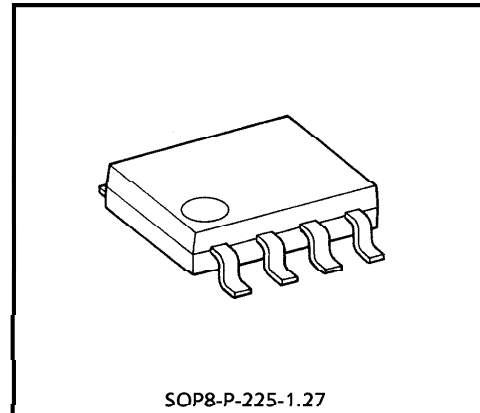


# TA8030F

## WATCHDOG TIMER

The TA8030F is a system reset IC for 5V supply voltage system. It is specially designed for microcomputer systems. It incorporates a watchdog timer for monitoring microcomputer operation and has many reset functions, including a reset timer output which will be given at power-on and another reset output which will be given when the supply voltage drops. With these functions, it helps build up a reliable system.

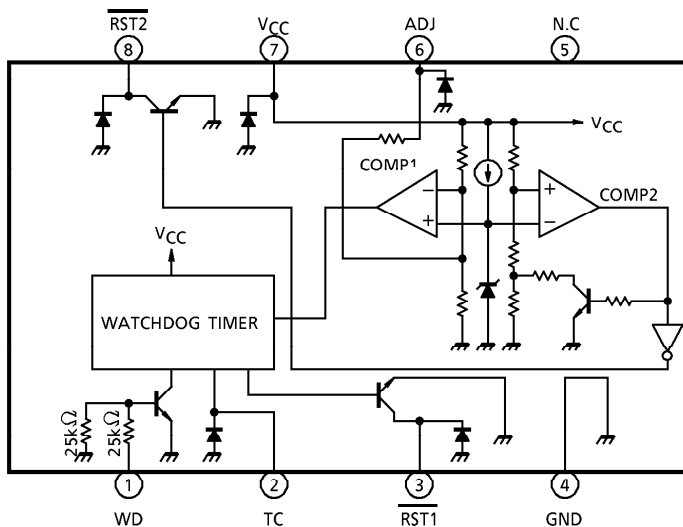


Weight : 0.08g (Typ.)

