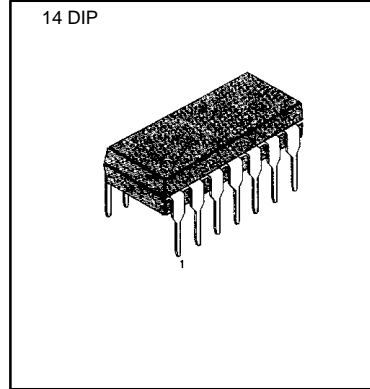


# LM556C (KA556/I)

# DUAL TIMER

## DUAL TIMER

The LM556/I series dual monolithic timing circuits are a highly stable controller capable of producing accurate time delays or oscillation. The LM556 is a dual LM555. Timing is provided an external resistor and capacitor for each timing function. The two timers operate independently of each other, sharing only  $V_{CC}$  and ground. The circuits may be triggered and reset on falling wave forms. The output structures may sink or source 200mA.



## FEATURES

- Replaces Two LM555C Timers
- Operates in Both Astable and Monostable Modes
- High Output Current
- TTL Compatible
- Timing From Microsecond to Hours
- Adjustable Duty Cycle
- Temperature Stability Of 0.005% Per °C

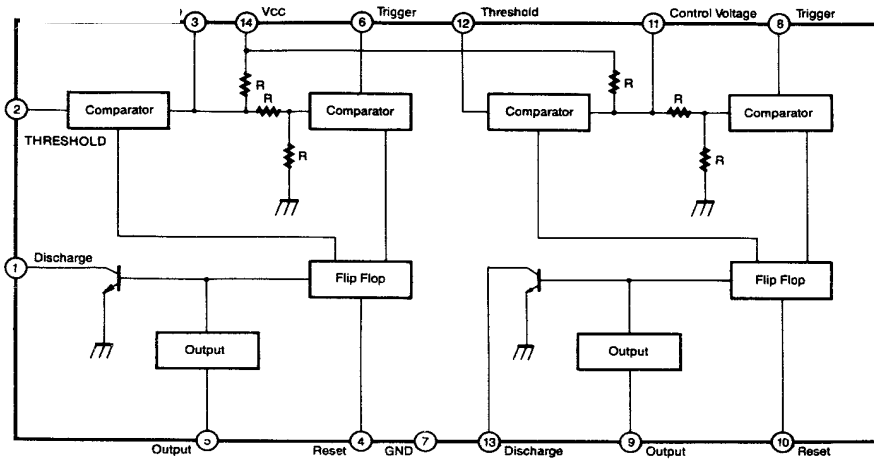
## ORDERING INFORMATION

Device	Package	Operating Temperature
LM556CN (KA556)	14 DIP	0 ~ + 70°C
KA556I	14 DIP	-40 ~ + 85°C

## APPLICATIONS

- Precision Timing
- Pulse Shaping
- Pulse Width Modulation
- Frequency Division
- Traffic Light Control
- Sequential Timing
- Pulse Generator
- Time Delay Generator
- Touch Tone Encoder
- Tone Burst Generator

## BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ )

Characteristic	Symbol	Value	Unit
Supply Voltage	$V_{CC}$	16	V
Lead Temperature (soldering 10sec)	$T_{LEAD}$	300	$^\circ\text{C}$
Power Dissipation	$P_D$	600	mW
Operating Temperature Range LM556	$T_{OPR}$	0 ~ + 70	$^\circ\text{C}$
LM556I		- 40 ~ + 85	$^\circ\text{C}$
Storage Temperature Range	$T_{STG}$	- 65 ~ + 150	$^\circ\text{C}$

