

AN7074K

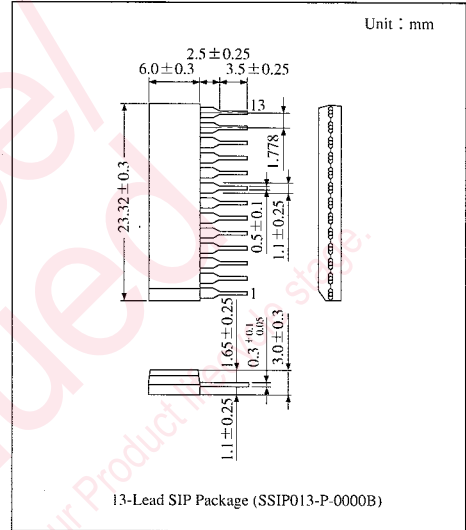
Audio Amplifier Muting Circuit

Overview

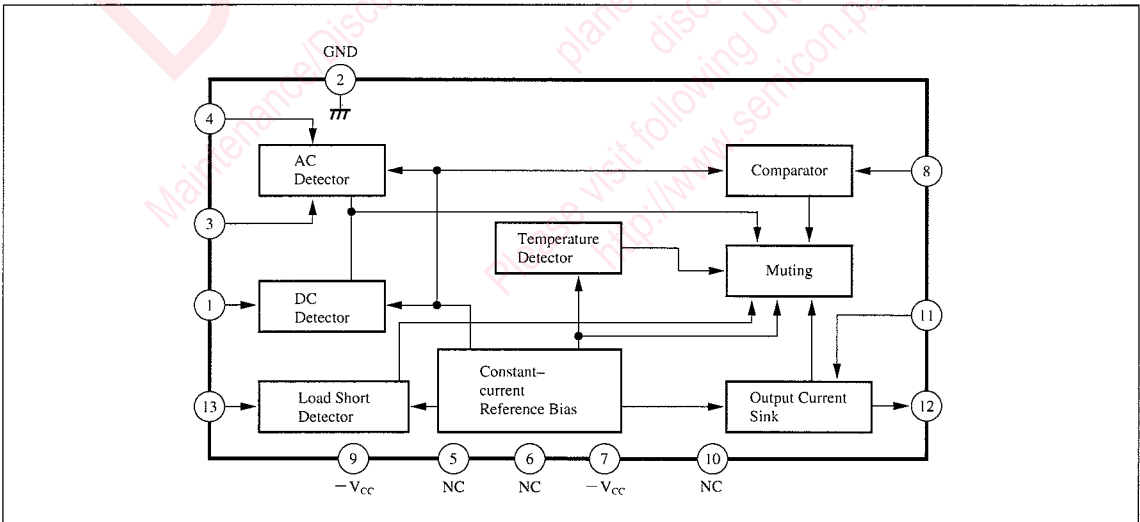
The AN7074K is an integrated circuit designed for muting and protection of Hi-Fi audio power amp.

Features

- Low power amp. muting shock noise when power is switched ON and OFF
- Protection of power amp. against abnormal voltage caused by DC detector circuit
- Protection of power amp. at load short-circuit due to load short detector



Block Diagram



Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Rating	Unit
Supply Voltage	V _{CC}	23.5	V
Supply Current	I _{CC}	30	mA
Power Dissipation	P _D	1000	mW
Operating Ambient Temperature	T _{opr}	-20 ~ +75	°C
Storage Temperature	T _{stg}	-55 ~ +150	°C

