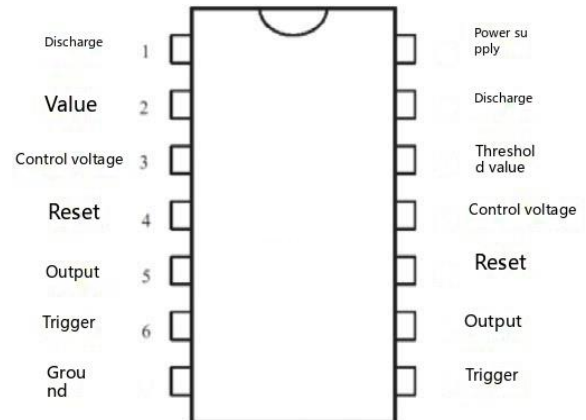


### Summary

NE556 dual-channel independent timer circuit is a controller that can produce highly accurate time delay or oscillation. In the time delay mode in operation, the time is precisely controlled by an external resistor and capacitor. For stable operation such as an oscillator, the free-running frequency

Both rate and duty cycle are accurately controlled by two external resistors and a capacitor. The circuit can be triggered or reset on the falling edge waveform, and the output structure can output or input current up to 200mA.

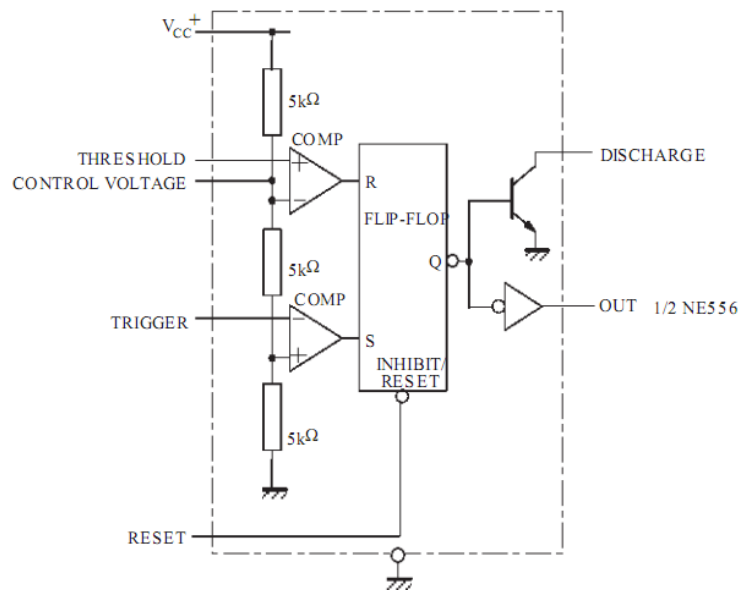
### Pin arrangement



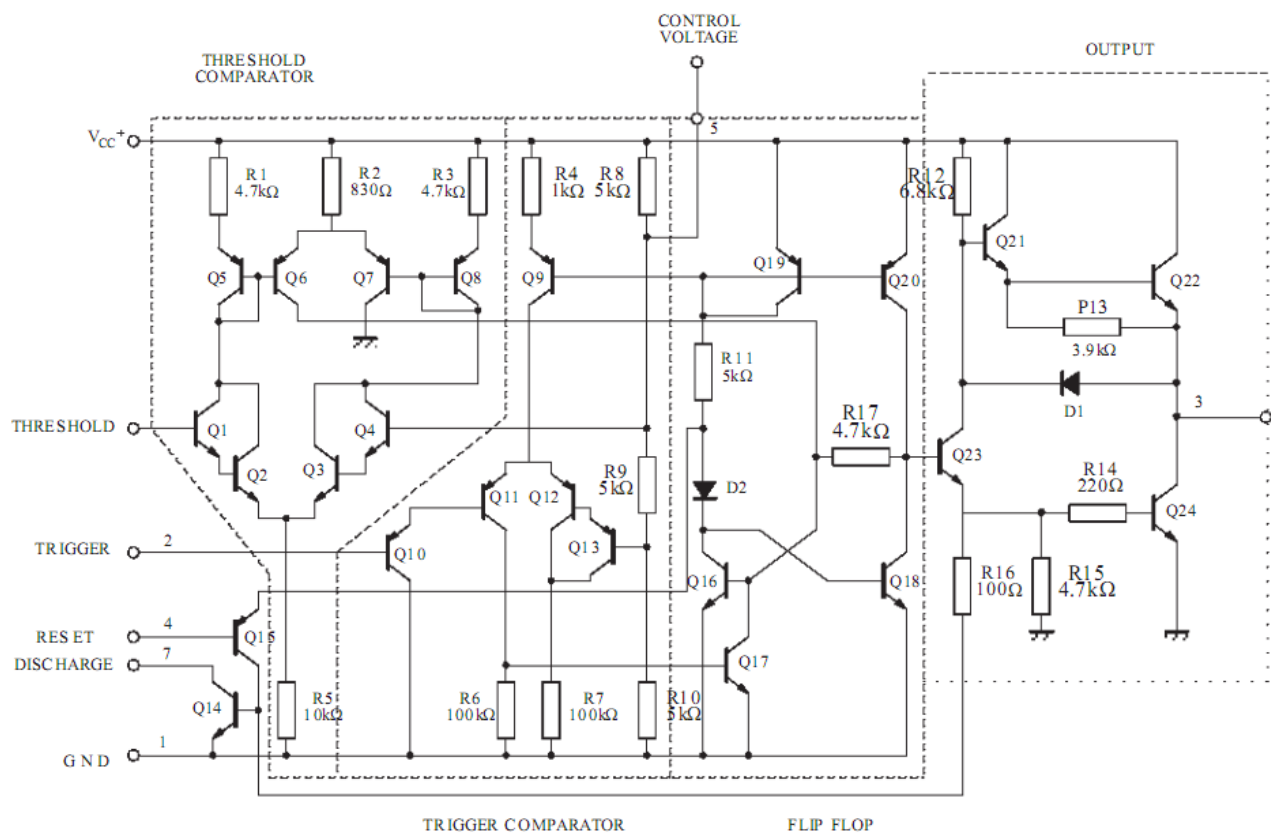
### Characteristic

- Low turn-off time
- The maximum operating frequency is greater than 500kHz.
- Time ranges from microseconds to several hours.
- There are two working modes: the intermediate steady state and the monostable state.
- High output current source or sink 200mA current
- Adjustable duty cycle
- TTL compatibility
- Temperature stability 0.005%/°C

structured flowchart



functional block diagram



# Universal dual channel precision timer

## Limiting service range

Symbol	parameter	value	Company
