Structure : Silicon Monolithic Integrated Circuit

Product : Sound processor for car audio

Type : **BD3485FS**

Package : SSOP-A32

●Feature

1. Reduce the external components by built-in equalizer filters.
   Possible to control Bass Treble Middle and LPF equalizer freely.
2. Built-in operational amplifier in front output for Super Bass function. Possible to control gain setting.
3. It is equipped with 2 systems of output terminals of Subwoofer. Moreover, the stereo signal of the front and rear, too, can be output by the I^2C BUS control.
4. Reduce the switching noise of Volume, Fader, Super Bass, Bass Middle Treble LPF gain and attenuation by using advanced switch circuit. (Possible to control all steps.)
5. It is possible for the bass, middle, treble to correspond to the simple loudness, too, with the gain adjustment quantity of ±20dB and 1 dB step gain adjustment.
6. Bi-CMOS process is suitable for the design
7. Built-in ground isolation amplifier inputs, ideal for external stereo input.
8. The package of this IC is SSOP-A32. The PCB layout can be easy and the area of PCB is reduced by putting sound input terminals together, and output terminals too.
9. It is possible to control by 3.3V / 5V for I^2C BUS and 2 wire serial controller.

●Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Power supply Voltage	VCC	10.0	V
Input Voltage	VIN	VCC+0.3～GND-0.3	V
Power Dissipation	Pd	950 *1	mW
Storage Temperature	Tastg	-55～+150	°C

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

●Operating Range

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	VCC	7.0	-	9.5	V
Temperature	Topr	-40	-	+85	℃

※ Design against radiation-proof isn't made.

Status of this document
The Japanese version of this document is the formal specification. A customer may use this translation only for a reference to help reading the formal version. If there are any differences in translation version of this document, formal version takes priority.

Application example
- ROHM cannot provide adequate confirmation of patents.
- The product described in this specification is designed to be used with ordinary electronic equipment or device (such as audio-visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys.)
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- ROHM assumes no responsibility for use of any circuits described herein, conveys no license under any patent or other right, and makes no representations that the circuits are free from patent infringement.

●Function

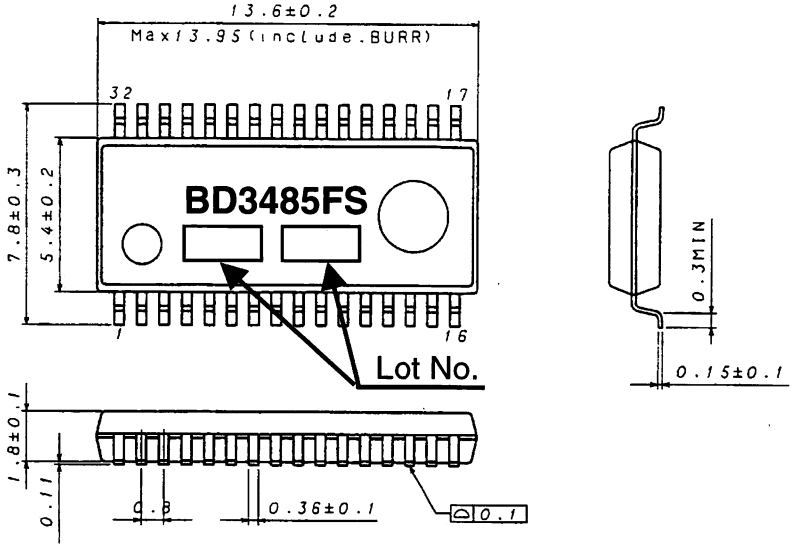
Function	Specifications
Input selector	Stereo 4 input Possible to select single/differential input at D input
Input gain	0～20dB (1dB step)
Mute	Possible to control by I^2C BUS or external compulsory mute terminal, Possible to use advanced switch and select 4 switching time
Volume	+15dB～-79dB (1dB step), -∞dB Possible to use advanced switch and select 8 switching time
Bass	-20～+20dB (1dB step), Q= 0.5, 1, 1.5, 2、 f0=60, 80, 100, 120 Possible to use advanced switch at changing gain
Middle	-20～+20dB (1dB step), Q= 0.75, 1, 1.25, 1.5、 f0=500, 1k, 1.5k 2.5k Possible to use advanced switch at changing gain
Treble	-20～+20dB (1dB step), Q= 0.75, 1.25、 f0=7.5k, 10k, 12.5k, 15k Possible to use advanced switch at changing gain
Fader	+15dB～-79dB (1dB step), -∞dB Possible to use advanced switch and select 8 switching time
Super Bass	0dB~20dB(0~+10dB/1dB step, +10dB~+20dB/2dB step)
LPF	fc=80/120/160Hz、 LPF=off
Level meter	2-wired serial control, DC Output

