

Structure Silicone monolithic integrated circuit

Product Name SCF built-in sound processor for car audio

Model Name **BD3801FS**

●Features

1. Switching noise of volume attenuation, tone gain and mute is alleviated by the soft switching circuit.
2. The number of external parts can be greatly reduced by incorporating external filter by switched capacitor circuit technology.
3. Use the Bi-CMOS process
4. I²C BUS control with the control voltage of 3.3V-5.0V.

●Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Applied Voltage	VCC	10.0	V
Input Voltage	V _{IN}	VCC+0.3~GND-0.3	V
Power Dissipation	Pd	950 *1	mW
Operating Temperature	Topr	-40~+85 *2	°C
Storage Temperature	Tastg	-55~+150	°C

*1 At Ta=25°C or higher, this value is decreased to 7.6mW/°C.

When Rohm standard board is mounted. Thermal resistance $\theta_{ja} = 131.6(^{\circ}\text{C}/\text{W})$.

Rohm standard board: size: 70×70×1.6 (mm³)

material: FR4 glass-epoxy substrate (copper foil area: not more than 3%).

*2 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 *3	VCC	7.0	-	9.5	V

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

*3 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

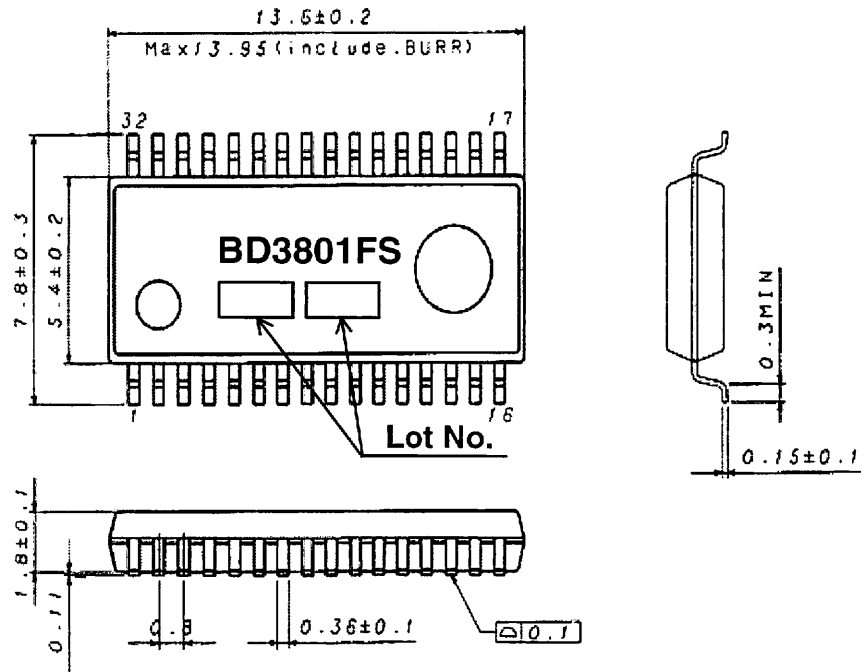
Function	Specifications
Input selector	Stereo 5 input Stereo 5 input, A input is the gland isolation amplifier input
Monaural Input	Equipped with 2 system of phone voice monaural and gland isolation amplifier input
Input gain	0~15dB, 1dB step
Mute	Control by I ² C BUS and external forced mute terminal can be done. Soft switching can be done with switching time in 4 steps
Volume	+6dB~-73dB(1dB step), -∞dB Soft switching can be done with switching time in 4 steps
Bass	-14~+14dB(2dB step), Q=0.5, 0.75, 1, 1.25 fo=30, 70, 100, 130Hz Soft switching can be done with switching time in 4 steps
Middle	-14~+14dB(2dB step), Q=0.4, 0.6, 0.8, 1 fo=400Hz, 1kHz Soft switching can be done for gain switching
Treble	-14~+14dB(2dB step), fc=5, 7.5, 10, 12.5kHz Soft switching can be done for gain switching
Fader	0dB~-60dB(2dB step), -∞dB

●Electrical characteristics

Unless otherwise specified, Ta=25°C, VCC=9V, f=1kHz, Vin=1Vrms, Rg=600Ω, RL=10kΩ, Input gain 0dB, Volume 0dB, Tone 0dB, Fader 0dB

