# Designated client product

This product will be discontinued its production in the near term.
And it is provided for customers currently in use only, with a time limit.
It can not be available for your new project. Please select other new or existing products.
For more information, please contact our sales office in your region.

New Japan Radio Co.,Ltd.

www.njr.com

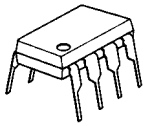
# TIMER

## ■ GENERAL DESCRIPTION

The **NJM555** monolithic timing circuit is a highly stable controller capable of producing accruate time delays or oscillation. In the time delay mode, delay time is precisely controlled by only two external parts : a resistor and a capacitor. For operation as an oscillator, both the free running frequency and the duty cycle are accurately controlled by two external resistors and a capacitor.

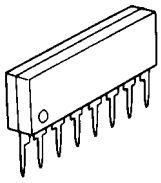
Terminals are provided for triggering and resetting. The circuit will trigger and reset on falling waveforms. The output can source or sink up to 200mA or drive TTL circuits.

## ■ PACKAGE OUTLINE



**NJM555D**

**NJM555M**



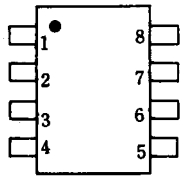
**NJM555L**

**NJM555V**

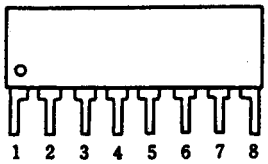
## ■ FEATURES

- Operating Voltage (4.5V to 16V)
- Less Number of External Components
- Package Outline DIP8, DMP8, SSOP8, SIP8
- Bipolar Technology

## ■ PIN CONFIGURATION



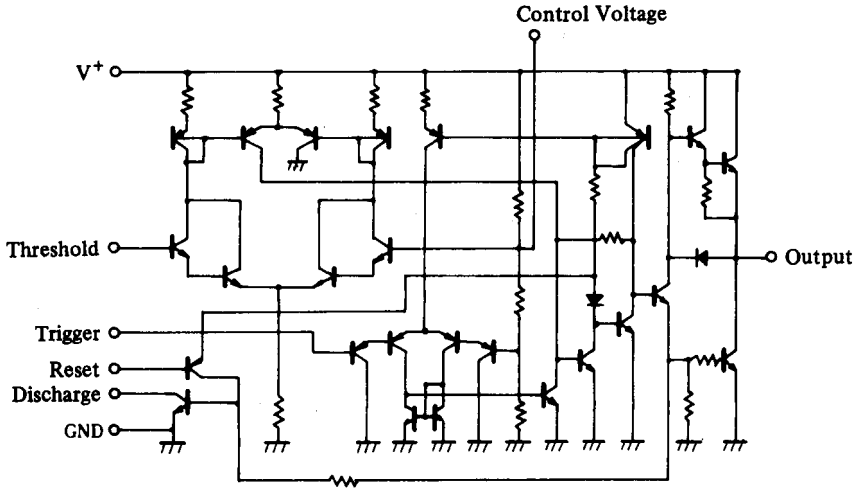

**NJM555D**
**NJM555M**
**NJM555V**




**NJM555L**

PIN FUNCTION
1. GND
2. Trigger
3. Output
4. Reset
5. Control Voltage
6. Threshold
7. Discharge
8. $V^+$

## ■ EQUIVALENT CIRCUIT



## ■ ABSOLUTE MAXIMUM RATINGS

($T_a$=25°C)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Supply Voltage | V+ | 18 | V |
| Power Dissipation | $P_D$ | (DIP8) 1000(Note1) | mW |
| | | (DMP8) 580(Note1) | mW |
| | | (SSOP8) 480(Note1) | mW |
| | | (SIP8) 1600(Note1) | mW |
| Operating Temperature Range | $T_{opr}$ | -40 to +85 | °C |
| Storage Temperature Range | $T_{stg}$ | -40 to +125 | °C |

Note1: Mounted on the EIA/JEDEC standard board (76.2×114.3×1.6mm, four layer, FR-4).