Vcc	Supply voltage	18	V
Toper	Operating temperature range	0~70	°C
Tj	Node temperature	150	°C
Tstg	Storage temperature range	-65~150	°C

## Recommended working conditions (TA=25 C°)

Symbol	parameter	value	Company
Vcc	Supply voltage	4.5~18	V
Vth, Vtrig, Vcl, Vreset	Maximum input voltage	Vcc	V

## Electrical characteristic parameter table (TA=25 C°, VCC=+5V to+15V, unless otherwise specified)

Symbol	parameter	minimum value	Typical value	Maximum	Company
Icc	Power supply current (RL ∞) { Note 1} - (2 timers) Low level state Vcc=+5V Vcc=+15V High level status Vcc=5V		6 20 4	10 24	mA
	Timing error (monostable) (RA=2K to 100k Ω, C=0.1 μ F) Initial accuracy(Note 2) And temperature drift Drift with power supply voltage		0.5 30 0.05	2 100 0.2	% ppm/°C %/V
	Timing error (unsteady state) RA=10k to 100k Ω, C=0.1 μ F, VCC =+15V Initial accuracy- (Note 2) and temperature drift Drift with power supply voltage		1.5 90 0.15		% ppm/°C %/V
Vcl	Control voltage level Vcc=+15V Vcc=+5V	9.6 2.9	10 3.33	10.4 3.8	V
Vth	threshold voltage Vcc=+15V Vcc=+5V	9.4 2.7	10 3.33	10.6 4	V
Ith	Threshold current- (Note 3)		0.1	0.25	uA
Vtrig	Trigger voltage Vcc=+15V	4.8	5	5.2	V