## ELECTRICAL CHARACTERISTICS

( $T_A = 25^\circ\text{C}$ ,  $V_{CC} = 5 - 15\text{V}$ , unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	$V_{CC}$		4.5		16	V
*1 Supply Current (two timers) (low state)	$I_{CC}$	$V_{CC} = 5\text{V}$ , $R_L = \infty$		5	12	mA
		$V_{CC} = 15\text{V}$ , $R_L = \infty$		16	30	mA
*2 Timing Error (monostable) Initial Accuracy Drift with Temperature Drift with Supply Voltage	ACCUR $\Delta t/\Delta T$ $\Delta t/\Delta V_{CC}$	$R_A = 2\text{k}\Omega$ to $100\text{k}\Omega$ $C = 0.1\mu\text{F}$ $T = 1.1\text{RC}$		0.75		%
			50		ppm/ $^\circ\text{C}$	
			0.1		%/V	
Control Voltage	$V_C$	$V_{CC} = 15\text{V}$	9.0	10.0	11.0	V
		$V_{CC} = 5\text{V}$	2.6	3.33	4.0	V
Threshold Voltage	$V_{TH}$	$V_{CC} = 15\text{V}$	8.8	10.0	11.2	V
		$V_{CC} = 5\text{V}$	2.4	3.33	4.2	V
*3 Threshold Voltage	$I_{TH}$			30	250	nA
Trigger Voltage	$V_{TR}$	$V_{CC} = 15\text{V}$	4.5	5.0	5.6	V
		$V_{CC} = 5\text{V}$	1.1	1.6	2.2	V
Trigger Current	$I_{TR}$	$V_{TH} = 0\text{V}$		0.01	2.0	$\mu\text{A}$
*5 Reset Voltage	$V_{RST}$		0.4	0.6	1.0	V
Reset Current	$I_{RST}$			0.03	0.6	mA
Low Output Voltage	$V_{OL}$	$V_{CC} = 15\text{V}$				
		$I_{SINK} = 10\text{mA}$		0.1	0.25	V
		$I_{SINK} = 50\text{mA}$		0.4	0.75	V
		$I_{SINK} = 100\text{mA}$		2.0	3.2	V
		$I_{SINK} = 200\text{mA}$		2.5		V
		$V_{CC} = 5\text{V}$				
	$I_{SINK} = 8\text{mA}$		0.25	0.35	V	
	$I_{SINK} = 5\text{mA}$		0.15	0.25	V	

**ELECTRICAL CHARACTERISTICS**(T<sub>A</sub> = 25°C, V<sub>CC</sub> = 5 - 15V, unless otherwise specified)

Characteristic	Symbol	Test Conditions	Min	Typ	Max	Unit
High Output Voltage	V <sub>OH</sub>	V <sub>CC</sub> = 15V I <sub>SOURCE</sub> = 200mA		12.5		V
		I <sub>SOURCE</sub> = 100mA	12.75	13.3		V
		V <sub>CC</sub> = 5V I <sub>SOURCE</sub> = 100mA	2.75	3.3		V
Rise Time of Output	t <sub>R</sub>			100	300	ns
Fall Time of Output	t <sub>F</sub>			100	300	ns
Discharge Leakage Current	I <sub>LKG</sub>			10	100	nA
*4 Matching Characteristics						
Initial Accuracy	ACCUR			1.0	2.0	%
Drift with Temperature	Δt/ΔT			10		ppm/°C
Drift with Supply Voltage	Δt/ΔV <sub>CC</sub>			0.2	0.5	%/V
*2 Timing Error (astable)		R <sub>A</sub> , R <sub>B</sub> = 1kΩ to 100kΩ				
Initial Accuracy	ACCUR	C = 0.1μF		2.25		%
Drift with Temperature	Δt/ΔT	V <sub>CC</sub> = 15V		150		ppm/°C
Drift with Supply Voltage				0.3		%/V

## Notes:

- \*1. Supply current when output is high is typically 1.0mA less at V<sub>CC</sub> = 5V
- \*2. Tested 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> for 15V operation.  
The maximum total R = 20MΩ, and for 5V operation the maximum total R = 6.6MΩ.
- \*4. Matching characteristics refer to the difference between performance characteristics of each timer section in the monostable mode.
- \*5. As reset voltage lowers, timing is inhibited and then the output goes low.

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