

7828999 0009139 391 RHM

●Absolute maximum ratings (Ta=25°C)

Item	Symbol	Rating	Unit
Supply voltage	V _{CC}	7.0	V
Output current 1	I _{OUT1}	-30	mA
Output current 2	I _{OUT2}	-200	μA
Power dissipation	P _A	900 *1(BA6162) 550 *2(BA6129F) (BA6162F)	mW
Operating temperature range	T _{OPR}	-20 ~ 75	°C
Storage temperature range	T _{STR}	-40 ~ 125	°C

I_{OUT1} is output current of V_{CC}. I_{OUT2} is output current of V_{BAT}.

*1 Derating is -9.0mW/°C at Ta>25°C

*2 Derating is -5.5mW/°C at Ta>25°C

Table 1

●Block diagram

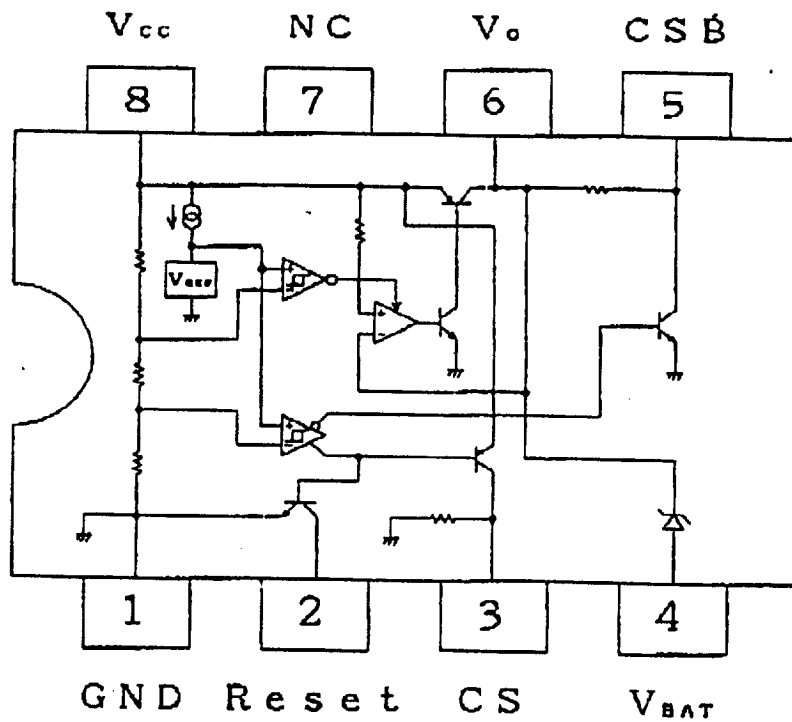


Figure 1

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●Pin description

Pin No.	Pin code	Pin function
1	GND	Substrate GND
2	Reset	Reset output
3	CS	CS output
4	V _{BAT}	Battery power supply
5	CSB	CSB output
6	V _o	Power supply output
7	NC	
8	V _{CC}	Power supply

