2-CHANNEL ELECTRONIC VOLUME WITH INPUT SELECTOR AND TONE CONTROL

■ GENERAL DESCRIPTION

The NJW1194 is a 2-channel electronic volume with4-in 1-out stereo audio selector and Tone Control. The NJW1194 performs low noise and low distortion characteristics with resistance ladder circuit.

All of functions are controlled via three-wired serial bus. Selectable 4-Chip address is available for using four chips on same serial bus line.

It's suitable for two-channel stereo system and or multi-channel audio system.

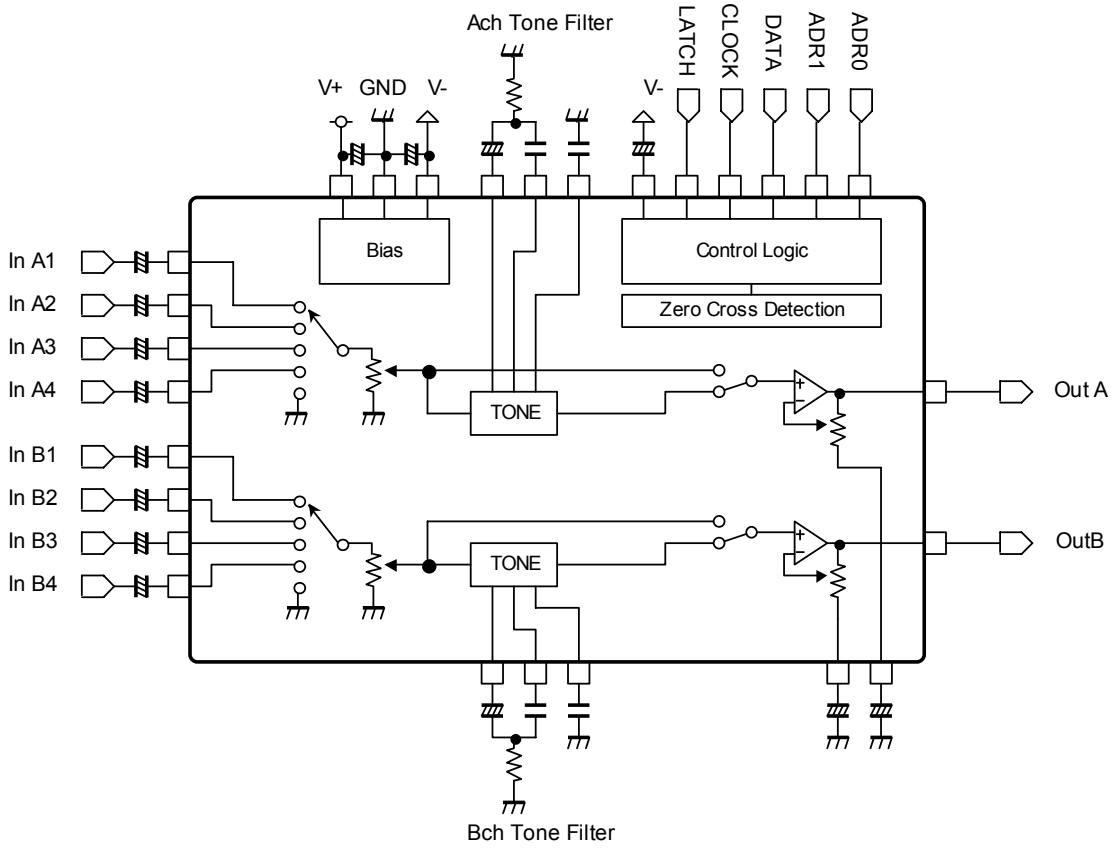
■PACKAGE OUTLINE

NJW1194V

■ FEATURES

- Operating Voltage ±4.5 to ±7.5V
- 3-Wired Serial Control Chip Address Select Function
- Low output noise -117dBVtyp.
- Low THD 0.0015%typ. (Vin=2Vrms, VOL=0dB)
- Input Selector(X4)
- Volume +31.5 to –95.0dB / 0.5dBstep, MUTE
- Tone Control 0to ±10dB/1dBstep
- Channel Separation -120dBtyp.
- Zero Cross Detection
- Bi-CMOS Technology
- Package Outline SSOP32

■ BLOCK DIAGRAM



■ **ABSOLUTE MAXIMUM RATING** (Ta=25°C)

PARAMETER	SYMBOL	RATING	UNIT
Power Supply Voltage	V_+/V_-	+8/-8	V
Maximum Input Voltage	V_{IM}	V_+/V_-	V
Power Dissipation	P_D	1000 NOTE: EIA/JEDEC STANDARD Test board (76.2x114.3x1.6mm, 2layer, FR-4) mounting	mW
Operating Temperature Range	Topr	-40 ~ +85	°C
Storage Temperature Range	Tstg	-40 ~ +125	°C

