Structure: Silicon Monolithic Integrated Circuit

Product: Sound Processor for car audio

Type: BD37521FS

Package: SSOP-A24

●Feature

1. Reduce switching noise of input gain control, mute, main volume, fader volume, bass, treble, loudness by using advanced switch circuit [Possible to control all steps]
2. Built-in ground isolation amplifier inputs, ideal for external stereo input.
3. Built-in input gain controller reduce switching noise for volume of a portable audio input.
4. Decrease the number of external components by built-in 2-band equalizer filter. And, possible to control Gv by I^2C BUS control.
5. It is possible for the bass, treble to the gain adjustment quantity of ±20dB and 1 dB step gain adjustment.
6. Bi-CMOS process is suitable for the design of low current and low energy. And it provides more quality for small scale regulator and heat in a set.
7. Package is SSOP-A24. Putting input-terminals together and output-terminals together can make PCB layout easier and can makes area of PCB smaller.)
8. It is possible to control by 3.3V / 5V for I^2C BUS.

●Absolute Maximum Ratings (Ta=25℃)

Parameter	Symbol	Limits	Unit
Power supply Voltage	VCC	10.0	V
Input voltage	VIN	VCC+0.3～GND-0.3	V
Power Dissipation	Pd	1000 ※1	mW
Storage Temperature	Tastg	-55～+150	℃

※1 At Ta＝25°C or higher, this value is decreaced to 8mW/°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.

●Function

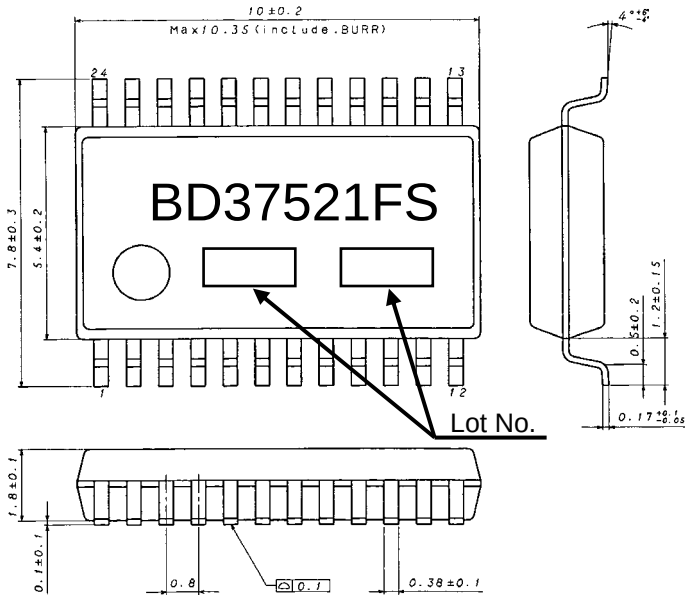
Function	Specifications
Input selector	Stereo 3 single-end input and 1differential input
Input gain	0～20dB (1dB step), Possible to use “Advanced switch” for prevention of switching noise
Mute	Possible to use “Advanced switch” for prevention of switching noise.
Volume	+15dB～−79dB (1dB step), −∞dB Possible to use “Advanced switch” for prevention of switching noise.
Bass	−20～+20dB (1dB step), Q=1, fo=100Hz Possible to use advanced switch at changing gain
Treble	−20～+20dB (1dB step), Q=1.25, fo=10kHz Possible to use advanced switch at changing gain
Fader	0dB～−79dB (1dB step), −∞dB Possible to use “Advanced switch” for prevention of switching noise.
Loudness	0dB～20dB (1dB step) Possible to use “Advanced switch” for prevention of switching noise.

●Electrical Characteristic

(Unless specified particularly, Ta=25℃, VCC=8.5V, f=1kHz, Vin=1Vrms, Rg=600Ω, R_L=10kΩ, A input,
Input gain 0dB, Mute OFF, Volume 0dB, Tone control 0dB, Loudness 0dB, Fader 0dB)