Table 2

●Input/output circuit diagram

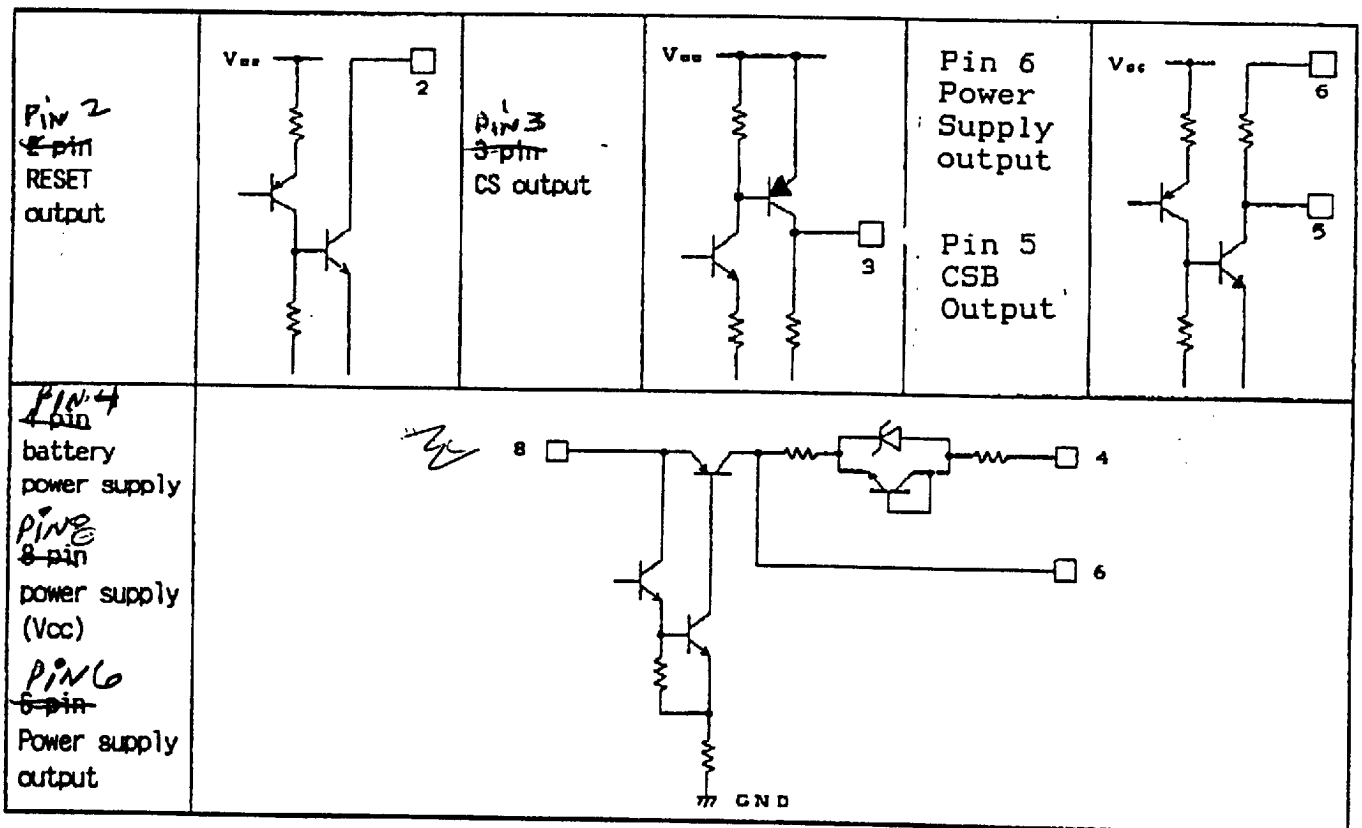


Table 3

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●Electrical characteristics

BA6129F

(Ta=25°C, VRRES=VCC=5V, RRES=10kΩ)

