

Audio signal processor for mini-component systems

BA7762AFS

The BA7762AFS is an audio signal processor IC for mini-component systems, and includes a recording equalizer, playback equalizer, and input switches.

●Applications

Mini-component systems

●Features

- 1) Dual circuits (for stereo use)
- 2) Chrome tape compatible (switchable EQ characteristics).
- 3) Input switches on chip (TAPE/AUX).
- 4) Compact SSOP-A32 package.

●Absolute maximum ratings (Ta = 25°C)

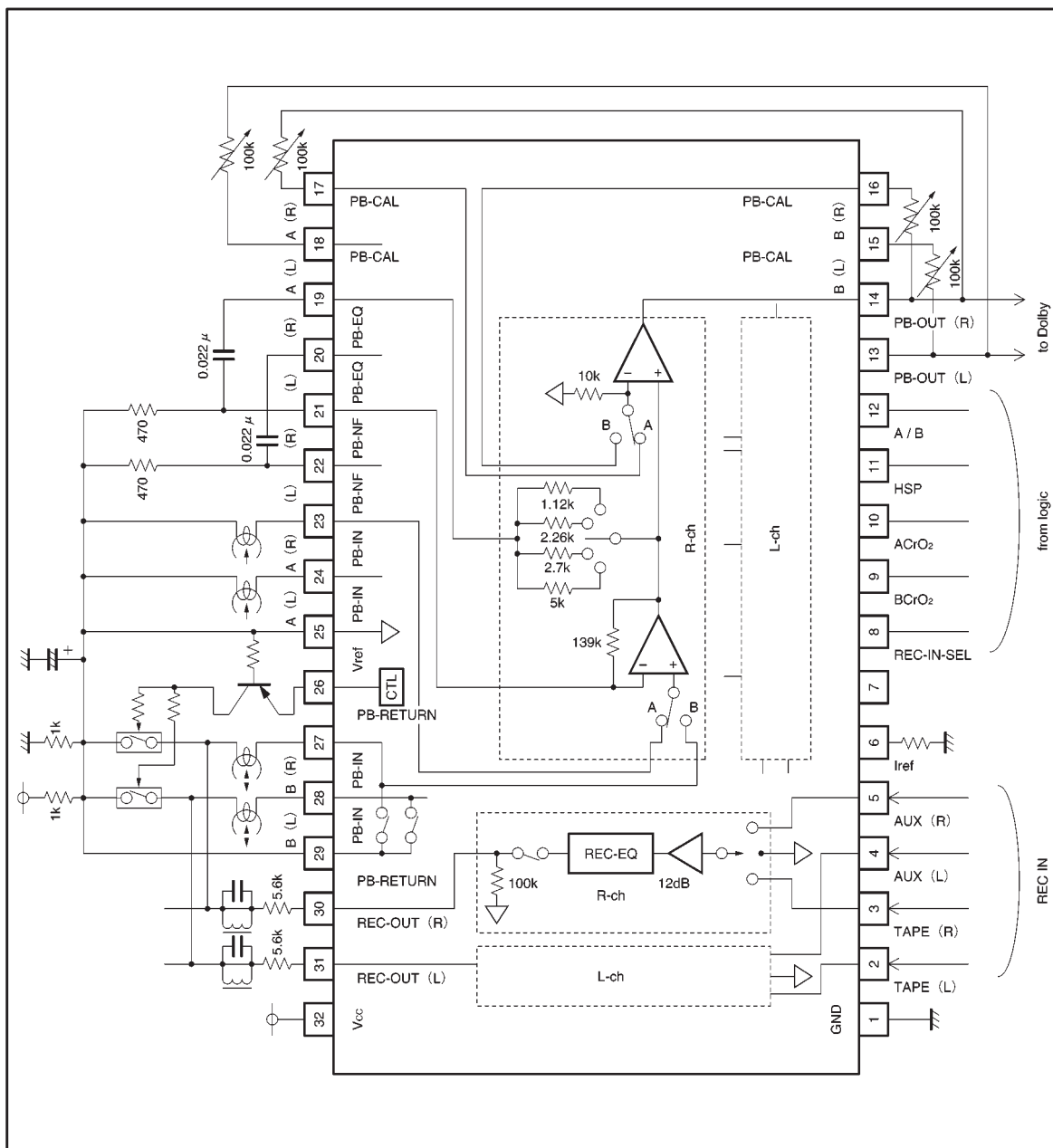
Parameter	Symbol	Limits	Unit
Applied voltage	V _{CC}	12.5	V
Power dissipation	P _d	800*	mW
Operating temperature	T _{opr}	-25~+75	°C
Storage temperature	T _{stg}	-55~+125	°C

* Reduced by 8.0mW for each increase in Ta of 1°C over 25°C.

