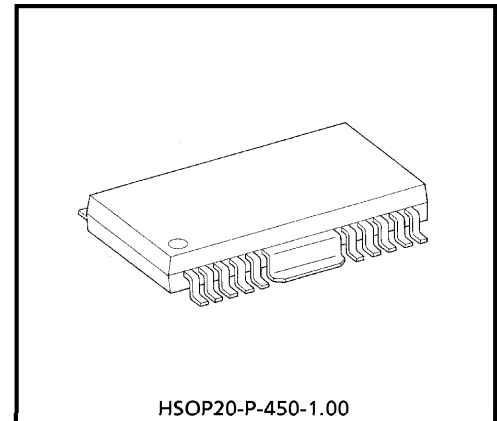


TENTATIVE

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 $5 \pm 0.15\text{V}$ 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 1.2mA (max.) enables direct connection to a car battery.



HSOP20-P-450-1.00

Weight : 0.79g (Typ.)

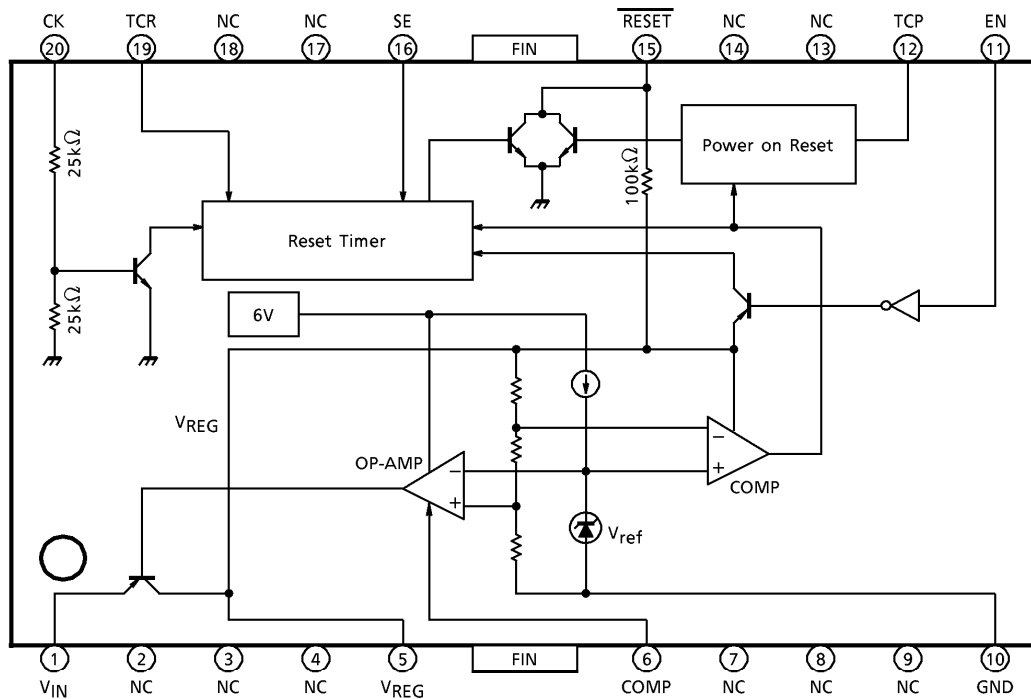
FEATURES

- Accurate output : $5\text{V} \pm 0.15\text{V}$
- Output power transistor attached : Current capacity
100mA (MAX.)
- Low standby current : 1.2mA (MAX.)
- Low input-output voltage : 0.8V (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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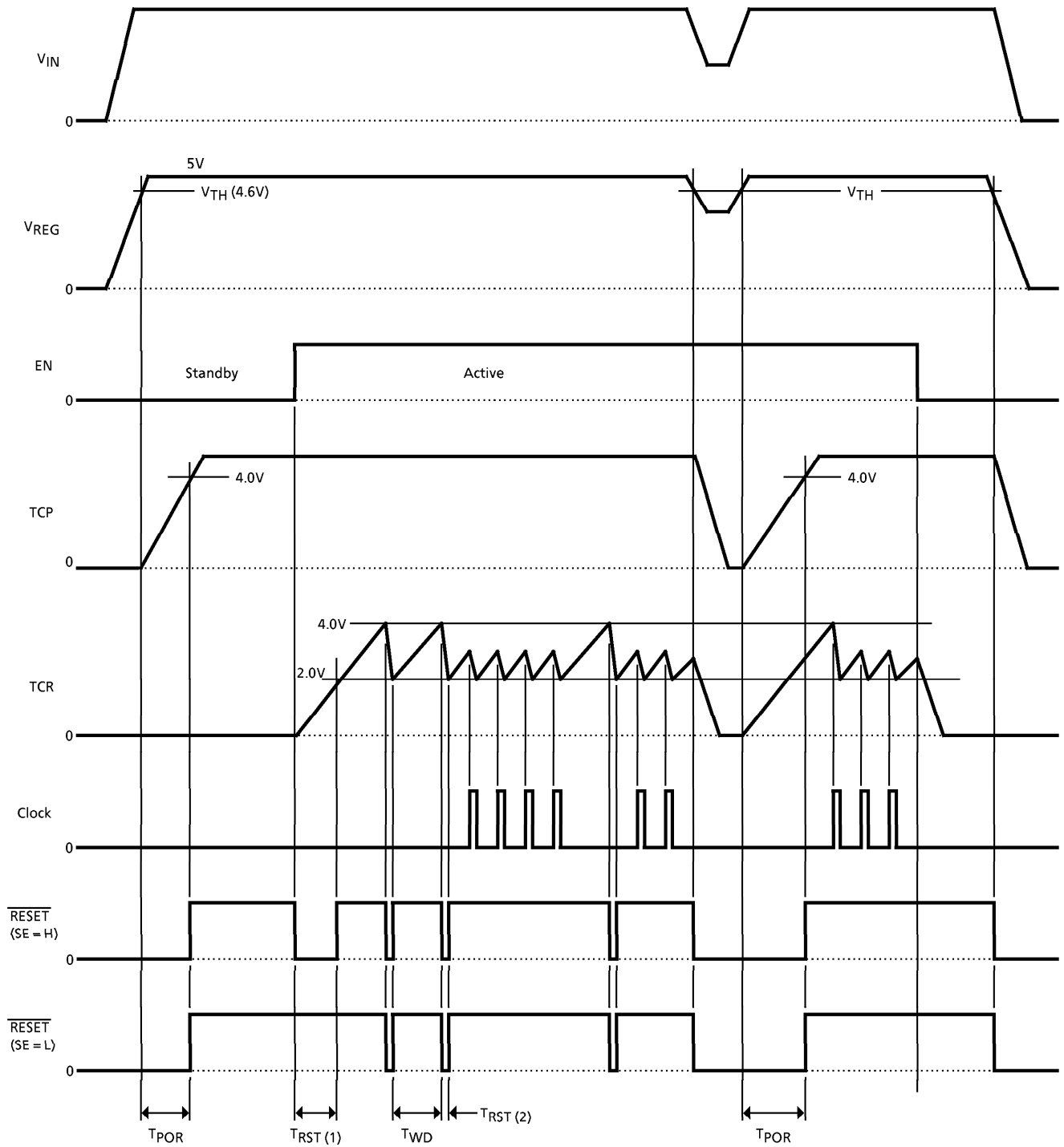
BLOCK DIAGRAM AND PIN LAYOUT



PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	V _{IN}	Power supply input pin
5	V _{REG}	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 1.2mA or less).
12	TCP	Time setting pin for the power-on reset timer when the power is on. Condenser C _P 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"> Pin supplies reset timer signal as selected by TCR pin condenser. Pin supplies reset pulses intermittently if no clock is given to the CK pin. NPN transistor collector output with pull-up resistor.
16	SE	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 _T 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	Non-connected pin. (Electrically, this pin is completely open.)

TIMING CHART



Note : See Electrical Characteristics for symbols in the timing chart.

MAXIMUM RATINGS (Ta = 25°C)

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

(Note 1) : Reverse battery

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

ELECTRICAL CHARACTERISTICS (V_{IN} = 6 to 18V, I_{LOAD} = 10mA, T_c = - 40 to 110°C)

