

## 3 SINGLE TIMERS

### DESCRIPTION

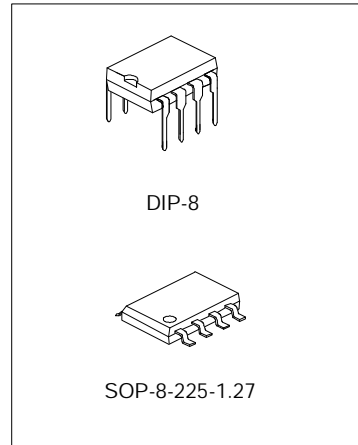
The UTC555 is a highly stable controller capable of producing accurate timing pulses. With monostable operation, the time delay is controlled by one external and one capacitor. With a stable operation, the frequency and duty cycle are accurately controlled with two external resistors and one capacitor.

### FEATURES

- \*High current driver capability(=200mA)
- \*Adjustable duty cycle
- \*Temperature stability of 0.005%/°C
- \*Timing from  $\mu\text{Sec}$  to Hours
- \*Turn off time less than  $2\mu\text{Sec}$

### APPLICATION

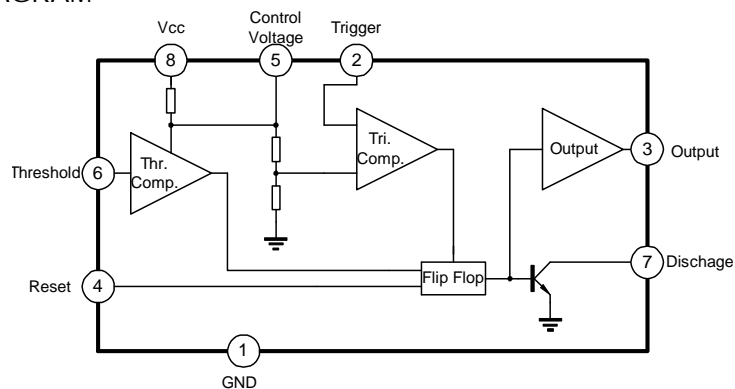
- \*Precision timing
- \*Pulse generation
- \*Time delay generation
- \*Sequential timing



### ORDERING INFORMATION

Device	package
UTC555E	SOP-8-225-1.27
UTC555D	DIP-8-300-2.54

### BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS(Ta=25°C)

Characteristic	Symbol	Value	Unit
Supply Voltage	Vcc	16	V
Power Dissipation	Pd	600	mW
Lead temperature	Tlead	300	°C
Operating Temperature	Topr	0 to 70	°C
Storage Temperature	Tstg	-65 to 150	°C

## ELECTRICAL CHARACTERISTICS( Ta=25°C ,Vcc=5~15V)

Characteristic	Symbol	Test Condition	Min	Typ.	Max	Unit
Supply voltage	Vcc		4.5		16	V
Supply Current (Note 1)	Icc	Vcc=5V,RL=∞		3	6	mA
		Vcc=15V,RL=∞		7.5	15	mA
Timing Error(monostable)						
Initial Accuracy(Note 2)	ACCUR	RA=1k to 100kμΩ		1.0	3.0	%
Drift with Temperature	Δt/ΔT	C=0.1μF		50		ppm/°C
Drift with supply voltage	Δt/ Δ Vcc			0.1	0.5	%/V
Timing Error(astable)						
Initial Accurary(Note 2)	ACCUR	RA=1k to 100kμΩ		2.25		%
Drift with Temperature	Δt/ΔT	C=0.1μF		150		ppm/°C
Drift with supply voltage	Δt/ΔVcc			0.3		%/V
Control Voltage	Vc	Vcc=15V	9.0	10.0	11.0	V
		Vcc=5V	2.6	3.33	4.0	V
Threshold Voltage	VTH	Vcc=15V		10.0		V
		Vcc=5V		3.33		V
Threshold Current(Note 3)	ITH			0.1	0.25	μA
Trigger voltage	Vtr	Vcc=5V	1.1	1.67	2.2	V
		Vcc=15V	4.5	5	5.6	V
Trigger Current	Itr	Vtr=0		0.01	2.0	μA
Reset Voltage	Vrst		0.4	0.7	1.0	V
Reset Current	Irst			0.1	0.4	mA
Low Output Voltage	VOL	Vcc=15V				
		Isink=10mA		0.06	0.25	V
		Isink=50mA		0.3	0.75	V
		Vcc=5V				
		Isink=5mA		0.05	0.35	V
High Output Voltage	VOH	Vcc=15V				
		Isource=200mA		12.5		V
		Isource=100mA	12.75	13.3		V
		Vcc=5V				
		Isource=100mA	2.75	3.3		V
Rise time of Output	tr			100		nSec
Fall time of Output	tf			100		nSec
Dischage Leakage Current	ILKG			20	100	nA

