

Structure Silicone monolithic integrated circuit

Product Name SCF built-in sound processor for car audio

Model Name **BD3805F**

●Features

- 1.Noise reduction for the gain switching through the soft switching circuit
- 2.Built-in external filter using 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	550 *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 5.5mW/°C.

When Rohm standard board is mounted. Thermal resistance $\theta_{ja} = 181.8$ (°C/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

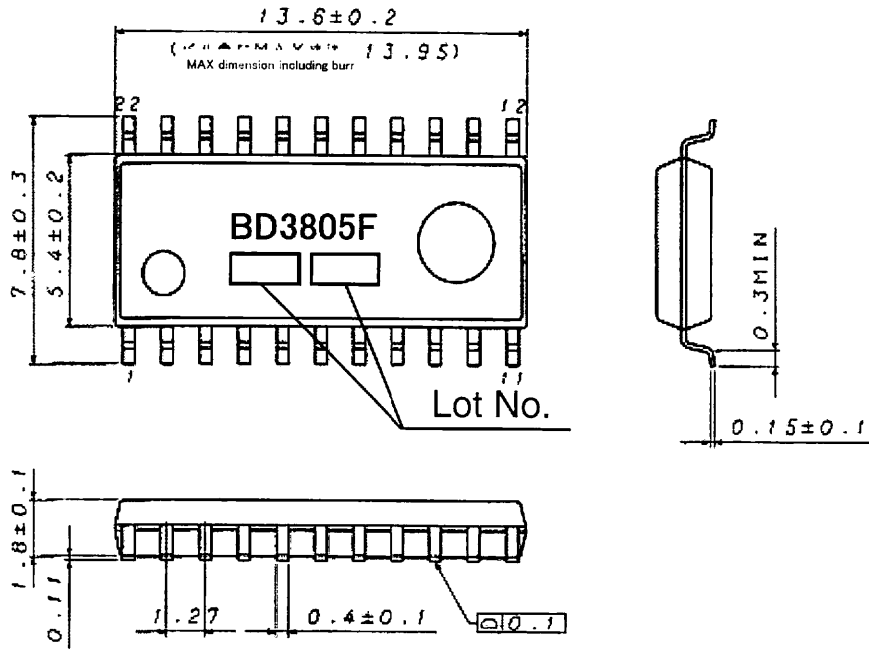
Function	Specifications
Input Selector	Stereo 4 input, A input can be switched between single and differential put
Input gain	0~15dB, 1dB step
Mute	Control by I ² C Bus and external forced mute terminal cab be done. Soft switching can be done with switching time in 4 steps.
Volume	+23dB~-79dB(1dB step), -∞dB; Soft switching can be done with switching time in 4 steps.
Middle	-15~+15dB(1dB step), Q=1, f0=500Hz, 1kHz; Soft switching can be done with gain switching
Bass	-15~+15dB(1dB step), Q=0.5, 0.75, 1, 1.25 f0=60, 70, 80, 100, 120, 140, 160, 200Hz; Soft switching can be done with gain switching
Treble	-15~+15dB(1dB step), fc=5, 7.5, 10, 12.5kHz; Soft switching can be done with gain switching
Fader	0dB~-58dB(2dB step), -∞dB; Soft switching can be done with switching time in 4 steps.

●Electrical characteristics

Unless otherwise specified, Ta=25°C, 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

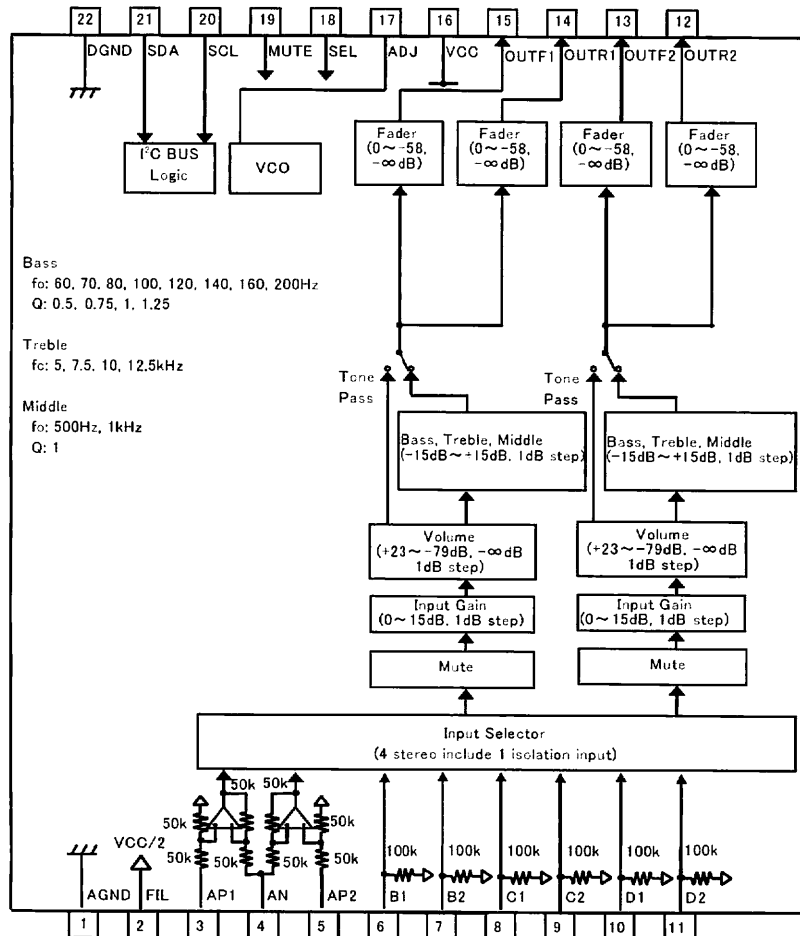
Parameter	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
Circuit Current upon no signal	I _Q	-	12	30	mA	VIN=0Vrms
Voltage gain	G _V	-1.5	0	1.5	dB	G _V =20log(VOUT/VIN)
Channel balance	CB	-1.5	0	1.5	dB	CB = GV1-GV2
Total harmonic distortion	THD	-	0.008	0.1	%	VOUT=1Vrms, BW=400-30kHz
Output noise voltage	V _{NO}	-	5	26	μVrms	Rg = 0Ω, BW = IHF-A
Residual output noise voltage*	V _{NOR}	-	2	10	μVrms	Fader = -∞dB, Rg = 0Ω BW = IHF-A
Cross-talk between channels *	CTC	-	-100	-80	dB	Rg = 0Ω, CTC=20log(VOUT/VIN) BW = IHF-A
Ripple rejection	RR	-	-70	-40	dB	f=100Hz, VRR=100mVrms RR=20log(VOUT/VIN)
Maximum input voltage	V _{IM}	2.1	2.5	-	Vrms	VIM at THD(VOUT)=1% BW=400-30KHz
Maximum gain	G _{V MAX}	+21	+23	+25	dB	Volume=+23dB, VIN=100mVrms, G _V =20log(VOUT/VIN)
Mute attenuation	G _{V MIN}	-	-100	-85	dB	Volume = -∞dB G _V =20log(VOUT/VIN) BW = IHF-A
Maximum output voltage	V _{OM}	2.1	2.5	-	Vrms	THD=1% BW=400-30KHz

●Dimensional outline drawing



SOP22 (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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