FAN7000D

Low Power Amplifier

Features

- Low quiescent current
- High power supply ripple rejection
- Low voltage operation
- A few of external part required
- Built in power save switch & mute switch

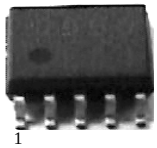
Typical Applications

- Portable compact disk player (DISCMAN)
- Portable mini disk player (MD)
- Disc-man
- MP3 player
- CD-ROM
- Other potable compact disk media
  Fan motor drive

Description

The FAN7000D is a monolithic integrated circuit and suitable dual amplifier for low power.

10-SSOP-225



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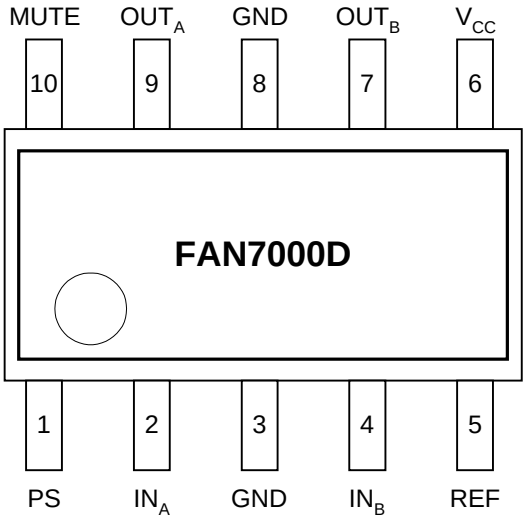
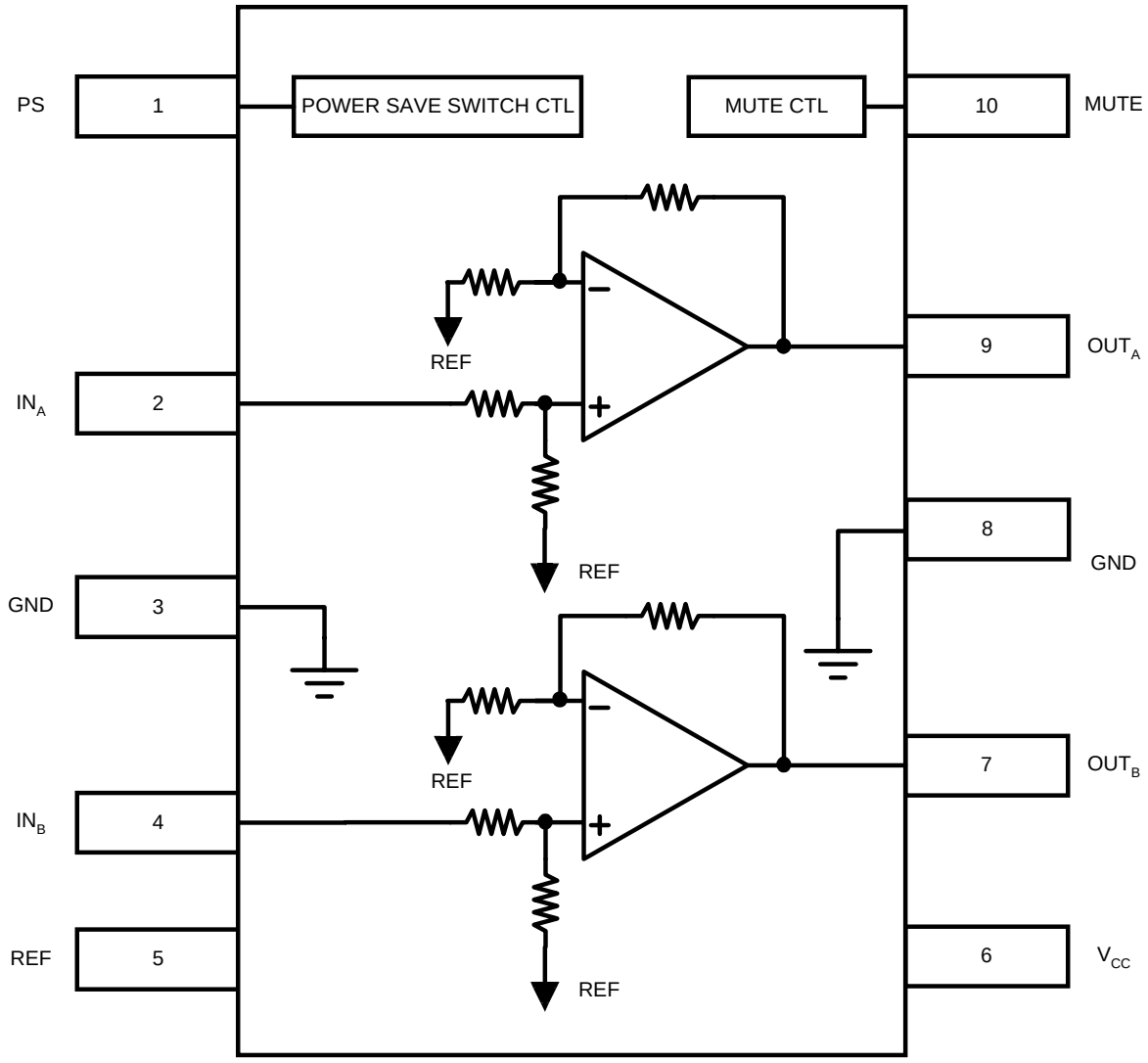
Pin Assignments



