

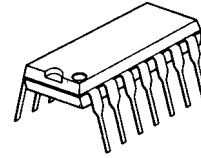
## DUAL TIMER

### ■ GENERAL DESCRIPTION

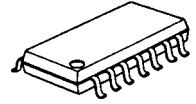
The **NJM556** dual monolithic timing circuit is a highly stable controller capable of producing accurate time delays or oscillation. In the time delay mode, delay time is precisely controlled by only two external parts : a resistor and a capacitor. For operation as an oscillator, both the free running frequency and the duty cycle are accurately controlled by two external resistors and capacitor.

Terminal 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



N JM556D



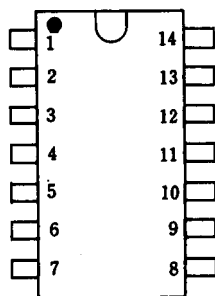
N JM556M

### ■ FEATURES

- Dual Timer Circuits
- Less number of External Components
- Package Outline
- Bipolar Technology

DIP14, DMP14

### ■ PIN CONFIGURATION

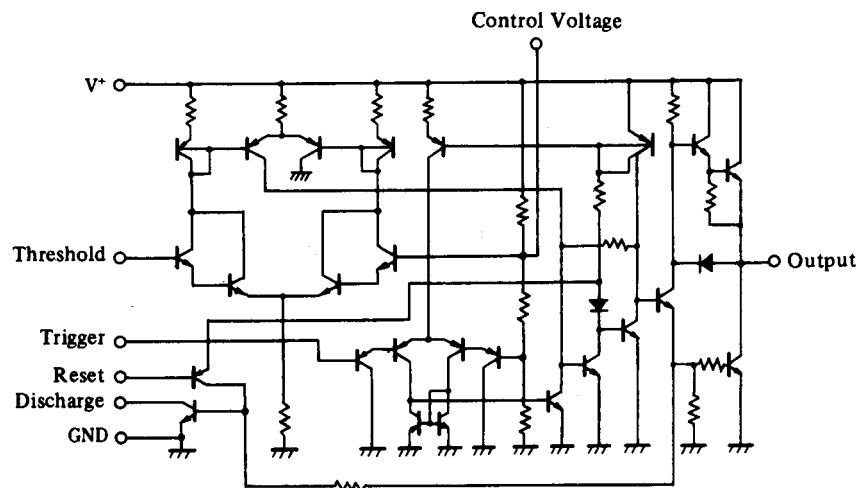


N JM556D  
N JM556M

#### PIN FUNCTION

- |                |                    |
|----------------|--------------------|
| 1. Discharge A | 8. Trigger B       |
| 2. Threshold A | 9. Output B        |
| 3. Control A   | 10. Reset B        |
| 4. Reset A     | 11. Control B      |
| 5. Output A    | 12. Threshold B    |
| 6. Trigger A   | 13. Discharge B    |
| 7. Ground      | 14. V <sup>+</sup> |

### ■ EQUIVALENT CIRCUIT (1/2 Shown)



# NJM556

## ■ ABSOLUTE MAXIMUM RATINGS

(T<sub>a</sub>=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	18	V
Power Dissipation	P <sub>D</sub>	(DIP14) 570 (DMP14) 700(note)	mW
Operating Temperature Range	T <sub>opr</sub>	-40 to +85	°C
Storage Temperature Range	T <sub>stg</sub>	-40 to +125	°C

(Note) At on PC board

## ■ ELECTRICAL CHARACTERISTICS

(V<sup>+</sup>=+5 to +15V, T<sub>a</sub>=25°C)

