

Structure                   Silicone monolithic integrated circuit

Product name               SCF built-in sound processor for car audio

Model Name                 **BD3827K**

●Features

- 1.Reduced noise for gain switching using soft switching circuit
- 2.Loudness is volume attenuation linked type and the frequency characteristics are determined by the externally mounted parts.
- 3.Use the Bi-CMOS process
- 4.Control voltage is 3.3-5.0V with 2-wire serial control.

●Absolute Maximum Ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Applied voltage	VCC	10.0	V
Input voltage	Vin	VCC+0.3~GND-0.3	V
Power Dissipation	Pd	1060 *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 8.5mW/°C.

When Rohm standard board is mounted. Thermal resistance  $\theta_{ja} = 117.6$  (°C/W).

Rohm standard board:                   size: 70×70×1.6 (mm<sup>3</sup>)

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	7.5	8.5	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

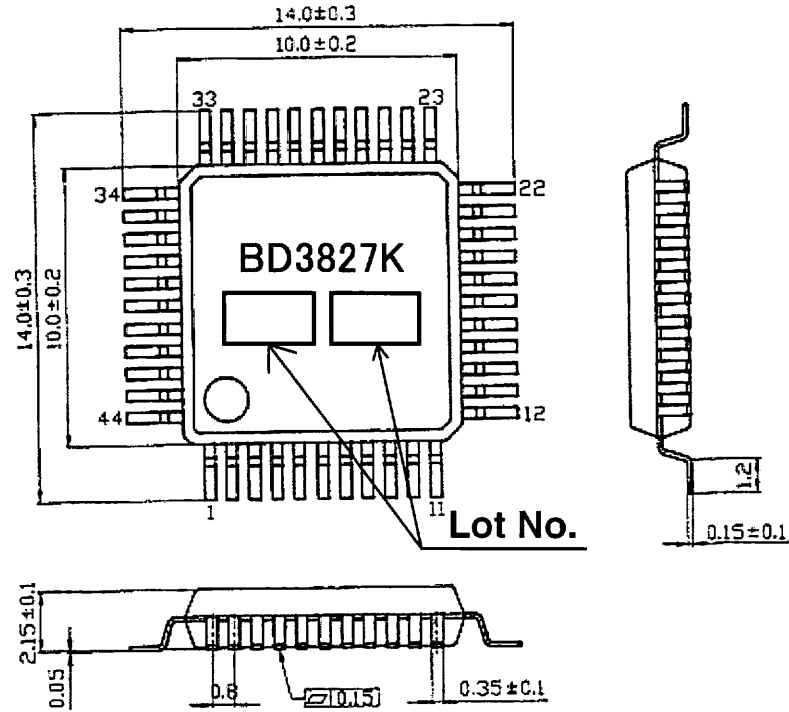
Function	Specifications
Input selector1,2	Dual mode stereo 5 input A input is differential input
Input Gain 1,2	0~6dB (1dB step), 6~20dB (2dB step) Dual mode
Volume	0dB~-36dB (1dB step), -36dB~-72dB (2dB step), -∞dB soft switching can be done.
Loudness	Taps at the volume -16dB, and -32dB position; with the external mount part, high and low range characteristics can be determined.
Bass	Gain=-20~+20dB (2dB step) Q=0.5, 0.75, 1, 1.25 f0=60, 80, 100, 120Hz Soft switching can be done for gain switching.
Treble	Gain=-20~+20dB (2dB step) f0=7.5, 10, 12.5, 15kHz Soft switching can be done for gain switching.
General purpose BPF	The C of externally mounted part can determine the central frequency. Q=1,1.85 Gain=-20~+20dB (2dB step) Soft switching can be done for gain switching
Fader	0dB~-72dB (2dB step), -∞dB 4 outputs independent control can be done. Soft switching can be done.
Output gain	Front & rear independent control can be done; Gain=0, +0.5, +1.0dB Soft switching can be done.
Sub-woofer	Mixed output for Channels 1 and 2 can be done in 1 system with 0dB~-28dB (2dB step), -∞dB. Soft switching can be done.

