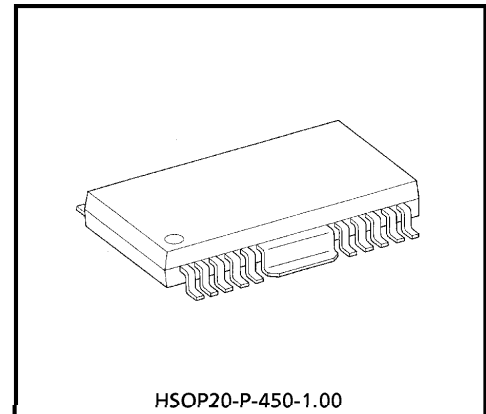


TENTATIVE TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

**TA8042F****5V VOLTAGE REGULATOR WITH WATCHDOG TIMER**

The TA8042F is an IC specially designed for microcomputer systems. It features an accurate reference voltage of  $5 \pm 0.15V$  and various system reset functions. The system reset includes a voltage monitor capable of switching between 4.6V and 4.2V and a watchdog timer for self-diagnosing the system, to prevent a system runaway. The protective functions include a reverse battery polarity, current limiter, and overheat protection. The low standby current of 1mA (max.) enables direct connection to a car battery.



HSOP20-P-450-1.00

Weight : 0.79g (Typ.)

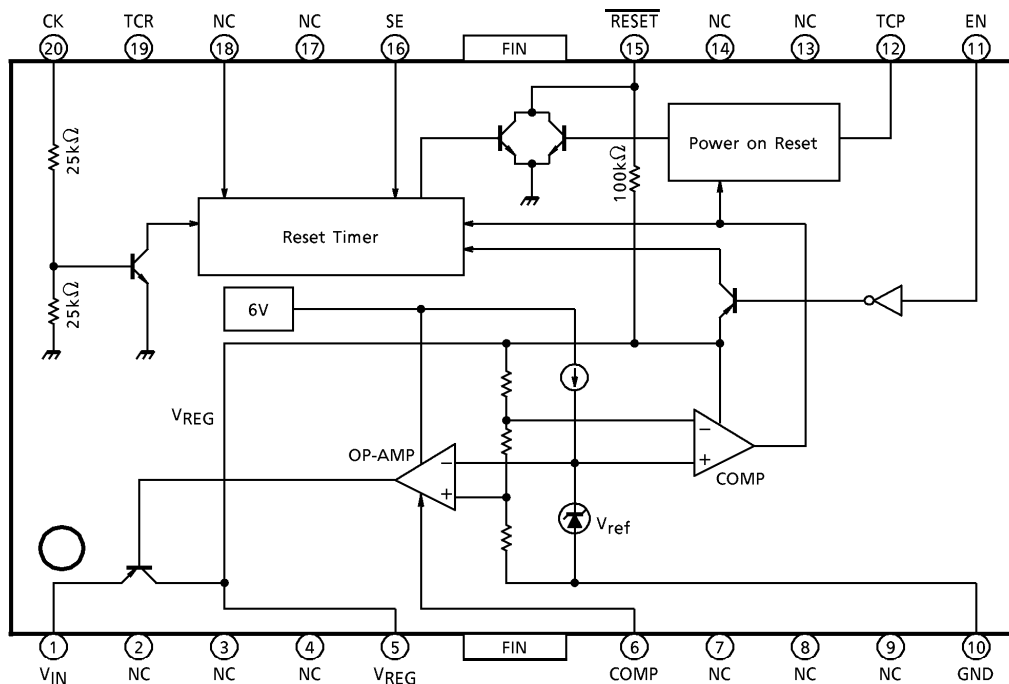
**FEATURES**

- Accurate output :  $5V \pm 0.15V$
- Output power transistor attached: Current capacity  
100mA (MAX.)
- Low standby current : 1mA (MAX.)
- Low input-output voltage : 0.6V (MAX.)
- Protection functions : Reverse battery polarity, overheat protection, current limiter
- Reset functions : Power-on reset (output timing switching), watchdog low voltage detection
- HSOP-20 pin power flat package