## ■ ELECTRICAL CHARACTERISTICS

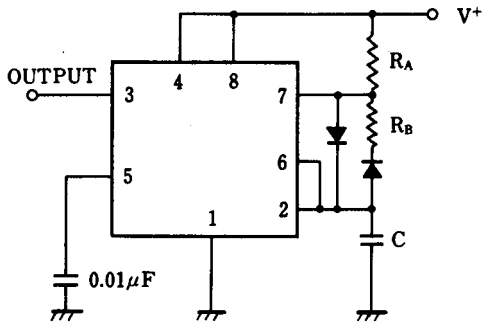
($V^+$=5 to 15V, $T_a$=25°C)

| PARAMETER | SYMBOL | TEST CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Operating Voltage | $V^+$ | | 4.5 | - | 16 | V |
| Operating Current | $I_{CC}$ | $V^+$=5V, $R_L$=∞(Note 2) | - | 3.0 | 6.0 | mA |
| Operating Current | $I_{CC}$ | $V^+$=15V, $R_L$=∞(Note 2) | - | 10 | 15 | mA |
| Timing Error | | | | | | |
| Initial Accuracy | $E_t$ | $T_a$=-20 to 75°C, $V^+$=5 to 15V(Note 3) | - | 1.0 | - | % |
| Drift with Temperature | $E_t$ | $T_a$=-20 to 75°C, $V^+$=5 to 15V(Note 3) | - | 50 | - | ppm / °C |
| Drift with Supply Voltage | $E_t$ | $T_a$=-20 to 75°C, $V^+$=5 to 15V(Note 3) | - | 0.1 | - | % / V |
| Threshold Voltage | $V_{th}$ | | - | 2 / 3 | - | ×$V^+$ |
| Trigger Voltage | $V_T$ | $V^+$=15V | - | 5.0 | - | V |
| Trigger Voltage | $V_T$ | $V^+$=5V | - | 1.67 | - | V |
| Trigger Current | $I_T$ | | - | 0.5 | - | µA |
| Reset Voltage | $V_R$ | | 0.4 | 0.5 | 1.0 | V |
| Reset Current | $I_R$ | | - | 0.1 | - | mA |
| Threshold Curret | $I_{th}$ | | - | 0.1 | 0.25 | µA |
| Control Voltage Level | $V_{CL}$ | $V^+$=15V | 9 | 10 | 11 | V |
| Control Voltage Level | $V_{CL}$ | $V^+$=5V | 2.6 | 3.33 | 4.0 | V |
| Output Voltage (Low) | $V_{OL}$ | $V^+$=15V Isink=10mA | - | 0.1 | 0.25 | V |
| Output Voltage (Low) | $V_{OL}$ | $V^+$=15V Isink=50mA | - | 0.4 | 0.75 | V |
| Output Voltage (Low) | $V_{OL}$ | $V^+$=15V Isink=100mA | - | 2.0 | 2.5 | V |
| Output Voltage (Low) | $V_{OL}$ | $V^+$=15V Isink=200mA | - | 2.5 | - | V |
| Output Voltage (Low) | $V_{OL}$ | $V^+$=5V Isink=5mA | - | 0.25 | 0.35 | V |
| Output Voltage (High) | $V_{OH}$ | $V^+$=15V Isource=200mA | - | 12.5 | - | V |
| Output Voltage (High) | $V_{OH}$ | $V^+$=15V Isource=100mA | 12.75 | 13.3 | - | V |
| Output Voltage (High) | $V_{OH}$ | $V^+$=15V Isource=40mA | - | 13.5 | - | V |
| Output Voltage (High) | $V_{OH}$ | $V^+$=5V Isource=100mA | 2.75 | 3.3 | - | V |
| Rise time of Output | $t_r$ | No Loading | - | 100 | - | ns |
| Fall time of Output | $t_f$ | No Loading | - | 100 | - | ns |