●Recommended operating conditions (Ta = 25°C)

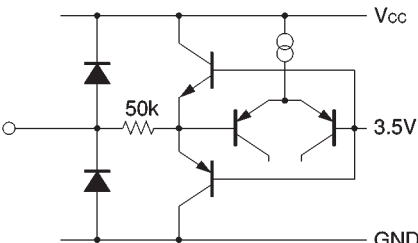
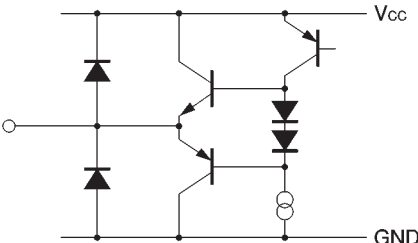
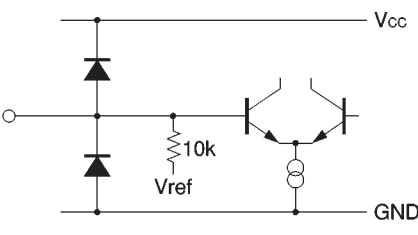
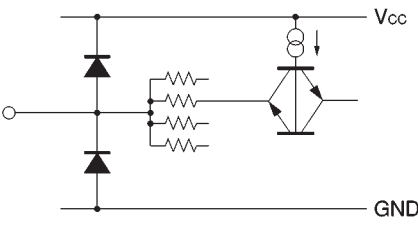
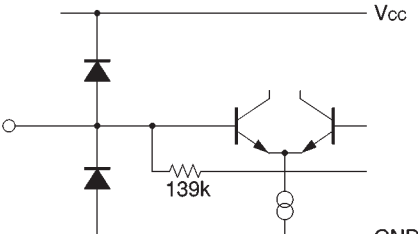
Parameter	Symbol	Limits	Unit
Power supply voltage	V _{CC}	9.5~12	V

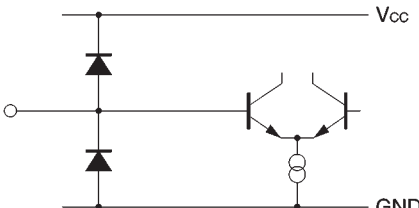
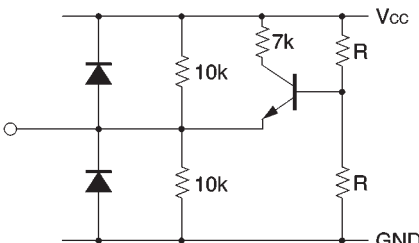
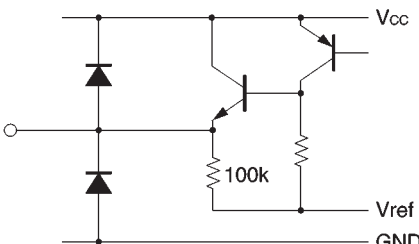
● Block diagram

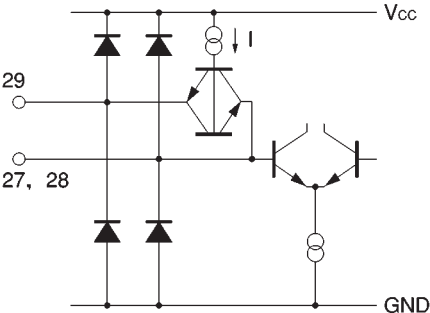
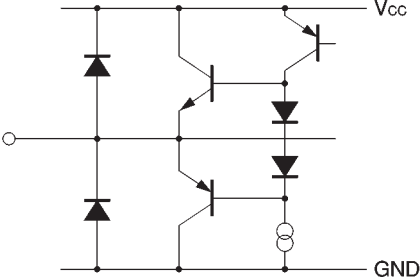


● Pin descriptions

Pin No.	Pin name	Pin voltage	Equivalent circuit	Function
1	GND	—	—	GND
2 3 4 5	TAPE (L) TAPE (R) AUX (L) AUX (R)	$V=V_{ref}$		REC EQ input
6	Iref	$V=1.3V$		Equalizer reference current input
8	REC SEL	$V=2.5V$		Mode control input
9 10	Bcr Acr	—		Mode control input
11	HSP	—		Mode control input