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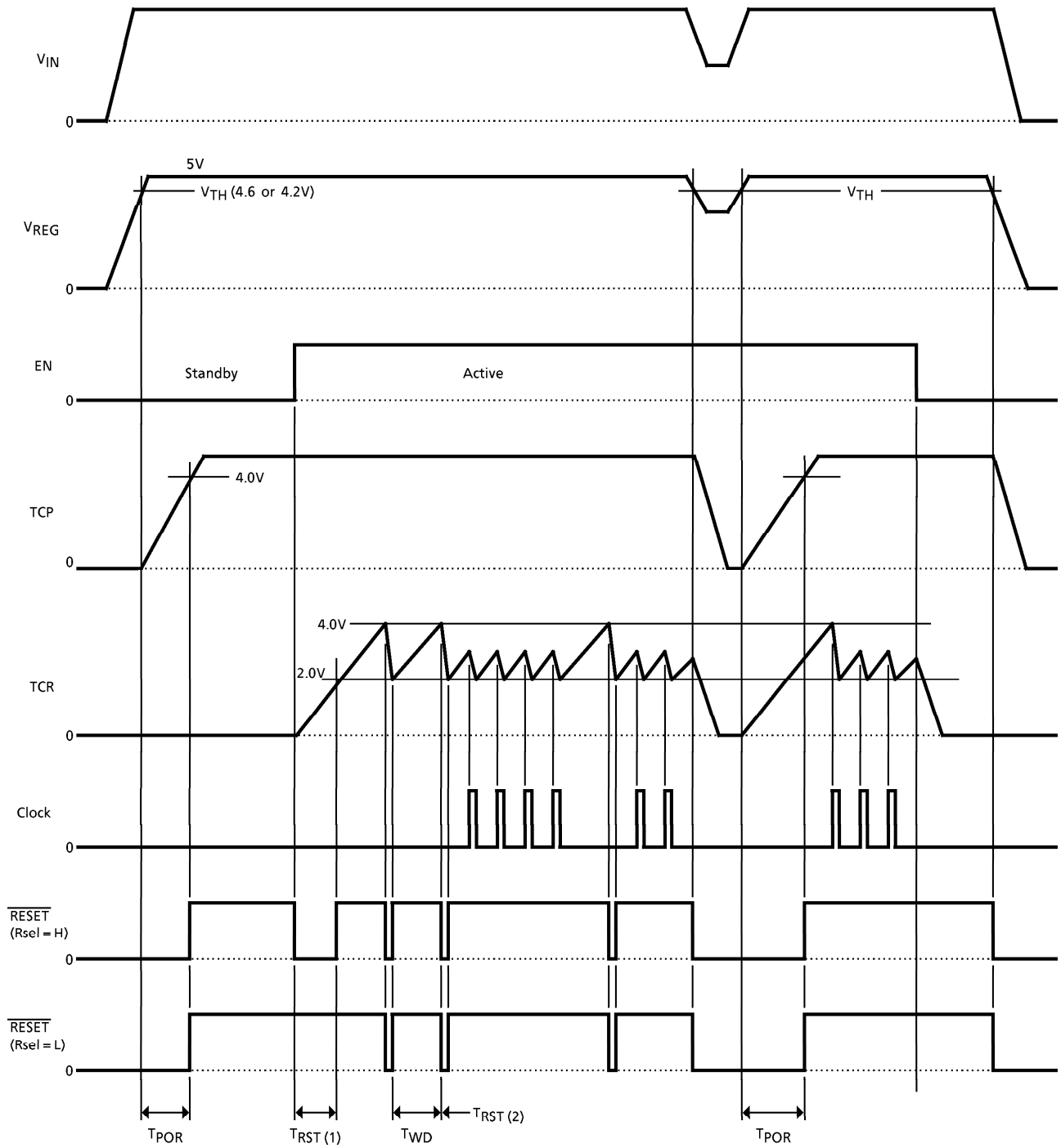
BLOCK DIAGRAM AND PIN LAYOUT



PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	V <sub>IN</sub>	Power supply input pin
5	V <sub>REG</sub>	5V rated voltage power supply output pin with a current capacity of 100mA (max.). Also serves as the reset timer power supply pin.
6	COMP	Phase compensation pin for stabilization of output.
10	GND	Grounded
11	EN	Reset timer function ON/OFF control pin. Set to "H" for active mode and "L" for standby mode (current consumption reduced to 1.0mA or less).
12	TCP	Time setting pin for the power-on reset timer when the power is on. Condenser CP connects to GND. Condenser charged with internal rated current.
15	$\overline{\text{RESET}}$	Reset output pin for watchdog timer. <ul style="list-style-type: none"> <li>Pin supplies reset timer signal as selected by TCR pin condenser.</li> <li>Pin supplies reset pulses intermittently if no clock is given to the CK pin. NPN transistor collector output with pull-up resistor.</li> </ul>
16	Rsel	Pin engages power-on reset when changing from standby to active mode. Pin engages power-on reset when Rsel = "H", and does not engage reset when Rsel = "L".
19	TCR	Time setting pin for the reset timer and watchdog timer. Condenser C <sub>T</sub> connects to GND. Condenser charged with internal rated current.
20	CK	Clock input pin for watchdog timer. Pin 15 $\overline{\text{RESET}}$ is connected if the IC is used only as a power-on reset timer.
2, 3, 4, 7, 8, 9, 13, 14, 17, 18	N.C	Not connected

**TIMING CHART**



## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	PIN	RATING	UNIT
Input Voltage	V <sub>IN1</sub>	V <sub>IN</sub> , EN	60 (1s)	V
	V <sub>IN2</sub>	V <sub>IN</sub>	- 30 (Note 1)	
	V <sub>IN3</sub>	CK	- 5~V <sub>REG</sub>	
	V <sub>IN4</sub>	Vsel, Rsel	- 0.3~V <sub>REG</sub>	
Output Current	I <sub>LOAD</sub>	V <sub>OUT</sub>	100	mA
	I <sub>OUT</sub>	RESET	2	
Output Voltage	V <sub>OUT</sub>	RESET	V <sub>REG</sub>	V
Power Dissipation	P <sub>D</sub>	—	2 (Note 2)	W
Operating Temperature	T <sub>opr</sub>	—	- 40~105	°C
Storage Temperature	T <sub>stg</sub>	—	- 55~150	°C
Lead Temperature-time	T <sub>sol</sub>	—	260 (10s)	°C

(Note 1) : Reverse battery

(Note 2) : When using 50×50×1.6mm, 50% Cu board

ELECTRICAL CHARACTERISTICS (V<sub>IN</sub> = 6 to 18V, I<sub>LOAD</sub> = 10mA, Ta = - 40 to 105°C)