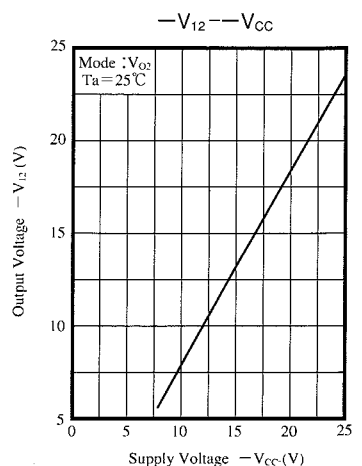
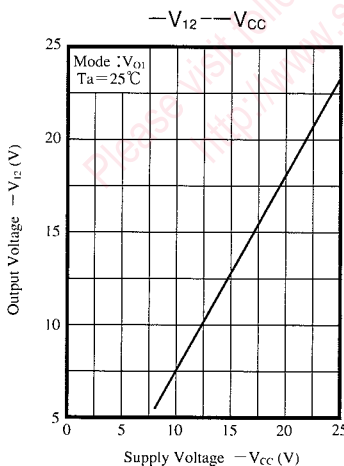
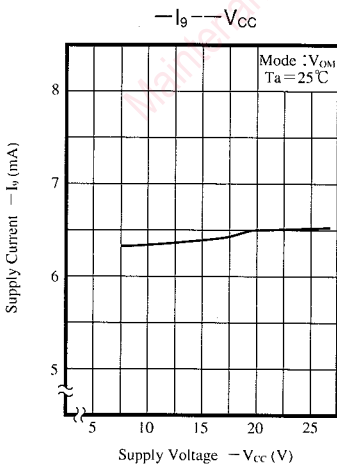
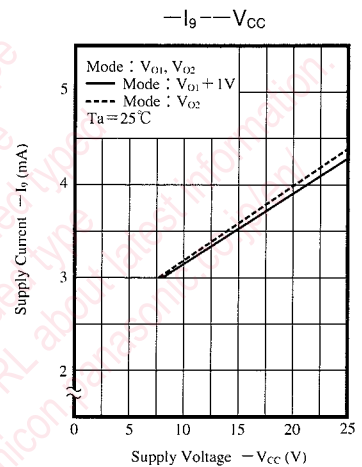
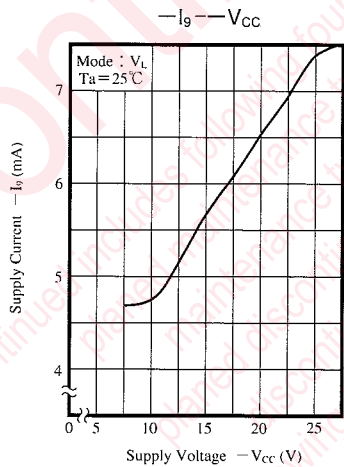
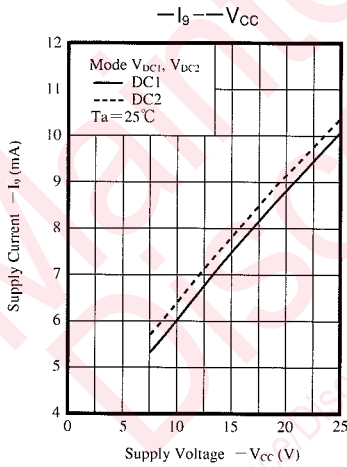
Recommended Operating Range (Ta = 25°C)

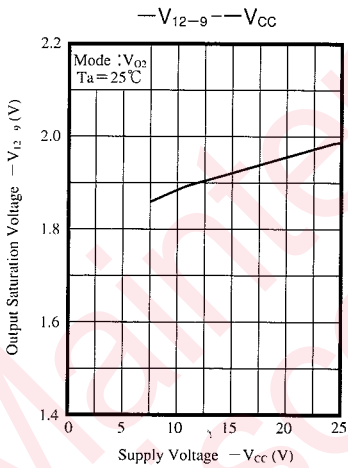
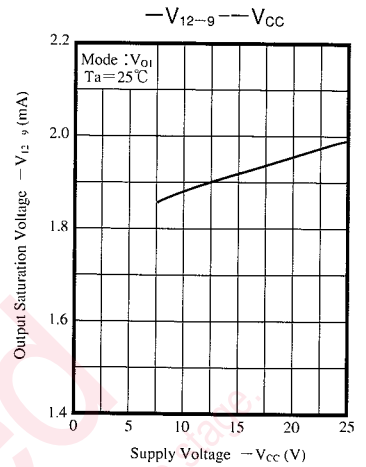
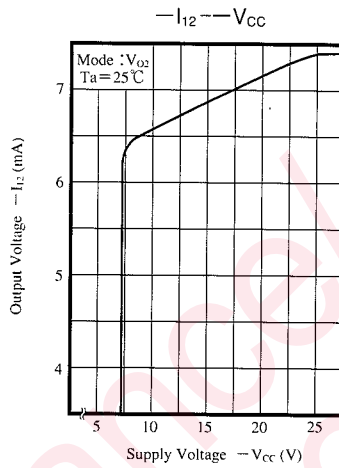
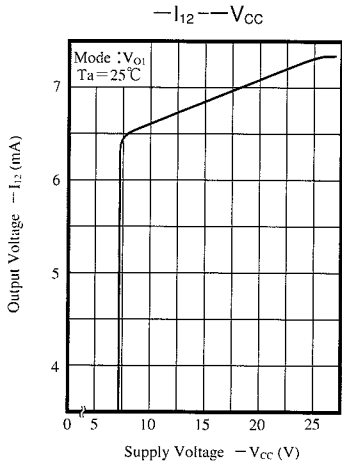
Parameter	Symbol	Range
Operating Supply Voltage Range	V _{CC}	-10V ~ -23V

Electrical Characteristics (V_{CC} = -23V, Ta = 25°C)

Parameter	Symbol	Condition	min.	typ.	max.	Unit
Supply Current (Normal)	I _{CC}		-7	-3.9	—	mA
Supply Current (Muting)	I _{CC (Mute)}		-20	-9.8	—	mA
Output Voltage (Muting)	V _{O (Mute)}		-0.3	—	—	V
Output Voltage (Normal)	V _O		—	—	-17.5	V