Note 2 : Low output condition (When the output is high, it is lower than the low output condition by 1mA in the standard specificatio.)
Note 3 : $R_A$, $R_B$=1k to 100kΩ, C=0.1µF, $V^+$=15V from 5V

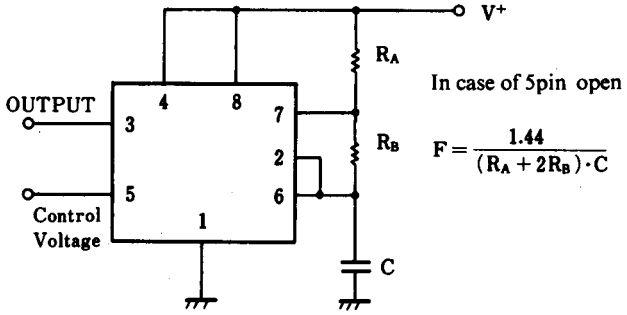
## ■ TYPICAL APPLICATION

(1) 50% Duty Cycle Oscillator




Duty cycle 50% at $R_A = R_B$
Due to $R_A$, $R_B$ value
the duty ratio becomes
lower than 50%.

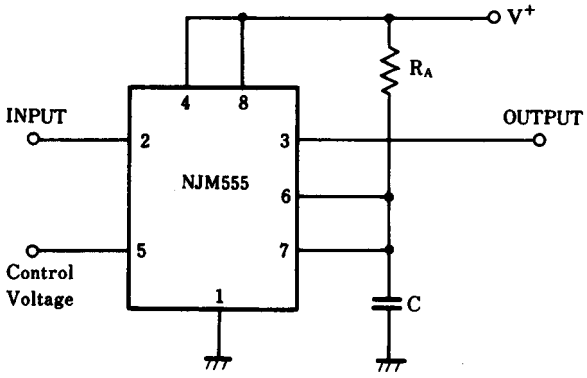
(2) Oscillation frequency can be changed by changing the control voltage.




In case of 5pin open

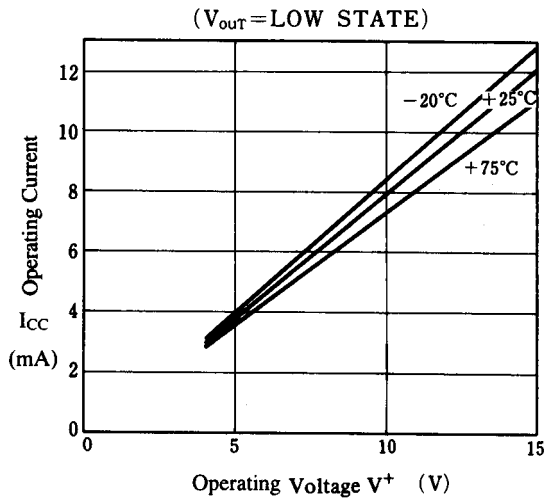
$$F = \frac{1.44}{(R_A + 2R_B) \cdot C}$$