### FEATURES

- Watchdog timer
- Power-on reset timer
- Dual-reset output
- Small SOP-8 pin

### BLOCK DIAGRAM AND PIN LAYOUT



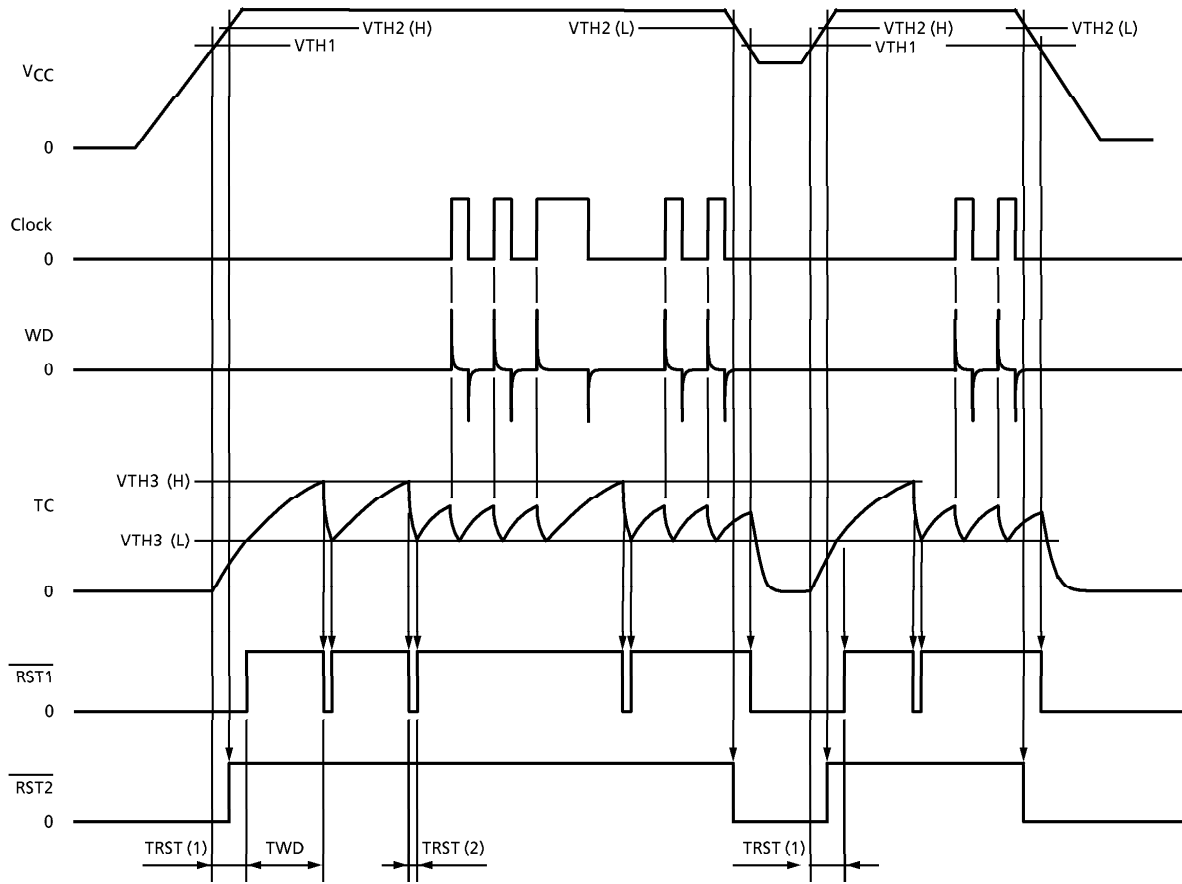
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## PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	WD	Clock input pin for watchdog timer. If this IC is only used as a power-on reset timer, this pin is connected to $\overline{RST1}$ .
2	TC	Time setting pin for the reset and watchdog timers. $R_1$ leads to $V_{CC}$ , and $C_1$ leads to GND.
3	$\overline{RST1}$	Supplies an NPN transistor open-collector output. <ul style="list-style-type: none"> <li>• Generates a reset signal determined by the CR combination connected to the TC pin.</li> <li>• Supplies reset pulses intermittently if no clock is given to the WD pin.</li> </ul>
4	GND	Grounded
6	ADJ	$V_{CC}$ detect voltage (1) adjusting pin. The detection voltage is 4.6V when this pin is grounded ; it is 3.5V when this pin is directly connected to $V_{CC}$ .
7	$V_{CC}$	Power supply pin for internal circuit. The output voltage can also be detected at this pin.
8	$\overline{RST2}$	Supplies an NPN transistor open-collector output. It is the output pin for $V_{CC}$ detect voltage (2) . The detect voltage has a hysteresis of 0.17V.
5	NC	Not connected pin

TIMING CHART



**MAXIMUM RATINGS** (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	17	V
Input Voltage	V <sub>IN</sub>	-7 to 7	V
Output Voltage	V <sub>OUT</sub>	7	V
Output Current	I <sub>OUT</sub>	10	mA
Power Dissipation	P <sub>D</sub>	280	mW
Operating Temperature	T <sub>opr</sub>	-40 to 85	°C
Storage Temperature	T <sub>stg</sub>	-55 to 150	°C
Lead Temperature-time	T <sub>sol</sub>	260 (10s)	°C

