

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

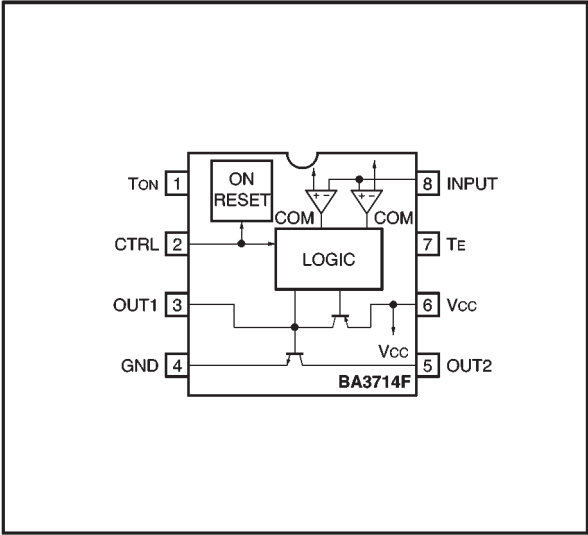
Parameter	Symbol	Limits	Unit
Power supply voltage	V_{CC}	4.5	V
Power dissipation	P_d	350*	mW
Operating temperature	T_{opr}	$-25 \sim +75$	$^\circ\text{C}$
Storage temperature	T_{stg}	$-55 \sim +125$	$^\circ\text{C}$

* 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, Ta = 25°C and VCC = 1.25V)

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 μA
Pin 3 source current	I _{SOURCE3}	60	80	—	μA	—
Pin 5 output saturation voltage	V _{ON5}	—	0.105	0.3	V	I ₅ =10mA, input level is 1.0V _{P-P}
Pin 5 sink current	I _{SINK5}	—	—	7	mA	V ₅ =0.3V
Input discrimination level	V _I	−22	−19	−16	dBm	f=100Hz
Input resistance	R _{IN}	23	33	43	kΩ	V _{IN} =100mV _{rms}
Operation assurance input pulse width	W _{P Min.}	200	—	—	ms	P _w =0.5V _{P-P} , T _E ≥0.7s, V ₇ ≤0.3V
Ripple rejection ratio	RR	—	—	−20	dBm	V _{CC} =0.9V, f _{RR} =100Hz, I ₃ =I ₅ =0 μA

● Measurement circuit

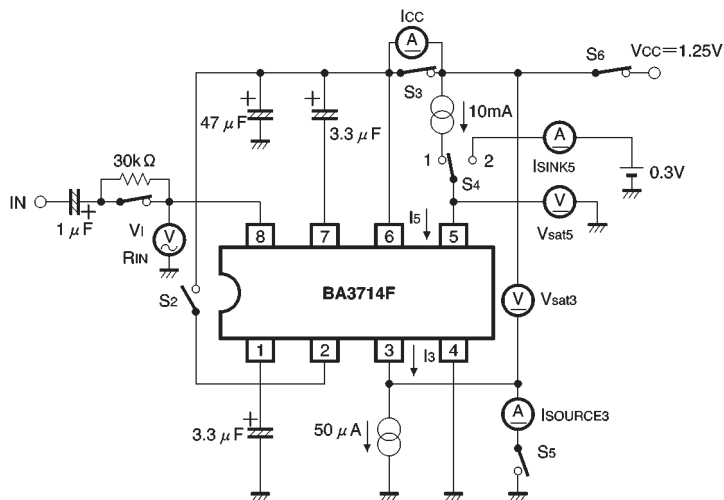


Fig. 1

● Timing chart

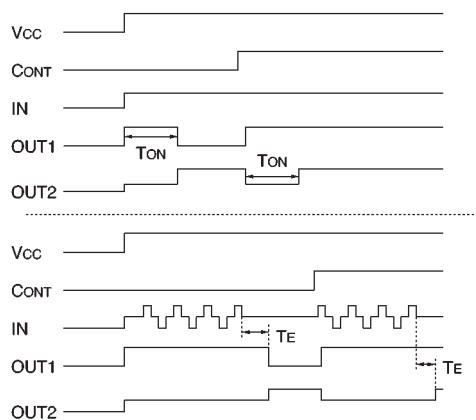


Fig. 2

● Application example

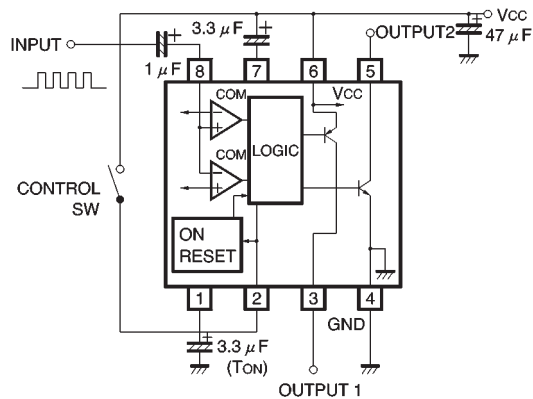


Fig. 3

●External dimensions (Units: mm)