### ●Electrical characteristics

Unless specified particularly, Ta=25°C, VCC=8.5V, f=1kHz, Vin=1Vrms, Rg=600Ω, RL=10kΩ, B input, Input gain 0dB, Volume 0dB, Bass 0dB, Treble 0dB, General purpose BPF 0dB, Fader 0dB

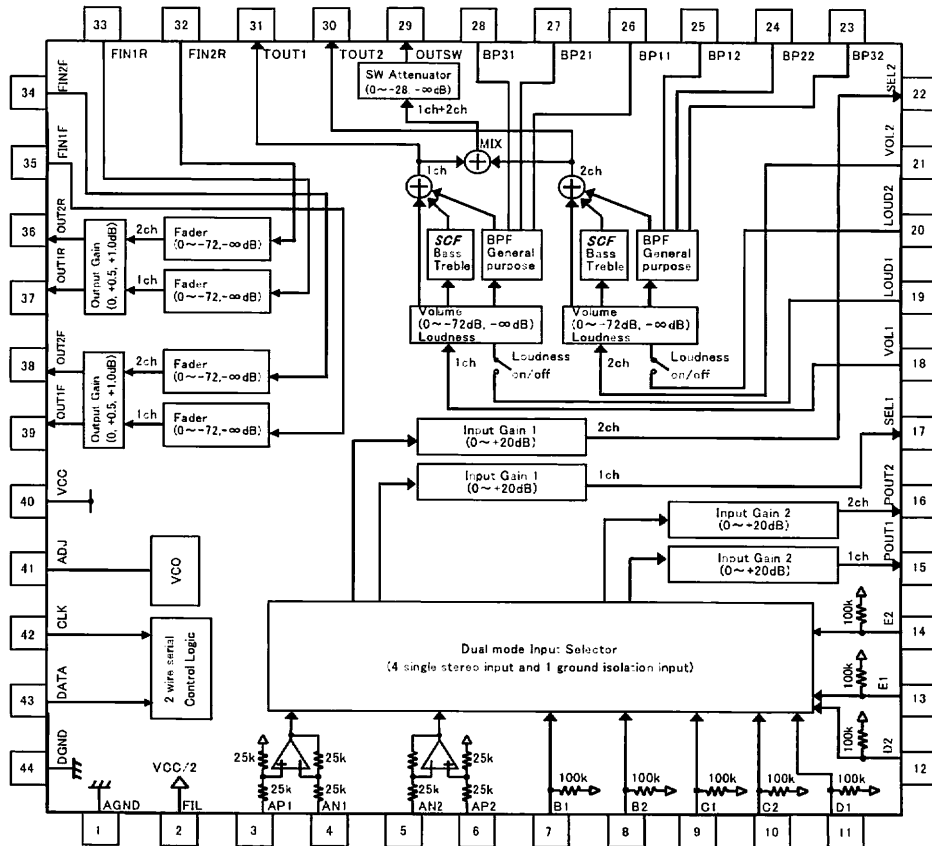
Parameter	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
Circuit current upon no signal	I <sub>Q</sub>	—	12	30	mA	No signal
Voltage gain	G <sub>V</sub>	-1.5	0	1.5	dB	G <sub>V</sub> = 20log(V <sub>OUT</sub> /V <sub>IN</sub> )
Channel balance	CB	-1.5	0	1.5	dB	CB = GV1-GV2
Total harmonic distortion	THD	—	0.002	0.09	%	V <sub>OUT</sub> = 1Vrms BW = 400-30KHz
Output noise voltage	V <sub>NO</sub>	—	6	25	μVrms	R <sub>g</sub> = 0Ω BW = IHF-A
Residual output noise voltage	V <sub>NOR</sub>	—	2	10	μVrms	Fader = -∞dB R <sub>g</sub> = 0Ω BW = IHF-A
Cross-talk between channels	CTC	85	100	—	dB	R <sub>g</sub> = 0Ω CTC = 20log (V <sub>OUT</sub> /V <sub>OUT</sub> ) BW = IHF-A
Ripple rejection	RR	40	70	—	dB	R <sub>g</sub> = 0Ω, f = 100Hz VRR = 100mVrms RR = 20log (VCCIN/VOUT)
Maximum input voltage	V <sub>IM</sub>	2.0	2.3	—	Vrms	V <sub>IM</sub> at THD (V <sub>OUT</sub> )=1% BW = 400-30KHz
Maximum attenuation	G <sub>V MIN</sub>	—	-104	-85	dB	Att. = -∞dB V <sub>IN</sub> =2Vrms G <sub>V</sub> = 20log (V <sub>OUT</sub> /V <sub>IN</sub> ) BW = IHF-A
Maximum output voltage	V <sub>OM</sub>	2.0	2.3	—	Vrms	THD=1% BW=400-30KHz

● Dimensional outline drawing



QFP44 (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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