Pin Definitions

Pin Number	Pin Name	Pin Function Description
1	PS	Power Save Switch
2	IN_A	Signal Input A
3	GND	Signal Ground
4	IN_B	Signal Input B
5	REF	Reference Voltage
6	V_{CC}	Supply Voltage
7	OUT_B	Signal Output B
8	GND	Power Ground
9	OUT_A	Signal Output A
10	MUTE	Mute On Switch

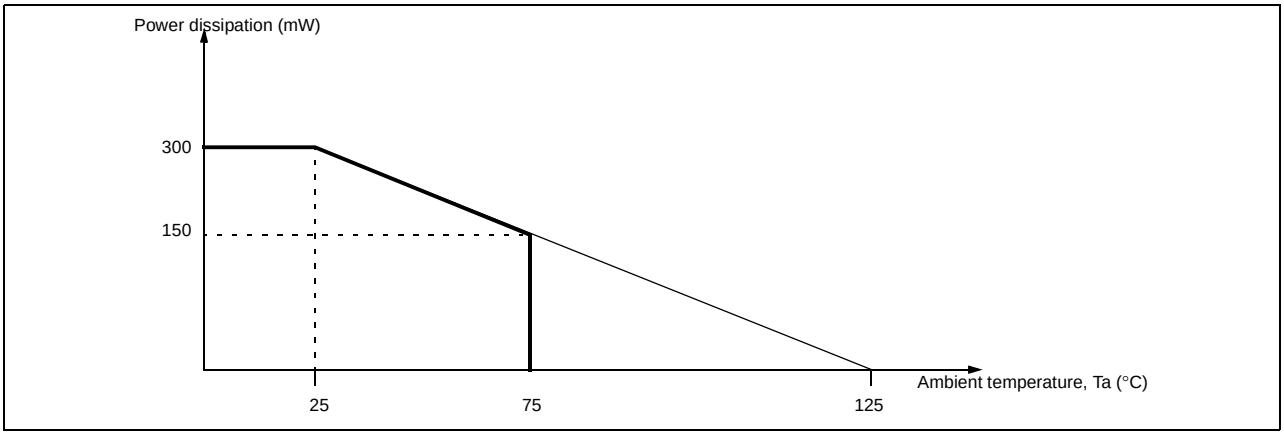
Internal Block Diagram



Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Value	Unit	Remark
Maximum Supply Voltage	V_{CC}	4.5	V	Maximum supply voltage
Power Dissipation	P_D	300	mW	Power dissipation
Operating Temperature	T_{OPR}	–20 ~ +75	°C	Operating temperature
Storage Temperature	T_{STG}	–55 ~ +125	°C	Storage temperature
Thermal Resistance	T_{ja}	150	°C/W	–