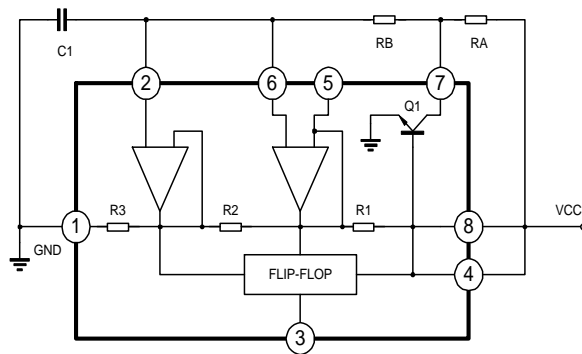
Note 1: Supply current when output is high is typically imA less at Vcc 5V.

Note 2: Tested at Vcc=5.0V and Vcc=15V.

Note 3: this will determine the maximum value of RA+RB for 15V operation, The max total 20MΩ, and for 5V operation the maximum total R=6.7MΩ.

# LINEAR INTEGRATED CIRCUIT

## APPLICATION CIRCUIT



## APPLICATION NOTE

The application circuit shows astable mode.

Pin 6(Threshold) is tied to Pin 2(Triiger) and Pin 4(reset) is tied to Vcc (Pin 8).

The external capacitor C1 of Pib 6 and Pin2 charges through RA,RB and discharges through RB only.

In the internal circuit of UTC555 one input of the upper comparator is the  $2/3V_{cc}$  ( $R_1=R_2=R_3$ ), another input if it is connected Pin 6.

as soon as charging C1 is higher than  $2/3V_{cc}$ , discharge transistor Q1 discharges to collector of transistor Q1.

Therefore, the flip-flop circuit is reset and output is low.

One input of lower comparator is the  $1/3V_{cc}$ , discharge transistor Q1 turn off and C1 charges through  $R_A$  and  $R_B$ .

Therefore, the flip-flop circuit is set output high.

So to say, when C1 charges through RA and RB output is high and when C1 discharge RB output is low. The charge time (output is high)  $t_1$  is  $0.693(RA+RB) C_1$  and the discharge time (output is low)  $T_2$  is  $0.693 RB * C_1$ .

$$\ln \left( \frac{V_{CC} - \frac{1}{3}V_{CC}}{V_{CC} - \frac{2}{3}V_{CC}} \right) = 0.693$$

Thus the total period time  $T$  is given by

$$T=T_1+T_2=0.693(RA+2RB)*C1.$$

Then the frequency of astable mode is given by

$$f = \frac{1}{T} = \frac{1.44}{(R_A + R_B) * C1}$$

The duty cycle is given by

$$D.C. = \frac{T_2}{T} = \frac{R_B}{R_A + 2R_B}$$

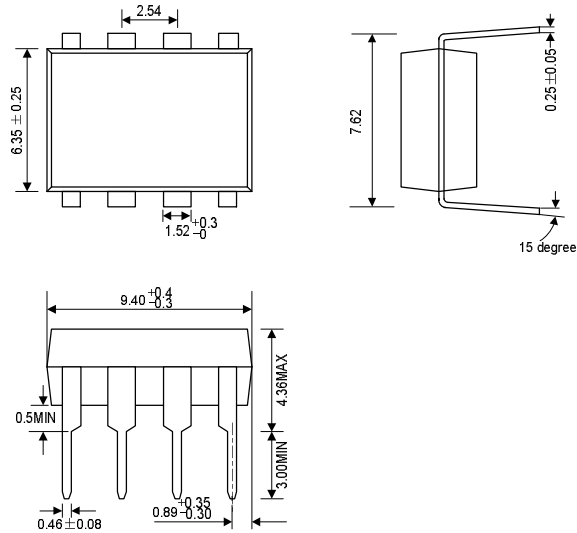
## PACKAGE OUTLINE

UTC555

LINEAR INTEGRATED CIRCUIT

DIP-8-300-2.54

UNIT: mm



SOP-8-225-1.27

UNIT: mm

