Structure : Silicon Monolithic Integrated Circuit

Product name : 1W+1W Stereo Speaker Amplifier/ Headphone Amplifier

Type : **BH7884EFV**

Features :
1) Low Noise & High Power Speaker Amplifiers
2) BassBoost mode for Speaker amplifiers
3) Low noise VCA(Voltage Controlled Amplifiers) for Headphone amplifiers
4) Various control functions
5) Low Power Supply current

○Absolute Maximum Ratings(Ta=25℃)

Parameter	Limits	Unit
Supply voltage	+6.0	V
Power dissipation	1100 *	mW
Storage temperature	-55 ～ +125	℃
Operating temperature	-10 ～ +70	℃

※Deratings is done at 11mW/℃ above Ta=25℃
(When mounting on a 70mmX70mmX1.6mm PCB board)

○Operating Range (Ta=25℃)

Parameter	Limits	Unit
Supply voltage	+3.0～+5.5	V

※This product is not designed for protection against radioactive rays.

Application example

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). Should you intend to use this product with equipment or devices which require an extremely high level or reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices),please be sure to consult with our sales representative in advance.

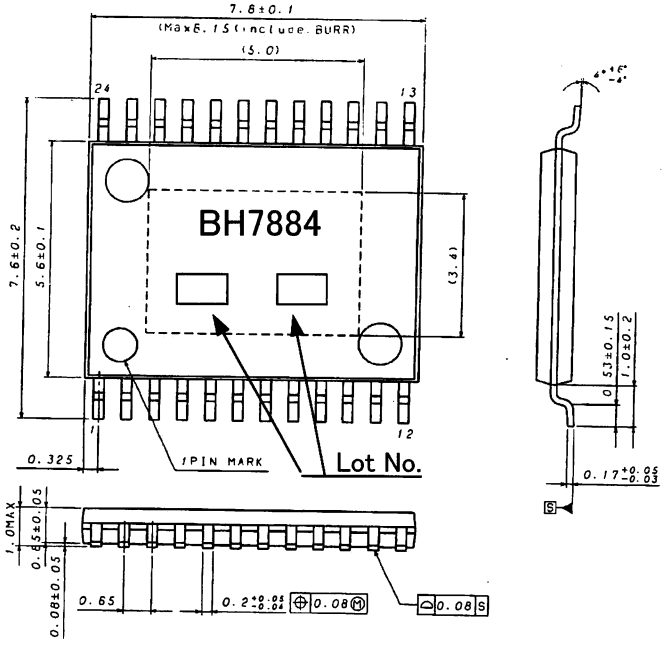
○Electrical characteristics (Unless otherwise noted, Vcc=3.3V、Ta=25℃、f=1kHz, 400Hz～30kHz BPF)

Parameter	Symbol	Limits			Unit	Conditions
		Min.	Typ.	Max.		
■1 CHIP						
Circuit current ACTV	I_A	—	9.0	18.0	mA	No signal ACTIVE
Circuit current SPND	Is	—	0.2	10.0	uA	No signal SUSPEND
■SP AMP						
Voltage gain1	$G_{SP}1$	9.0	12.0	15.0	dB	SE, Vin=-18dBV,R_L=8Ω
Voltage gain2	$G_{SP}2$	15.2	18.2	21.2	dB	BTL, Vin=-18dBV
Distortion	D_{SP}	—	0.1	1.0	%	BTL, Vin=-18dBV
Maximum output level	V_{OSP}	2.2	5.2	—	dBV	BTL, D_{SP}=1%
Output noise level	V_{NSP}	—	-97	-80	dBV	SE, DIN-Audio
Cross talk	CT_{SP}	—	-90	-80	dBV	SE, Vin=-18dBV, DIN-Audio
Output level on mute	MT_{SP}	—	-102	-80	dBV	BTL, Vin=-18dBV
■HP AMP						
Voltage gain 3	G_{HP}	2.6	5.6	8.6	dB	VOL:MAX,R_L=10kΩ, Vin=-12dBV
Voltage gain 4	G_{HP}	-10	-7	-4	dB	VOL:MAX,R_L=32Ω, Vin=-12dBV
Distortion	D_{HP}	—	0.025	0.1	%	VOL:MAX, R_L=32Ω Vin=-8dBV
Variable width of volume	$\triangle G_{HP}$	70	100	—	dB	VOL:MIN～MAX, R_L=32Ω
Maximum output level	Vo_{HP}	-2.0	1.0	—	dBV	VOL:MAX, D_{HP}=1%, R_L=10kΩ
Output noise level	V_{NHP}	—	-98	-80	dBV	VOL:MAX, R_L=32Ω, DIN-Audio
Cross talk	CT_{HP}	—	-98	-80	dBV	VOL:MAX,R_L=32Ω, Vin=-12dBV DIN-Audio
Output level on mute	MT_{HP}	—	-110	-80	dBV	VOL:MAX,R_L=32Ω, Vin=-12dBV DIN-Audio
■BEEP AMP						
Output voltage level	V_{BP}	0.8	1.25	—	Vpp	Vin=1.3dBV,f=1kHz, 20MHzLPF
■BIAS						
Output voltage level	V_{BIAS}	1.4	1.7	2.0	V	No Signal