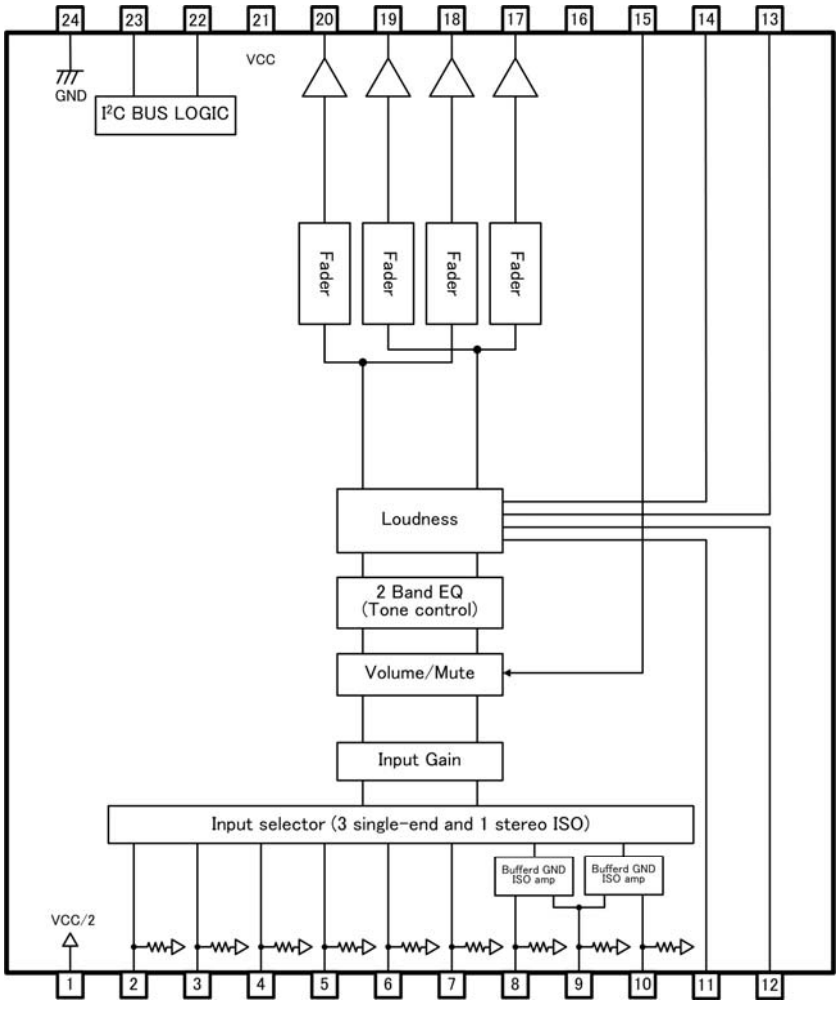
Item	Symbol	Limit			Unit	Condition
		Min.	Typ.	Max.		
Current upon no signal	IQ	−	38	48	mA	No signal
Voltage gain	GV	-1.5	0	1.5	dB	Gv=20log(VOUT/VIN)
Channel balance	CB	-1.5	0	1.5	dB	CB = GV1-GV2
Total harmonic distortion	THD+N	−	0.001	0.05	%	VOUT=1Vrms BW=400-30KHz
Output noise voltage	VNO	−	3.8	15	μVrms	Rg = 0Ω BW = IHF-A
Residual output noise voltage	VNOR	−	1.8	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	VIM	2.1	2.3	−	Vrms	VIM at THD+N(VOUT)=1% BW=400-30kHz
Maximum gain	GV MAX	13	15	17	dB	Volume = 15dB VIN=100mVrms Gv=20log(VOUT/VIN)
Maximum attenuation	GV MIN	−	-100	-85	dB	Volume=−∞dB Gf=20log(VOUT/VIN) BW=IHF-A
Maximum output voltage	VOM	2.0	2.2	−	Vrms	THD+N=1% BW=400-30kHz

●Dimensional outline drawing



SSOP-A24 (Unit : mm)

●Block Diagram



●Descriptions of terminal

Terminal No.	Terminal Name
1	FIL
2	A1
3	A2
4	B1
5	B2
6	C1
7	C2
8	DP1
9	DN
10	DP2
11	LDA1
12	LDB1
13	LDB2
14	LDA2
15	MUTE
16	N.C.
17	OUTR2
18	OUTR1
19	OUTF2
20	OUTF1
21	VCC
22	SCL
23	SDA
24	GND

●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.

Notes

No copying or reproduction of this document, in part or in whole, is permitted without the consent of ROHM Co.,Ltd.

The content specified herein is subject to change for improvement without notice.

The content specified herein is for the purpose of introducing ROHM's products (hereinafter "Products"). If you wish to use any such Product, please be sure to refer to the specifications, which can be obtained from ROHM upon request.

Examples of application circuits, circuit constants and any other information contained herein illustrate the standard usage and operations of the Products. The peripheral conditions must be taken into account when designing circuits for mass production.

Great care was taken in ensuring the accuracy of the information specified in this document. However, should you incur any damage arising from any inaccuracy or misprint of such information, ROHM shall bear no responsibility for such damage.

The technical information specified herein is intended only to show the typical functions of and examples of application circuits for the Products. ROHM does not grant you, explicitly or implicitly, any license to use or exercise intellectual property or other rights held by ROHM and other parties. ROHM shall bear no responsibility whatsoever for any dispute arising from the use of such technical information.

The Products specified in this document are intended to be used with general-use electronic equipment or devices (such as audio visual equipment, office-automation equipment, communication devices, electronic appliances and amusement devices).

The Products specified in this document are not designed to be radiation tolerant.

While ROHM always makes efforts to enhance the quality and reliability of its Products, a Product may fail or malfunction for a variety of reasons.

Please be sure to implement in your equipment using the Products safety measures to guard against the possibility of physical injury, fire or any other damage caused in the event of the failure of any Product, such as derating, redundancy, fire control and fail-safe designs. ROHM shall bear no responsibility whatsoever for your use of any Product outside of the prescribed scope or not in accordance with the instruction manual.

The Products are not designed or manufactured to be used with any equipment, device or system which requires an extremely high level of reliability the failure or malfunction of which may result in a direct threat to human life or create a risk of human injury (such as a medical instrument, transportation equipment, aerospace machinery, nuclear-reactor controller, fuel-controller or other safety device). ROHM shall bear no responsibility in any way for use of any of the Products for the above special purposes. If a Product is intended to be used for any such special purpose, please contact a ROHM sales representative before purchasing.

If you intend to export or ship overseas any Product or technology specified herein that may be controlled under the Foreign Exchange and the Foreign Trade Law, you will be required to obtain a license or permit under the Law.

ROHM SEMICONDUCTOR

Thank you for your accessing to ROHM product informations.
More detail product informations and catalogs are available, please contact us.

ROHM Customer Support System

http://www.rohm.com/contact/