Power Dissipation Curve



Recommended Operating Conditions (Ta = 25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Operating Supply Voltage	V_{CC}	1.8	3.0	4.0	V
Recommended Load	R_L	16	–	32	Ω

Electrical Characteristics (R_L = 16Ω, Rg = 600Ω, Ta = 25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Quiescent Current 1	I_{CC1}	V_{CC} = 2.4V	-	5.5	10.0	mA
Quiescent Current 2	I_{CC2}	V_{CC} = 4.5V, Mute = GND	-	1.0	2.0	mA
Quiescent Current 3	I_{CC3}	V_{CC} = 4.5V, PS = GND	-	-	1.0	μA
Close Loop Voltage Gain 1	G_{VC1}	V_{CC} = 2.4V, f = 1KHz, V_O = –10dBm	30	32	34	dB
Close Loop Voltage Gain 2	G_{VC1}	V_{CC} = 1.8V, f = 1KHz, V_O = –20dBm	29	32	34	dB
Channel Balance 1	ΔG_{V1}	V_{CC} = 2.4V, f = 1KHz, V_O = –10dBm	-	-	1.0	dB
Channel Balance 2	ΔG_{V2}	V_{CC} = 1.8V, f = 1KHz, V_O = –20dBm	-	-	1.0	dB
Total Harmonic Distortion	THD	V_{CC} = 2.0V, f = 1KHz, P_O = 1mW	-	0.5	1.5	%
Ripple Rejection Ratio	RR	V_{CC} = 1.8V, f = 100Hz, Rg = 1KΩ, V_R = –20dBm, BPF = 100Hz	43	60	-	dB
Crosstalk	CT	V_{CC} = 2.4V, f = 100Hz, Rg = 1KΩ, V_O = –10dB	43	50	-	dB
Output Noise Voltage	V_{NOISE}	V_{CC} = 4.5V, Rg = 1KΩ, BPF = 20Hz ~ 20KHz	-	60	100	μVrms
Output Power	P_{OUT}	V_{CC} = 3.0V, f = 1KHz, THD = 10%	20	40	-	mW
PS Attenuation Ratio	ATT_{PS}	V_{CC} = 1.8V, f = 100Hz, PS = GND, V_{IN} = –10dB	-	-	-80	dB
MUTE attenuation ratio	ATT_{MU}	V_{CC} = 1.8V, f = 100Hz, MUTE = GND, V_{IN} = –10dB	-	-	-80	dB
PS ON input current	I_{PSON}	V_{CC} = 1.5V, V_{REF} ≥ 0.85V	-	0.2	1.0	μA
MUTE OFF input current	I_{MOFF}	V_{CC} = 1.5V, V_{REF} ≥ 0.85V	-	0.2	1.0	μA
PS ON high level	V_{HPS}	V_{CC} = 1.5V, V_{REF} ≥ 0.85V	0.5	0.65	-	V
MUTE OFF high level	V_{HMU}	V_{CC} = 1.5V, V_{REF} ≥ 0.85V	0.5	0.65	-	V

Application Information

1. PS Block

This block diagram describes the power save switch circuits.

The drive block is controlled by PS pin, which can be derived from micro controller.

It controls bias of the internal circuits of FAN7000D, so that it makes FAN7000D operate when input voltage level reaches high level.

2. Mute Block

The block diagram describes the mute on switch circuits.

The drive block is controlled by MUTE pin, which can be derived from micro controller.