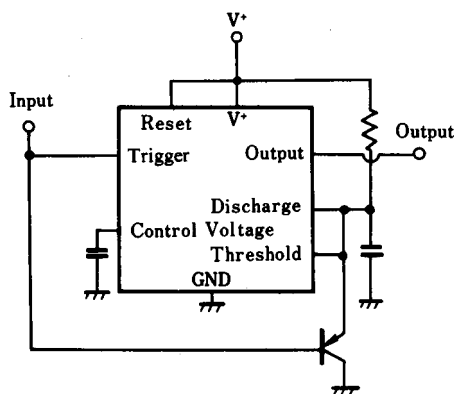
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V <sup>+</sup>		4.5	-	16	V
Operating Current (Note 2)	I <sub>CC</sub>	V <sup>+</sup> =5V, R <sub>L</sub> =∞ (Each Section)	-	3	6	mA
Operating Current (Note 2)	I <sub>CC</sub>	V <sup>+</sup> =15V, R <sub>L</sub> =∞ (Each Section)	-	10	14	mA
Threshold Voltage	V <sub>TH</sub>		-	2/3	-	×V <sup>+</sup>
Trigger Voltage	V <sub>T</sub>	V <sup>+</sup> =15V	-	5	-	V
Trigger Voltage	V <sub>T</sub>	V <sup>+</sup> =5V	-	1.67	-	V
Trigger Current	I <sub>T</sub>		-	0.5	-	μA
Reset Voltage	V <sub>R</sub>		0.4	0.7	1.0	V
Reset Current	I <sub>R</sub>		-	0.1	-	mA
Threshold Current	I <sub>T</sub>		-	0.03	0.1	μA
Control Voltage Level	V <sub>CL</sub>	V <sup>+</sup> =15V	9	10	11	V
Control Voltage Level	V <sub>CL</sub>	V <sup>+</sup> =5V	2.6	3.33	4	V
Output Voltage Drop (Low)	V <sub>OL</sub>	V <sup>+</sup> =15V, I <sub>SINK</sub> =10mA	-	0.1	0.25	V
Output Voltage Drop (Low)	V <sub>OL</sub>	V <sup>+</sup> =15V, I <sub>SINK</sub> =50mA	-	0.4	0.75	V
Output Voltage Drop (Low)	V <sub>OL</sub>	V <sup>+</sup> =15V, I <sub>SINK</sub> =100mA	-	2	2.75	V
Output Voltage Drop (Low)	V <sub>OL</sub>	V <sup>+</sup> =15V, I <sub>SINK</sub> =200mA	-	2.5	-	V
Output Voltage Drop (Low)	V <sub>OL</sub>	V <sup>+</sup> =5V, I <sub>SINK</sub> =5mA	-	0.25	0.35	V
Output Voltage Drop (High)	V <sub>OH</sub>	V <sup>+</sup> =15V, I <sub>SOURCE</sub> =200mA	-	12.5	-	V
Output Voltage Drop (High)	V <sub>OH</sub>	V <sup>+</sup> =15V, I <sub>SOURCE</sub> =100mA	12.75	13.3	-	V
Output Voltage Drop (High)	V <sub>OH</sub>	V <sup>+</sup> =15V, I <sub>SOURCE</sub> =40mA	-	13.5	-	V
Output Voltage Drop (High)	V <sub>OH</sub>	V <sup>+</sup> =5V, I <sub>SOURCE</sub> =100mA	2.75	3.3	-	V

(Note 2) Operating Current when output high typically 2mA less.