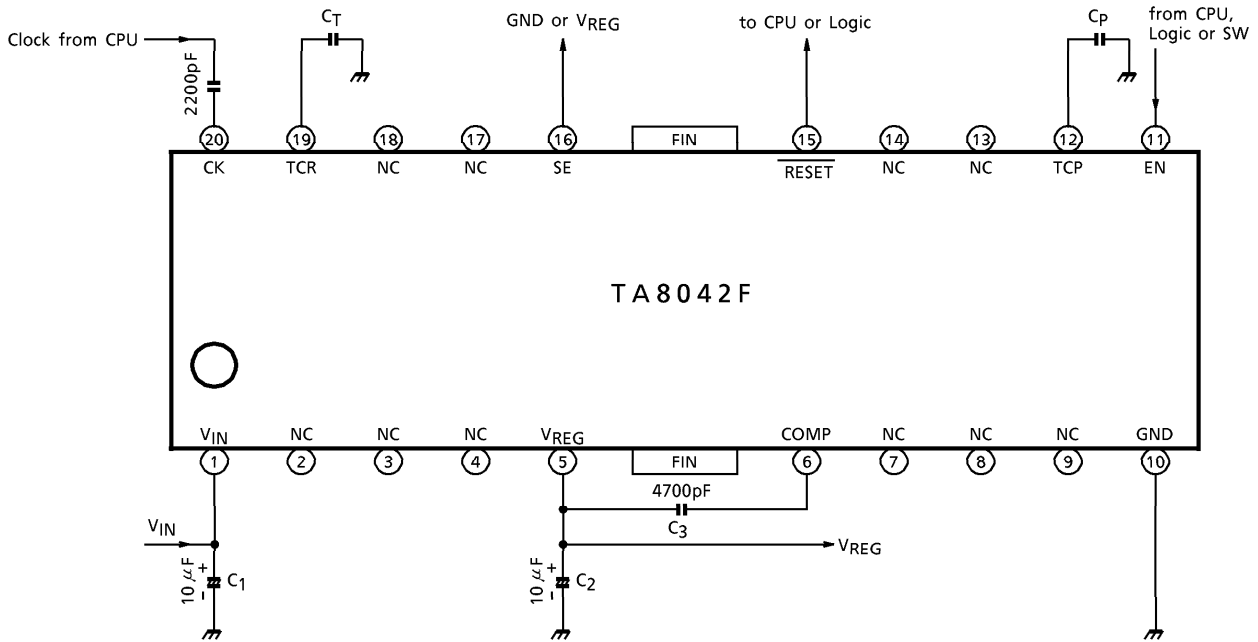
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{REG}	V _{REG}	—		4.85	5.0	5.15	V
Line Regulation	V _{LINE}	V _{REG}	—	V _{IN} = 5.5~40V	—	0.1	0.5	%
Load Regulation	V _{LOAD}	V _{REG}	—	I _{LOAD} = 1~50mA	—	0.1	0.5	%
Temperature Coefficient	—	V _{REG}	—		—	0.01	—	% / °C
Input-output Voltage	V _{DROP}	V _{REG}	—	I _{LOAD} = 100mA	—	0.3	0.8	V
Current Limiter	I _{LIMIT}	V _{REG}	—		—	200	—	mA
Overheat Detection	T _{SD}	—	—		—	150	—	°C
Input Current	I _{IN}	EN	—	V _{IN} = 0~5V	—	—	5	μA
Input Voltage	V _{IH}				2.0	—	—	V
	V _{IL}	—	—	1.0	V			
Output Voltage	V _{OL}	RESET	—	I _{OL} = 1mA	—	—	0.5	V
Charging Current	I _{IN}	TCR	—	V _{IN} = 0~3.5V	—	50	—	μA
Threshold Voltage	V _{IH}	TCR	—		—	V _{REG} × 80%	—	V
	V _{IL}				—	V _{REG} × 40%	—	
Input Current	I _{IN}	CK	—	V _{IN} = 5V	—	0.17	0.35	mA
Input Voltage	V _{IH}	CK	—		2.0	—	—	V
	V _{IL}				—	—	0.5	
Charging Current	I _{IN}	TCP	—	V _{IN} = 0~3.5V	—	50	—	μA
Threshold Voltage	V _{TH}				—	V _{REG} × 80%	—	V
Reset Detection Voltage	V _{TH}	—	—		—	V _{REG} × 92%	—	V
	V _{TH-V}				—	4.6	—	
Standby Current	I _{ST}	V _{IN}	—	V _{IN} = 14V, EN = "L"	—	0.5	1.2	mA

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

CHARACTERISTIC	SYMBOL	PIN	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Power-on Reset Timer	T_{POR}	\overline{RESET}	—		$50 \times C_p$	$80 \times C_p$	$110 \times C_p$	ms
Watchdog Timer	T_{WD}	\overline{RESET}						
Reset Timer (1)	$T_{RST(1)}$	\overline{RESET}						
Reset Timer (2)	$T_{RST(2)}$	\overline{RESET}						
Clock Pulse Width	T_W	CK	—		3	—	—	μs

(Note) C_T C_p is measured in units of μF .

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.