Characteristics Curve





Pin Descriptions

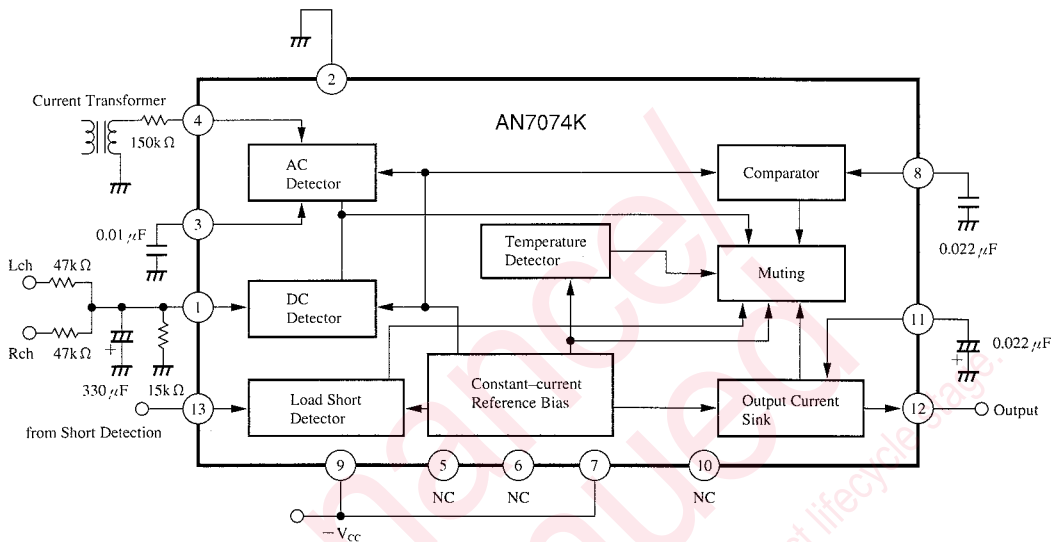
Pin No.	Pin Voltage (V)	Description	Equivalent Circuit
1	0	DC detection pin	
2	0	GND pin	
3	0	AC detection time constant setting pin	
4	0	AC detection electric potential detection pin	

Others

Pin Descriptions (Cont.)

Pin No.	Pin Voltage (V)	Description	Equivalent Circuit
5 6	—	NC	—
7	—	NC Although Pin ⑦ is not $-V_{CC}$ pin, connect to $-V_{CC}$. (Same electric potential as Pin ⑨) Never give it electric potential except $-V_{CC}$.	—
8	0	Muting time constant setting pin	
9	-23	Negative supply pin	—
10	—	NC	—
11	0	Rise time constant setting pin	
12	—	Output pin	
13	—	External load short detection pin	

Application Circuit



Although Pin⑦ is not $-V_{CC}$ pin, connect to $-V_{CC}$. (Same electric potential as Pin⑨)
Never give it electric potential except $-V_{CC}$.

Supplementary Explanation

• Usage

※ For the internal equivalent circuit, refer to the Pin Descriptions.

- (1) When power voltage of $-V_{CC}$ is applied, the AN7074K gets into the muting state.
- (2) When electric potential ($\pm 0.8V$ or larger) from the secondary coil of the AC transformer is applied thereafter to the AC detection pin (Pin④) through the $150k\Omega$ resistance, the muting state is cleared after the lapse of time determined by the capacitance of the external capacitor of Pin⑪. (Reference : After the lapse of 1 second in case the capacitance is $10\mu F$) This external capacitor of Pin③ protects AC from momentary power failure, and the AN7074K is never muted by momentary disconnection of the power supply.
When the muting mode was cleared, the AN7074K returns to the state of normal operation. Explained next is the operation under some abnormal condition.
- (3) If the output center point abnormally deviated due to a breakdown of the output T_r , electric potential ($\pm 0.8V$ or larger) from the output pins of Lch and Rch is applied to the DC detection pin (Pin①) through the high resistance for protection of the speakers, and the AN7074K gets into the muting state after the lapse of time determined by the capacitance of the external capacitor of Pin⑧. (Reference : After the lapse of 0.7 second in case the capacitance is $0.022\mu F$)
If the electric potential became $0V$, the muting state is cleared.
It is possible to lower the detection sensitivity by reducing the electric potential applied to Pin① by dividing the concerned resistance.
- (4) The voltage level on the short detection Pin⑬ is usually kept to $-V_{CC}$, and if the voltage of $-V_{CC}+4V$ or more was externally applied as the short detection signal, the AN7074K actuates the latch circuit and gets into the muting state. The mute mode once started is never cleared unless the power supply is cut off because of the actuated latch circuit.
- (5) The muting operation is no more than variation of the DC voltage on the output Pin⑫. It is necessary, therefore, to actuate the concerning relay by using this DC voltage, mute the drive stage of the output T_r , etc.

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