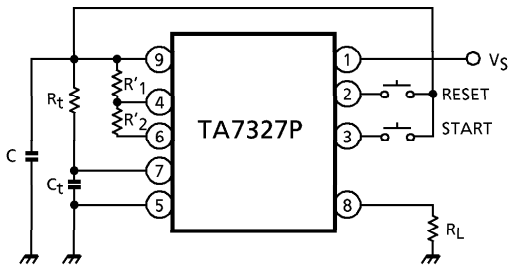
$C = 1 \sim 10 \mu F$

$t_{2A} \fallingdotseq 4096 C_t \cdot R_t$ (s)

C_t : (F)

R_t : (Ω)

(B)



$C = 1 \sim 10 \mu F$

$V_H < V_{CC} - 1V$, $V_L > 1.2V$

$$t_{2B} = 4096\ C_t \cdot R_t \left| \ell n \frac{r_1}{r_1 + r_2} \right| \text{ (s)}$$

C_t : (F)

R_t : (Ω)

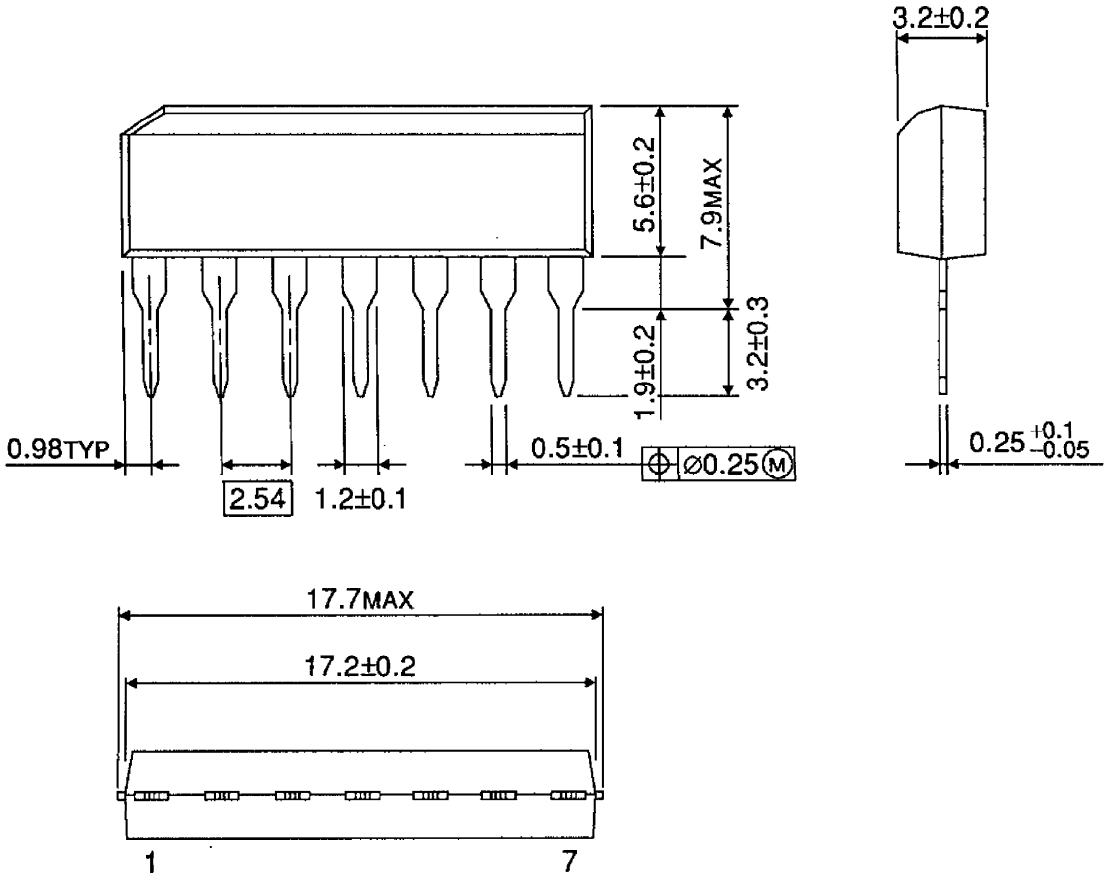
