

# 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. ( $I_O = 0.9mA$ )
- 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	$T_{stg}$	$-55 \sim +125$	$^\circ C$

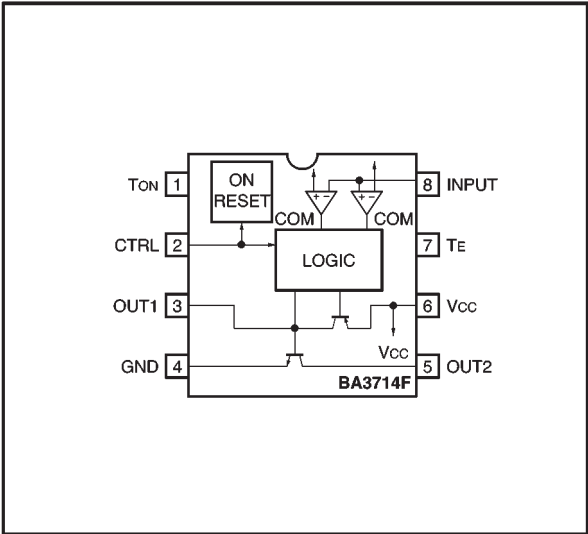
\* Reduced by 3.5mW for each increase in  $T_a$  of  $1^\circ C$  over  $25^\circ C$ .

### ●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, Ta = 25°C and Vcc = 1.25V)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I <sub>Q</sub>	—	0.9	1.8	mA	V <sub>IN</sub> =0V <sub>rms</sub> , 2pin : OPEN
ON detection time	T <sub>ON</sub>	3.1	4.4	5.7	s	—
END detection time	T <sub>E</sub>	0.98	1.4	1.82	s	—
Pin 3 output saturation voltage	V <sub>sat3</sub>	—	0.11	0.3	V	I <sub>3</sub> =70 μA
Pin 3 source current	I <sub>SOURCE3</sub>	60	80	—	μA	—
Pin 5 output saturation voltage	V <sub>ON5</sub>	—	0.105	0.3	V	I <sub>5</sub> =10mA, input level is 1.0V <sub>P-P</sub>
Pin 5 sink current	I <sub>SINK5</sub>	—	—	7	mA	V <sub>5</sub> =0.3V
Input discrimination level	V <sub>I</sub>	−22	−19	−16	dBm	f=100Hz
Input resistance	R <sub>IN</sub>	23	33	43	kΩ	V <sub>IN</sub> =100mV <sub>rms</sub>
Operation assurance input pulse width	W <sub>P Min.</sub>	200	—	—	ms	P <sub>w</sub> =0.5V <sub>P-P</sub> , T <sub>E</sub> ≥0.7s, V <sub>I</sub> ≤0.3V
Ripple rejection ratio	RR	—	—	−20	dBm	V <sub>CC</sub> =0.9V, f <sub>RR</sub> =100Hz, I <sub>3</sub> =I <sub>5</sub> =0 μA

### ●Measurement circuit

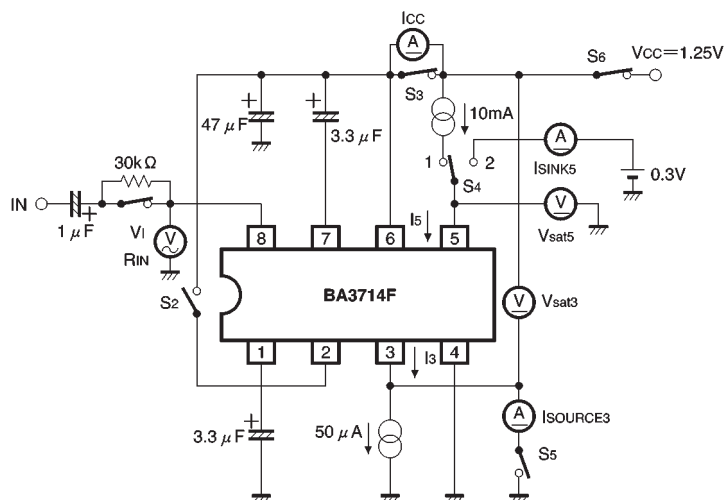


Fig. 1

●Timing chart

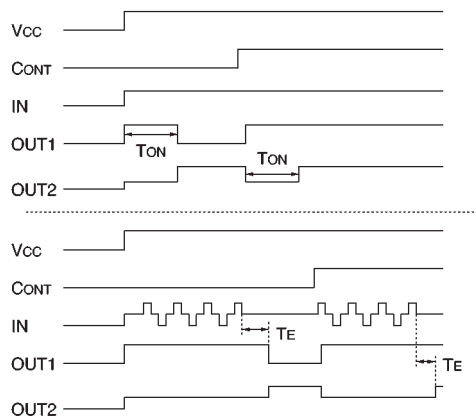


Fig. 2

- Application example

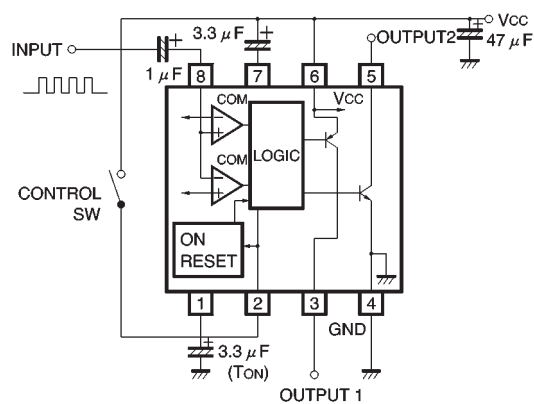


Fig. 3

●External dimensions (Units: mm)