■ **ELECTRICAL CHARACTERISTICS**(Ta=25°C, V^+/V^-=±7V, RL=47kΩ, Volume=0dB, TONE=OFF, In:input,Out:output)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
◆ Power Supply						
Operating Voltage	V_+/V_-		±4.5	±7.0	±7.5	V
Supply Current 1	I_{CC}	No signal	-	12	17	mA
Supply Current 2	I_{EE}	No signal	-	12	17	mA
◆ Input/Output Characteristics (Output)						
Maximum Output Voltage	V_{OM}	f=1kHz,THD=1% VOL=0dB	3.6	4.2	-	Vrms
Voltage Gain1	G_{V1}	V_{IN}=2Vrms, f=1kHz VOL=0dB	-0.5	0	0.5	dB
Voltage Gain2	G_{V2}	V_{IN}=100mVrms, f=1kHz VOL=+15dB	+14	+15	+16	dB
Voltage Gain Error1	ΔG_{V1}	V_{IN}=2Vrms, f=1kHz VOL=0dB	-0.5	0	0.5	dB
Voltage Gain Error2	ΔG_{V2}	f=1kHz, V_{IN}=2Vrms VOL=-60dB	-1.0	0	1.0	dB
Maximum Attenuation	A_{TT}	f=1kHz, V_{IN}=2Vrms VOL=-95dB, A-weight	-	-95	-	dB
Mute Level	Mute	f=1kHz, V_{IN}=2Vrms VOL=Mute, A-weight	-	-120	-	dB
Cross Talk 1	CT1	f=1kHz, V_{IN} =2Vrms,A-weight VOL=0dB, Rg=0Ω	-	-120	-	dB
Cross Talk 2	CT2	f=20kHz, V_{IN} =2Vrms VOL=0dB, Rg=0Ω	-	-100	-	dB
Channel Separation 1	CS1	f=1kHz, V_{IN} =2Vrms,A-weight VOL=0dB, Rg=0Ω	-	-120	-90	dB
Channel Separation 2	CS2	f=20kHz, V_{IN} =2Vrms VOL=0dB, Rg=0Ω	-	-100	-	dB
Channel Separation 3	CS3	f=1kHz, V_{IN} =2Vrms,A-weight VOL=0dB, Rg=0Ω TONE=ON (Bass=Treble=0dB)	-	-110	-90	dB
Channel Separation 4	CS4	f=20kHz, V_{IN} =2Vrms VOL=0dB, Rg=0Ω TONE=ON (Bass=Treble=0dB)	-	-90	-	dB
Input Impedance	R_{IN}	Select Channel Input Terminal	15	20	-	kΩ

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PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
◆ Input/Output Characteristics (Output)						
Output Noise1	V_{NO1}	VOL=0dB, Rg=0Ω, A-weight, TONE=ON (Bass=Treble=0dB)	-	-113 (2.2μ)	-100 (10μ)	dBV (Vrms)
Output Noise2	V_{NO2}	VOL=0dB, Rg=0Ω, A-weight, TONE=OFF	-	-117 (1.41μ)	-	dBV (Vrms)
Total Harmonic Distortion 1	THD1	f=1kHz,V_{IN}=200mVrms,VOL=0dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.002	-	%
Total Harmonic Distortion 2	THD2	f=10kHz, V_{IN} =200mVrms,VOL=0dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.002	-	%
Total Harmonic Distortion 3	THD3	f=1kHz, V_{IN} =2Vrms,VOL=0dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.0015	-	%
Total Harmonic Distortion 4	THD4	f=10kHz, V_{IN} =2Vrms,VOL=0dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.005	-	%
Total Harmonic Distortion 5	THD5	f=1kHz, V_{IN} =200mVrms,VOL=+15dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.002	-	%
Total Harmonic Distortion 6	THD6	f=10kHz, V_{IN} =200mVrms, VOL=+15dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.002	-	%
Total Harmonic Distortion 7	THD7	f=1kHz, V_{IN} =2Vrms,VOL=-18dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.002	0.02	%
Total Harmonic Distortion 8	THD8	f=10kHz, V_{IN} =2Vrms,VOL=-18dB, BW=400Hz-30kHz TONE=ON (Bass=Treble=0dB)	-	0.002	-	%

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PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
◆Tone Control Characteristics						
Treble Voltage Gain 1	G_{VTREB1}	V_{IN}=100mVrms, f=10kHz VOL=0dB, TONE=ON, Treble=0dB	-2.0	0	2.0	dB
Treble Voltage Gain 2	G_{VTREB2}	V_{IN}=100mVrms, f=10kHz VOL=0dB, TONE=ON, Treble=+10dB	8.0	10.0	12.0	dB
Treble Voltage Gain 3	G_{VTREB3}	V_{IN}=100mVrms, f=10kHz VOL=0dB, TONE=ON, Treble=-10dB	-12.0	-10.0	-8.0	dB
Bass Voltage Gain 1	G_{VBASS1}	V_{IN}=100mVrms, f=100Hz VOL=0dB, TONE=ON, Bass=0dB	-2.0	0	2.0	dB
Bass Voltage Gain 2	$G_{VBASS\ 2}$	V_{IN}=100mVrms, f=100Hz VOL=0dB, TONE=ON, Bass=+10dB	8.0	10.0	12.0	dB
Bass Voltage Gain 3	$G_{VBASS\ 3}$	V_{IN}=100mVrms, f=100Hz VOL=0dB, TONE=ON, Bass=-10dB	-12.0	-10.0	-8.0	dB
◆Logic Control Characteristics						
High Level Input Voltage	V_{IH}	DATA, CLOCK, LATCH, ADR0, ADR1	2.5	-	V^+	V
Low Level Input Voltage	V_{IL}	DATA, CLOCK, LATCH, ADR0, ADR1	0	-	1.5	V