●Electrical characteristics

Unless specified particularly, Ta=25℃, VCC=8.5V, f=1kHz, Vin=1Vrms, Rg=600Ω, RL=10kΩ, A input,
Input gain 0dB, Mute off, Volume 0dB, Tone control 0dB, Super Bass 0dB, Fader 0dB

Item	Symbol	Limit			Unit	Condition
		Min.	Typ.	Max.		
Current upon no signal	I_Q	–	36	50	mA	No Signal
Voltage gain	G_V	-1.5	0	1.5	dB	Gv=20log(VOUT/VIN)
Channel balance	CB	-1.5	0	1.5	dB	CB=G_{V1}-G_{V2}
Total harmonic distortion	THD	–	0.007	0.05	%	VOUT=1Vrms BW=400-30kHz
Output noise voltage	V_{NO}	–	10.5	25	μVrms	Rg=0Ω BW=IHF-A
Residual output noise voltage	V_{NOR}	–	2.5	10	μVrms	Fader=-∞dB Rg=0Ω BW=IHF-A
Cross-talk between channels	CTC	–	-100	-90	dB	Rg=0Ω CTC=20log(VOUT/VIN) BW=IHF-A
Ripple rejection	RR	–	-70	-40	dB	f=100Hz VRR=100mVrms RR=20log(VOUT/VCCIN)
Common mode rejection ratio	CMRR	50	65	–	dB	DP1 and DN input DP2 and DN input CMRR=20log(VIN/VOUT) BW=IHF-A
Maximum input voltage	V_{IM}	2.1	2.3	–	Vrms	VIM at THD+N(VOUT)=1% BW=400-30kHz
Maximum gain	$G_{V\,MAX}$	+13	+15	+17	dB	Volume=+15dB VIN=100mVrms Gv=20log(VOUT/VIN)
Maximum attenuation	$G_{F\,MIN}$	–	-100	-85	dB	Volume=-∞dB Gf=20log(VOUT/VIN) BW=IHF-A
Maximum output voltage	V_{OM}	2	2.2	–	Vrms	THD+N=1% BW=400-30kHz