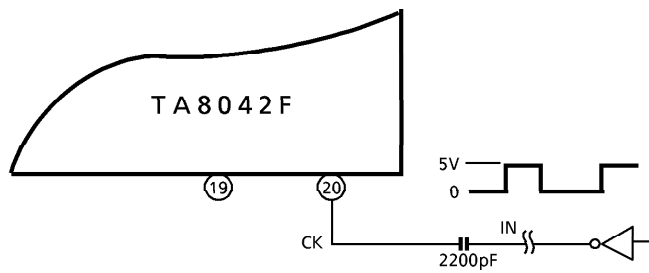
* To use Fin, short it to GND.

RECOMMENDED CONDITIONS

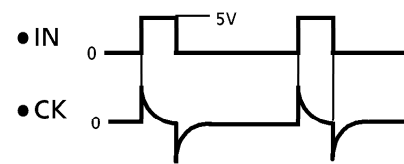
PART NAME	MIN.	MAX.	UNIT
C _T	0.01	100	μF
C _P	0.01	100	μF

APPLICATION CIRCUIT FOR CK INPUT

Capacitor Coupling



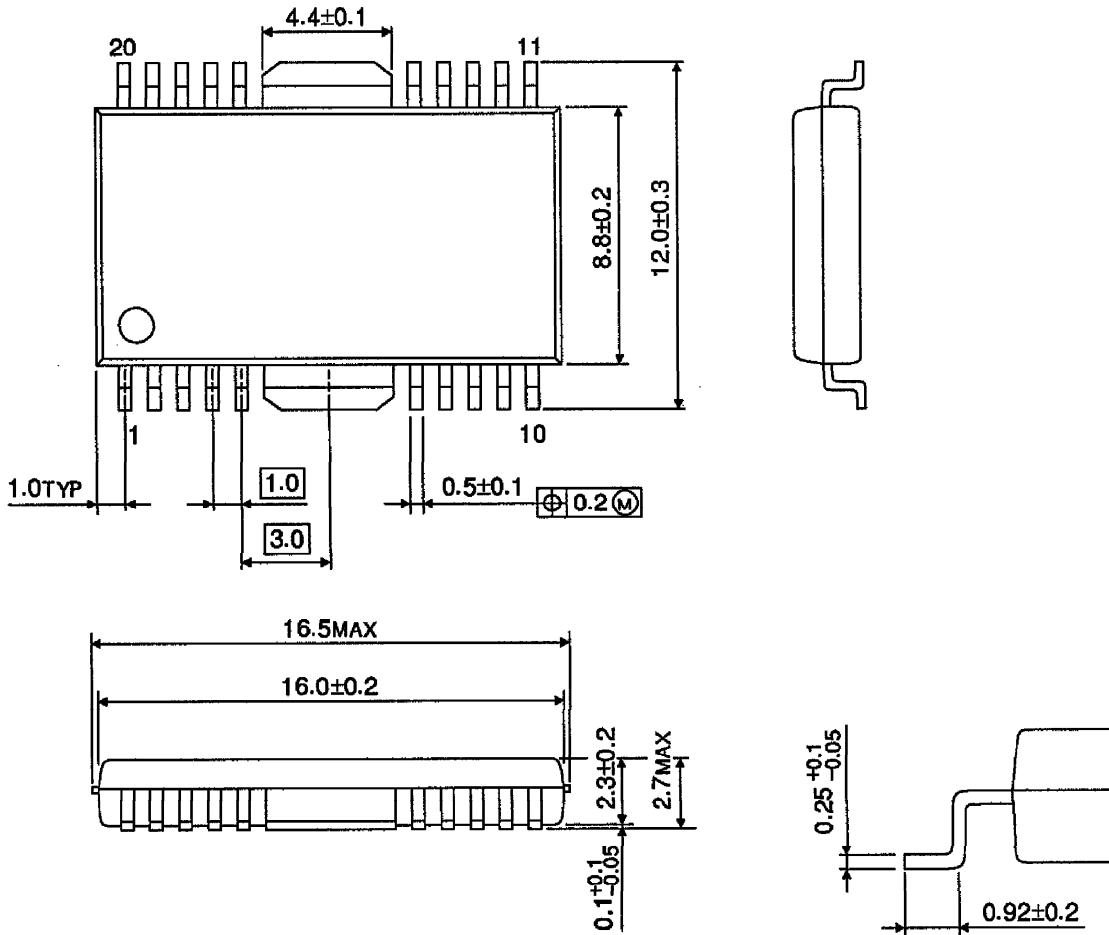
Timing Chart



The capacitor coupling allows reset pulses to be supplied intermittently from the $\overline{\text{RESET}}$ pin whether the input level (IN) is high or low.

OUTLINE DRAWING
HSOP20-P-450-1.00

Unit : mm



Weight : 0.79g (Typ.)