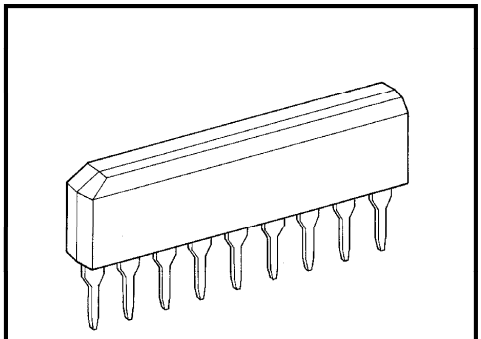
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD6347S

CONVENTIONAL TIMER

The TD6347S is an automotive I^2L monolithic timer. It is a long-term timer superior in voltage and temperature characteristics. It produces an NPN transistor open-collector output.
The IC has three inputs : start / reset and two modes, so that it can be used in a variety of application fields.



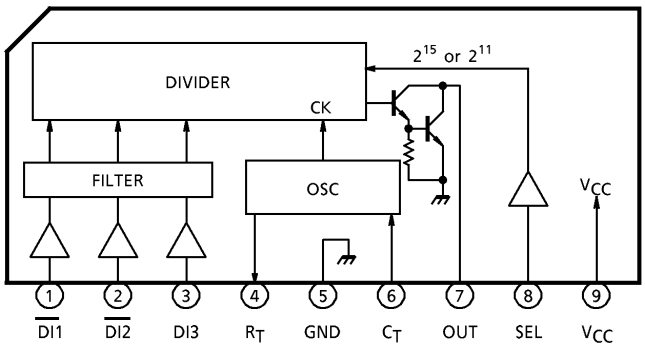
SIP9-P-2.54A

Weight : 0.92g (Typ.)

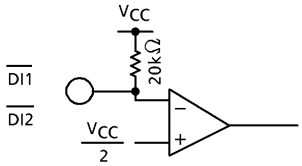
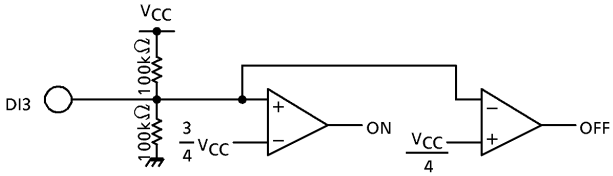
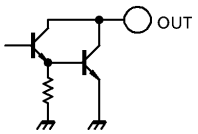
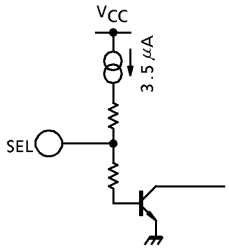
FEATURES

- Small standby current : 1mA
- 3 inputs : start / reset and two modes
- Power-on reset function incorporated
- Good voltage characteristics : ±0.05% / V
- Good temperature characteristics : ±0.02% / °C
- Output current / output withstand voltage : 250mA / 30V

BLOCK DIAGRAM AND PIN LAYOUT



PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	$\overline{DI1}$	Connected to the input switch. When this pin is grounded, the IC accepts the input, and the output is reversed. The input circuit is as follows : 
2	$\overline{DI2}$	When this pin is grounded, the IC is reset. The input circuit construction is the same as that of $\overline{DI1}$.
3	DI3	When the input switch is connected and this pin is grounded, the output turns off. When this pin is connected to V_{CC}, the output turns on. The input circuit is as follows : 
4	R_T	The resistor for basic clock oscillation is connected between this pin and pin 6.
5	GND	Grounded
6	C_T	The capacitor for basic clock oscillation is connected to this pin. The clock frequency T is determined by external resistor R and capacitor C as follows : T (ms) = 1.75C (μF) R (kΩ) The time constant of the input filter consisting of $\overline{DI1}$, $\overline{DI2}$, and DI3 is four times the basic clock period.
7	OUT	Output pin. The circuit is shown at right. 
8	SEL	Timer time select pin. When this pin is open, the timer time is 32768 (2^{15}) times the clock period. When it is grounded, the timer time is 2048 (2^{11}) times the clock period. The input circuit is as follows : 
9	V_{CC}	Power supply pin