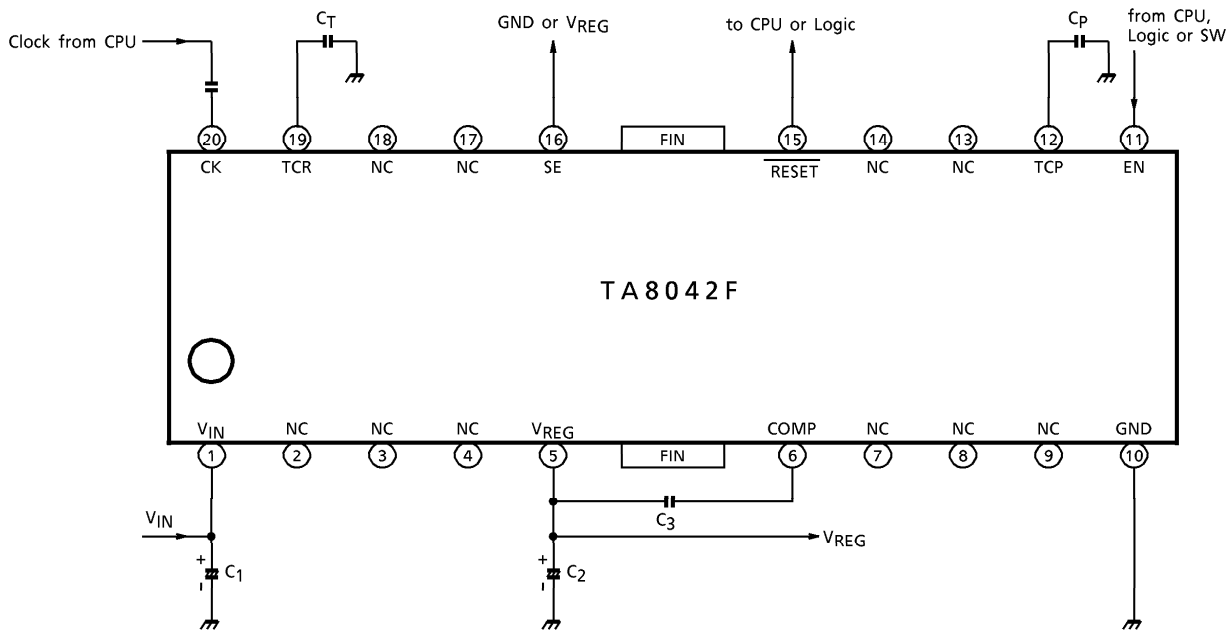
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>REG</sub>	V <sub>REG</sub>	—		4.85	5.0	5.15	V
Line Regulation	V <sub>LINE</sub>	V <sub>REG</sub>	—	V <sub>IN</sub> = 5.5~40V	—	0.1	0.5	%
Load Regulation	V <sub>LOAD</sub>	V <sub>REG</sub>	—	I <sub>LOAD</sub> = 1~50mA	—	0.1	0.5	%
Temperature Coefficient	—	V <sub>REG</sub>	—		—	0.01	—	% / °C
Input-output Voltage	V <sub>DROP</sub>	V <sub>REG</sub>	—	I <sub>LOAD</sub> = 100mA	—	0.3	0.6	V
Current Limiter	I <sub>LIMIT</sub>	V <sub>REG</sub>	—		—	200	—	mA
Overheat Detection	T <sub>SD</sub>	—	—		—	150	—	°C
Input Current	I <sub>IN</sub>	EN	—	V <sub>IN</sub> = 0~5V	—	—	5	μA
Input Voltage	V <sub>IH</sub>			2.0	—	—	V	
	V <sub>IL</sub>			—	—	1.0	V	
Output Voltage	V <sub>OL</sub>	RESET	—	I <sub>OL</sub> = 1mA	—	—	0.5	V
Charging Current	I <sub>IN</sub>	TCR	—	V <sub>IN</sub> = 0~3.5V	—	100	—	μA
Threshold Voltage	V <sub>IH</sub>	TCR	—		—	V <sub>REG</sub> × 80%	—	V
	V <sub>IL</sub>			—	V <sub>REG</sub> × 40%	—	V	
Input Current	I <sub>IN</sub>	CK	—	V <sub>IN</sub> = 5V	—	0.17	0.35	mA
Input Voltage	V <sub>IH</sub>	CK	—		2.0	—	—	V
	V <sub>IL</sub>			—	—	0.5	V	
Charging Current	I <sub>IN</sub>	TCP	—	V <sub>IN</sub> = 0~3.5V	—	100	—	μA
Threshold Voltage	V <sub>TH</sub>			—	V <sub>REG</sub> × 80%	—	V	
Reset Detection Voltage	V <sub>TH-H</sub>	V <sub>REG</sub>	—	Vsel = GND	—	V <sub>REG</sub> × 92%	—	V
	V <sub>TH-L</sub>			Vsel = V <sub>REG</sub>	—	V <sub>REG</sub> × 84%	—	V
Standby Current	I <sub>ST</sub>	V <sub>IN</sub>	—	V <sub>IN</sub> = 14V, EN = "L"	—	0.5	1.0	mA

**ELECTRICAL CHARACTERISTICS** ( $V_{IN} = 6$  to  $18V$ ,  $I_{LOAD} = 10mA$ ,  $T_a = -40$  to  $105^{\circ}C$ )

CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Power-on Reset Timer	TPOR	$\overline{RESET}$	—		—	$40 \times C_p$	—	ms
Watchdog Timer	TWD	$\overline{RESET}$			—	$20 \times C_T$	—	
Reset Timer (1)	TRST (1)	$\overline{RESET}$			—	$20 \times C_T$	—	
Reset Timer (2)	TRST (2)	$\overline{RESET}$			—	$0.7 \times C_T$	—	
Clock Pulse Width	$T_W$	CK	—		3	—	—	$\mu s$

(Note) CT is measured in units of  $\mu F$ .