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Current drain in Monitor mode	I _{CC}			2.0	mA	V _{CC} =5V, V _{BAT} =3V
Input/output Voltage difference	V _{BAT1}		0.03	0.05	V	V _{CC} =5V, V _{BAT} =3V, I _O =-1mA
Vo output voltage 1	V _{O1}	4.95	4.97		V	V _{CC} =5V, V _{BAT} =3V, I _O =-1mA
Vo output voltage 2	V _{O2}	4.70	4.90		V	V _{CC} =5V, V _{BAT} =3V, I _O =-15mA
Vo output voltage 3	V _{O3}	4.50	4.86		V	V _{CC} =5V, V _{BAT} =3V, I _O =-30mA
Detection voltage	V _D	3.35	3.50	3.65	V	V _{CC} =H→L
Detection hysteresis voltage	V _{BH}		100		mV	V _{CC} =L→H
Reset output voltage L	V _{RESL}			0.4	V	V _{CC} =3V
Reset leakage current	I _{RESH}			0.1	μA	V _{CC} =5V, V _{RES} =7V
Reset operation limit voltage	V _{OPL}		0.8	1.2	V	V _{CC} =H→L, V _{RES} ≤0.4V
CS output voltage L	V _{CSL}			0.1	V	V _{CC} =3V, V _{BAT} =3V, I _{CS} =+1μA
CS output voltage H	V _{CSH}	4.9			V	V _{CC} =5V, V _{BAT} =3V, I _{CS} =-1μA
CSB output voltage L	V _{CSBL}			0.1	V	V _{CC} =5V, V _{BAT} =3V, I _{CSB} =+1μA
CSB output voltage H	V _{CSBH}	V _O -0.1			V	V _{CC} =3V, V _{BAT} =3V, I _{CSB} =-1μA
Detection voltage temperature characteristic	K _{VD}	-0.05		+0.05	%/°C	
Switching voltage	V _S	3.15	3.30	3.45	V	V _{CC} =H→L, V _{BAT} =3V, R _O =200kΩ
Switching hysteresis voltage	V _{BH}		100		mV	V _{CC} =L→H, V _{BAT} =3V, R _O =200kΩ
Switching voltage temperature characteristic	K _{VS}	-0.05		+0.05	%/°C	
Current drain in Back-up mode	I _{CCB}			0.5	μA	V _{CC} =GND, V _{BAT} =3V
Input/output voltage difference 2	V _{BAT2}		0.20	0.30	V	V _{CC} =GND, V _{BAT} =3V, I _O =-1μA
Vo output voltage 4	V _{O4}	2.70	2.80		V	V _{CC} =GND, V _{BAT} =3V, I _O =-1μA
Vo output voltage 5	V _{O5}	2.60	2.67		V	V _{CC} =GND, V _{BAT} =3V, I _O =-100μA
Reverse current	I _{OR}			0.1	μA	V _{CC} =5V, V _{BAT} =GND

Table 4

Note) + Polarity defines current sink
 - polarity defines current source

This IC is not designed for radiation-hardened applications.

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BA6162/F

(Ta=25°C, VRRES=VCC=5V, RRES=10kΩ)

Item	Symbol	Min.	Typ.	Max.	Unit	Condition
Current drain in Monitor mode	I _{CC}			2.0	mA	V _{CC} =5V, V _{BAT} =3V
Input/output Voltage difference	V _{BAT1}		0.03	0.05	V	V _{CC} =5V, V _{BAT} =3V, I _O =-1mA
Vo output voltage 1	V _{O1}	4.95	4.97		V	V _{CC} =5V, V _{BAT} =3V, I _O =-1mA
Vo output voltage 2	V _{O2}	4.70	4.90		V	V _{CC} =5V, V _{BAT} =3V, I _O =-15mA
Vo output voltage 3	V _{O3}	4.50	4.86		V	V _{CC} =5V, V _{BAT} =3V, I _O =-30mA
Detection voltage	V _D	4.00	4.20	4.40	V	V _{CC} =H→L
Detection hysteresis voltage	V _{BH}		100		mV	V _{CC} =L→H
Reset output voltage L	V _{RESL}			0.4	V	V _{CC} =3V
Reset leakage current	I _{RESH}			0.1	μA	V _{CC} =5V, V _{RES} =7V
Reset operation limit voltage	V _{OPL}		0.8	1.2	V	V _{CC} =H→L, V _{RES} ≤0.4V
CS output voltage L	V _{CSL}			0.1	V	V _{CC} =3V, V _{BAT} =3V, I _{CS} =+1μA
CS output voltage H	V _{CSH}	4.9			V	V _{CC} =5V, V _{BAT} =3V, I _{CS} =-1μA
CSB output voltage L	V _{CSBL}			0.1	V	V _{CC} =5V, V _{BAT} =3V, I _{CSB} =+1μA
CSB output voltage H	V _{CSBH}	V _O -0.1			V	V _{CC} =3V, V _{BAT} =3V, I _{CSB} =-1μA
Detection voltage temperature characteristic	K _{V_D}	-0.05		+0.05	%/°C	
Switching voltage	V _D	3.15	3.30	3.45	V	V _{CC} =H→L, V _{BAT} =3V, R _O =200kΩ
Switching hysteresis voltage	V _{BH}		100		mV	V _{CC} =L→H, V _{BAT} =3V, R _O =200kΩ
Switching voltage temperature characteristic	K _{V_D}	-0.05		+0.05	%/°C	
Current drain in Back-up mode	I _{CCB}			0.5	μA	V _{CC} =GND, V _{BAT} =3V
Input/output voltage difference 2	V _{BAT2}		0.20	0.30	V	V _{CC} =GND, V _{BAT} =3V, I _O =-1μA
Vo output voltage 4	V _{O4}	2.70	2.80		V	V _{CC} =GND, V _{BAT} =3V, I _O =-1μA
Vo output voltage 5	V _{O5}	2.60	2.67		V	V _{CC} =GND, V _{BAT} =3V, I _O =-100μA
Reverse current	I _{OR}			0.1	μA	V _{CC} =5V, V _{BAT} =GND