TRUTH TABLE

(1) Input Switch

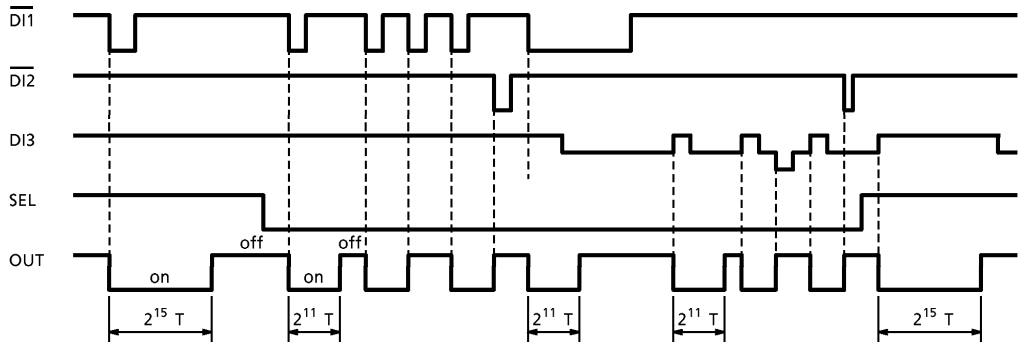
Input			Output
$\overline{DI1}$	$\overline{DI2}$	DI3	
H→L	H	H or M	Inversion
H	H	M→H	ON
H	H	L	OFF
don't care	L	don't care	OFF

(2) Timer Time

SEL	Timer Time
H	2^{15} T※
L	2^{11} T※

※ T = 1.75 CR

TIMING CHART



MAXIMUM RATINGS (Ta = 25°C)

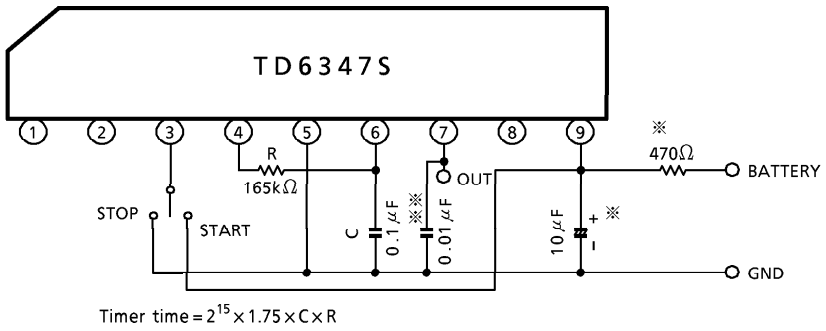
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	30	V
Output Current	I_{OUT}	250	mA
Output Voltage	V_{OUT}	30	V
Operating Voltage	V_{opr}	5 to 16	V
Power Dissipation	P_D	500	mW
Operating Temperature	T_{opr}	− 40 to 85	°C
Storage Temperature	T_{stg}	− 55 to 150	°C

ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 12V)

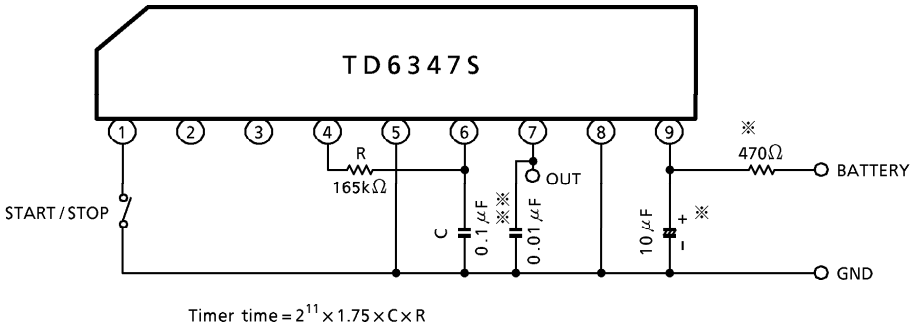
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Consumption	I_{CC}	V_{CC}	—	OUT = OFF	—	—	1.0	mA
Input Threshold Voltage	V_{TH}	$\overline{DI1}$	—	—	5.4	6	6.6	V
		$\overline{DI2}$	—	—	5.4	6	6.6	
		DI3	—	START mode	8.1	9	9.9	
			—	STOP mode	2.7	3	3.3	
Input Current	I_{IL}	$\overline{DI1}$	—	V_{IL} = 0V	—	—	− 1.0	mA
		$\overline{DI2}$	—	V_{IL} = 0V	—	—	− 1.0	
		DI3	—	V_{IL} = 0V	—	—	− 0.25	
	I_{IH}		—	V_{IH} = 12V	—	—	0.25	
Output Voltage	V_{OL}	OUT	—	I_{OL} = 200mA	—	—	1.3	V
Output Leakage Current	I_{LEAK}		—	V_{OUT} = 30V	—	—	100	μA
Input Current	I_{IN}	C_T	—	V_{IN} = 1 to 4V	—	—	± 1	μA
Output Voltage	V_{OH}	R_T	—	I_{OH} = 50μA	3.5	3.9	4.3	V
	V_{OL}			I_{OL} = 50μA	—	—	0.3	

