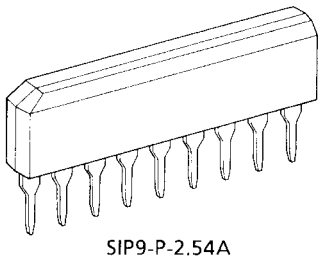
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD6347S,TD6347F

CONVENTIONAL TIMER

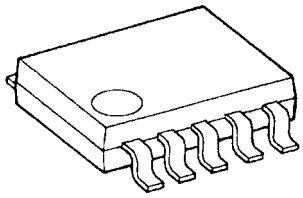
The TD6347S、TD6347F is an automotive I^2L monolithic timer. It is a long-term timer superior in voltage and temperature characteristics. It produces an NPN transistor open-collector output.
The IC has three inputs：start / reset and two modes, so that it can be used in a variety of application fields.

TD6347S



SIP9-P-2.54A

TD6347F



SSOP10-P-225-1.00

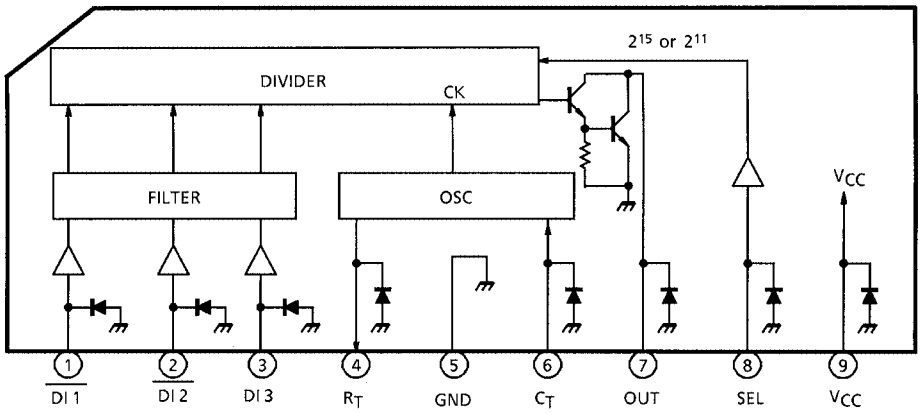
Wegiht
SIP9-P-2.54A : 0.92 g (Typ.)
SSOP10-P-225-1.00 : 0.10 g (Typ.)

FEATURES

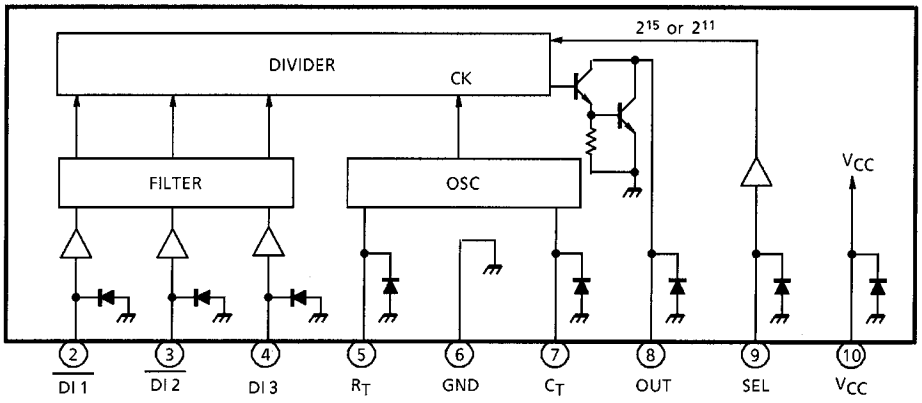
- Small standby current ：1mA
- 3 inputs：start / reset and two modes
- Power-on reset function incorporated
- Good voltage characteristics ：± 0.05% / V
- Good temperature characteristics ：± 0.02% / °C
- Output current / output withstand voltage ：250mA / 30V
- SIP9-PIN (TD6347S)
- SSOP10-PIN (TD6347F)

BLOCK DIAGRAM AND PIN LAYOUT

TD6347S

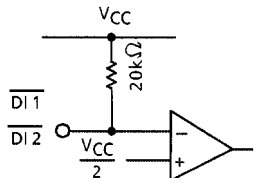
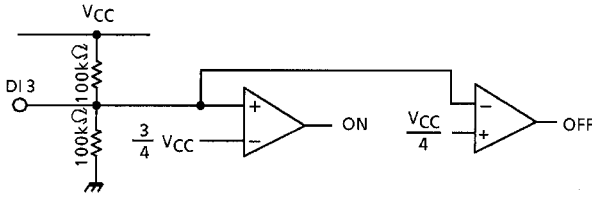
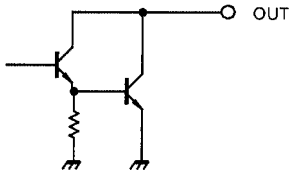
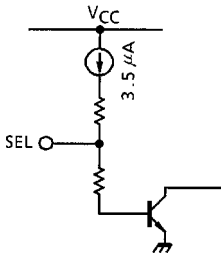


TD6347F



Note: TD6347S and TD6347F are the same chip; only the packages are different.

