

1.5V signal sensor

BA3714F

The BA3714F is a signal sensor consisting of a sensor circuit which detects the presence of an input signal, a logic circuit which controls an output drive circuit based on the input signal, and an output drive circuit. The signal sensor circuit employs the dual-wave rectified current method for excellent response.

The outputs T_E of Pin 3 and T_{ON} of Pin 5 can be respectively set by choosing appropriate values for the capacitor between Pin 7 and V_{cc} and the capacitor between Pin 1 and ground.

Drive outputs include two systems OUT1 and OUT which are controlled by the logic block. These systems can be combined to enable a wide range of designs.

● Applications

Tape end sensors for 1.5 to 3V headphone stereos

Mute and song selection sensors

● Features

- 1) Operation possible at ultra-low voltages. ($V_{cc} = 0.8$ to 4.5V)
- 2) Minimal attached components.
- 3) Uses dual rectified current method for excellent signal response.
- 4) Very low current dissipation. ($I_o = 0.9\text{mA}$)
- 5) When used for a tape end sensor, can also be used with mechanical auto-off.
- 6) SOP 8-pin package allows space conservation on the board.

● Absolute maximum ratings ($T_a = 25^\circ\text{C}$)

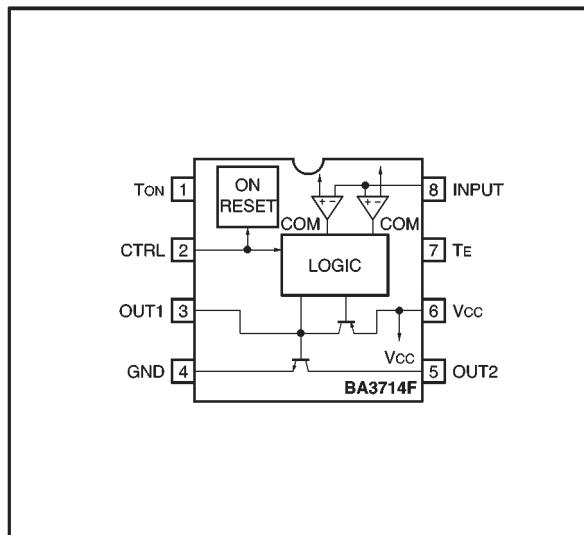
Parameter	Symbol	Limits	Unit
Power supply voltage	V_{cc}	4.5	V
Power dissipation	P_d	350*	mW
Operating temperature	T_{opr}	-25~+75	°C
Storage temperature	T_{stg}	-55~+125	°C

* Reduced by 3.5mW for each increase in T_a of 1°C over 25°C.

● Recommended operating conditions ($T_a = 25^\circ\text{C}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{cc}	0.8	1.25	4.5	V

● Block diagram

● Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$ and $V_{cc} = 1.25\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I_Q	—	0.9	1.8	mA	$V_{IN}=0\text{V}_{\text{rms}}$, 2pin : OPEN
ON detection time	T_{ON}	3.1	4.4	5.7	s	—
END detection time	T_E	0.98	1.4	1.82	s	—
Pin 3 output saturation voltage	V_{sat3}	—	0.11	0.3	V	$I_s=70\text{ }\mu\text{A}$
Pin 3 source current	$I_{SOURCE3}$	60	80	—	μA	—
Pin 5 output saturation voltage	V_{ON5}	—	0.105	0.3	V	$I_s=10\text{mA}$, input level is $1.0\text{V}_{\text{P-P}}$
Pin 5 sink current	I_{SINK5}	—	—	7	mA	$V_5=0.3\text{V}$
Input discrimination level	V_I	-22	-19	-16	dBm	$f=100\text{Hz}$
Input resistance	R_{IN}	23	33	43	k Ω	$V_{IN}=100\text{mV}_{\text{rms}}$
Operation assurance input pulse width	$W_{P,\text{Min.}}$	200	—	—	ms	$P_w=0.5\text{V}_{\text{P-P}}$, $T_E \geq 0.7\text{s}$, $V_7 \leq 0.3\text{V}$
Ripple rejection ratio	RR	—	—	-20	dBm	$V_{cc}=0.9\text{V}$, $f_{RR}=100\text{Hz}$, $I_3=I_5=0\text{ }\mu\text{A}$

● Measurement circuit

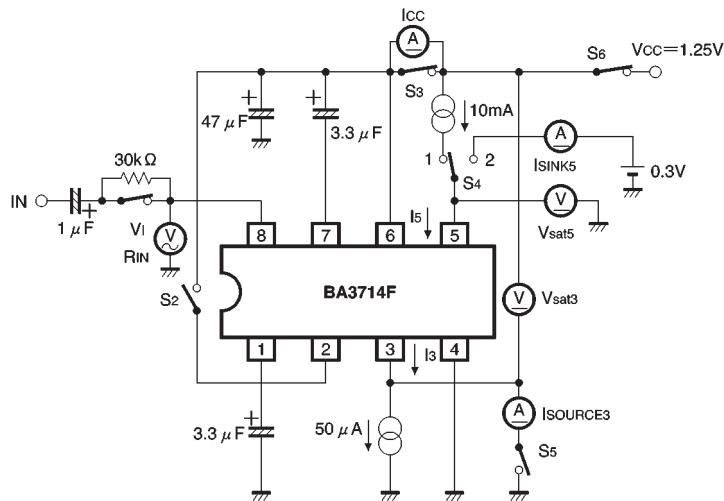


Fig. 1

● Timing chart

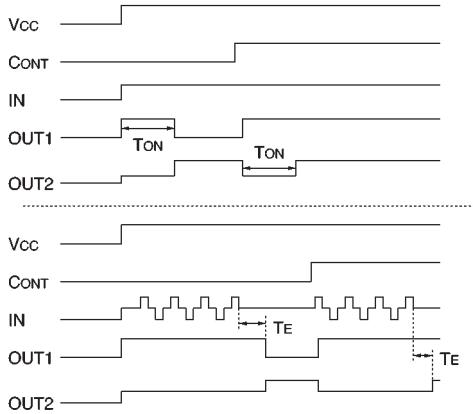


Fig. 2

● Application example

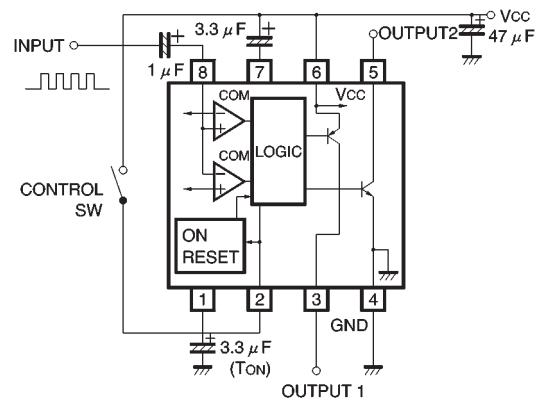


Fig. 3

● External dimensions (Units: mm)