Table 5

Note) + Polarity defines current sink
 - polarity defines current source

This IC is not designed for radiation-hardened applications.

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Test Circuit

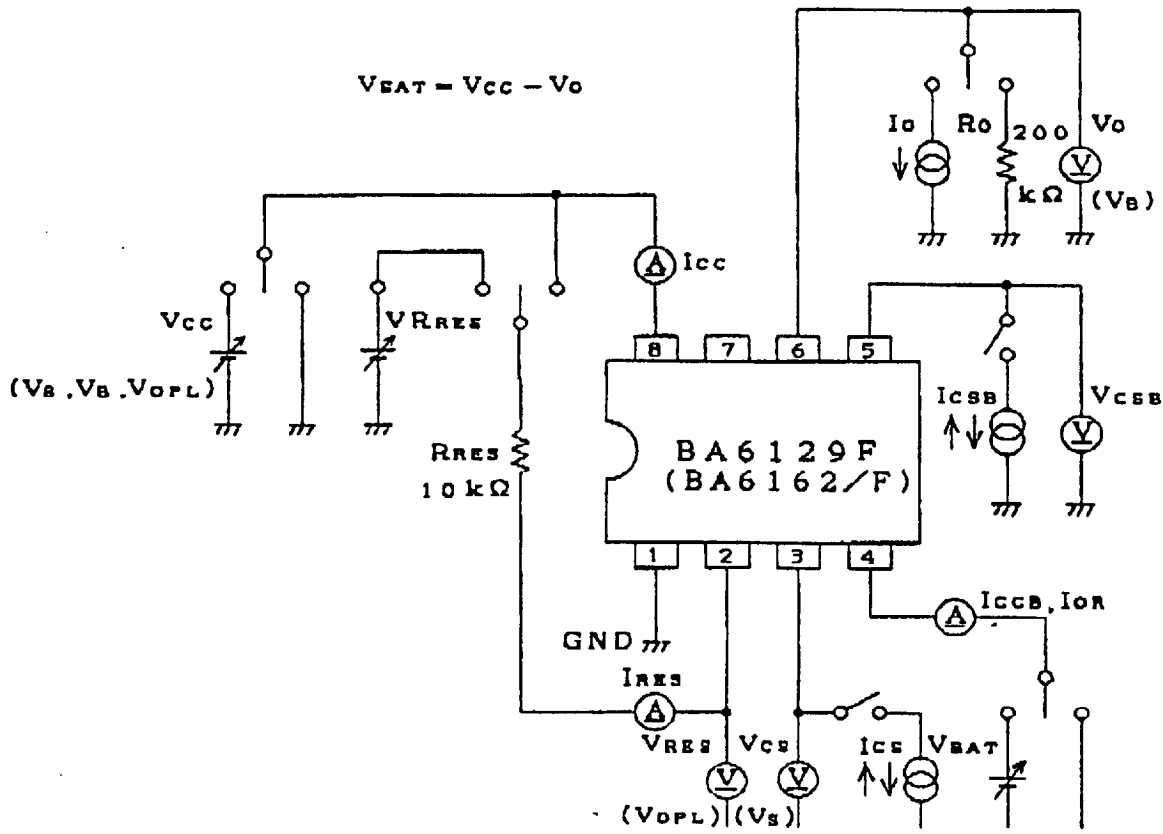


Figure 2

● Operating Description

The BA6129F and BA6162/F have two functions, logic out and power switching. Ref. Table 3.