Pin No.	Pin name	Pin voltage	Equivalent circuit	Function
12	A / B	—		Mode control input
13 14	PBOUT (L) PBOUT (R)	V=Vref		PB output
15 16 17 18	PB Cal B (L) PB Cal B (R) PB Cal A (L) PB Cal A (R)	V=Vref		Feedback input
19 20	PB EQ (R) PB EQ (L)	V=Vref		PB-EQ output
21 22	PB NF (L) PB NF (R)	V=Vref		PB-EQ feedback input

Pin No.	Pin name	Pin voltage	Equivalent circuit	Function
23 24	PBOUT (L) PBOUT (R)	$V=V_{ref}$		PB A Deck input
25	Vref	$V=V_{ref}$		Reference
26	PB RETURN	A : $V=V_{ref}$ B : $V=V_{ref}$		Pin that outputs $V_{ref} + 3V$ when Bin Active

Pin No.	Pin name	Pin voltage	Equivalent circuit	Function
27	PB IN B (R)	V=Vref		PB B Deck input
28	PB IN B (L)			REC Return
29	REC RETURN			—
30 31	RECOUT (R) RECOUT (L)	V=Vref		PEC-EQ output
32	Vcc	—	—	Vcc

●Electrical characteristics (unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{CC} = 10.5\text{V}$, $V_{ref} = 5.25\text{V}$, PB-EQ standard DC gain 55.9dB (R_9 , R_{10} , R_{18} , and $R_{19} = 11.0\text{k}\Omega$))

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Quiescent current	I_Q	8	15	22	mA	No signal
Logic threshold	V_{IL}	0	—	1.0	V	—
	V_{IM}	2.0	—	3.0	V	—
	V_{IH}	4.0	—	V_{CC}	V	—
PB-REC crosstalk	CT PB / REC (1)	—	−80	−60	dBV	$f_{in}=1\text{kHz}$, $V_{in}=400\text{mVrms}^{*1}$ REC · EQ→PB · EQ
	CT PB / REC (2)	—	−70	−50	dBV	$f_{in}=1\text{kHz}$, $V_{in}=24\text{mVrms}^{*1}$ PB · EQ→REC · EQ
PB-EQ gain	GV PB (1)	29.0	32.0	35.0	dB	$f_{in}=1\text{kHz}$, $V_{in}=0.6\text{mVrms}$
	GV PB (2)	25.0	28.0	31.0	dB	$f_{in}=10\text{kHz}$, $V_{in}=0.6\text{mVrms}$
	GV PB (3)	20.8	23.8	26.8	dB	$f_{in}=10\text{kHz}$, $V_{in}=0.6\text{mVrms}$
	GV PB (4)	19.4	22.4	25.4	dB	$f_{in}=20\text{kHz}$, $V_{in}=0.6\text{mVrms}$
	GV PB (5)	14.8	17.8	20.8	dB	$f_{in}=20\text{kHz}$, $V_{in}=0.6\text{mVrms}$
PB-EQ maximum output	$V_{omax PB}$	0.3	2.0	—	Vrms	$f_{in}=1\text{kHz}$, THD=1%
PB-EQ THD	THD PB	—	0.1	0.5	%	$f_{in}=1\text{kHz}$, $V_{in}=0.6\text{mVrms}$
PB-EQ noise	$V_N PB$	—	30	70	μVrms	$R_g=820\Omega^{*1}$
PB-EQ channel separation	CT R / L(1)	—	−70	−50	dBV	$f_{in}=1\text{kHz}$, $V_{in}=24\text{mVrms}^{*1}$
PB-EQ crosstalk	CT A / B	—	−75	−55	dBV	$f_{in}=1\text{kHz}$, $V_{in}=24\text{mVrms}^{*1}$