PIN DESCRIPTION

PIN No. TD6347S	PIN No. TD6347F	SYMBOL	DESCRIPTION
1	2	$\overline{DI1}$	Connected to the input switch. When this pin is grounded, the IC accepts the input, and the output is reversed. The input circuit is shown at right. 
2	3	$\overline{DI2}$	When this pin is grounded, the IC is reset. The input circuit construction is the same as that of $\overline{DI1}$.
3	4	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 shown at right. 
4	5	R_T	The resistor for basic clock oscillation is connected between this pin and C_T pin.
5	6	GND	Grounded
6	7	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	8	OUT	Output pin.The circuit is shown at right. 
8	9	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 shown at right. 
9	10	V_{CC}	Power supply pin
—	1	NC	Not connected pin.(Electrically,this pin is completely open.)

TRUTH TABLE

(1) Input Switch

Input			Output
$\overline{DI1}$	$\overline{DI2}$	$\overline{DI3}$	
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 (ms)
H	2^{15} T *
L	2^{11}T *

*: T=1.75CR、C : (μF)、R : (kΩ)

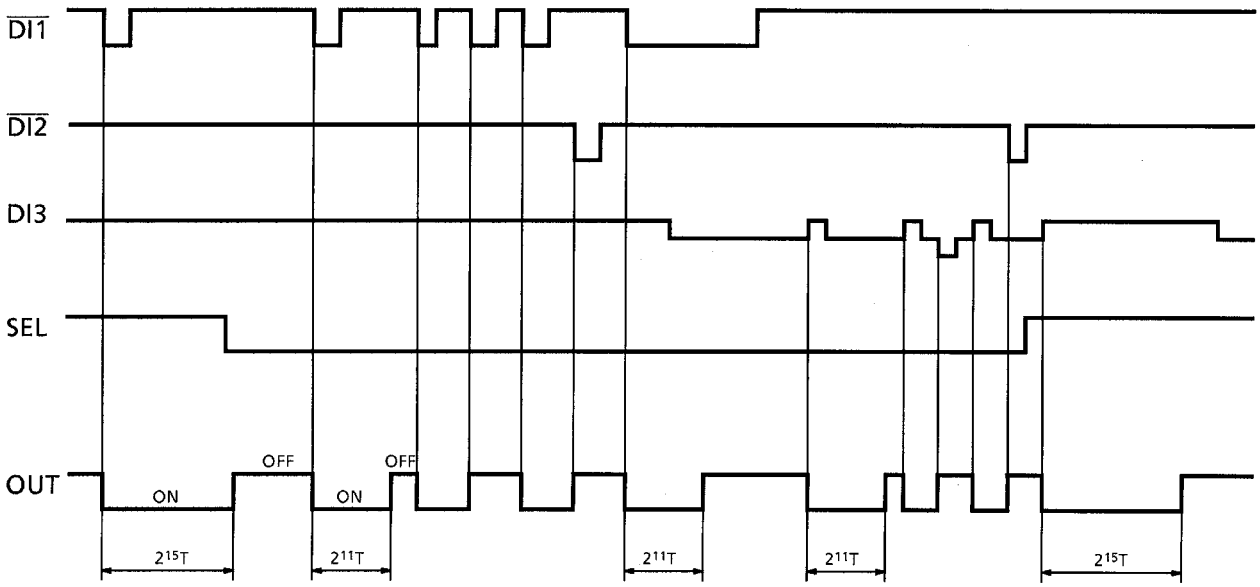
(3) Filter Time (L,M and H level detection time)

2×T～4×T

(4) C / R Recommend

C	0.001μF～10μF
R	100kΩ～500kΩ

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}	5～16	V
Power Dissipation	P_D	500 / 400 *	mW
Operating Temperature	T_{opr}	−40～85	℃
Storage Temperature	T_{stg}	−55～150	℃