(3) Pulse Width Modulation

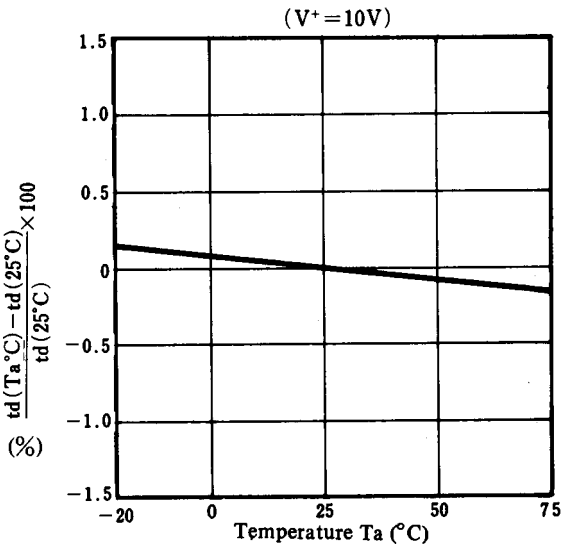


## ■ TYPICAL CHARACTERISTICS

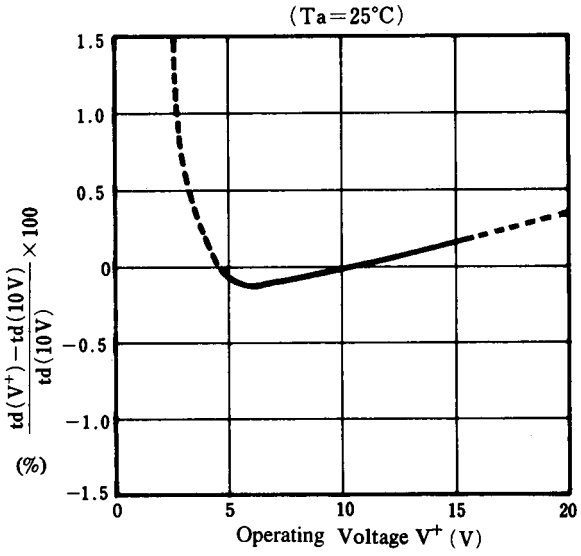
### Operating Current vs. Operating Voltage