*1 DIN AUDIO

(unless otherwise noted, $T_a = 25^\circ\text{C}$, $V_{CC} = 10.5\text{V}$, and $V_{ref} = 5.25\text{V}$)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
REC EQ frequency characteristics	GV REC NN1	6.3	8.3	9.8	dB	$f_{IN}=1\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC NN2	9.3	11.3	13.3	dB	$f_{IN}=5\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC NN3	16.3	19.3	22.3	dB	$f_{IN}=10\text{kHz}$, $V_{IN}=10\text{mVrms}$
REC EQ frequency characteristics	GV REC NC1	9.7	11.2	12.7	dB	$f_{IN}=1\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC NC2	14.5	16.5	18.5	dB	$f_{IN}=5\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC NC3	20.7	23.7	26.7	dB	$f_{IN}=10\text{kHz}$, $V_{IN}=10\text{mVrms}$
REC EQ frequency characteristics	GV REC HN1	7.1	8.6	10.1	dB	$f_{IN}=2\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC HN2	11.2	13.2	15.2	dB	$f_{IN}=10\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC HN3	17.8	20.8	23.8	dB	$f_{IN}=20\text{kHz}$, $V_{IN}=10\text{mVrms}$
REC EQ frequency characteristics	GV REC HC1	11.2	12.7	14.2	dB	$f_{IN}=2\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC HC2	16.1	18.1	20.1	dB	$f_{IN}=10\text{kHz}$, $V_{IN}=10\text{mVrms}$
	GV REC HC3	23.1	26.1	29.1	dB	$f_{IN}=20\text{kHz}$, $V_{IN}=10\text{mVrms}$
REC-EQ channel separation	CT R / L (2)	—	−70	−50	dBV	$f_{IN}=1\text{kHz}$, $V_{IN}=400\text{mVrms}^{*1}$
REC-EQ crosstalk	CT Tape / AUX	—	−70	−50	dBV	$f_{IN}=1\text{kHz}$, $V_{IN}=400\text{mVrms}^{*1}$
REC MUTE attenuation	R MUTE ATT	—	−70	−50	dBV	$f_{IN}=1\text{kHz}$, $V_{IN}=400\text{mVrms}^{*1}$
REC-EQ maximum output	Vomax REC	1.2	1.8	—	Vrms	$f_{IN}=1\text{kHz}$, THD=1%
REC EQ THD	THD REC	—	0.35	0.7	%	$f_{IN}=1\text{kHz}$, $V_{IN}=100\text{mVrms}$
REC EQ S / N	S / N REC	—	−69	−60	dBV	$R_g=5.1\ \Omega$, IHF A

