Structure Silicone monolithic integrated circuit

Product name Audio sound processor for TV

Model Name **BD3869AF/BD3869AS**

●Features

1. Built-in loudness linked to volume attenuation amount
2. Maximum of 3 channels can be used simultaneously with I^2C BUS control at the control voltage of 3.3V-5.5V
3. Use the Bi-CMOS process

●Absolute Maximum Ratings

Parameter		Symbol	Limits	Unit
Applied voltage		VCC	10.0	V
Input voltage		Vin	VCC+0.3～GND-0.3	V
Power Dissipation	BD3869AF	Pd	680 *1	mW
	BD3869AS		750 *2	
Operating temperature		Topr	-40～+85 *3	°C
Storage temperature		Tastg	-55～+150	°C

*1 At Ta＝25°C or higher, this value is decreased to 5.5mW/°C. Thermal resistance θja = 181.8 (°C/W).

*2 At Ta＝25°C or higher, this value is decreased to 6.0mW/°C. Thermal resistance θja = 166.7 (°C/W).
When Rohm standard board is mounted.
Rohm standard board: size: 70×70×1.6 (mm^3)
material: FR4 glass-epoxy substrate (copper foil area: not more than 3%).

*3 As long as voltage stays within operating voltage range, certain circuit operation is guaranteed in the operating temperature range.
Allowable loss conditions are related to temperature, to which care must be taken.
In addition though the standard value of its electrical characteristics cannot be guaranteed under the conditions other than those specified, original functions are maintained.

●Operating Voltage Range

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage *4	VCC	5.3	9.0	9.5	V

Basic operation shall be available at Ta=25°C.

*4 As long as temperature components must be set in accordance with the operating voltage and temperature ranges before using this IC.
In addition, though the standard value of its electrical characteristics cannot be guaranteed under the conditions other than those specified, original functions are maintained.

●Function

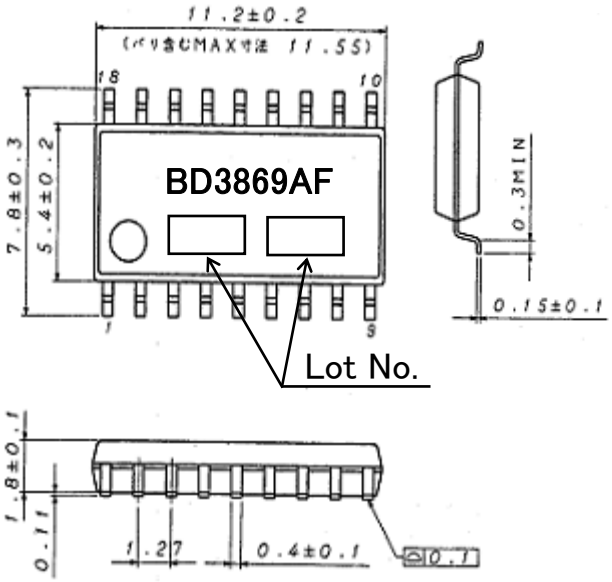
Function	Specifications
Front volume	From 0dB to -89dB(1dB step)
Loudness	Volume attenuation linked type
Bass	±14dB(2dB Step),
Treble	±14dB(2dB Step),
Rear Volume	From 0dB to-20dB(1dB step), -25dB,-30dB,-35dB-45dB,-60dB, MUTE

●Electrical characteristics

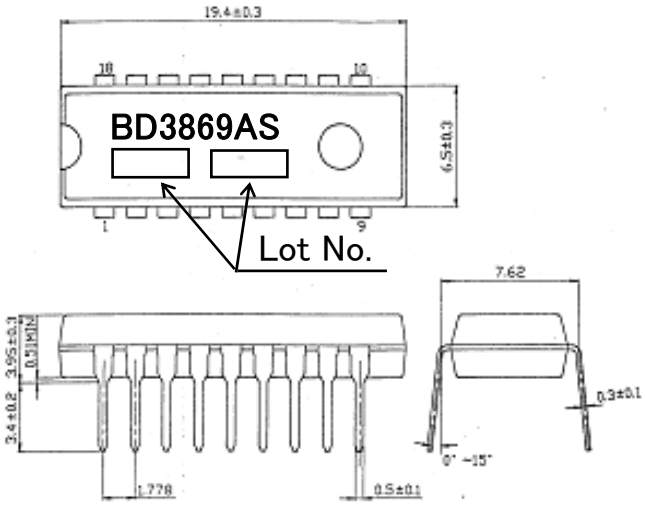
Unless specified: Ta=25℃, VCC=9V, f=1kHz, Vin=1Vrms, Rg=600Ω, RL=10kΩ, A single input, Input gain 0dB, Volume = 0dB, middle 0dB, bass = 0dB, treble = 0dB, fader 0dB

