

Structure : Silicon Monolithic Integrated Circuit

Product : Audio Sound Controller for home audio

Type : **BD3861FS**

- Features :
- 1) High S/N achieved by implementing 2-stage configuration of Front Volume and Rear Volume
  - 2) Volume and Tone implemented with the resistance ladder circuit to achieve high performance with low noise and low distortion
  - 3) Adopting the BiCMOS process achieves low-consumption current, which contributes to energy-saving design.  
It has the advantage in quality over scaling down of the internal regulators and heat control.
  - 4) For the packages, SSOP-A32 is used. Input pins and output pins are organized and separately laid out so as to keep the signal flows in one direction; consequently, simplifying pattern layout of the set board and decreasing the board dimensions.

Absolute Maximum Ratings (Ta=25°C)

Item	Symbol	Value	Unit
Power Supply Voltage	Vcc	10	V
Power Dissipation	Pd	950*2	mW
Input Voltage Range	Vin	GND-0.3 to Vcc+0.3	V
Operation Temperature Range	Topr	-25 to +75	°C
Storage Temperature Range	Tstg	-55 to +125	°C

\*Over Ta=25°C, derating at the rate of 9.5mW/°C.  
When installed on the standard board (size: 70 × 70 × 1.6mm).

Operating Voltage Range

Symbol	Range	Unit
Vcc	6.5 to 9.5	V

Note that ROHM cannot provide adequate confirmation of patents.

The product described in this specification is designed to be used with ordinary electronic equipment or devices (such as audio-visual equipment, office-automation equipment, communications devices, electrical appliances, and electronic toys).

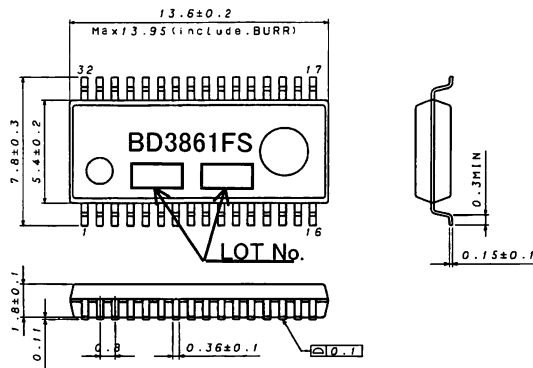
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Electrical characteristics

VCC=9V, f=1KHz, VIN=1Vrms, Rg=600Ω, RL=10KΩ, Ta=25°C, Input Gain=0dB, VOL=0dB, Bass, Middle, Treble=0dB, unless otherwise noted.