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● Measurement circuit

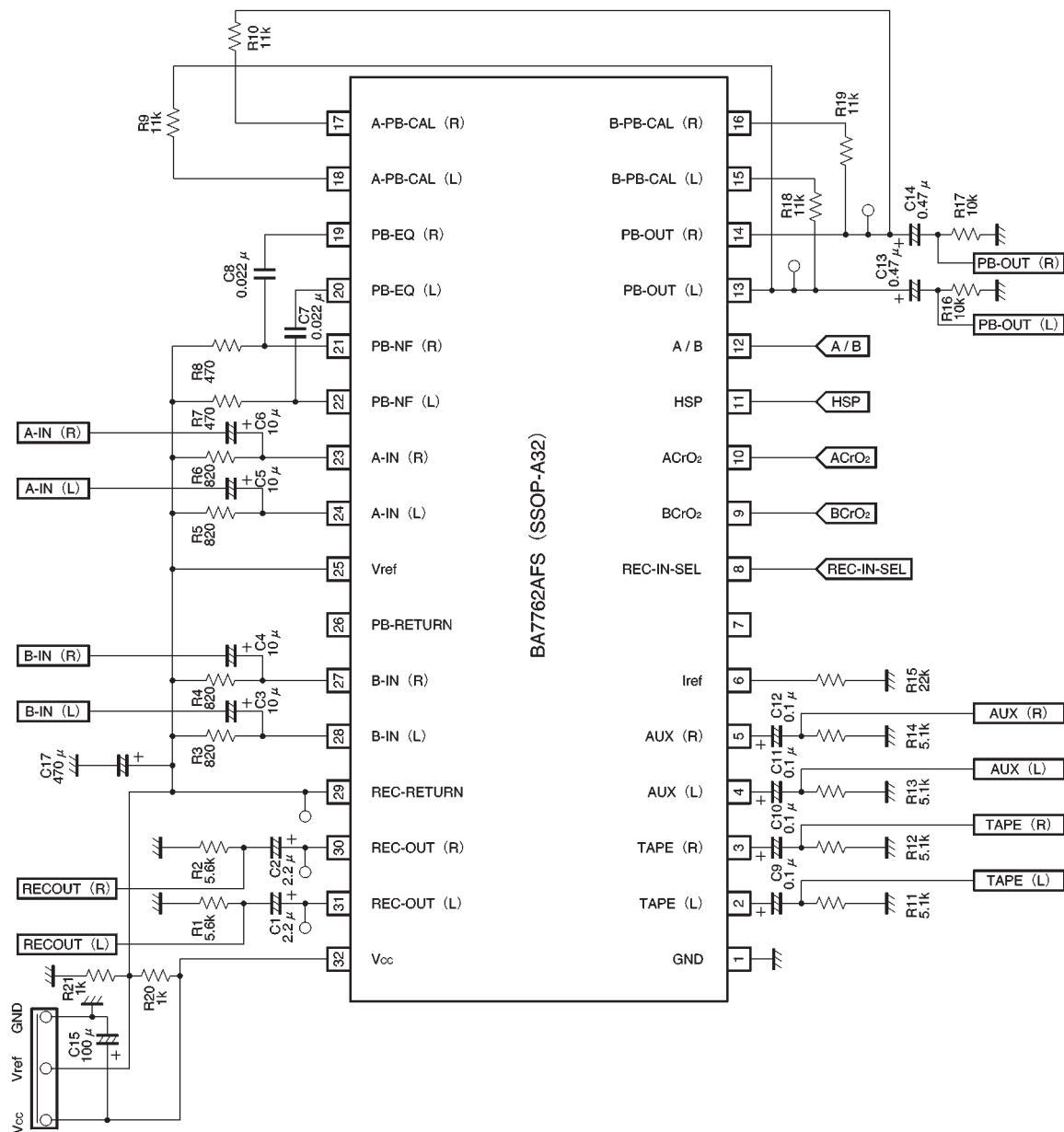


Fig.1

● Measurement circuit conditions

Parameter	Pin No.	Control voltage				
		A/B	REC-IN-SEL	A CrC ₂	B CrC ₂	HSP
Quiescent current	I _Q	L	L	L	L	L
Logic threshold	V _{IL}	—	—	—	—	—
	V _{IM}	—	—	—	—	—
	V _{IH}	—	—	—	—	—
PB-REC crosstalk	CT PB / REC (1)	L	L / H	L	L	L
	CT PB / REC (2)	L / H	L	L	L	L
PB-EQ gain	GV PB (1)	L / H	L	L	L	L
	GV PB (2)	L / H	L	L	L	L
	GV PB (3)	L / H	L	H	H	L
	GV PB (4)	L / H	L	L	L	H
	GV PB (5)	L / H	L	H	H	H
PB-EQ maximum output	Vomax PB	L / H	L	L	L	L
PB-EQ THD	THD PB	L / H	L	L	L	L
PB-EQ noise	VN PB	L / H	L	L	L	L
PB-EQ channel separation	CT R / L (1)	L / H	L	L	L	L
PB-EQ crosstalk	CT A / B	L / H	L	L	L	L
REC EQ frequency characteristics	GV REC NN1	L	L / H	L	L	L
	GV REC NN2	L	L / H	L	L	L
	GV REC NN3	L	L / H	L	L	L
REC EQ frequency characteristics	GV REC NC1	L	L / H	L	H	L
	GV REC NC2	L	L / H	L	H	L
	GV REC NC3	L	L / H	L	H	L
REC EQ frequency characteristics	GV REC HN1	L	L / H	L	L	H
	GV REC HN2	L	L / H	L	L	H
	GV REC HN3	L	L / H	L	L	H
REC EQ frequency characteristics	GV REC HC1	L	L / H	L	H	H
	GV REC HC2	L	L / H	L	H	H
	GV REC HC3	L	L / H	L	H	H
REC-EQ channel separation	CT R / L (2)	L	L / H	L	L	L
REC-EQ crosstalk	CT Tape / AUX	L	L / H	L	L	L
REC MUTE attenuation	R MUTE ATT	L	M	L	L	L
REC EQ maximum output	Vomax REC	L	L / H	L	L	L
REC EQ THD	THD REC	L	L / H	L	L	L
REC EQ S/N	S / N REC	L	L / H	L	L	L

●Control table

Pin No.	Pin name	L	M	H
12	A / B	Ain Active*1	Ain Active	Bin active*1
		Return SW ON	Return SW ON	Return SW OFF
		REC OUT Active	REC OUT Active	REC OUT Hiz
8	REC-IN-SEL	TAPE	MUTE	AUX
9	B CrO ₂	*1, *2	—	*1, *2
10	A CrO ₂	*1	—	*1
11	HSP	Normal	—	Hi speed

*1 PB-EQ LOGIC

*2 REC-EQ LOGIC

A CrO ₂	B CrO ₂	HSP			
		L		H	
		A/B			
		L	H	L	H
L	L	120 μ	120 μ	60 μ	60 μ
L	H	120 μ	70 μ	60 μ	35 μ
H	L	70 μ	120 μ	35 μ	60 μ
H	H	70 μ	70 μ	35 μ	35 μ

B CrO ₂	HSP	
	L	H
L	Normal speed	High speed
	Normal Tape	Normal Tape
H	Normal speed	High speed
	Chrome Tape	Chrome Tape

●External dimensions (Units: mm)

