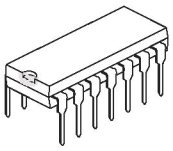
DUAL TIMER

■ DESCRIPTION

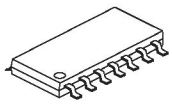
The TK556 dual monolithic circuit is a highly stable controller capable of producing accurate delays or oscillation. The TK556 is the dual of TK5555; timing is provided an external resistor and capacitor for each function. The two timers operate independently of each other, sharing only V_{CC} and GND. The circuits may be triggered and reset on falling wave forms. The output structures may sink or source 200mA.

■ FEATURES

*High Current Driver Capability(=200mA)
*Adjustable Duty Cycle
*Timing From μSec to Hours
*Temperature Stability of 0.005%/°C
*TTL Compatible
*Operates in Both Astable and Monostable Modes



DIP-14



SOP-14

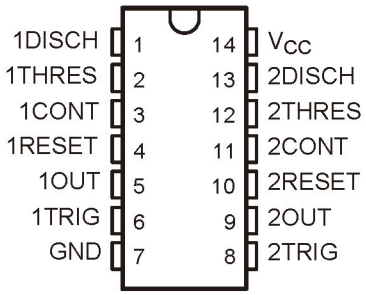
■ APPLICATIONS

* Precision Timers From Microseconds to Hours
* Pulse-Shaping Circuits
* Missing-Pulse Detectors
* Tone-Burst Generators
* Pulse-Width Modulators
* Pulse-Position Modulators
* Sequential Timers
* Pulse Generators
* Frequency Dividers
* Application Timers
* Industrial Controls
* Touch-Tone Encoders

■ ORDERING INFORMATION

Part Number	Package	Packing	Temperature(TA)	Package Qty
TK556CC	SOIC-14	Reel	0°C ~ 70°C	2500
TK556CD	DIP-14	Tube	0°C ~ 70°C	1000

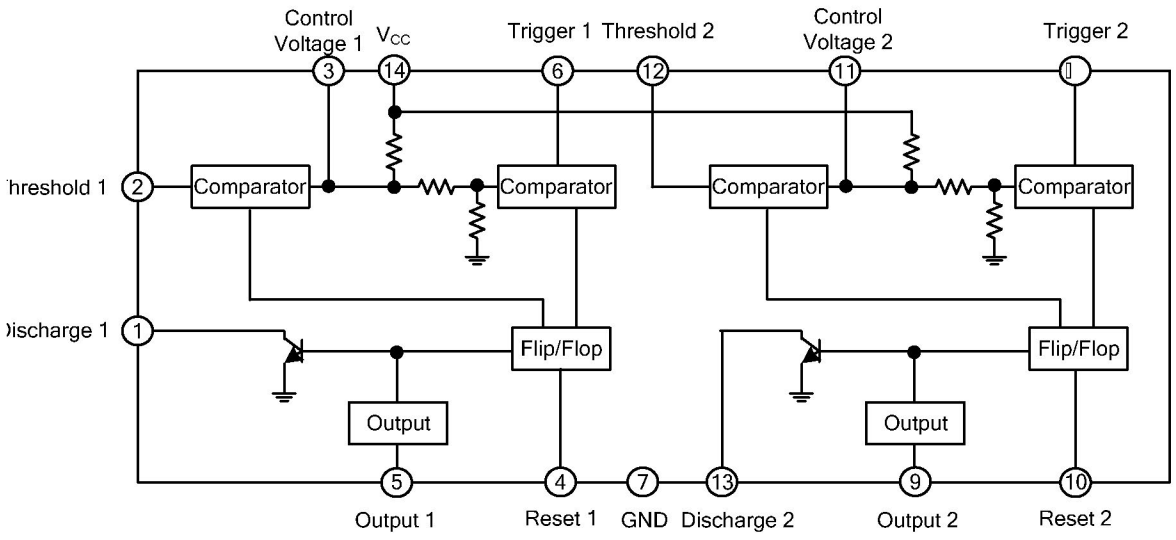
■ Pin Configuration



■ PIN DESCRIPTION

PIN NO.	PIN NAME	DESCRIPTION
1,13	DISCH	Open collector output to discharge timing capacitor
2,12	THRES	Threshold voltage input
3,11	CONT	Controls comparator thresholds
4,10	RESET	Active low reset input forces and discharge low
5,9	OUT	High current timer output signal
6,8	TRIG	Trigger voltage input
7	GND	Ground
14	V_{CC}	Input supply voltage