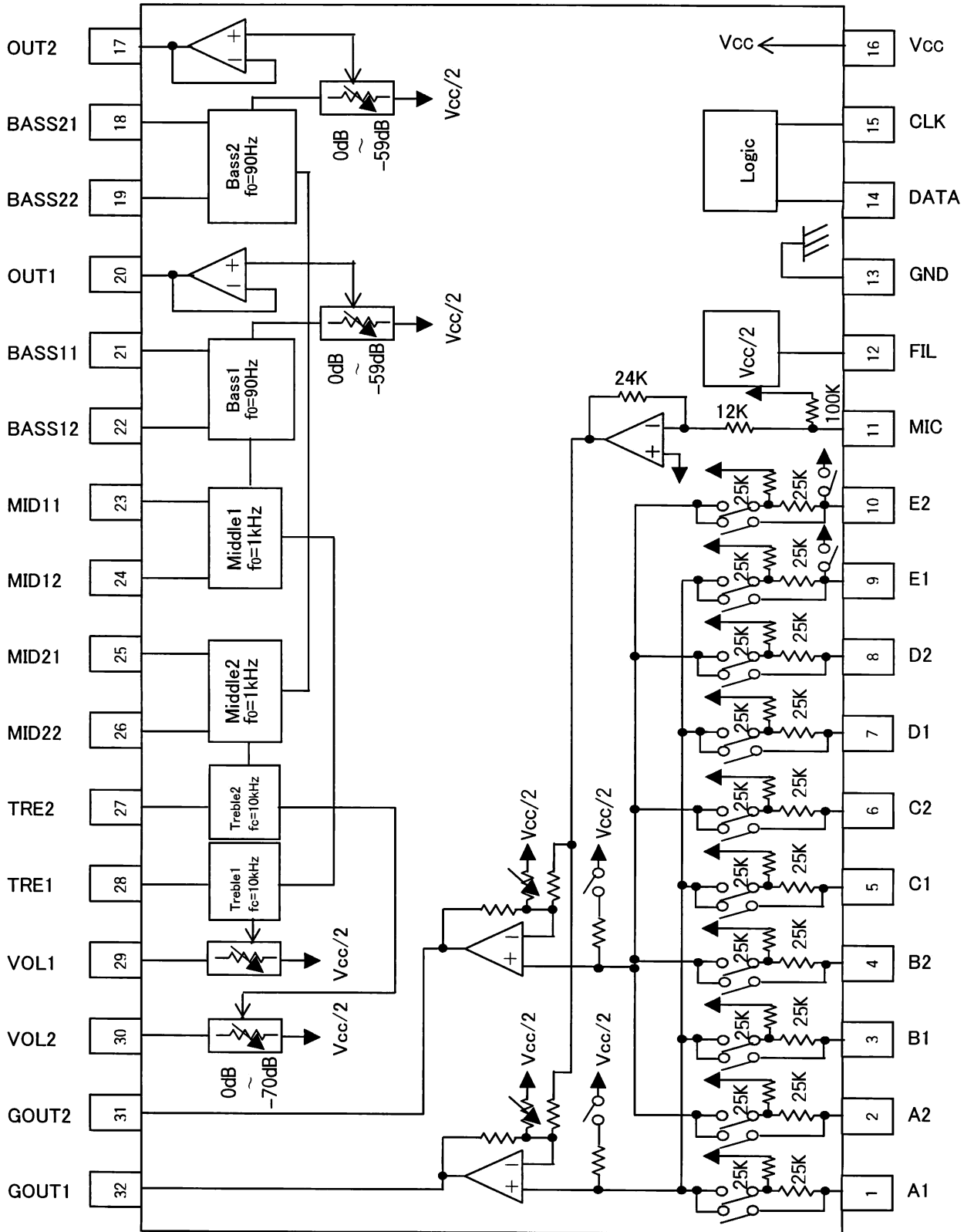
Item	Symbol	Standard Value			Unit	Condition
		Min.	Typ.	Max.		
Circuit Current	IQ	-	13.0	26.0	mA	At no signal
Output Voltage Gain	GV	-1.5	0.0	1.5	dB	GV=20log(VOUT/VIN)
Total Harmonic Distortion	THD	-	0.02	0.08	%	400 to 30kHz BPF
Maximum Output Voltage	VOM	2.0	2.5	-	Vrms	THD=1%
Output Noise Voltage	VNO	-	8.0	15.0	μVrms	Rg=0kΩ, IHF-A
Cross-talk between Channels	CT	-	-80	-70	dB	Rg=0kΩ, IHF-A
6dB SW Gain	GV6	5	6	7	dB	VIN=200mVrms GV6=20log(VOUT/VIN)
Cross-talk between Selectors	CS	-	-80.0	-70.0	dB	Rg=0kΩ, IHF-A CS=20log(VOUT/VIN)
INPUT MUTE Amount	GminI	-	-	-90.0	dB	IHF-A GminI=20log(VOUT/VIN)
OUTPUT MUTE Amount	GminO	-	-	-90.0	dB	IHF-A GminO=20log(VOUT/VIN)
Bass Boost Gain (Max)	GBB	12	14	16	dB	VIN=200mVrms, f=90Hz, From 0 to 14dB GBB=20log(VOUT/VIN)
Bass Cut Gain (Max)	GBC	-16	-14	-12	dB	VIN=200mVrms, f=90Hz, From -14 to 0dB GBC=20log(VOUT/VIN)
Middle Boost Gain (Max)	GMB	10	12	14	dB	VIN=200mVrms, f=1kHz From 0 to 12dB GMB=20log(VOUT/VIN)
Middle Cut Gain (Max)	GMC	-14	-12	-10	dB	VIN=200mVrms, f=1kHz From -12 to 0dB GMC=20log(VOUT/VIN)
Treble Boost Gain (Max)	GTB	10	12	14	dB	VIN=200mVrms, f=10kHz From 0 to 12dB GTB=20log(VOUT/VIN)
Treble Cut Gain (Max)	GTC	-14	-12	-10	dB	VIN=200mVrms, f=10kHz From -12 to 0dB GTC=20log(VOUT/VIN)
Microphone Voltage Gain	GMIC	4.5	6.0	7.5	dB	VIN=200mVrms GMIC=20log(VOUT/VIN)