## Universal dual channel precision timer

	V <sub>CC</sub> =+5V	1.45	1.67	1.9	
I <sub>trig</sub>	Trigger current (V <sub>trig</sub> =0V)		0.5	0.9	uA
I <sub>dis</sub> ? off ?	Discharge pin leakage current (output high) (V <sub>DI</sub> =10V)		20	100	nA
V <sub>dis</sub> ? sat ?	Saturation voltage of discharge pin (Output low level) (Note 5 5) V <sub>CC</sub> =+15V= IDIS15 15mA V <sub>CC</sub> =+5V, and IDIS = 4.5mA.		180 80	480 200	mV
Tr	Output rise time		100	200	nS
Tf	Output fall time		100	200	nS
Toff	Closing time (Note 6) (Versat = V <sub>CC</sub> )		0.5	0.5	uS

Note: 1. When the output is high, the typical power supply current is

less than 1mA. 2. Test at V<sub>CC</sub> =+ 5V and V<sub>CC</sub>=+15V.

3. This will determine the maximum value of R<sub>A</sub>+R<sub>B</sub> when the power supply is +15V, with the maximum value of R =20MΩ and the maximum value of R =3.5MΩ when the power supply is 5V.

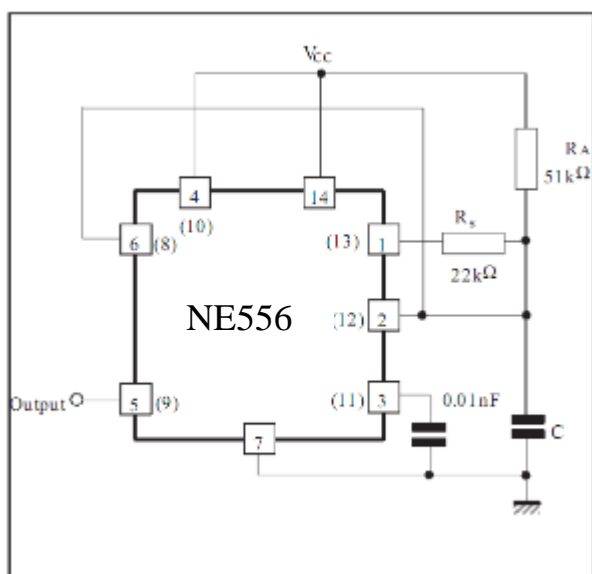
4. Specify the trigger input high level.

5.7 The pin has no overcurrent protection, and shall not exceed the provided package heat dissipation level.

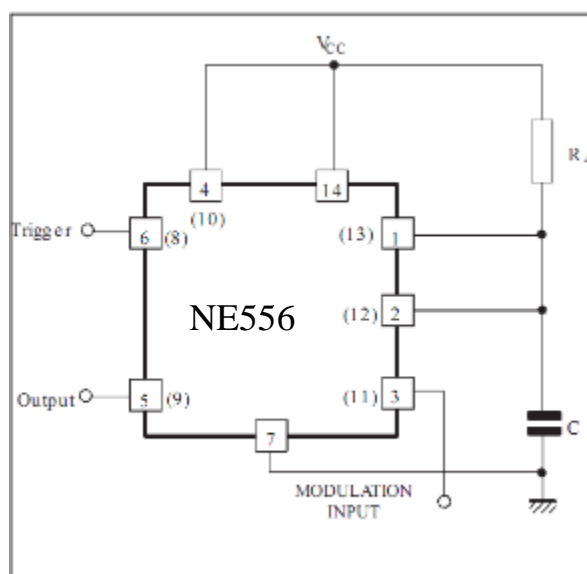
6. Measured from the forward input pulse, V<sub>CC</sub> enters the threshold terminal from 0 to 0.8 times, and the time for the output trigger terminal to drop from high level to low level is related to the threshold terminal.