Logic output configurations:

- (1) Reset output - NPN Transistor, Open collector.
- (2) CS output - PNP Transistor, Open collector with pull down resistor.
- (3) CSB output - NPN Transistor, Open collector with pull up resistor.

Power Switching Configuration:

- (1) PNP Power Transistor.
- (2) Shot-key barrier diode.

Thresholds are determined by an internal voltage reference and divider network. Hysteresis is controlled by an internal comparator.

A threshold one low voltage condition switches the reset signal low, CS low and CSB high. These signals may be used to set an SRAM circuit to standby.

During normal operation the load is supplied from V_{CC} via a series PNP power transistor. A threshold two low voltage condition turns off the series pass transistor forward biasing the shot-key diode thus switching the load voltage source from V_{CC} to V_{BAT} .

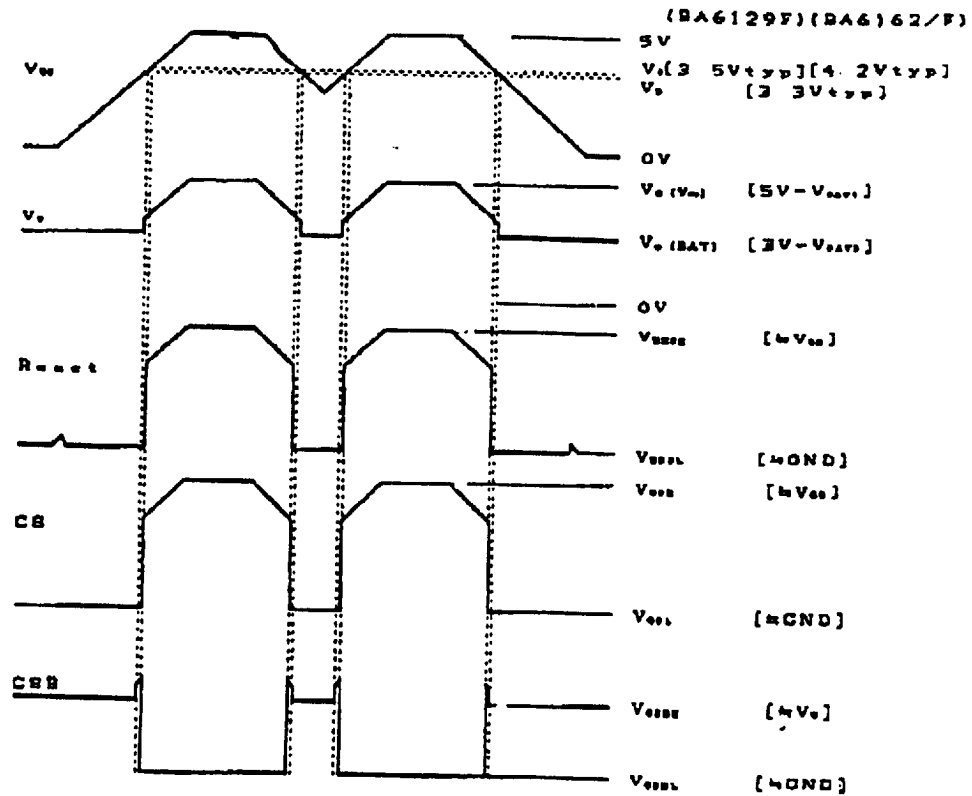
● Definitions:

- Threshold one. - Detection Voltage, V_{Δ} .
 Threshold two. - Switching Voltage, V_{Σ} .

Part Number	Detection Voltage, V_{Δ} .
BA6126	$V_{\Delta} = 3.5$ V. Typ. when V_{CC} is falling. $V_{\Delta} = V_{\Delta} + 0.1$ when V_{CC} is rising.
BA6162/F	$V_{\Delta} = 4.2$ V. Typ. when V_{CC} is falling. $V_{\Delta} = V_{\Delta} + 0.1$ when V_{CC} is rising.