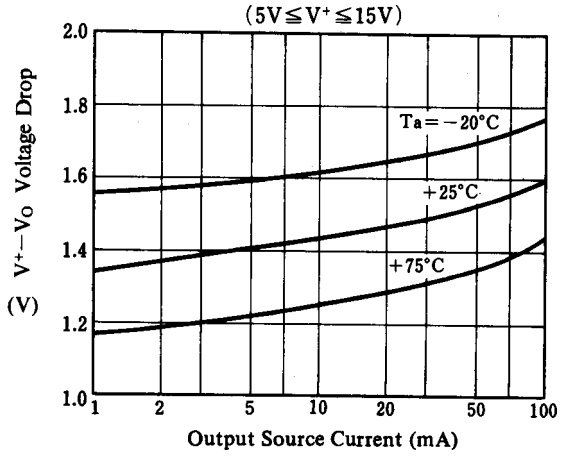

### Delay Time vs. Temperature



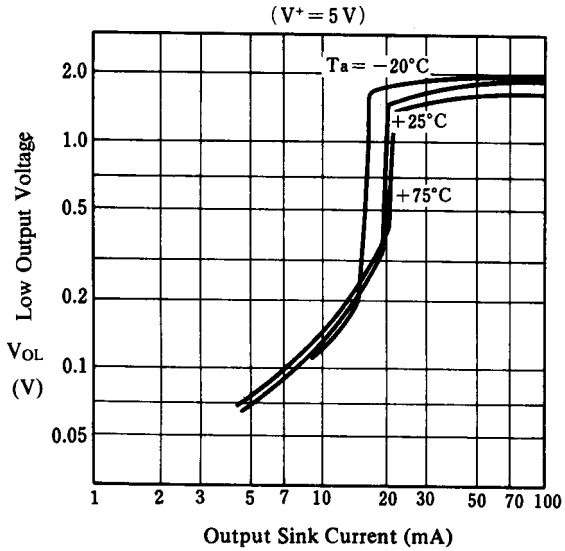

### Delay Time vs. Operating Voltage



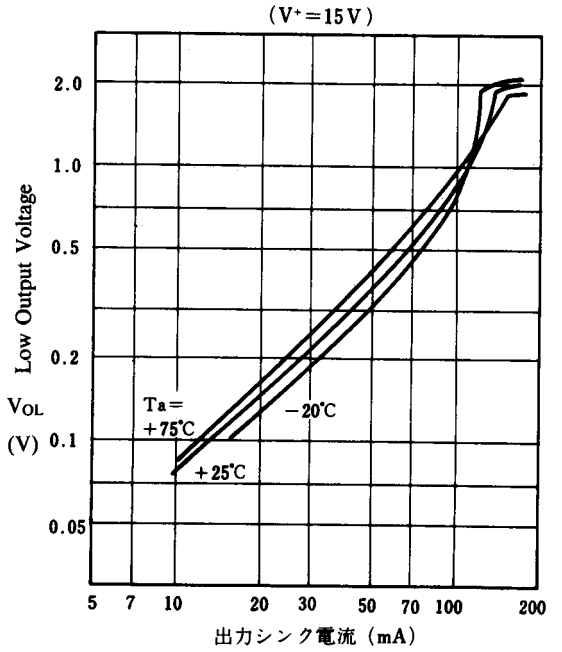

### High Output Voltage Drop vs. Output Source Current




### Low Output Voltage vs. Output Sink Current




### Low Output Voltage vs. Output Sink Current



## ■ TYPICAL CHARACTERISTICS

1. Monostable Operation

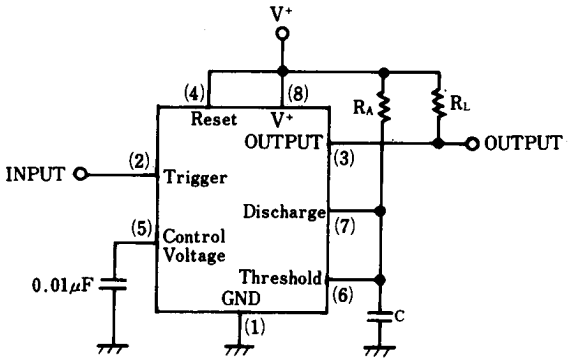



**Fig. 1**

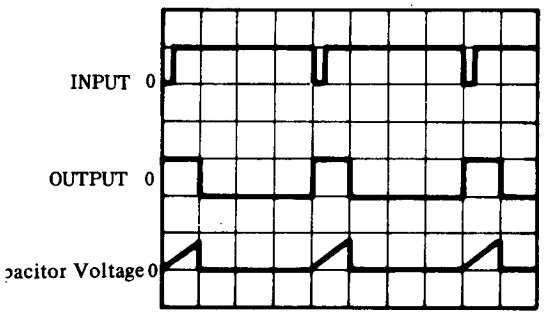
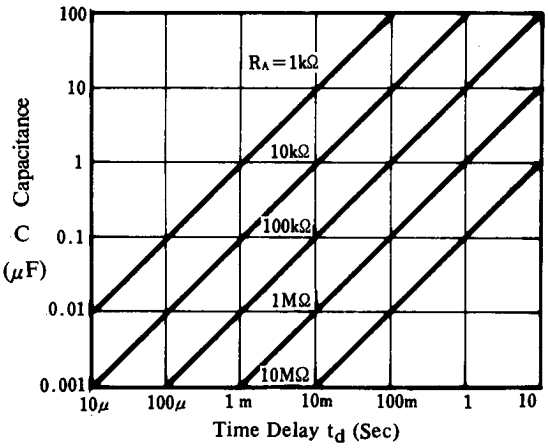



**Fig.2 Wave Form**




**Time Delay vs. $R_A$, $R_B$ and C**

Fig. 2 shows a typical example of the monostable operation. $T_H = 1.1R_A \cdot C$ assuming that $T_H$ be the time at the high output level in this figure.