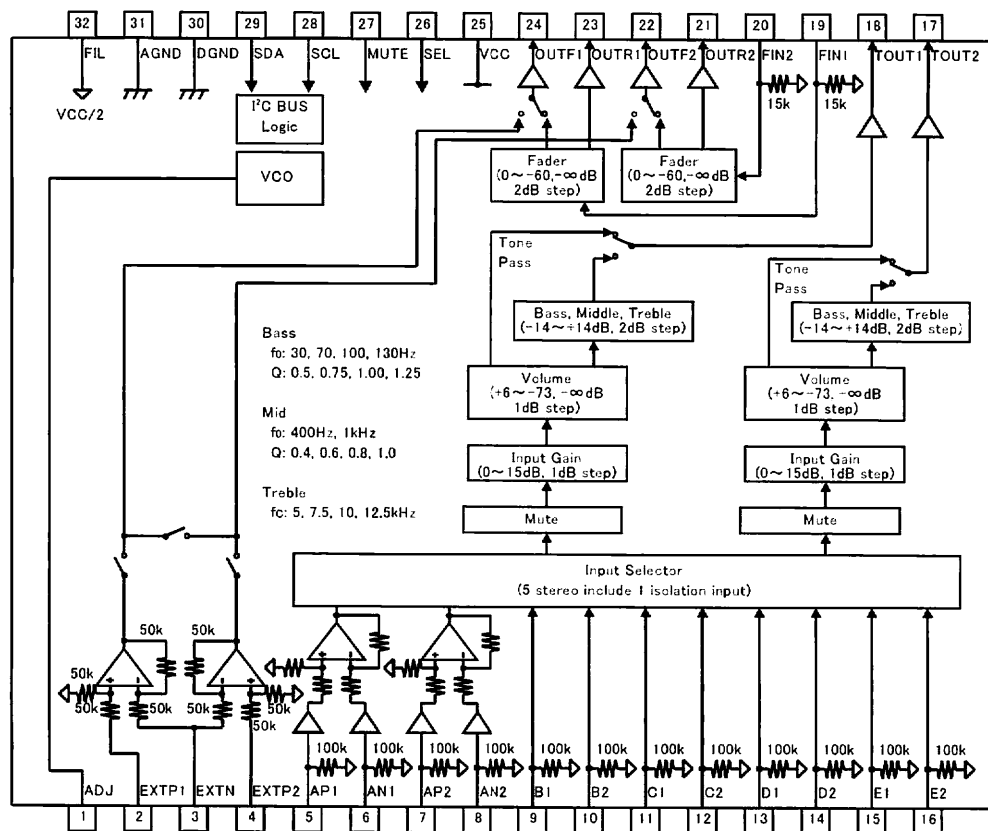
Parameter	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
Current upon no signal	IQ	-	10	30	mA	VIN=0Vrms
Voltage gain	GV	-1.5	0	1.5	dB	GV=20log(VOUT/VIN)
Channel balance	CB	-1.5	0	1.5	dB	CB = GV1-GV2
Total harmonic distortion	THD	-	0.005	0.1	%	VOUT=1Vrms, BW=400-30kHz
Output noise voltage	VNO	-	6	26	μVrms	Rg = 0Ω, BW = IHF-A
Residual output noise voltage	VNOR	-	2	10	μVrms	Volume & Fader = -∞dB Rg = 0Ω, BW = IHF-A
Cross-talk between channels	CTC	-	-90	-80	dB	Rg = 0Ω, BW = IHF-A
Ripple rejection	RR	-	-50	-40	dB	f=100Hz, VRR=100mVrms RR=20log(VOUT/VIN)
Maximum input voltage	VIM	2.1	2.5	-	Vrms	VIM at THD(VOUT)=1% BW=400-30kHz
Maximum attenuation *	GV MIN	-	-95	-85	dB	Volume = -∞dB GV=20log(VOUT/VIN) BW = IHF-A
Maximum output voltage	VOM	2.1	2.5	-	Vrms	THD(VOUT)=1% BW=400-30kHz

● Dimensional outline drawing



SSOP-A32 (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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