Part Number	Switching Voltage, V_{Σ} .
BA6126 and BA6162/F	$V_{\Sigma} = 3.3$ V. Typ. when V_{CC} is falling. $V_{\Sigma} = V_{\Sigma} + 0.1$ when V_{CC} is rising.

● Voltage Level Diagram



Note: Hysteresis is omitted.

● Application circuit

Figure 3

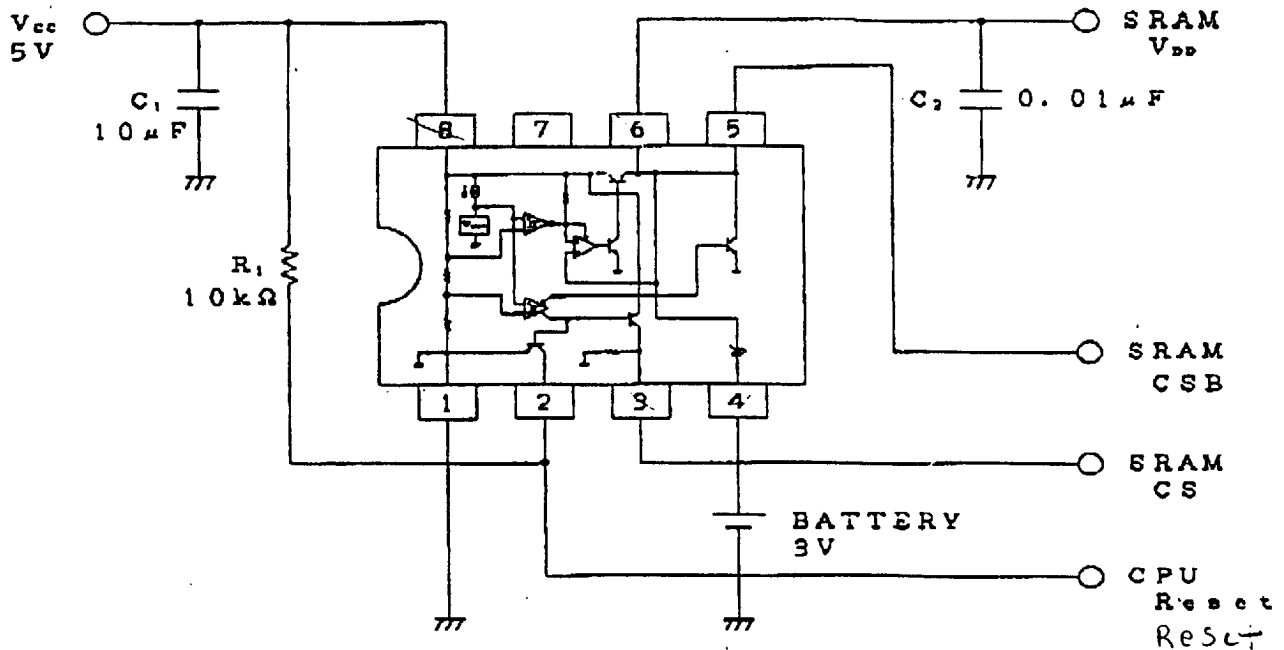


Figure 4

* Caution

1) Power Supply, V_{CC}

The BA6129F and BA6162/F are designed to operate with a V_{CC} of 5 volts. These devices may be operated at other voltages providing the following conditions are met.

$$V_B + V_{SH} < V_{CC} < V_{CC \text{ max}}$$

$$V_{CC} - V_{BAT} < 5 \text{ V}$$

V_B = Detection Voltage

V_{SH} = Switching Voltage Hysteresis

2) Battery Voltage, V_{BAT}

The BA6129F and BA6162/F are designed to operate with a V_{BAT} voltage of 3 volts. These devices may be operated at other voltages providing the following conditions are met.

$$V_{BAT} < V_B$$

$$V_{CC} - V_{BAT} < 5 \text{ V}$$