○Electrical characteristics (Unless otherwise noted, Vcc=3.3V、Ta=25℃、f=1kHz, 400Hz～30kHz BPF)

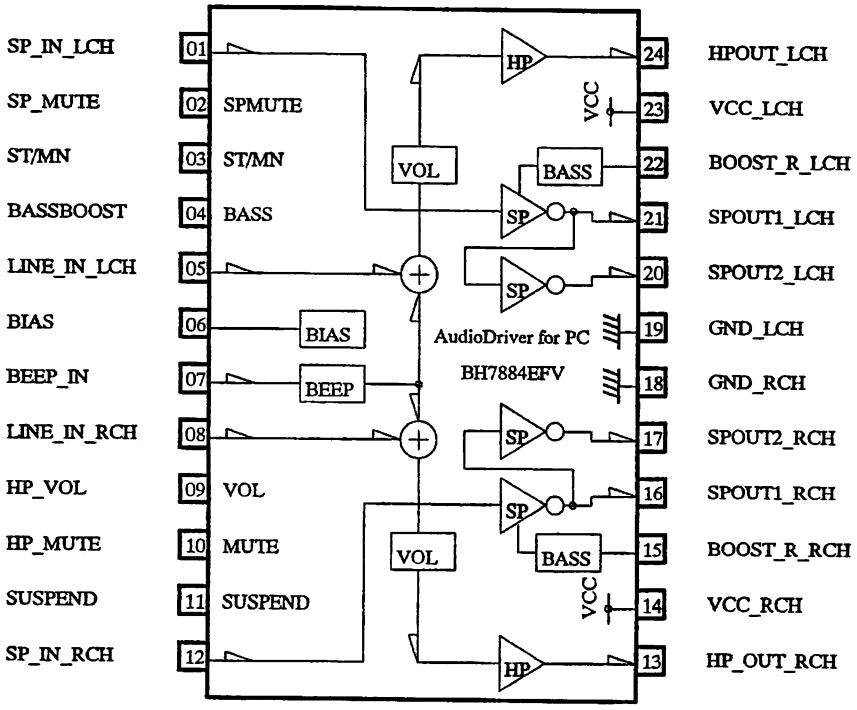
■CTRL						
ACTIVE mode	V_{11H}	VCC -0.3	—	VCC	V	Active mode. Hold Voltage of 11pin.
SUSPEND mode	V_{11L}	GND	—	0.3	V	Suspend mode. Hold Voltage of 11pin.
SP/ON mode	V_{2H}	VCC -0.3	—	VCC	V	SP/ON mode. Hold Voltage of 2pin.
SP/OFF mode	V_{2L}	GND	—	0.3	V	SP/OFF mode. Hold Voltage of 2pin.
BASS-BOOST/ON mode	V_{4H}	VCC -0.7	—	VCC	V	SP/BassBoost mode. Hold Voltage of 4pin.
BASS-BOOST/OFF mode	V_{4L}	GND	—	0.7	V	SP/NonBoost mode. Hold Voltage of 4pin.
STEREO mode	V_{3H}	VCC -0.7	—	VCC	V	SP/STEREO mode. Hold Voltage of 3pin.
MONO mode	V_{3L}	GND	—	0.7	V	SP/MONO mode. Hold Voltage of 3pin.
ACTIVE mode	V_{10H}	VCC -0.7	—	VCC	V	HP/Active mode. Hold Voltage of 10pin.
MUTE mode	V_{10L}	GND	—	0.7	V	HP/MUTE mode. Hold Voltage of 10pin.
■PSRR						
Ripple rejection ratio	G_{PR}	—	-64	—	dBV	f=100Hz, 0.3Vpp, SIN Input SPOUT monitor, DIN-Audio

○Outer dimensions



HTSSOP-B24 (Unit:mm)

○Block diagram



○Pin number and pin name

Pin No.	Pin name
1	SP_IN_LCH
2	SP_MUTE
3	ST/MN
4	BASSBOOST
5	LINE_IN_LCH
6	BIAS
7	BEEP_IN
8	LINE_IN_RCH
9	HP_VOL
10	HP_MUTE
11	SUSPEND
12	SP_IN_RCH
13	HPOUT_RCH
14	VCC_RCH
15	BOOST_R_LCH
16	SPOUT1_RCH
17	SPOUT2_RCH
18	GND_RCH
19	GND_LCH
20	SPOUT2_LCH
21	SPOUT1_LCH
22	BOOST_R_LCH
23	VCC_LCH
24	HPOUT_LCH

○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 miss-installation

When mounting the LSI on a board, pay adequate attention to orientation and placement discrepancies of the LSI. If it is miss-installed 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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