**ELECTRICAL CHARACTERISTICS** (V<sub>CC</sub> = 5V, Ta = -40 to 85°C)

(1) DC CHARACTERISTICS

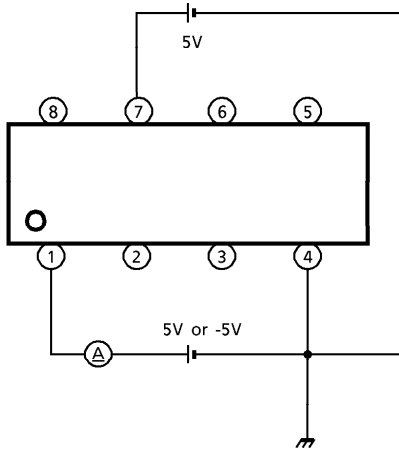
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Current	I <sub>IH</sub>	WD	1	V <sub>IN</sub> = 5V	0.1	0.17	0.35	mA
	I <sub>IL</sub>		1	V <sub>IN</sub> = -5V	-0.06	-0.1	-0.2	
Input Voltage	V <sub>IH</sub>	WD	2	—	2.2	—	—	V
	V <sub>IL</sub>		2	—	—	—	0.6	
Input Current	I <sub>IN</sub>	TC	4	V <sub>IN</sub> = 1.5V	-2	—	2	μA
Output Current	I <sub>OUT</sub>	TC	4	V <sub>OUT</sub> = 4.2V	2.4	4	7.7	mA
Watchdog Timer Threshold Voltage	V <sub>TH3</sub> (H)	TC	3	—	3.5	4	4.5	V
	V <sub>TH3</sub> (L)		3	—	1.75	2	2.25	
Output Voltage	V <sub>OL</sub>	RST1	5	I <sub>OUT</sub> = 2mA	—	—	0.5	V
Output Leakage Current	I <sub>LEAK</sub>	RST2	6	V <sub>OUT</sub> = 7V	—	—	5	μA
V <sub>CC</sub> Detect Voltage (1)	V <sub>TH1</sub>	V <sub>CC</sub>	—	—	4.0	4.25	4.5	V
	V <sub>TH1</sub> (H)		3	AJD = GND	4.3	4.6	4.9	
	V <sub>TH1</sub> (L)		3	ADJ = V <sub>CC</sub>	3.25	3.5	3.75	
V <sub>CC</sub> Detect Voltage (2)	V <sub>TH2</sub> (H)	V <sub>CC</sub>	3	—	4.4	4.65	4.9	V
	ΔV <sub>TH2</sub>		3	—	—	0.17	0.3	
Current Consumption	I <sub>CC</sub>	V <sub>CC</sub>	7	—	—	2.5	4.5	mA

(2) AC CHARACTERISTICS

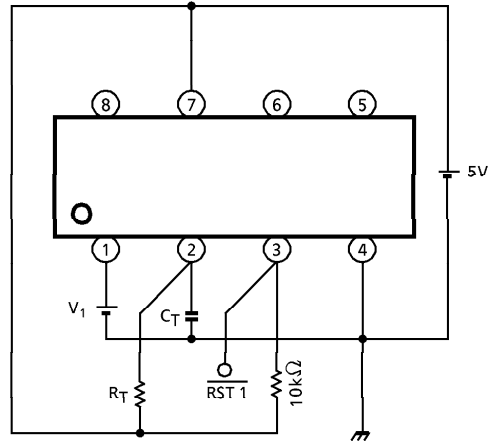
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Watchdog Timer	T <sub>WD</sub>	RST1	3	—	0.9 × C <sub>1</sub> R <sub>1</sub>	1.1 × C <sub>1</sub> R <sub>1</sub>	1.3 × C <sub>1</sub> R <sub>1</sub>	s
Reset Timer (1)	T <sub>RST</sub> (1)	RST1	3	—	0.4 × C <sub>1</sub> R <sub>1</sub>	0.5 × C <sub>1</sub> R <sub>1</sub>	0.6 × C <sub>1</sub> R <sub>1</sub>	s
Reset Timer (2)	T <sub>RST</sub> (2)	RST1	3	—	350 × C <sub>1</sub>	750 × C <sub>1</sub>	1500 × C <sub>1</sub>	s
Input Pulse Width	T <sub>W</sub>	WD	3	—	3	—	—	μs
Transfer Delay Time	t <sub>d1</sub>	RST1	3	t <sub>dHL</sub> (C <sub>1</sub> = 0μF)	—	3	10	μs
	t <sub>d2</sub>	RST2	3	t <sub>dHL</sub> , t <sub>dLH</sub>	—	3	10	μs