### Typical application

50% duty cycle oscillator



pulse width modulator

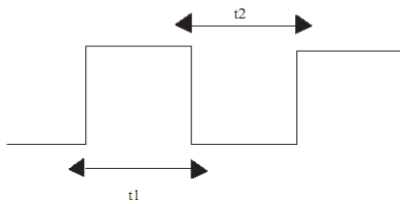


## Universal dual channel precision timer

$$t_1 = 0.693 R_A C$$

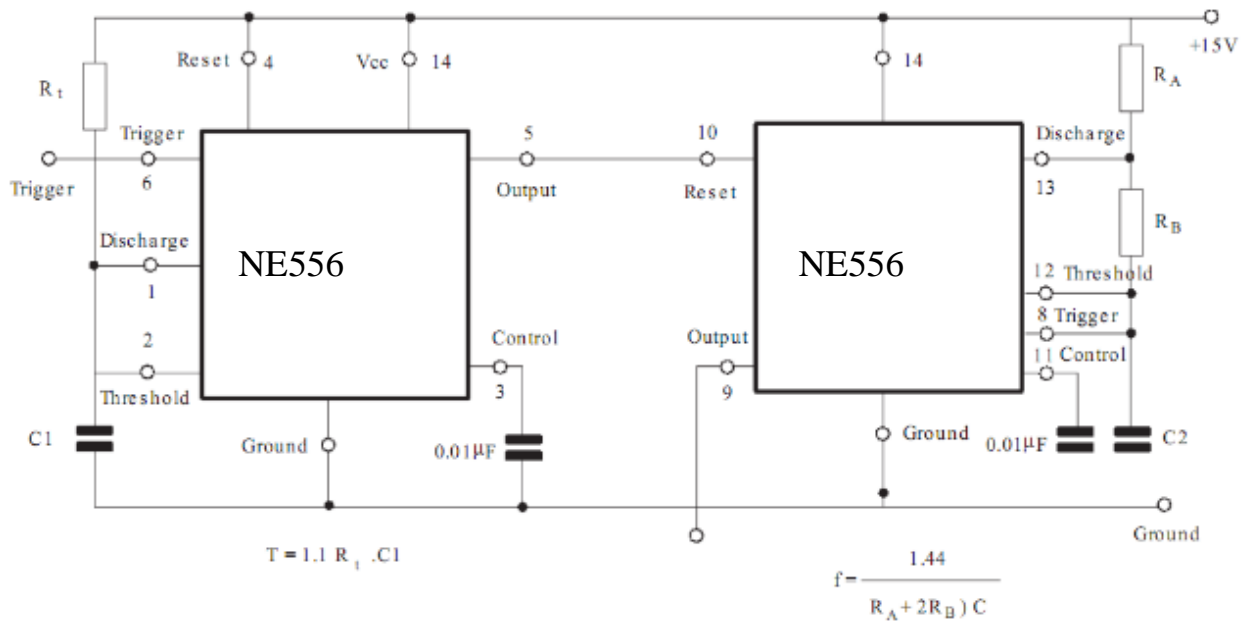
$$t_2 = [(R_A R_B) / (R_A + R_B)] \text{CLn} \left[ \frac{R_B - 2R_A}{2R_B - R_A} \right]$$

$$f = \frac{1}{t_1 + t_2} \quad R_B < \frac{1}{2} R_A$$



### Scale generator

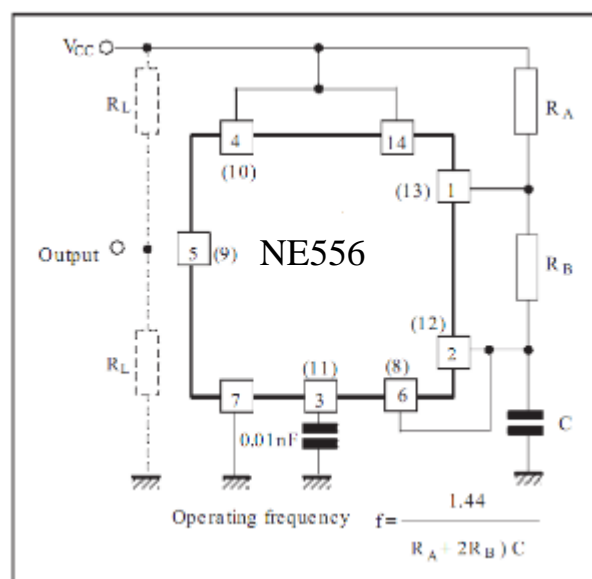
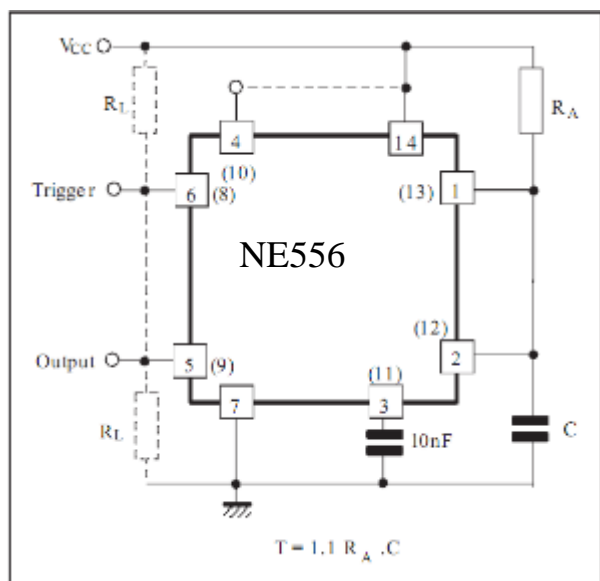
For a tone pulse train generator, the first timer is used as a monostable and determines the tone duration, which is triggered by a positive pulse at pin 6, and the second timer is triggered by a positive pulse, which is enabled by a high output monostable. It is connected as an unsteady state and determines the frequency of the tone.