When the pin of mute turns on, it makes reference voltage of internal circuits approximately 0V, so that it keeps the device of FAN7000D off.

3. AMP Block

This block diagram describes the AMP block with resistances, which control gain of FAN7000D.

The gain of FAN7000D is $\frac{V_{OUT}}{V_{IN}} \cong 40 \cong 32[dB]$

Output voltage of FAN7000D can be 40 times as much as input voltage, so it eliminates the number of external circuits and offers headphone input.

4. Popping Noise Reduction

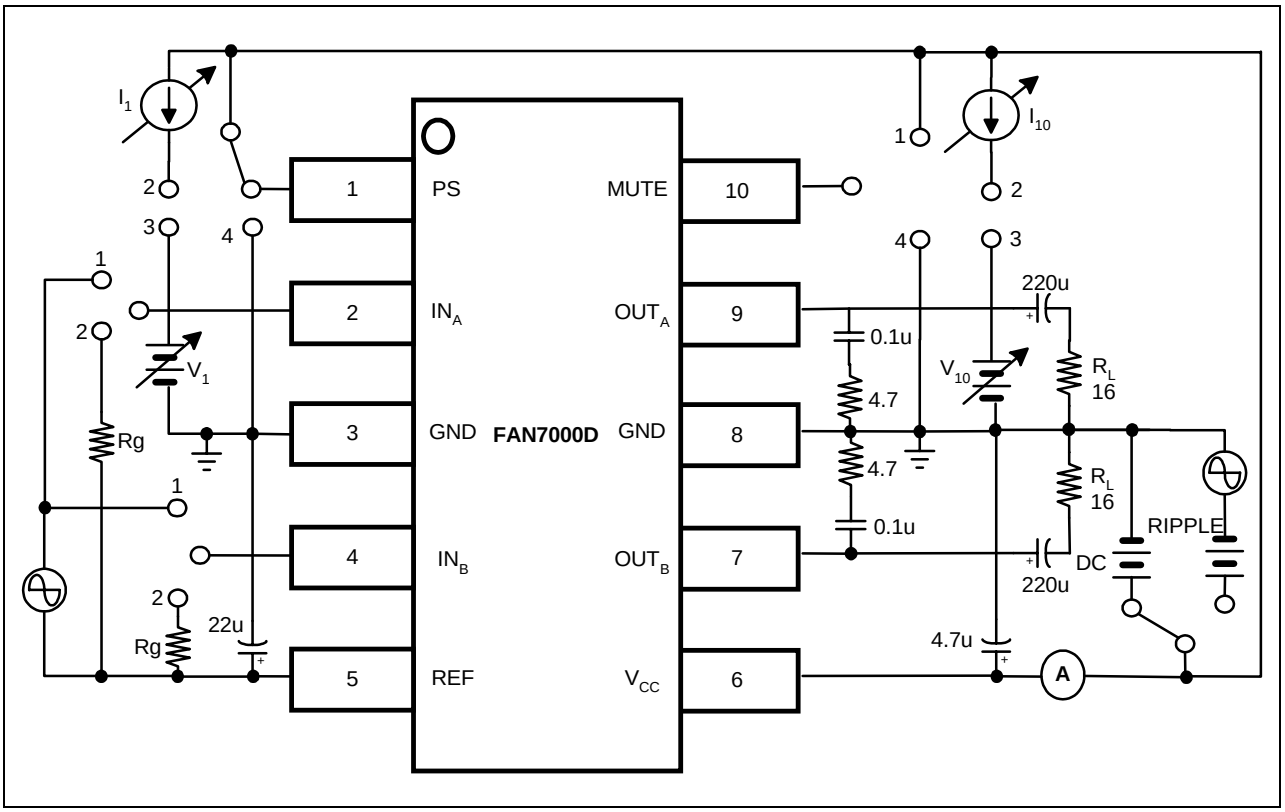
If PS pin (Pin1 , Power save switch) connect the micro controller, the micro controller must follow the same sequence 1 in order to reduce popping noise on mute mode.