TEST CIRCUIT

1.  $I_{IH}$ ,  $I_{IL}$  (WD)

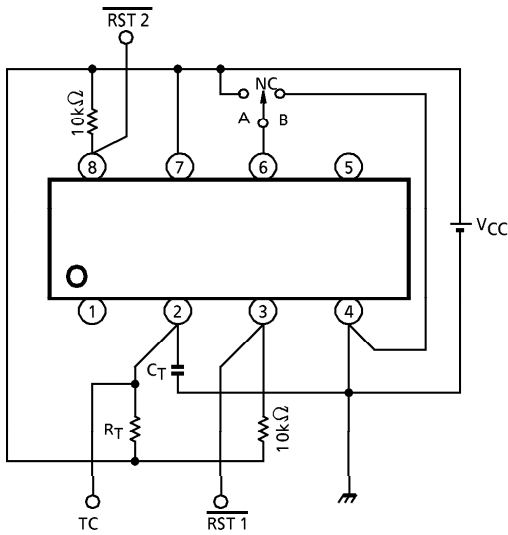


2.  $V_{IH}$ ,  $V_{IL}$  (WD)



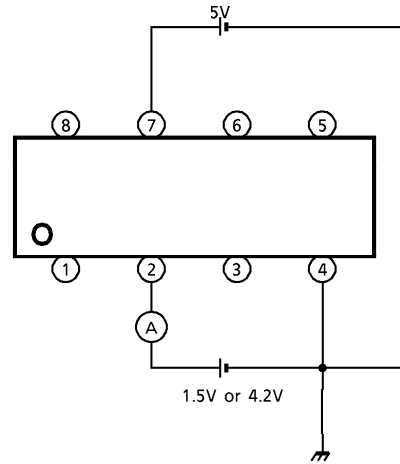
$\overline{RST1}$  should be 5V when  $V_1 = 2.2V$ .  
 $\overline{RST1}$  should be a pulse signal when  $V_1 = 0.6V$ .

3.  $V_{TH3}$  (H), (L) (TC),  $V_{TH1}$  (H) (L)  
 $\Delta V_{TH2}$  (H), AC CHARACTERISTICS

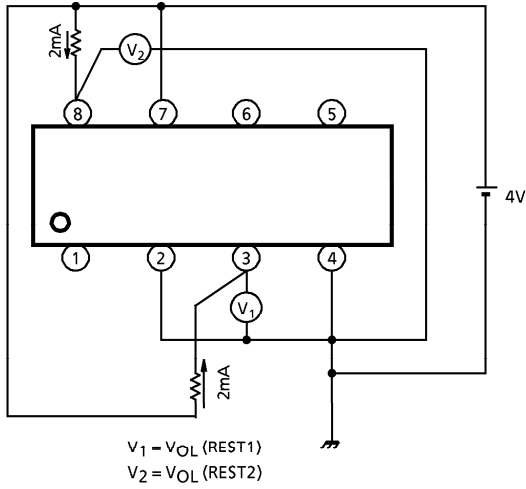


∴ See TIMING CHART.  
 $\Delta V_{TH2} = V_{TH2} (H) - V_{TH2} (L)$

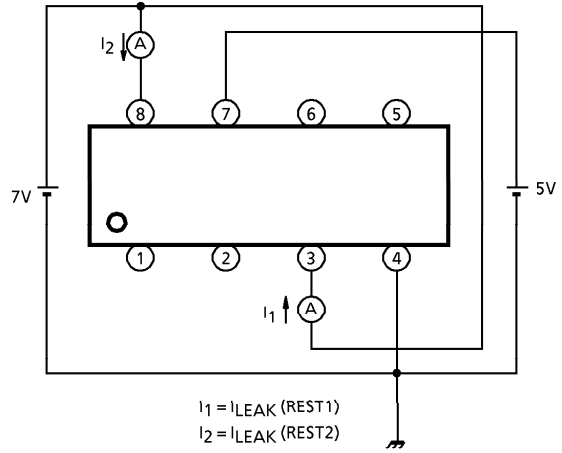
4.  $I_{IN}$ ,  $I_{OUT}$  (TC)