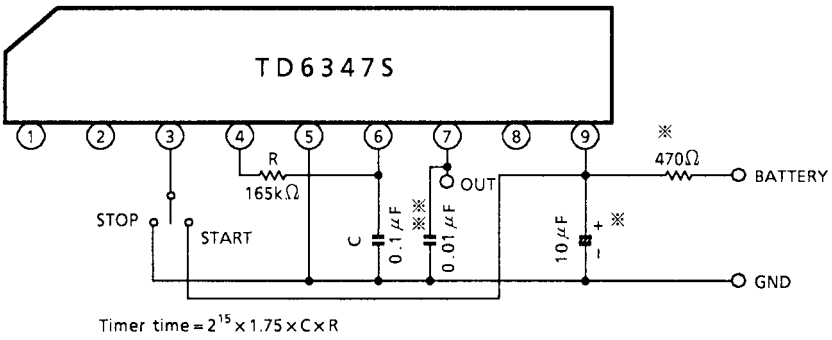
*:PD TD6347S/TD6347F

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

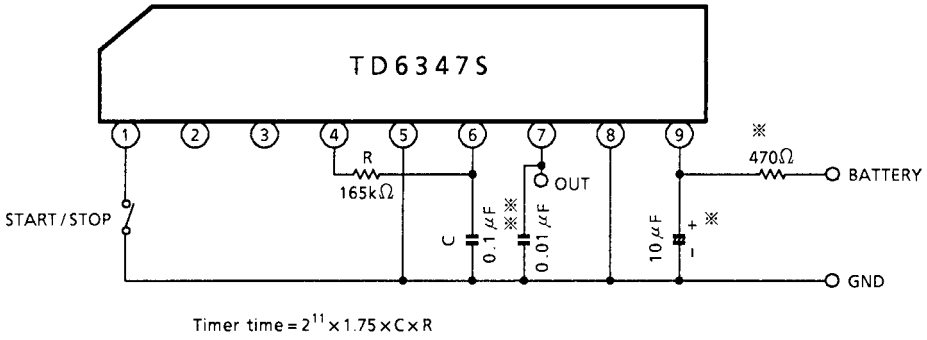
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Current Consumption	I_{CC}	V_{CC}	—	OUT = OFF	—	—	1.0	mA
Input Threshold Voltage	V_{TH}	$\overline{DI1}$	—	—	5.4	6	6.6	V
		$\overline{DI2}$	—	—	5.4	6	6.6	
		DI3	—	START mode	8.1	9	9.9	
			—	STOP mode	2.7	3	3.3	
Input Current	I_{IL}	$\overline{DI1}$	—	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) (Numbers in ○ show pin numbers of the TD6347S, those in ( ) show pin numbers of the TD6347F)