Outline dimensions and Marking diagram



SSOP-A32 Unit: (mm)

Block diagram



Terminal description

Terminal number	Terminal name	Terminal description	Terminal number	Terminal name	Terminal description
1	A1	1ch input terminal A	17	OUT2	2ch output terminal
2	A2	2ch input terminal A	18	BASS21	2ch bass filter setting terminal
3	B1	1ch input terminal B	19	BASS22	2ch bass filter setting terminal
4	B2	2ch input terminal B	20	OUT1	1ch output terminal
5	C1	1ch input terminal C	21	BASS11	1ch bass filter setting terminal
6	C2	2ch input terminal C	22	BASS12	1ch bass filter setting terminal
7	D1	1ch input terminal D	23	MID11	1ch middle filter setting terminal
8	D2	2ch input terminal D	24	MID12	1ch middle filter setting terminal
9	E1	1ch input terminal E	25	MID21	2ch middle filter setting terminal
10	E2	2ch input terminal E	26	MID22	2ch middle filter setting terminal
11	MIC	Microphone input terminal	27	TRE2	2ch treble filter setting terminal
12	FIL	1/2 VCC terminal	28	TRE1	1ch treble filter setting terminal
13	GND	Grounding terminal	29	VOL1	1ch volume input terminal
14	DATA	Serial data input terminal	30	VOL2	2ch volume input terminal
15	CLK	Serial clock input terminal	31	GOUT2	2ch input selector output terminal
16	VCC	Power supply terminal	32	GOUT1	1ch input selector output terminal

Caution on use

- 1) About operation voltage supply range  
 Within operation voltage supply range, basic circuit function operation is guaranteed within operation ambient temperature. But please confirm set up of constant and element, voltage set up and temperature set up on use.
- 2) About operation temperature range  
 If it within recommended operation voltage range, circuit function operation is guaranteed within operation temperature. It corralled to conditions of power dissipation to temperature.  
 Please watch out except condition stipulated by electrical characteristics within the range, It cannot guarantee standard value of electrical characteristics. But it retains original function.
- 3) Power-on reset  
 Any circuit to perform initialization in the IC upon power on is not contained. Therefore, be sure to send initial data to all the addresses upon power on. Moreover, be sure to mute the set side until the initial data has been sent. For data setting at the second time or later, necessary address only can be modified.
- 4) Schmidt circuit  
 This IC has the Schmidt circuit as preventive measures against logic signal input into the DATA (14pin) and CLK (15pin) terminals. Therefore, this IC is not affected so much by noise to a logic signal line. For the "High" voltage for logic control, voltage in a range from 2.6 to 5.5V is available.
- 5) Setting of input gain  
 Because of the S/N characteristics, it is recommendable to turn ON 6dBSW in input gain in a range between 6 and 20dB (in 2dB increment).
- 6) Input pin E1 (9pin) and E2 (10pin)  
 Input pin E1 (9pin) and E2 (10pin) has a built-in mute circuit. It is the optimal for the auxiliary input.
- 7) Microphone terminal  
 If the microphone terminal (11pin) is not used, use this IC in "open" because of the S/N characteristics.
- 8) Serial control  
 Wire the CLK terminal and DATA terminal taking care not interfere with an analog signal line.

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U.S.A / San Diego	TEL : +1(858)625-3630	FAX : +1(858)625-3670
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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
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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
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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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