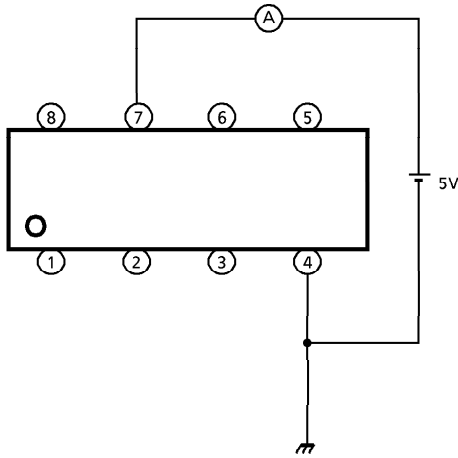
5.  $V_{OL}(\overline{RST1}) (\overline{RST2})$



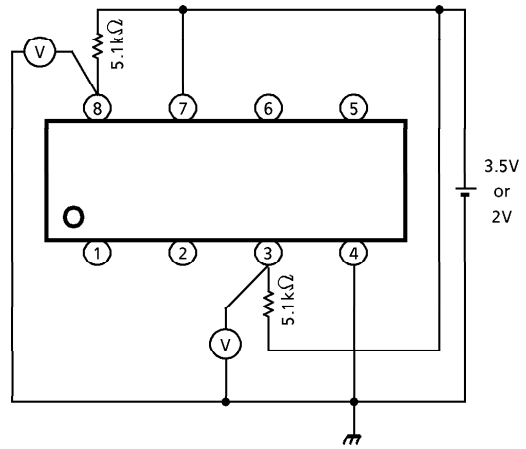
6.  $I_{LEAK}(\overline{RST1}) (\overline{RST2})$