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

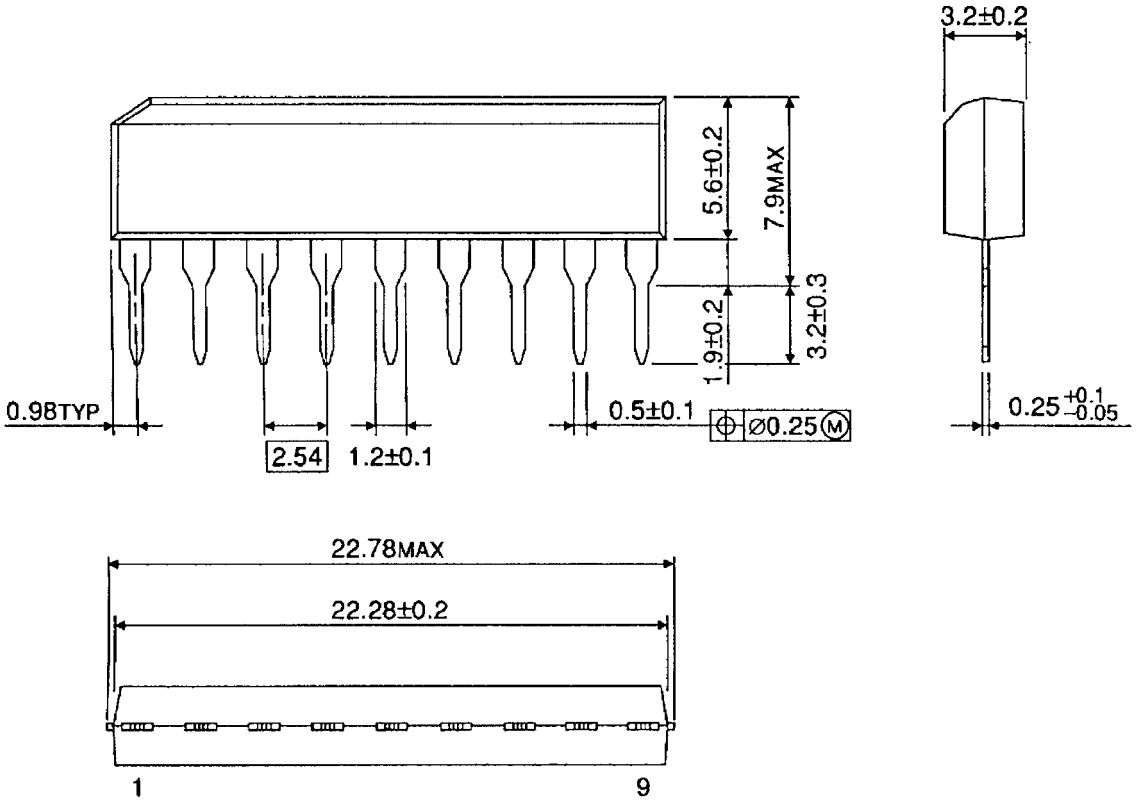


※: If the IC is used with a regulated power supply which is free from surge voltage, the CR combination is unnecessary.

※※: For negative surge absorption

PACKAGE DIMENSIONS

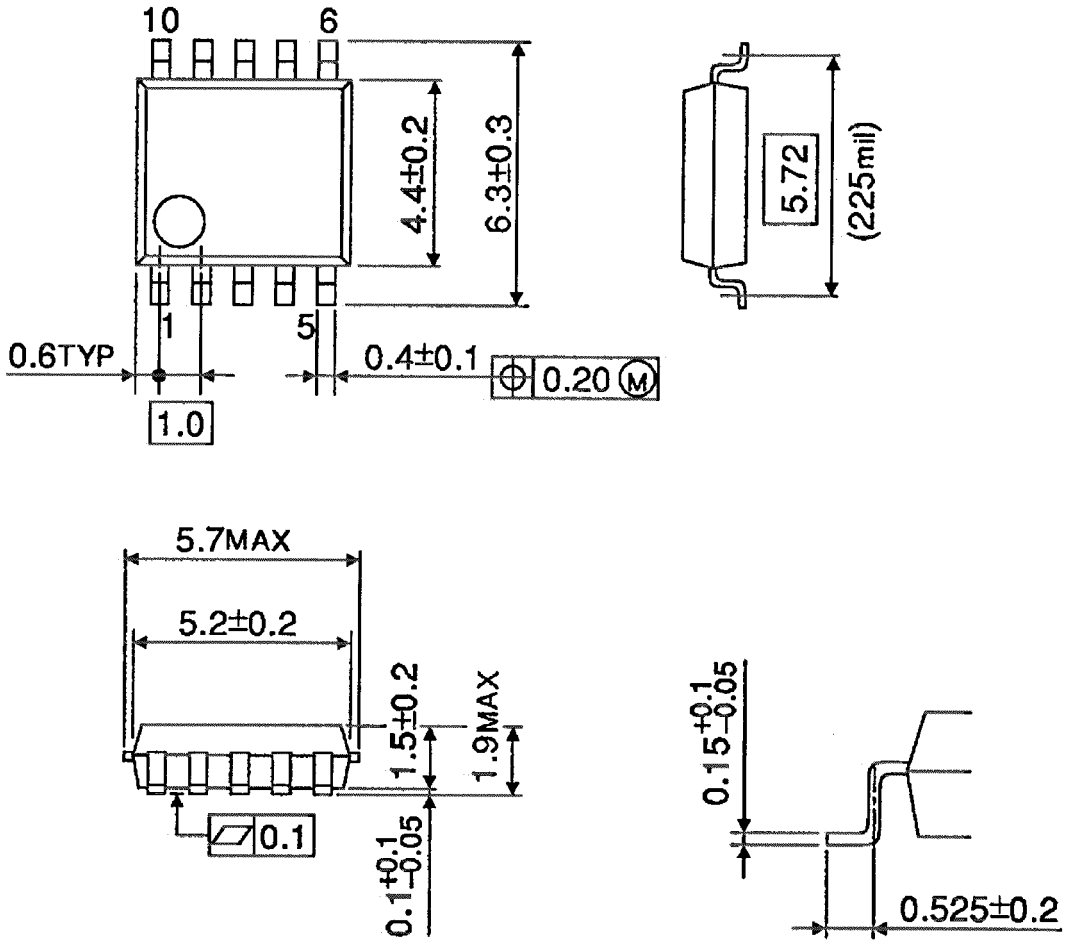
SIP9-P-2.54A Unit : mm



Weight: 0.92 g (Typ.)

PACKAGE DIMENSIONS

SSOP10-P-225-1.00 Unit : mm



Weigh : 0.10 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EAA_S

- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.