**EXAMPLE OF APPLICATION CIRCUIT**

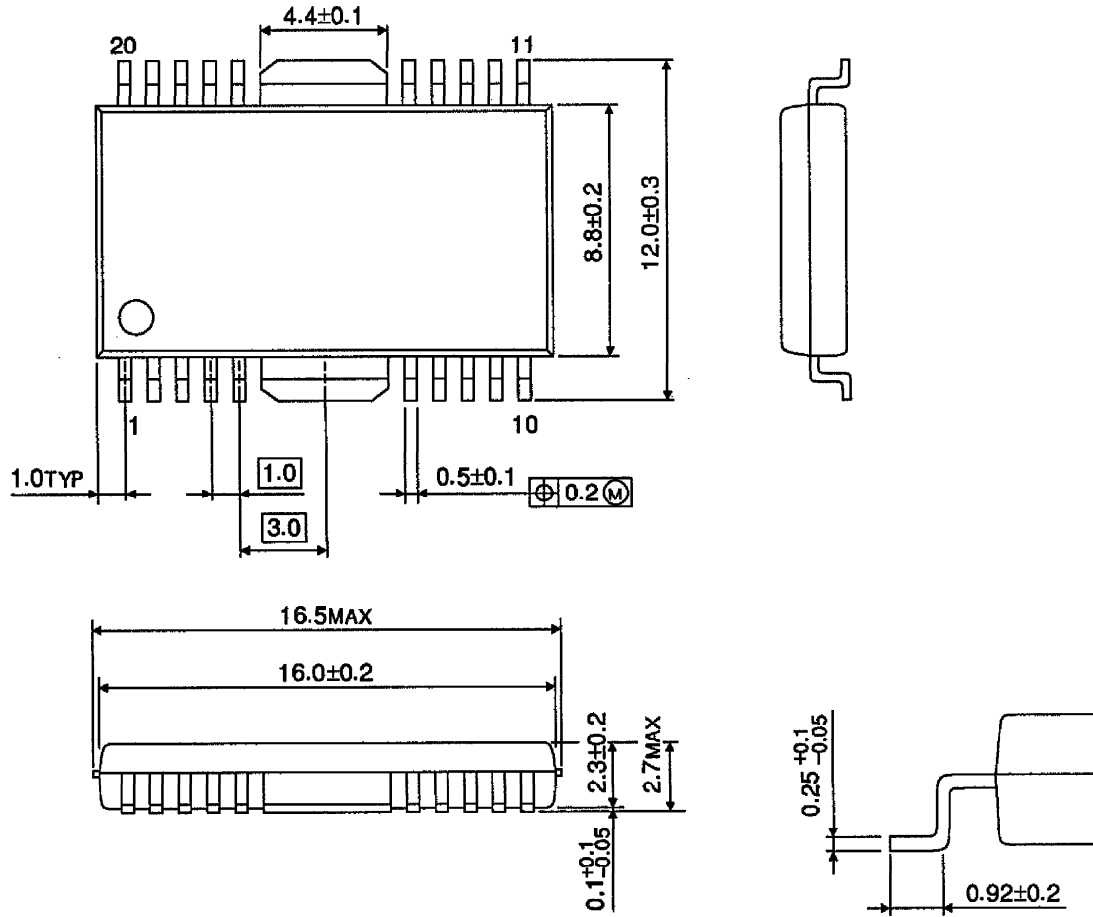


**Cautions for Wiring:**

$C_1$  and  $C_2$  are for absorbing disturbances, noise, etc.  $C_3$  is for phase compensation. Connect each condenser as close to the IC as possible.

**OUTLINE DRAWING**  
HSOP20-P-450-1.00

Unit : mm



Weight : 0.79g (Typ.)