Structure : Silicon Monolithic Integrated Circuit

Product : Sound Processor for car audio

Type : BD37511FS

Package : SSOP-A20

●Feature

1. Reduce switching noise of mute, main volume, fader volume, bass, and treble by using advanced switch circuit [Possible to control all steps]
2. Decrease the number of external components by built-in 2-band equalizer filter. And, possible to control Gv of 2-band equalizer by I^2C BUS control.
3. It is possible for the bass, treble to the gain adjustment quantity of ±20dB and 1 dB step gain adjustment.
4. 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.
5. Package is SSOP-A20. Putting input-terminals together and output-terminals together can make PCB layout easier and can makes area of PCB smaller.)
6. 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	940 ※1	mW
Storage Temperature	Tastg	-55～+150	℃

※1 At Ta＝25°C or higher, this value is decreaced to 7.5mW/°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

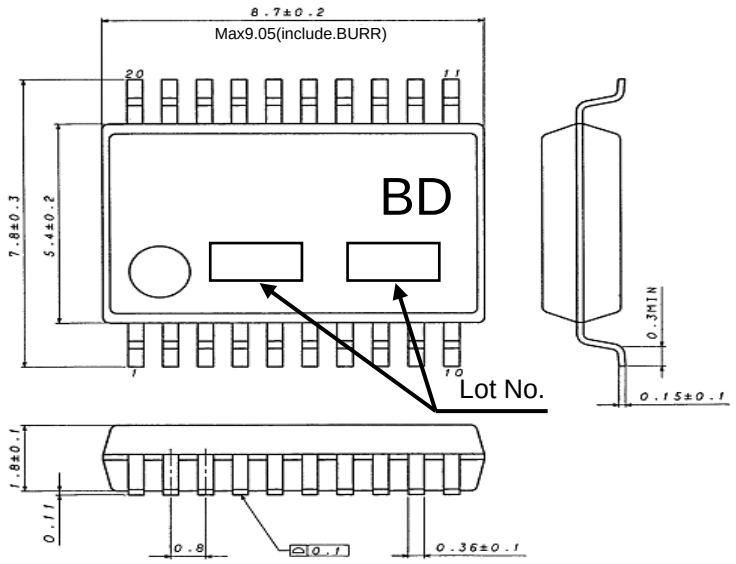
Function	Specifications
Input selector	Stereo 3 single-end input
Input gain	0～20dB (1dB step)
Mute	Possible to use “Advanced switch” for prevention of switching noise.
Volume	0dB～−40dB (1dB step) Possible to use “Advanced switch” for prevention of switching noise.
Bass	−20～+20dB (1dB step), Q=1, fo=100Hz Possible to use advanced switch at changing gain
Treble	−20～+20dB (1dB step), Q=1, fo=10kz Possible to use advanced switch at changing gain
Fader	0dB～−62dB (1dB step), −∞dB 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, Fader 0dB)

Item	Symbol	Limit			Unit	Condition
		Min.	Typ.	Max.		
Current upon no signal	I_Q	−	15	30	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 = GV1-GV2
Total harmonic distortion	THD+N	−	0.005	0.05	%	VOUT=1Vrms BW=400-30KHz
Output noise voltage	V_{NO}	−	6	25	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	-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)
Maximum input voltage	V_{IM}	2.1	2.3	−	Vrms	VIM at THD+N(VOUT)=1% BW=400-30kHz
Maximum attenuation	$G_{V\,MIN}$	−	-100	-85	dB	Fader =−∞dB Gf=20log(VOUT/VIN) BW=IHF-A
Maximum output voltage	V_{OM}	2.0	2.2	−	Vrms	THD+N=1% BW=400-30kHz

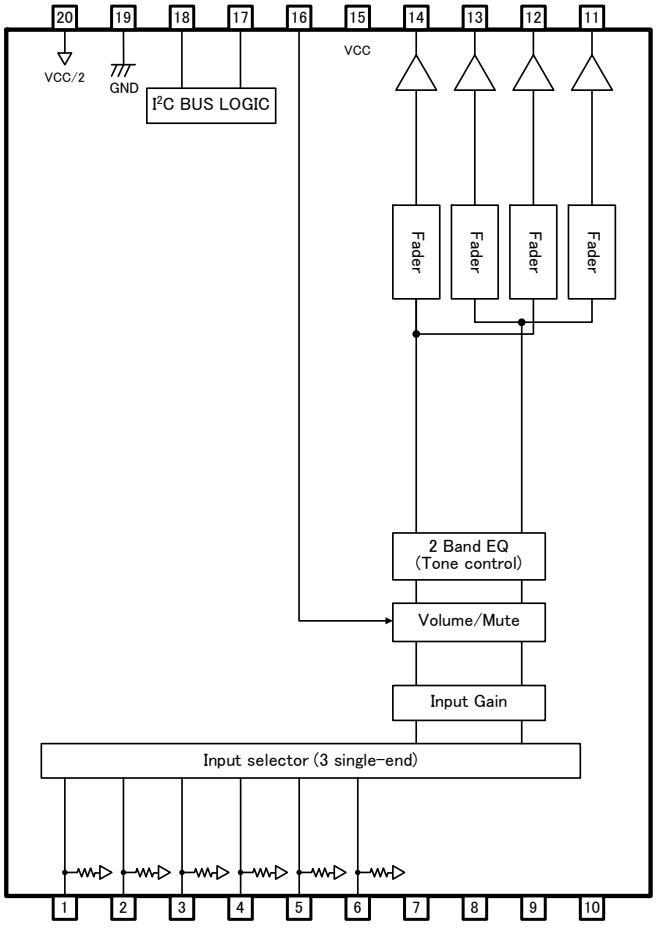
●Dimensional outline drawing



SSOP-A20 (Unit : mm)

(UNIT:mm)

●Block Diagram



●Descriptions of terminal

Terminal No.	Terminal Name
1	A1
2	A2
3	B1
4	B2
5	C1
6	C2
7	TEST1
8	TEST2
9	TEST3
10	NC
11	OUTR2
12	OUTR1
13	OUTF2
14	OUTF1
15	VCC
16	MUTE
17	SCL
18	SDA
19	GND
20	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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