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.
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New Japan Radio Co.,Ltd.

www.njr.com

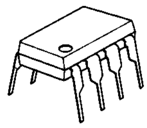
TIMER

■ GENERAL DESCRIPTION

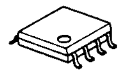
The **NJM555** monolithic timing circuit is a highly stable controller capable of producing accruate time delays or oscillation. In the time delay mode, delay time is precisely controlled by only two external parts : a resistor and a capacitor. For operation as an oscillator, both the free running frequency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

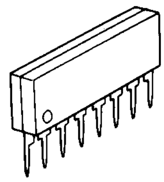
■ PACKAGE OUTLINE



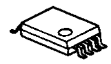
NJM555D



NJM555M



NJM555L

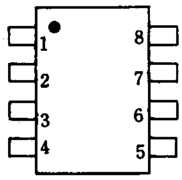


NJM555V

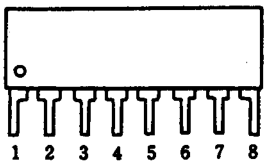
■ FEATURES

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

■ PIN CONFIGURATION



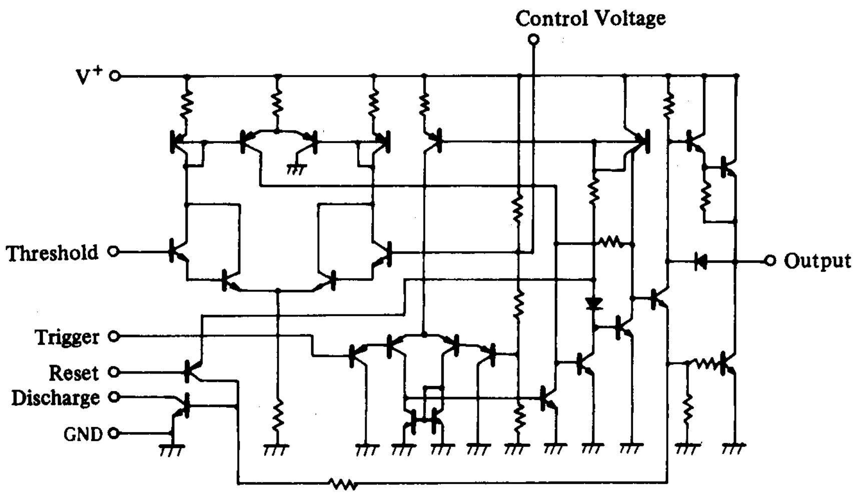
NJM555D
NJM555M
NJM555V



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) (DMP8) 580(Note1) (SSOP8) 480(Note1) (SIP8) 1600(Note1)	mW mW mW 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

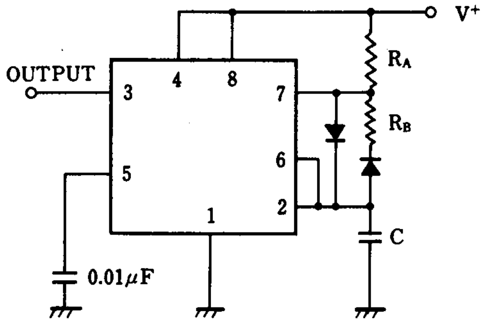
(V^+=5 to 15V, T_a=25°C)

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

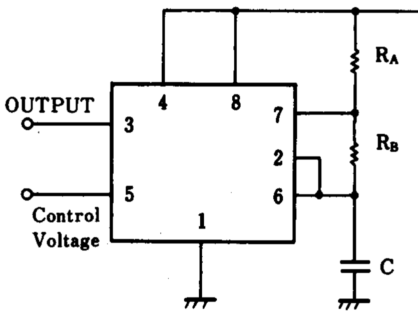
■ TYPICAL APPLICATION

(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%.