7.  $I_{CC}$

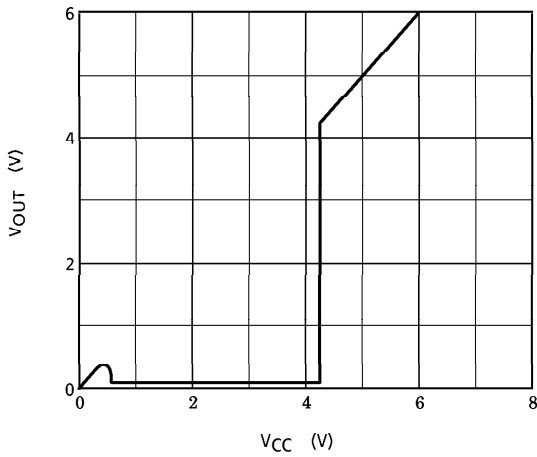


8.  $V_{OL}(1, 2) (\overline{RST1}) (\overline{RST2})$

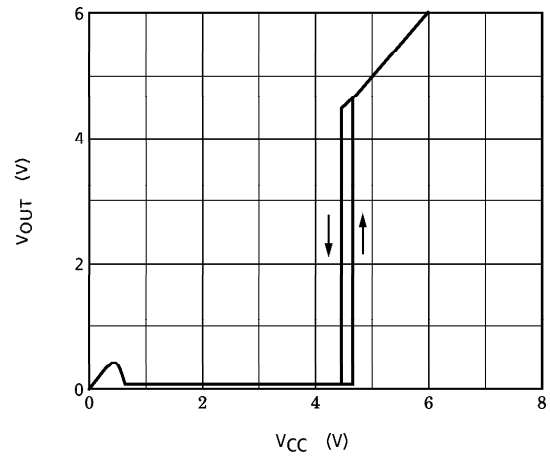


RESET OUTPUT STANDARD CHARACTERISTICS

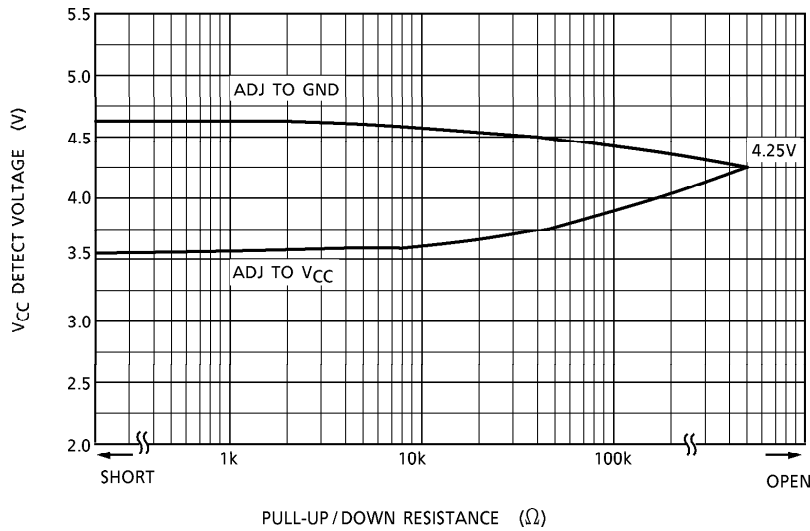
1.  $\overline{RST1}$



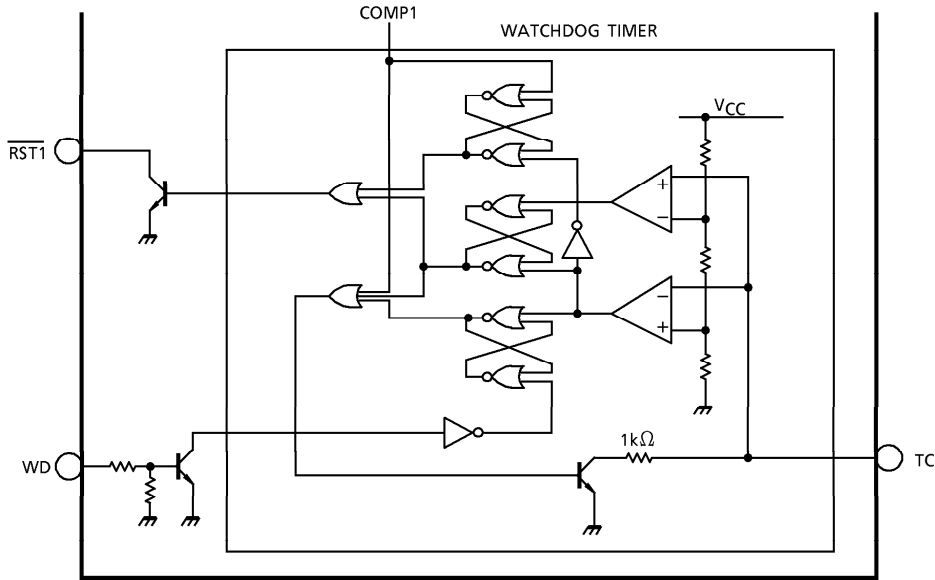
2.  $\overline{RST2}$



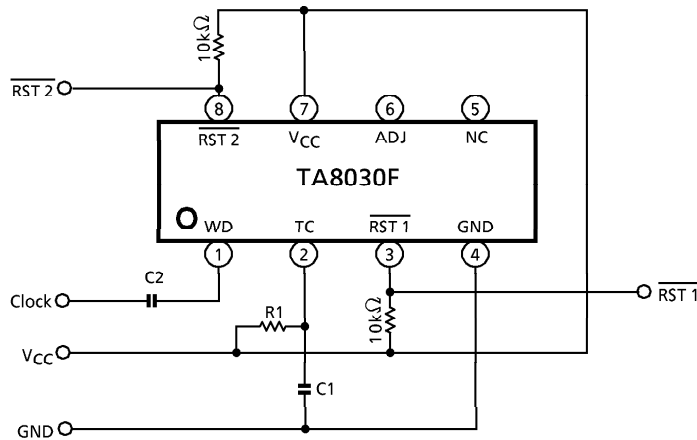
ADJ PIN PULL-UP / DOWN RESISTANCE VS  $V_{CC}$  DETECT VOLTAGE



EQUIVALENT CIRCUIT DIAGRAM (WATCHDOG TIMER)