Parameter	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
Circuit current upon no signal	IQ	-	3	7	mA	Vin=0Vrms
Maximum input voltage	VIM	2.2	2.5	-	Vrms	Front Volume = -6dB THD(Vout)=1%
Maximum output voltage	VOM	2.1	2.3	-	Vrms	THD=1%
Voltage gain	GV	-2	0	2	dB	Gv=20log(Vout/Vin)
Channel balance	CB	-1.5	0	1.5	dB	CB = Gv1-Gv2
Total harmonic distortion	THD	-	0.01	0.2	%	Vout=1Vrms BPF=400-30kHz
Output noise voltage	VNO	-	2.3	15	μVrms	BPF = IHF-A Rg=0Ω
Residual noise voltage	VMNO	-	1.4	10	μVrms	Front Volume = -89dB Rear Volume = -∞, BPF = IHF-A Rg=0Ω
Cross talk 1ch→2ch	CT	70	95	-	dB	CT = 20log(Vin/Vout), BPF=IHF-A
Maximum attenuation	ATT_{MAX}	-	-114	-90	dB	Front Volume = -89dB Rear Volume = -∞, ATT_{MAX}=20log(Vout/Vin) BPF=IHF-A

●Dimensional outline drawing

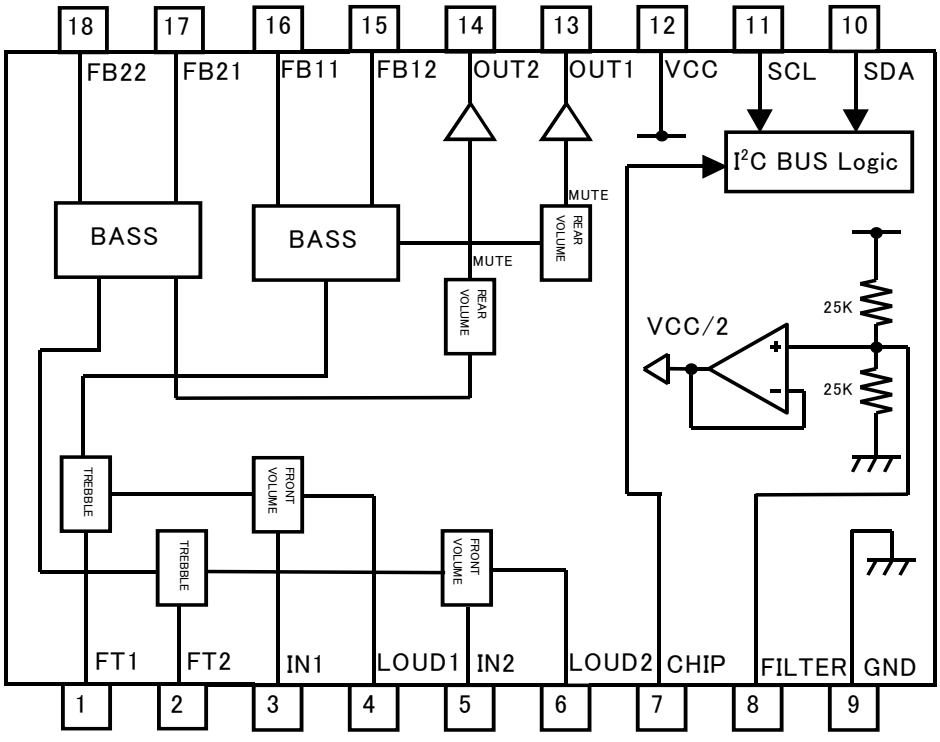


SOP-18 (Unit : mm)



SDIP-18 (Unit : mm)

●Block diagram



●Cautions on use

(1) Numbers and data in entries are representative design values and are not guaranteed values of the items.
(2) Although we are confident in recommending the sample application circuits, carefully check their characteristics further when using them. When modifying externally attached component constants before use, determine them so that they have sufficient margins by taking into account variations in externally attached components and the Rohm LSI, not only for static characteristics but also including transient characteristics.
(3) Absolute maximum ratings
If applied voltage, operating temperature range, or other absolute maximum ratings are exceeded, the LSI may be damaged. Do not apply voltages or temperatures that exceed the absolute maximum ratings. If you think of a case in which absolute maximum ratings are exceeded, enforce fuses or other physical safety measures and investigate how not to apply the conditions under which absolute maximum ratings are exceeded to the LSI.
(4) GND potential
Make the GND pin voltage such that it is the lowest voltage even when operating below it. Actually confirm that the voltage of each pin does not become a lower voltage than the GND pin, including transient phenomena.
(5) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
(6) Shorts between pins and misinstallation
When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is misinstalled and the power is turned on, the LSI may be damaged. It also may be damaged if it is shorted by a foreign substance coming between pins of the LSI or between a pin and a power supply or a pin and a GND.
(7) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

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