EXAMPLE OF APPLICATION CIRCUIT

(1) 15-minute timer (using DI3)



(2) 56-second timer (using $\overline{DI1}$)



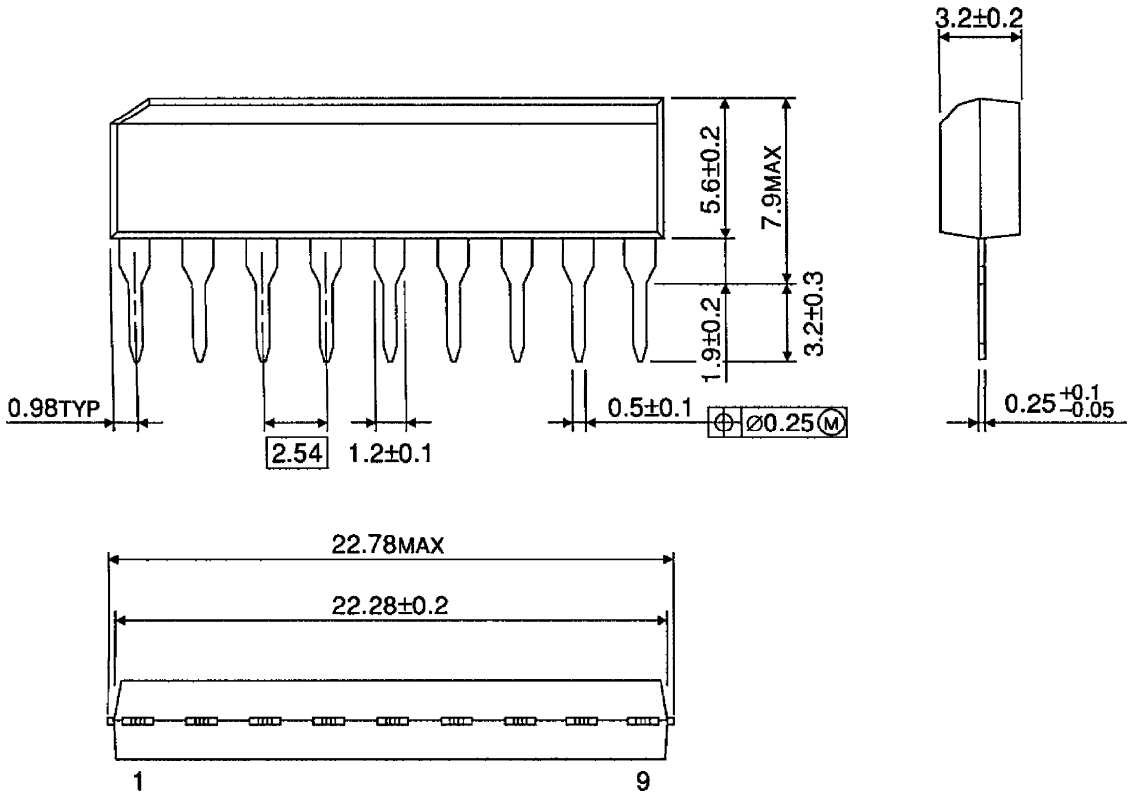
※ If the IC is used with a regulated power supply which is free from surge voltage, the CR combination is unnecessary.

※※ For negative surge absorption

OUTLINE DRAWING

SIP9-P-2.54A

Unit : mm



Weight : 0.92g (Typ.)