EXAMPLE OF APPLICATION CIRCUIT



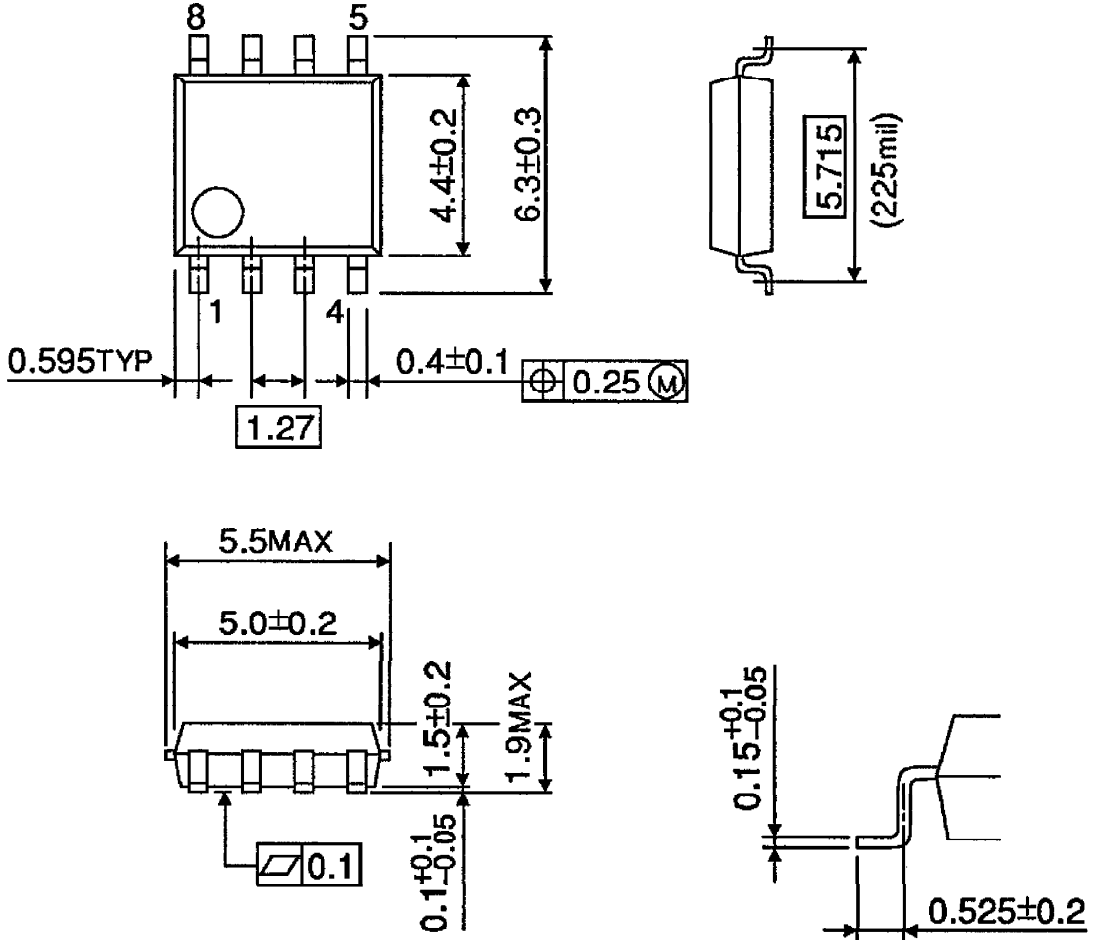
RECOMMENDED CONDITIONS

PART NAME	MIN.	TYP.	MAX.	UNIT
C <sub>1</sub>	0.01	—	100	μF
R <sub>1</sub>	10	—	100	kΩ
C <sub>2</sub>	—	2200	—	pF



OUTLINE DRAWING  
SOP8-P-225-1.27

Unit : mm



Weight : 0.08g (Typ.)