

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. ($I_Q = 0.9mA$)
- 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 ($T_a = 25^\circ C$)

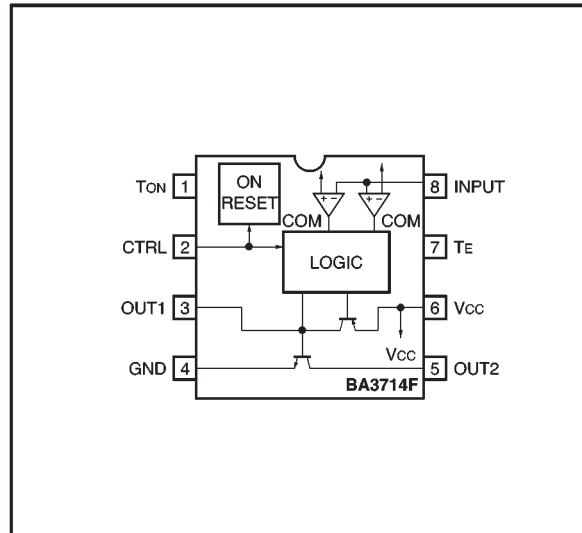
Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	4.5	V
Power dissipation	P_d	350*	mW
Operating temperature	T_{opr}	$-25 \sim +75$	$^\circ C$
Storage temperature	T_{stg}	$-55 \sim +125$	$^\circ C$

* Reduced by 3.5mW for each increase in T_a of $1^\circ C$ over $25^\circ C$.

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

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	$V_{IN}=0V_{rms}$, 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	$I_3=70\mu\text{A}$
Pin 3 source current	$I_{SOURCE3}$	60	80	—	μA	—
Pin 5 output saturation voltage	V_{ON5}	—	0.105	0.3	V	$I_5=10\text{mA}$, input level is $1.0V_{P-P}$
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	$V_{IN}=100\text{mV}_{rms}$
Operation assurance input pulse width	$W_{P\text{ Min.}}$	200	—	—	ms	$P_W=0.5V_{P-P}$, $T_E \geq 0.7\text{s}$, $V_7 \leq 0.3\text{V}$
Ripple rejection ratio	RR	—	—	-20	dBm	$V_{CC}=0.9\text{V}$, $f_{RR}=100\text{Hz}$, $I_3=I_5=0\mu\text{A}$

● Measurement circuit

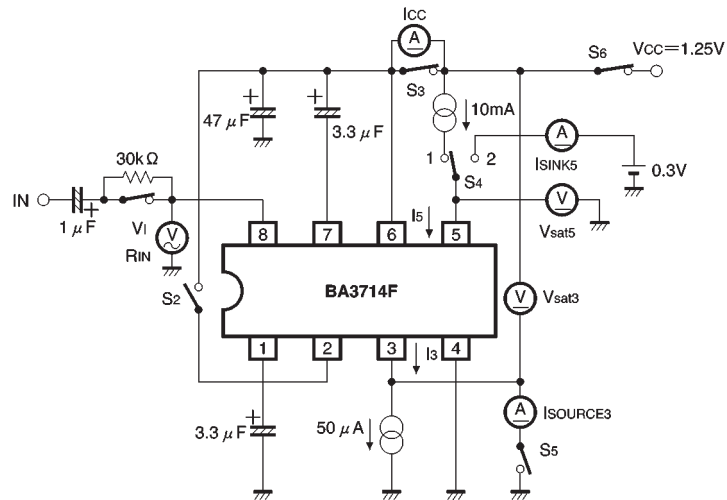


Fig. 1

● Timing chart

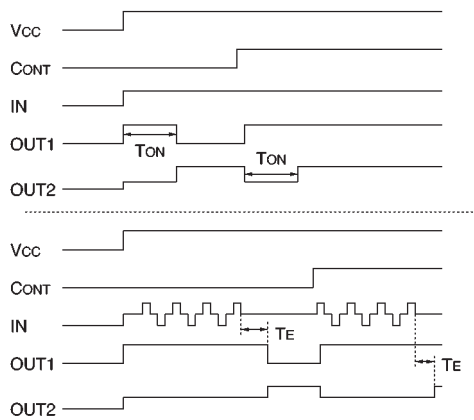


Fig. 2

● Application example

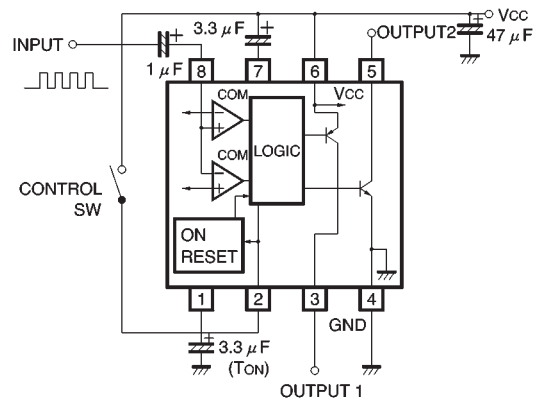


Fig. 3

● External dimensions (Units: mm)