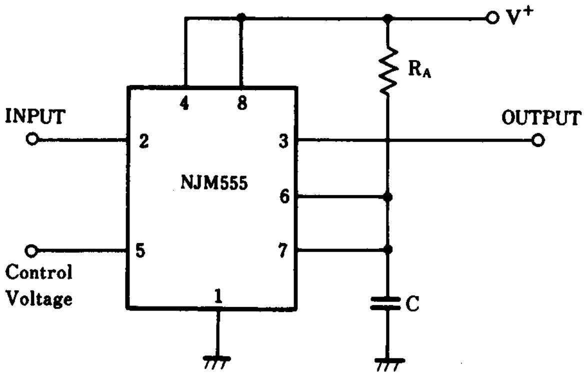
(2) Oscillation frequency can be changed by changing the control voltage.



In case of 5pin open

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

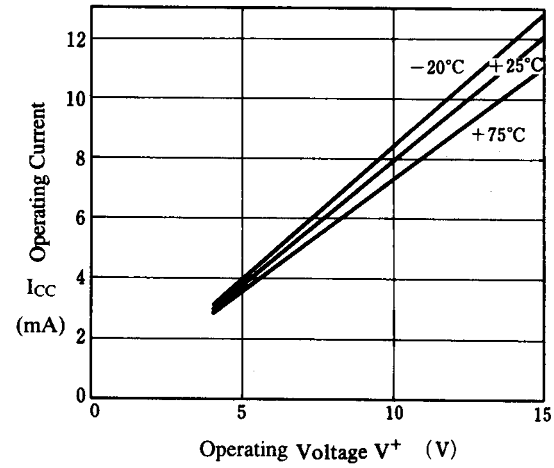
(3) Pulse Width Modulation



■ TYPICAL CHARACTERISTICS

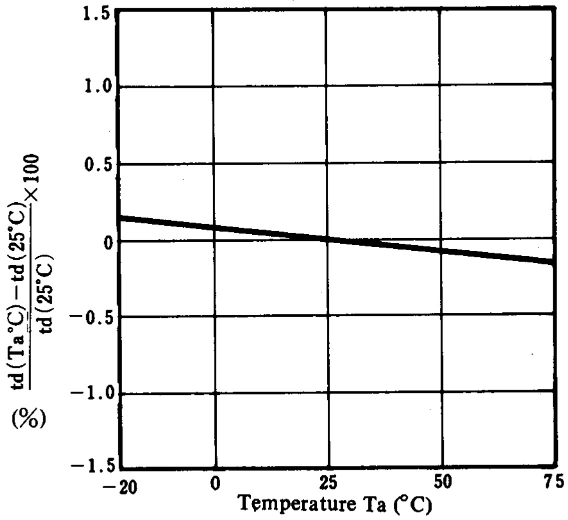
Operating Current vs. Operating Voltage

(V_{OUT}=LOW STATE)



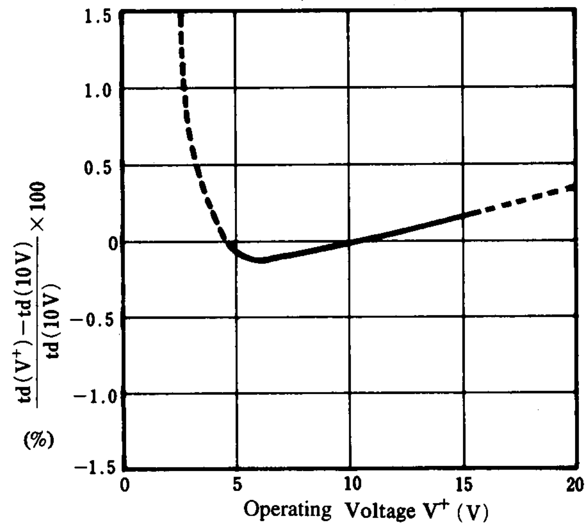
Delay Time vs. Temperature

(V+=10V)