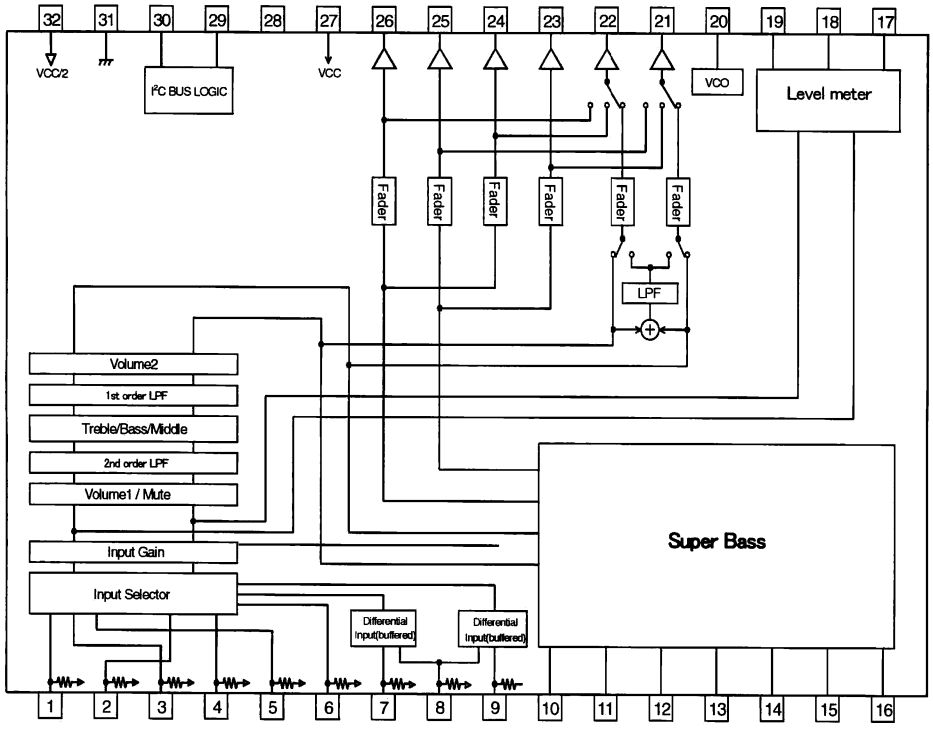
●Dimensional outline drawing



(UNIT:mm)

SSOP-A32

●Block diagram



●Terminal No. / Terminal Name

Terminal No.	Terminal name
1	A1
2	A2
3	B1
4	B2
5	C1
6	C2
7	DP1
8	DN
9	DP2
10	SB32
11	SB12
12	SB22
13	SBIAS
14	SB21
15	SB11
16	SB31
17	CLK
18	DATA
19	LOUT
20	ADJ
21	OUTS2
22	OUTS1
23	OUTR2
24	OUTR1
25	OUTF2
26	OUTF1
27	VCC
28	MUTE
29	SCL
30	SDA
31	GND
32	FIL

●Cautions on use

(1) 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.
(2) 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.
(3) Thermal design
Perform thermal design in which there are adequate margins by taking into account the allowable power dissipation in actual states of use.
(4) 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.
(5) Operation in strong magnetic fields
Adequately evaluate use in a strong magnetic field, since there is a possibility of malfunction.

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Please contact our sales offices for details ;

U.S.A / San Diego	TEL : +1(858)625-3630	FAX : +1(858)625-3670
Atlanta	TEL : +1(770)754-5972	FAX : +1(770)754-0691
Dallas	TEL : +1(972)312-8818	FAX : +1(972)312-0330
Germany / Dusseldorf	TEL : +49(2154)9210	FAX : +49(2154)921400
United Kingdom / London	TEL : +44(1)908-282-666	FAX : +44(1)908-282-528
France / Paris	TEL : +33(0)1 56 97 30 60	FAX : +33(0) 1 56 97 30 80
China / Hong Kong	TEL : +852(2)740-6262	FAX : +852(2)375-8971
Shanghai	TEL : +86(21)6279-2727	FAX : +86(21)6247-2066
Dilian	TEL : +86(411)8230-8549	FAX : +86(411)8230-8537
Beijing	TEL : +86(10)8525-2483	FAX : +86(10)8525-2489
Taiwan / Taipei	TEL : +866(2)2500-6956	FAX : +866(2)2503-2869
Korea / Seoul	TEL : +82(2)8182-700	FAX : +82(2)8182-715
Singapore	TEL : +65-6332-2322	FAX : +65-6332-5662
Malaysia / Kuala Lumpur	TEL : +60(3)7958-8355	FAX : +60(3)7958-8377
Philippines / Manila	TEL : +63(2)807-6872	FAX : +63(2)809-1422
Thailand / Bangkok	TEL : +66(2)254-4890	FAX : +66(2)256-6334

Japan /
(Internal Sales)

Tokyo 2-1-1, Yaesu, Chuo-ku, Tokyo 104-0082
TEL : +81(3)5203-0321 FAX : +81(3)5203-0300

Yokohama 2-4-8, Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa 222-8575
TEL : +81(45)476-2131 FAX : +81(45)476-2128

Nagoya Dainagayo Building 9F 3-28-12, Meieki, Nakamura-ku, Nagoya,Aichi 450-0002
TEL : +81(52)581-8521 FAX : +81(52)561-2173

Kyoto 579-32 Higashi Shiokouji-cho, Karasuma Nishi-iru, Shiokoujidori, Shimogyo-ku, Kyoto 600-8216
TEL : +81(75)311-2121 FAX : +81(75)314-6559

(Contact address for overseas customers in Japan)

Yokohama TEL : +81(45)476-9270 FAX : +81(045)476-9271

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