Monostable

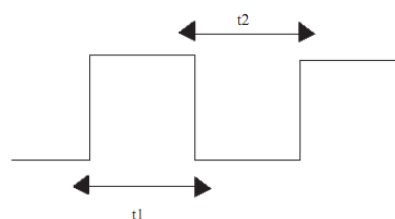
Steady state operation

## Universal dual channel precision timer



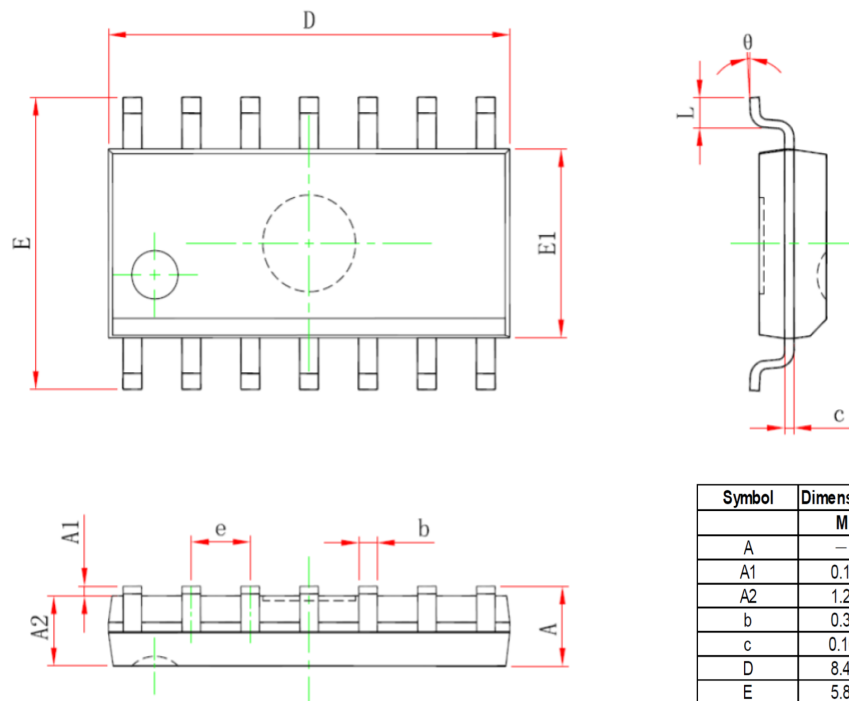
$$t_1 = 0.693 (R_A + R_B) \text{ C Output High}$$

$t_2 = 0.693 R_B C$  Output Low



## PACKAGE OUTLINE DIMENSIONS

SOP-14



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	—	1.750	—	0.069
A1	0.100	0.250	0.004	0.010
A2	1.250	—	0.049	—
b	0.310	0.510	0.012	0.020
c	0.100	0.250	0.004	0.010
D	8.450	8.850	0.333	0.348
E	5.800	6.200	0.228	0.244
E1	3.800	4.000	0.150	0.157
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°

## Marking

UMW xxxx  
NE556

## Ordering information

Order code	Package	Baseqty	Deliverymode
UMW NE556DR	SOP-14	2500	Tape and reel