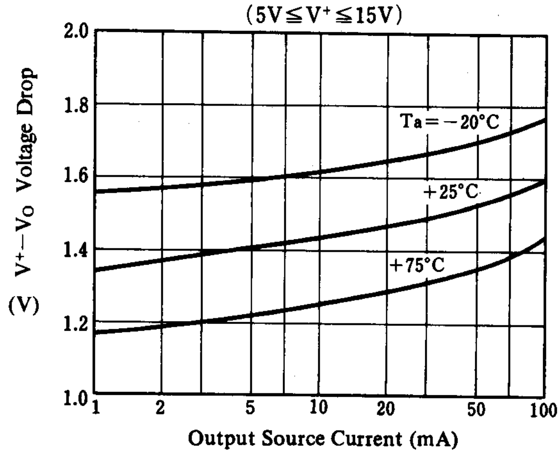
Delay Time vs. Operating Voltage

(Ta=25°C)



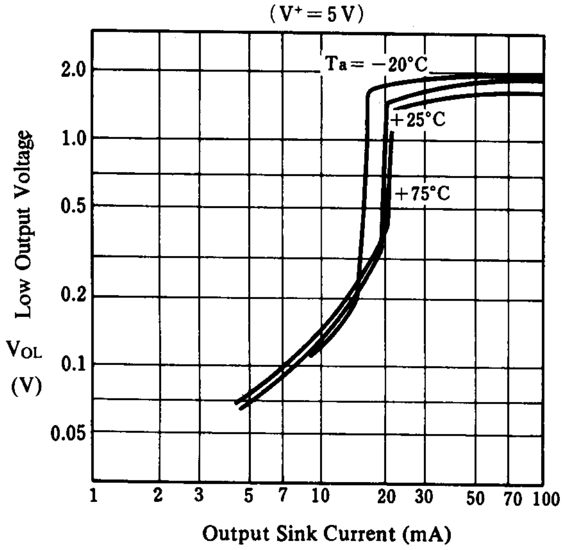
High Output Voltage Drop vs. Output Source Current

(5V≦V+≦15V)



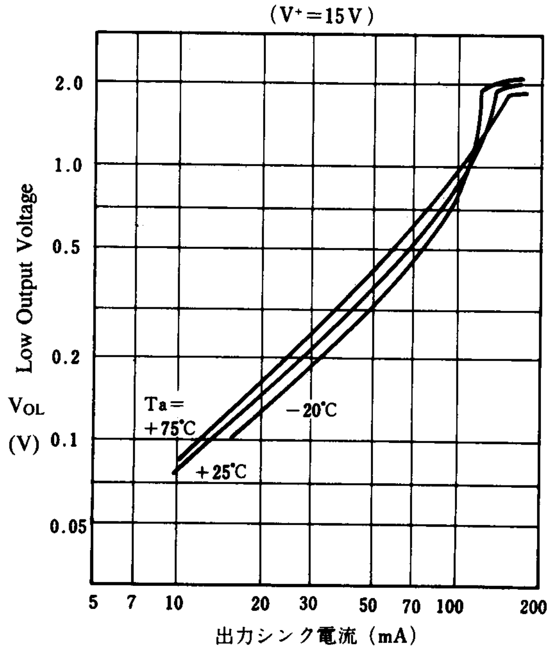
Low Output Voltage vs. Output Sink Current

(V+=5V)



Low Output Voltage vs. Output Sink Current

(V+=15V)