PS on $\rightarrow$ Mute on $\rightarrow$ PS off $\rightarrow$ Mute operation $\rightarrow$ PS on $\rightarrow$ Mute off $\rightarrow$ Normal operation (Sequence 1)

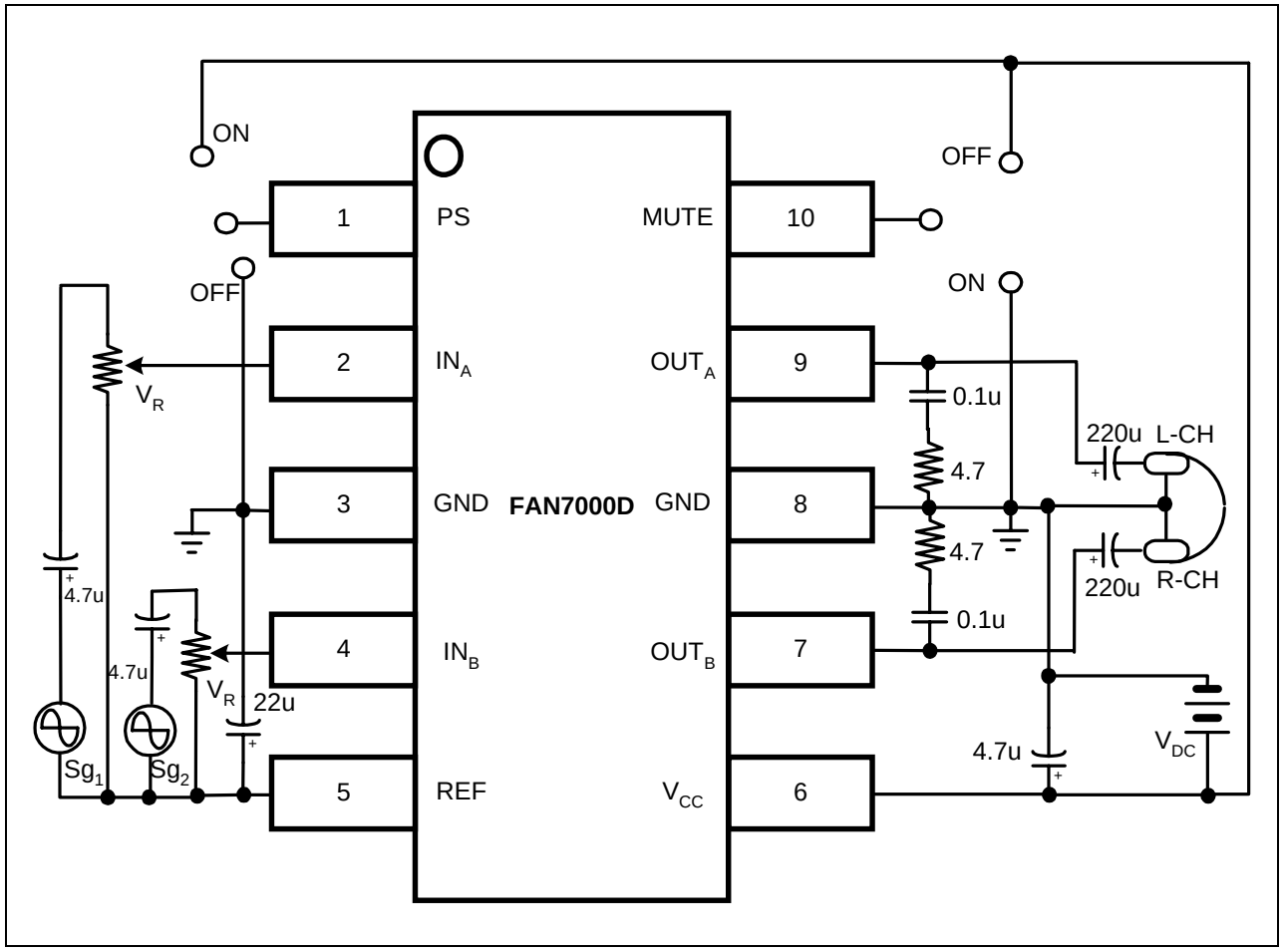
If PS connect V_{CC}, the micro controller follow the sequence 2.