$r_1 = R_1 // R'_1$, $R_1 = 30k\Omega$

$r_2 = R_2 // R'_2$, $R_2 = 50k\Omega$

OUTLINE DRAWING

SIP7-P-2.54A

Unit : mm

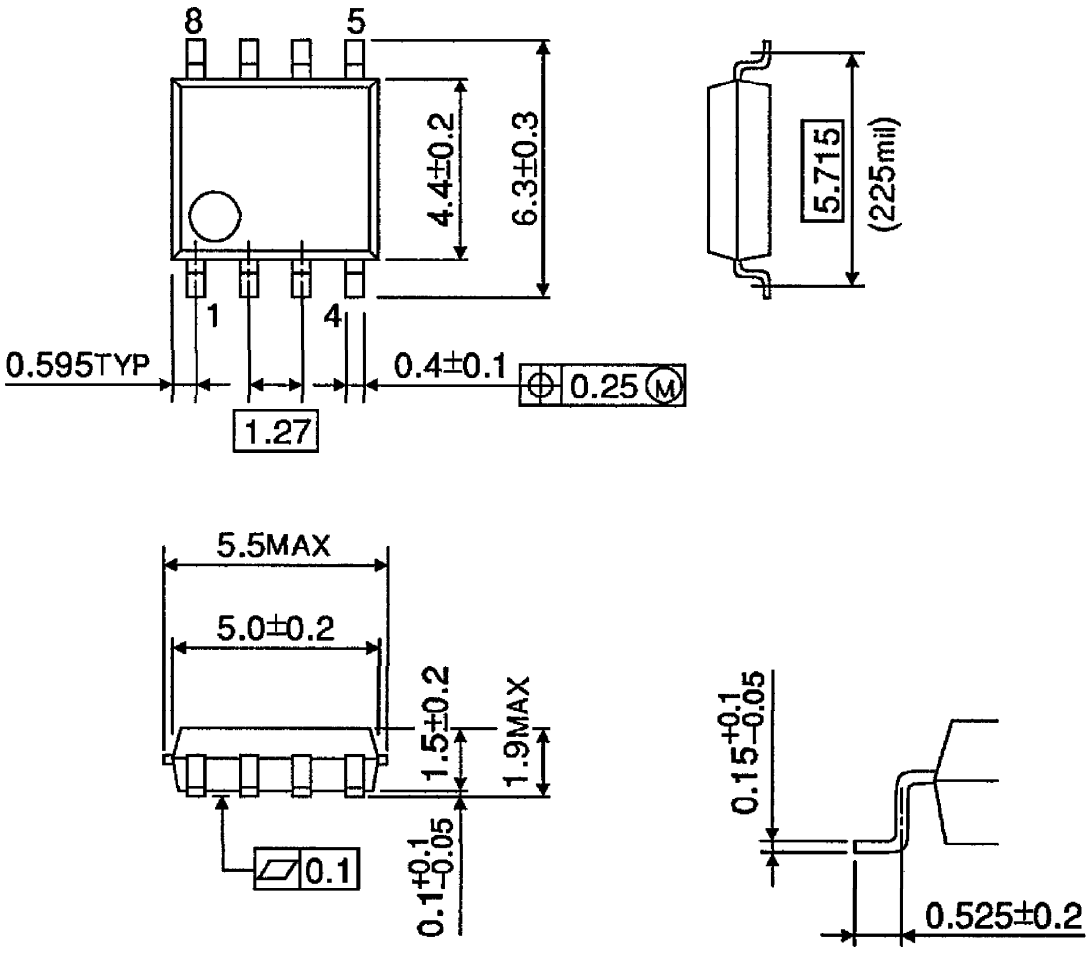


Weight : 0.7g (Typ.)

OUTLINE DRAWING

SOP8-P-225-1.27

Unit : mm

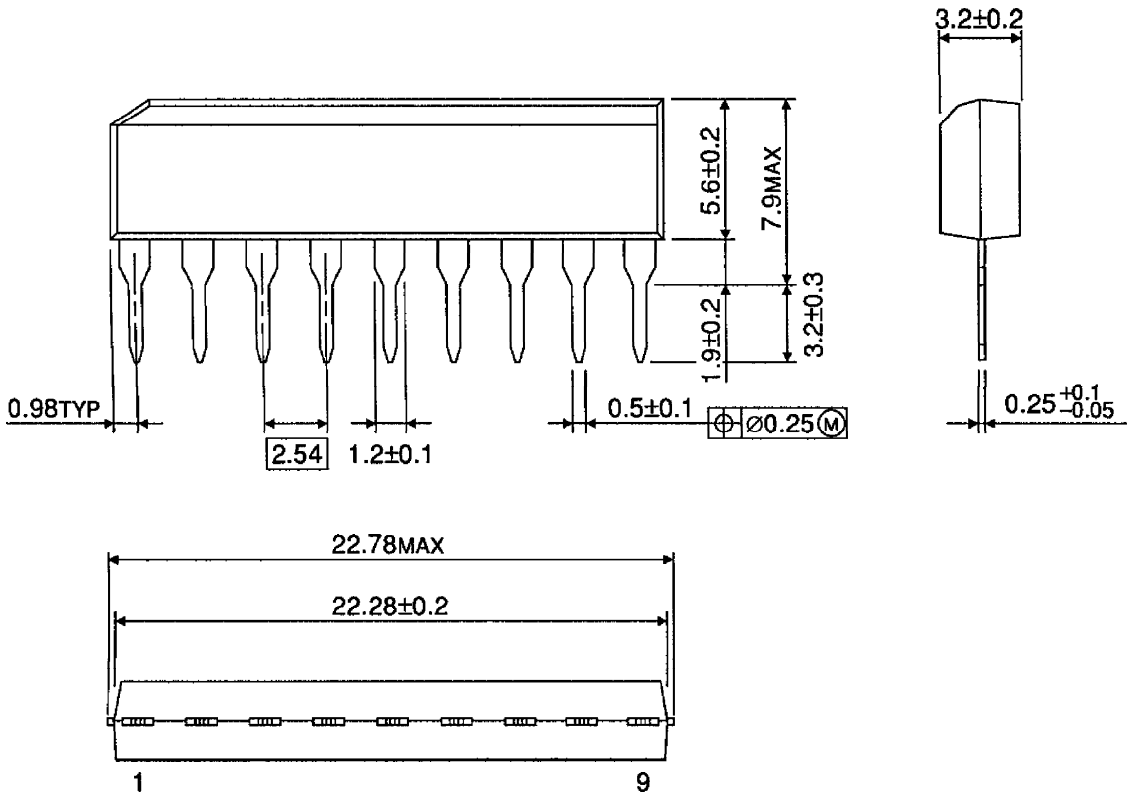


Weight : 0.1g (Typ.)

OUTLINE DRAWING

SIP9-P-2.54A

Unit : mm



Weight : 0.9g (Typ.)