■ TYPICAL CHARACTERISTICS

1. Monostable Operation

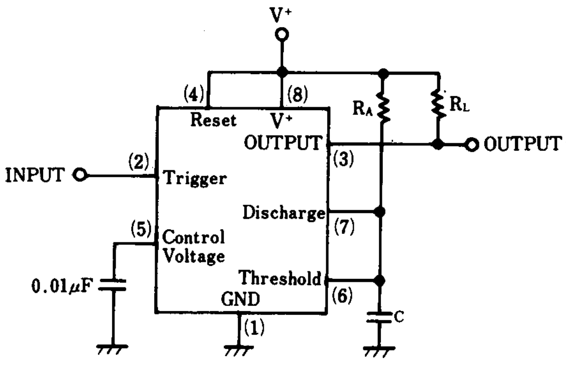


Fig. 1

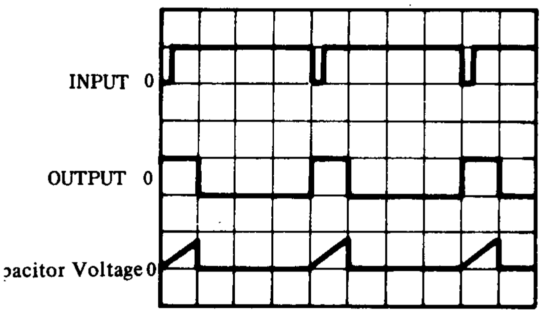
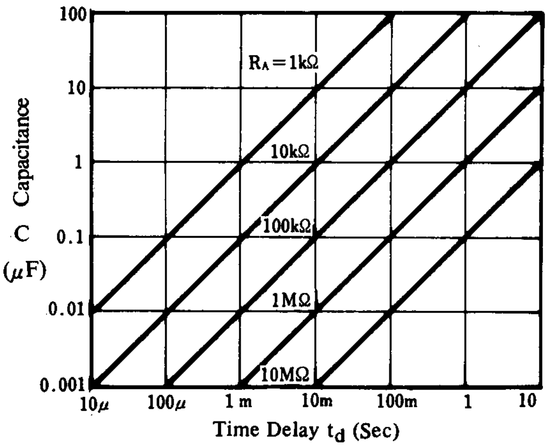


Fig.2 Wave Form



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

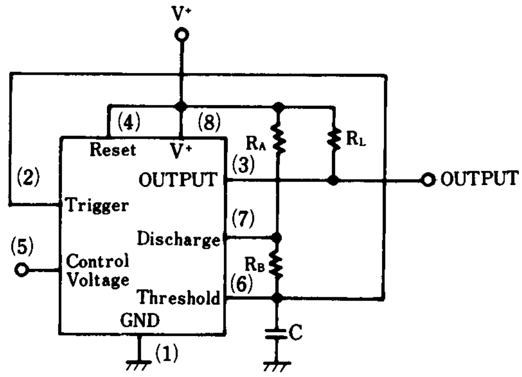


Fig. 3

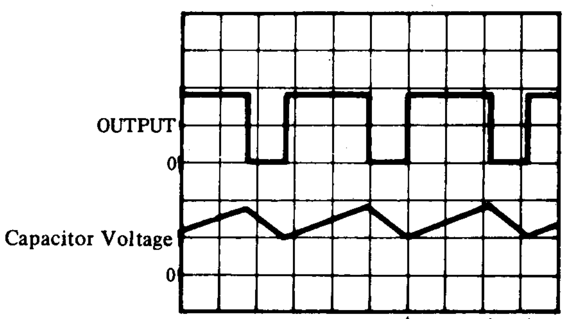
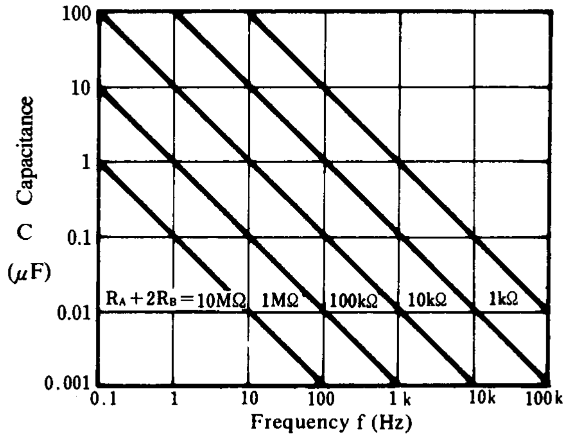


Fig.4 Wave Form (T_H, T_L)



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:

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