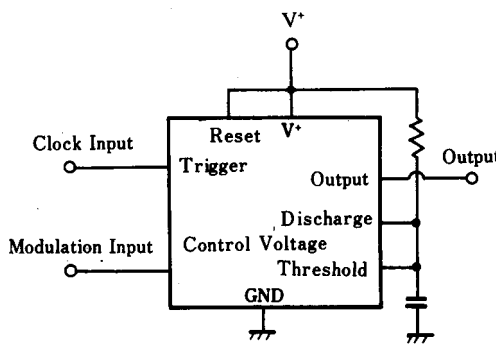
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Timing Error (Free Running) (Note 3)						
Initial Accuracy	E <sub>ta</sub>	R <sub>A</sub> , R <sub>B</sub> =2k to 100kΩ, C=0.1μF	-	2.25	-	%
vs. Temperature	E <sub>tb</sub>	R <sub>A</sub> , R <sub>B</sub> =2k to 100kΩ, C=0.1μF	-	150	-	ppm / °C
vs. Operating Voltage	E <sub>tc</sub>	R <sub>A</sub> , R <sub>B</sub> =2k to 100kΩ, C=0.1μF	-	0.3	-	% / Volt
Timing Error (Monostable) (Note 3)						
Initial Accuracy	E <sub>tm</sub>	R <sub>A</sub> , R <sub>B</sub> =2k to 100kΩ, C=0.1μF	-	0.75	-	%
vs. Temperature	E <sub>tb</sub>	R <sub>A</sub> , R <sub>B</sub> =2k to 100kΩ, C=0.1μF	-	50	-	ppm / °C
vs. Operating Voltage	E <sub>tc</sub>	R <sub>A</sub> , R <sub>B</sub> =2k to 100kΩ, C=0.1μF	-	0.1	-	% / Volt
Matching Characteristics Between Each Section						
Initial Accuracy			-	0.5	1	%
vs. Temperature			-	±10	-	ppm / °C
vs. Operating Voltage			-	0.2	0.5	% / Volt

(Note 3) : Tested at V<sup>+</sup>=+5V to +15V

## ■ TYPICAL APPLICATION



Missing pulse Detection Circuit

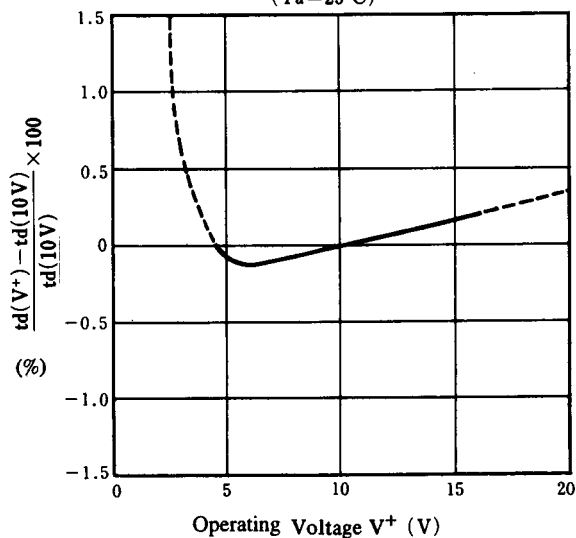


Pulse Width Modulation Circuit

## ■ TYPICAL CHARACTERISTICS

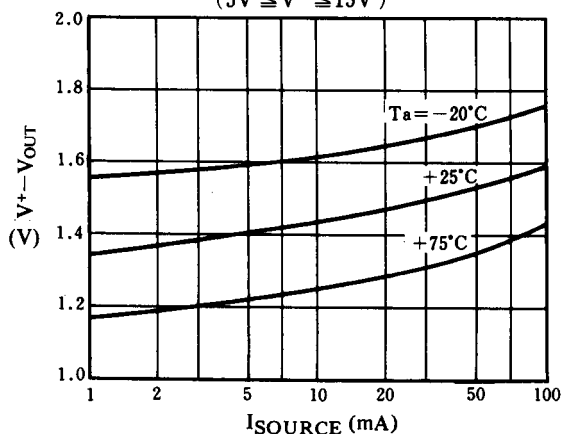
Delay Time vs. Operating Voltage

( $T_a = 25^\circ\text{C}$ )



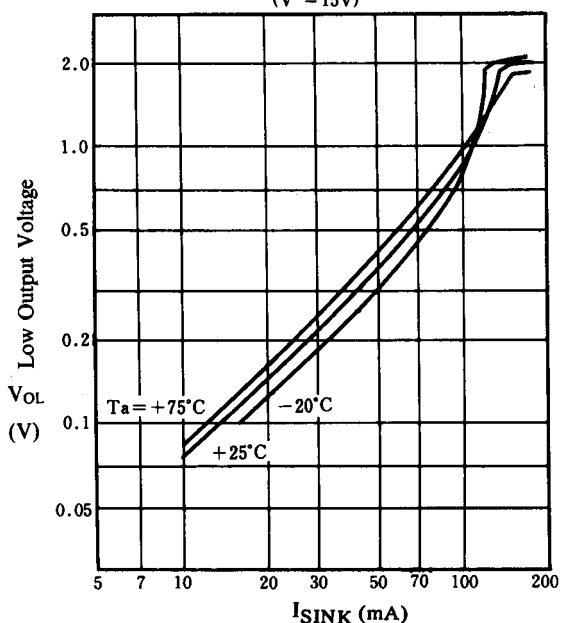
High Output Voltage Drop vs. Output Source Current