Mute on $\rightarrow$ Mute Operation $\rightarrow$ Mute off $\rightarrow$ Normal operation (Sequence 2)

Test Circuits

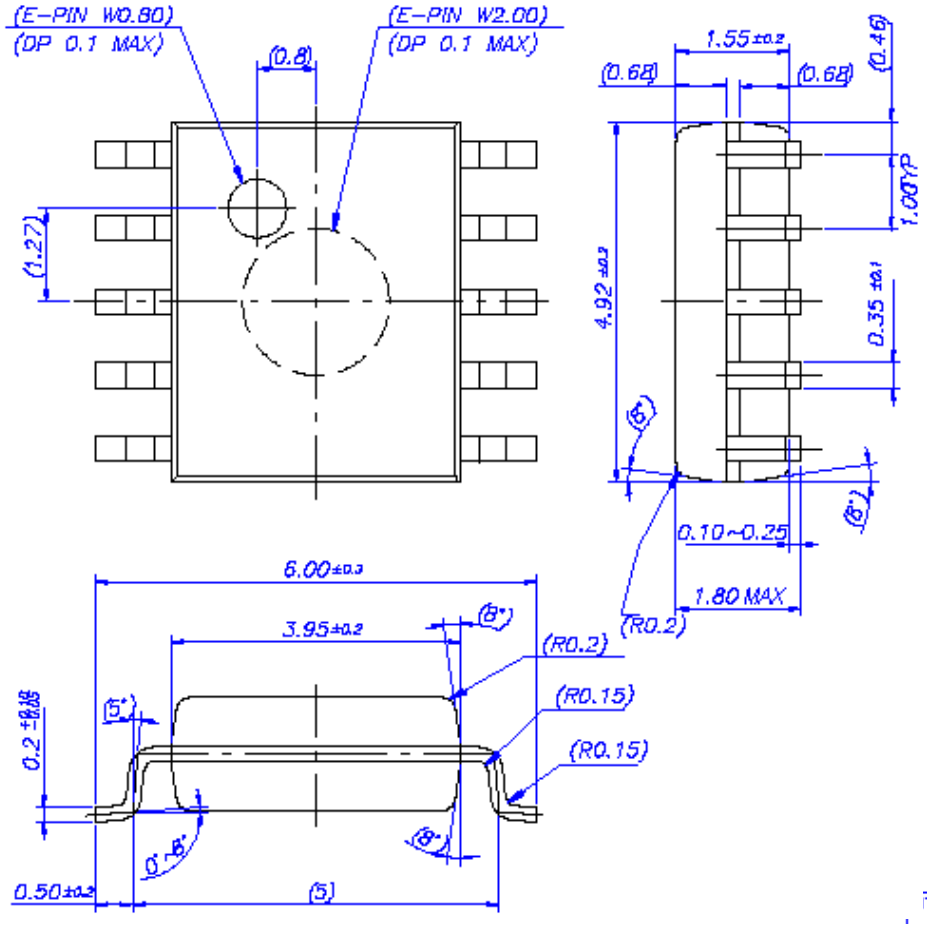


Typical Application Circuits



Package Dimensions

10-SSOP-225



Ordering Information

Device	Package	Operating Temp.
FAN7000D	10-SSOP-225	–20°C ~ +75°C
FAN7000DTF	10-SSOP-225	–20°C ~ +75°C

9/12/01 0.0m 001
Stock#DSxxxxxxxx