■ BLOCK DIAGRAM



■ ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	16	V
Power Dissipation	P_D	600	mW
Lead Temperature(soldering 10 sec.)	T_{LEAD}	300	°C
Operating Temperature	T_{OPR}	-20 ~ +85	°C
Storage Temperature	T_{STG}	-6 5~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ ELECTRICAL CHARACTERISTICS (T_A=25°C ,V_{CC}=5 to 15V, unless otherwise specified)

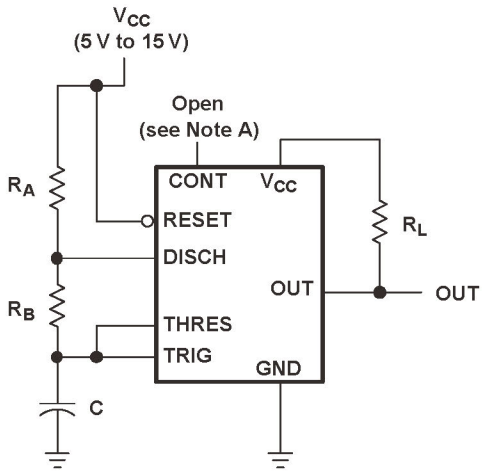
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply voltage	V_{CC}		4.5		16	V
Supply Current(two timers) (low state), (Note 1)	I_{CC}	V_{CC}=5V, R_L=∝		5	12	mA
		V_{CC}=15V, R_L=∝		16	30	mA
TIMING ERROR (MONOSTABLE)						
Initial Accuracy (Note 2)	A_{CCUR}	R_A=2KΩ to 100KΩ C=0.1μF, T=1.1RC		0.75		%
Drift with Temperature	$\Delta t/\Delta T$			50		ppm/°C
Drift with Supply Voltage	$\Delta t/\Delta V_{CC}$			0.1		%/V
TIMING ERROR (ASTABLE)						
Initial Accuracy (Note 2)	A_{CCUR}	R_A=1KΩ to 100KΩ C=0.1μF, V_{CC}=15V		2.25		%
Drift with Temperature	$\Delta t/\Delta T$			150		ppm/°C
Drift with Supply Voltage	$\Delta t/\Delta V_{CC}$			0.3		%/V
Control Voltage	V_C	V_{CC}=15V	9.0	10.0	11.0	V
		V_{CC}=5V	2.6	3.33	4.0	V
Threshold Voltage	V_{TH}	V_{CC}=15V	8.8	10.0	11.2	V
		V_{CC}=5V	2.4	3.33	4.2	V
Threshold Current (Note 3)	I_{TH}			30	250	nA
Trigger Voltage	Vt_R	V_{CC}=5V	1.1	1.6	2.2	V
		V_{CC}=15V	4.5	5	5.6	V
Trigger Current	It_R	V_{tR}=0		0.01	2.0	μA
Reset Voltage (Note 4)	V_{RST}		0.28	0.4	1.12	V
Reset Current	I_{RST}			0.03	0.6	mA
Low Output Voltage	V_{OL}	V_{CC}=15V, I_{SINK}=10mA		0.1	0.25	V
		V_{CC}=15V, I_{SINK}=50mA		0.4	0.75	V
		V_{CC}=15V, I_{SINK}=100mA		2	3.2	V
		V_{CC}=15V, I_{SINK}=200mA		2.5		V
		V_{CC}=5V, I_{SINK}=5mA		0.15	0.25	V
		V_{CC}=5V, I_{SINK}=8mA		0.25	0.35	V
High Output Voltage	V_{OH}	V_{CC}=15V, I_{SOURCE}=200mA		12.5		V
		V_{CC}=15V, I_{SOURCE}=100mA	12.75	13.3		V
		V_{CC}=5V, I_{SOURCE}=100mA	2.75	3.3		V
Rise Time of Output	t_R			100	300	nSec
Fall Time of Output	t_F			100	300	nSec
Discharge Leakage Current	I_{LKG}			20	100	nA

■ ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
MATCHING PARAMETER						
Initial Accuracy (Note 5)	A_{CCUR}	R_A, RB=1KΩ to 100KΩ C=0.1μF, V_{CC}=15V		1	2	%
Drift with Temperature	$\Delta t/\Delta T$			10		ppm/°C
Drift with Supply Voltage	$\Delta t/\Delta V_{CC}$			0.2	0.5	%/V

Notes: 1.Supply current when output is high is typically 1mA less at V_{CC} 5V.
2. Tested at V_{CC}=5V and V_{CC}=15V.
3: This will determine the maximum value of RA+RB for 15V operation, The maximum total is R=20MΩ, and for 5V operation the maximum total is R=6.6MΩ.
4: As reset voltage lower, timing is inhibited and then the output goes low.
5: Matching parameters refer to the difference between performance parameters of each timer section in the monostable mode.

APPLICATION INFORMATION



NOTE A: Bypassing the control-voltage input to ground with a capacitor might improve operation. This should be evaluated for individual applications.

Figure 1. Circuit for Astable Operation

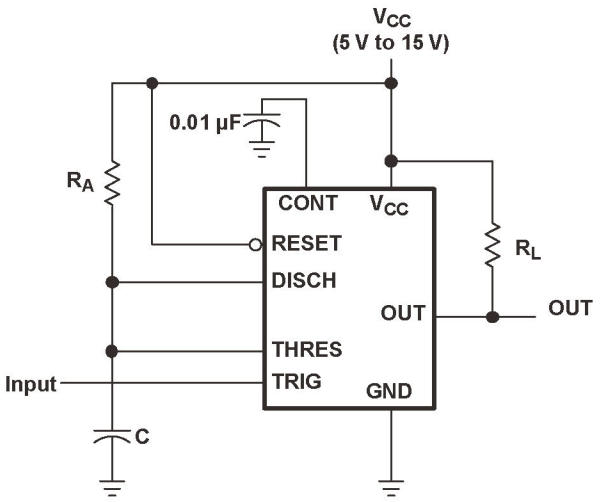
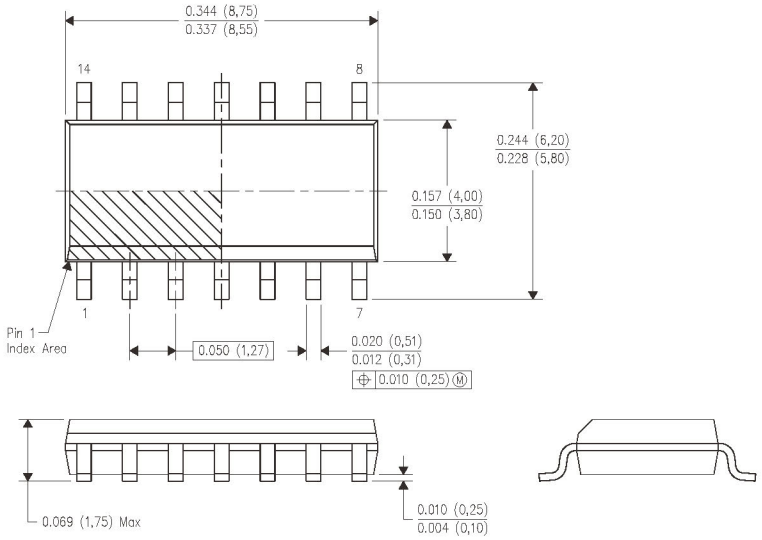


Figure 2. Circuit for Monostable Operation

■ SOIC-14 PACKAGE



■ DIP-14 PACKAGE