( $5\text{V} \leq V^+ \leq 15\text{V}$ )



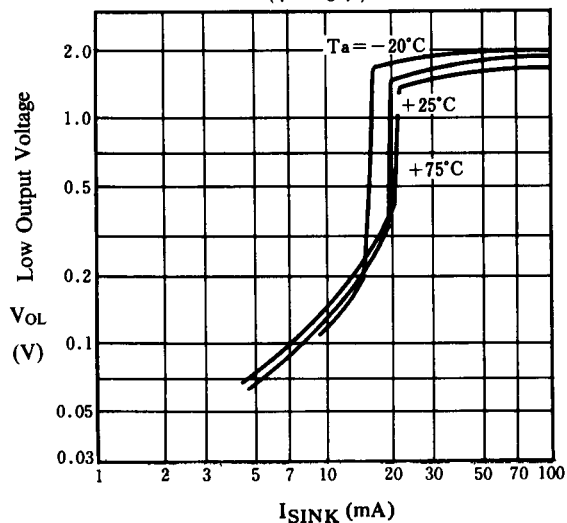
Low Output Voltage vs. Output Sink Current

( $V^+ = 15\text{V}$ )



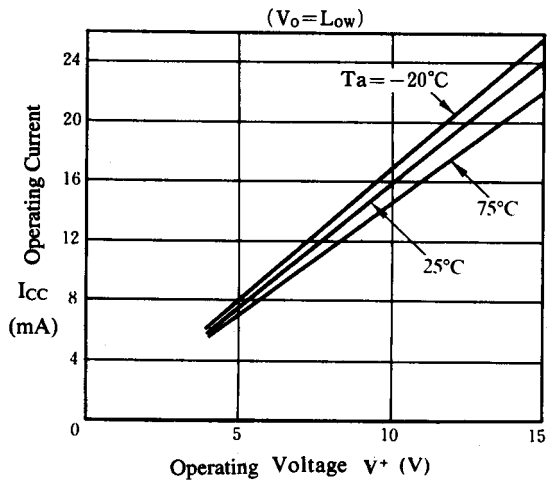
Low Output Voltage vs. Output Sink Current

( $V^+ = 5\text{V}$ )

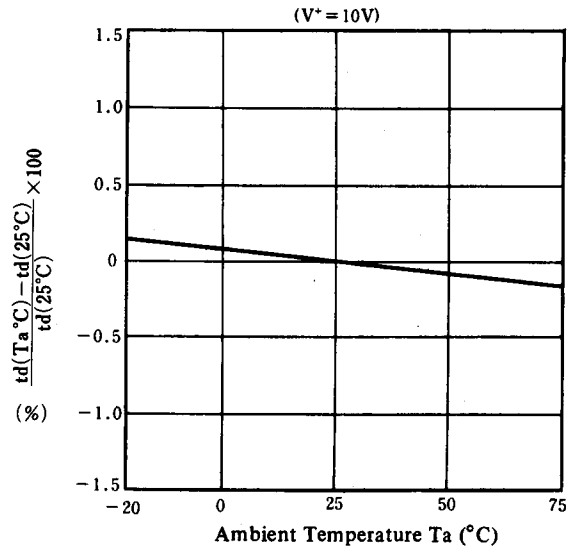


## ■ TYPICAL CHARACTERISTICS

Operating Current vs. Operatig Voltage



Delay time vs. Temperature



**[CAUTION]**

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