4-Channel Electronic Volume with Input Selector

■ GENERAL DESCRIPTION

The **NJW1195A** is a 4-channel electronic volume with 4-in 2-out stereo audio selector. It performs low noise and low distortion characteristics with resistance ladder circuit.

The **NJW1195A** is also available for 2-channel differential transmission electronic volume with 2-in 1-out stereo audio selector by a differential transmission select function.

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.

At the volume attenuated, the **NJW1195A** improves low distortion compared with NJW1195. Furthermore, the **NJW1195A** supports both single power supply operation and dual power supply operation.

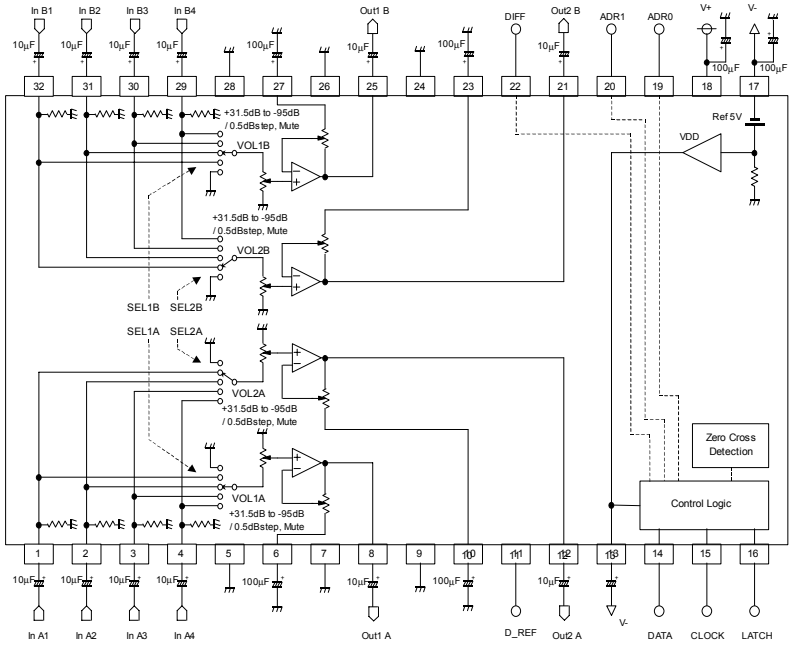
■ PACKAGE OUTLINE

NJW1195AV

■ FEATURES

● Operating Voltage	Dual power supply : ±3.5 to ±7.5V Single power supply : +7.0 to +15V
● 3-Wired Serial Control	Chip Address Select Function
● Selectable 4-Chip Address	Available for using four chips on same serial bus line
● Low Output Noise	-118dBV typ. (1.26μVrms typ.)
● Low Distortion	0.0003% typ. at Vin=1Vrms (Differential transmission)
● 4in 2out Stereo Signal Selector	
● Volume	+31.5 to –95dB / 0.5dB step, Mute
● Differential transmission select function	
● Channel Separation	-120dB typ.
● 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	800 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, VOL=0dB)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
◆ Power Supply						
Operating Voltage	V_+/V_-		±3.5	±7.0	±7.5	V
Supply Current 1	I_{CC}	No signal	-	9	15	mA
Supply Current 2	I_{EE}	No signal	-	9	15	mA
◆ Input/Output Characteristics (Output)						
Maximum Output Voltage	V_{OM}	f=1kHz,THD=1% VOL=0dB	3.6	4.2	-	Vrms
Voltage Gain 1	G_{V1}	V_{IN}=2Vrms, f=1kHz VOL=0dB	-0.5	0	0.5	dB
Voltage Gain 2	G_{V2}	V_{IN}=100mVrms, f=1kHz VOL=+15dB	+14	+15	+16	dB
Voltage Gain Error 1	ΔG_{V1}	V_{IN}=2Vrms, f=1kHz VOL=0dB	-0.5	0	0.5	dB
Voltage Gain Error 2	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, Out1 vs. Out2	-	-120	-90	dB
Channel Separation 2	CS2	f=20kHz, V_{IN} =2Vrms VOL=0dB, Rg=0Ω, Out1 vs. Out2	-	-100	-	dB
Channel Separation 3	CS3	f=1kHz, V_{IN} =2Vrms,A-weight VOL=0dB, Rg=0Ω, Out A vs. Out B	-	-120	-90	dB
Channel Separation 4	CS4	f=20kHz, V_{IN} =2Vrms VOL=0dB, Rg=0Ω, Out A vs. Out B	-	-100	-	dB
Input Impedance *	R_{IN}	Select Channel Input Terminal	12.0	16.7	-	kΩ

* Input Impedance is reduced by half (9.1kΩ typ.) when input selector 1 (SEL1) and input selector 2 (SEL2) chose the same input.

■ **ELECTRICAL CHARACTERISTICS (Ta=25°C, V^+/V^-=±7V, RL=47kΩ, Volume=0dB)**

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
◆ Input/Output Characteristics (Output)						
Output Noise1	V_{NO1}	Volume=0dB, Rg=0, A-weight	-	-118 (1.26μ)	-100 (10μ)	dBV (Vrms)
Output Noise2	V_{NO2}	Volume=-95dB, Rg=0, A-weight	-	-118 (1.26μ)	-	dBV (Vrms)
Total Harmonic Distortion 1	T.H.D.1	f=1kHz,V_{IN}=200mVrms,Volume=0dB, BW=400Hz-30kHz	-	0.001	-	%
Total Harmonic Distortion 2	T.H.D.2	f=10kHz, V_{IN} =200mVrms,Volume=0dB, BW=400Hz -30kHz	-	0.001	-	%
Total Harmonic Distortion 3	T.H.D.3	f=1kHz, V_{IN} =2Vrms,Volume=0dB, BW=400Hz -30kHz	-	0.001	-	%
Total Harmonic Distortion 4	T.H.D.4	f=10kHz, V_{IN} =2Vrms,Volume=0dB, BW=400Hz-30kHz	-	0.001	-	%
Total Harmonic Distortion 5	T.H.D.5	f=1kHz, V_{IN} =200mVrms, Volume=+15dB, BW=400Hz-30kHz	-	0.001	-	%
Total Harmonic Distortion 6	T.H.D.6	f=10kHz, V_{IN} =200mVrms, Volume=+15dB, BW=400Hz-30kHz	-	0.0015	-	%
Total Harmonic Distortion 7	T.H.D.7	f=1kHz, V_{IN} =2Vrms, Volume=-24dB, BW=400Hz-30kHz	-	0.003	0.01	%
Total Harmonic Distortion 8	T.H.D.8	f=10kHz, V_{IN} =2Vrms, Volume=-24dB, BW=400Hz-30kHz	-	0.003	-	%
Total Harmonic Distortion 9	T.H.D.9	f=1kHz, V_{IN} =1Vrms,Volume=0dB, BW=400Hz-30kHz, Differential transmission	-	0.0003	-	%
Total Harmonic Distortion 10	T.H.D.10	f=10kHz, V_{IN} =1Vrms,Volume=0dB, BW=400Hz-30kHz, Differential transmission	-	0.0003	-	%
◆Logic Control Characteristics						
High Level Input Voltage	V_{IH}	DATA, CLOCK, LATCH, ADR0, ADR1, DIFF Terminal Input	2.5	-	V^+	V
Low Level Input Voltage	V_{IL}	DATA, CLOCK, LATCH, ADR0, ADR1, DIFF Terminal Input	0	-	1.5	V