2. Free Running Operation

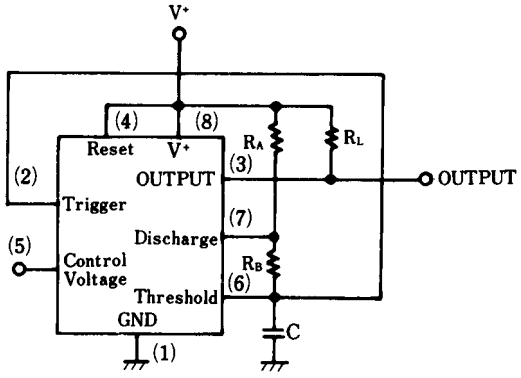



**Fig. 3**

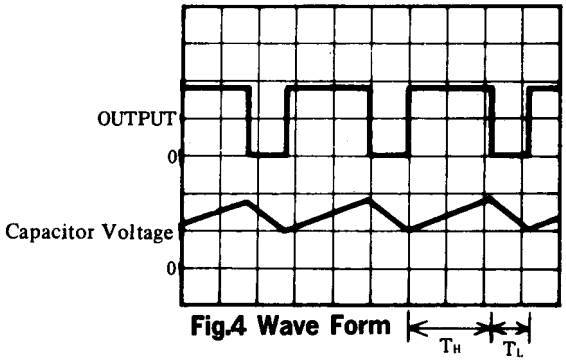
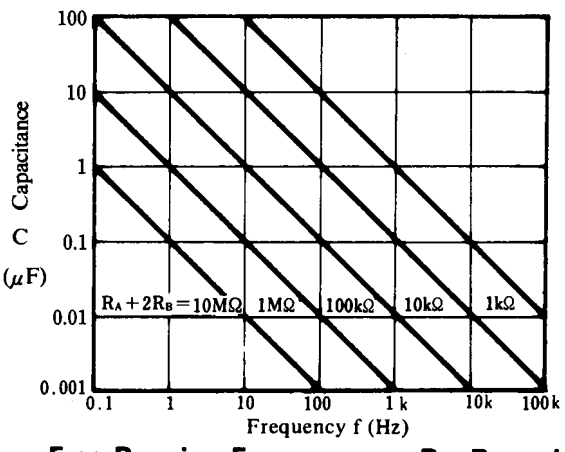



**Fig.4 Wave Form**




**Free Running Frequency vs. $R_A$, $R_B$ and C**

Fig. 4 shows a typical example of the free running operation.

The charge time (output High) is given by:

$$T_H = 0.693 (R_A + R_B) \cdot C$$

And the discharge time (output Low) by:

$$T_L = 0.693 R_B \cdot C$$

The frequency of oscillation is:

$$F = \frac{1.44}{(R_A + 2R_B) \cdot C}$$

The duty cycle is:

$$D = \frac{T_H}{T_H + T_L} = \frac{R_A + R_B}{R_A + 2R_B}$$

[CAUTION]
The specifications on this databook are only given for information , without any guarantee as regards either mistakes or omissions. The application circuits in this databook are described only to show representative usages of the product and not intended for the guarantee or permission of any right including the industrial rights.

# X-ON Electronics

Largest Supplier of Electrical and Electronic Components

***Click to view similar products for*** Timers & Support Products ***category:***

***Click to view products by*** Nisshinbo ***manufacturer:***

Other Similar products are found below :

MIC1557YD5-TR NLV14541BDG PT8A2515TAEX PT8A2514APE S-35710M01I-E8T3U S-35720C01A-K8T2U SY87700ALZG LM555CM MAX7375AXR185+T SA555S-13 SE556J S-1410H30-K8T2U4 S-35710C01I-K8T2U S-35720C01I-K8T2U S-35720C02I-K8T2U S-35730C01I-K8T2U S-35740C01I-K8T2U S-1410G29-K8T2U4 S-1410A28-K8T2U4 S-1410I45-K8T2U4 ALD555PAL ALD7555PAL AD807A-155BRZ AD808-622BRZ ADN2807ACPZ ADN2814ACPZ ADN2819ACPZ-CML SE555QS-13 NE555S-13 ZSCT1555N8TA XD556 NJM567D NE555L-D08-T NE555N NE555N XD555 XD7555 XD551 LMC555N LM555N TLC555N ICM7555CD ICM7242IPAZ ICM7555IPAZ ICM7242IPA+ ICM7555IPA+ ICM7556IPD+ ALD2502SBL MC14541BDG ICM7556ISD+