4-Channel Electronic Volume with Input Selector

■ GENERAL DESCRIPTION

The NJW1195 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 NJW1195 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.

■ PACKAGE OUTLINE



NJW1195V

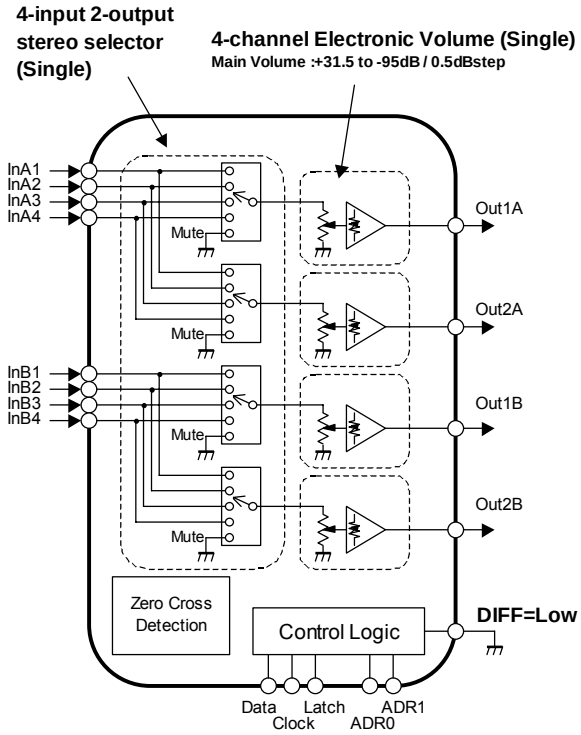
■ FEATURES

● Operating Voltage	±4.5 to ±7.5V
● 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.
● 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

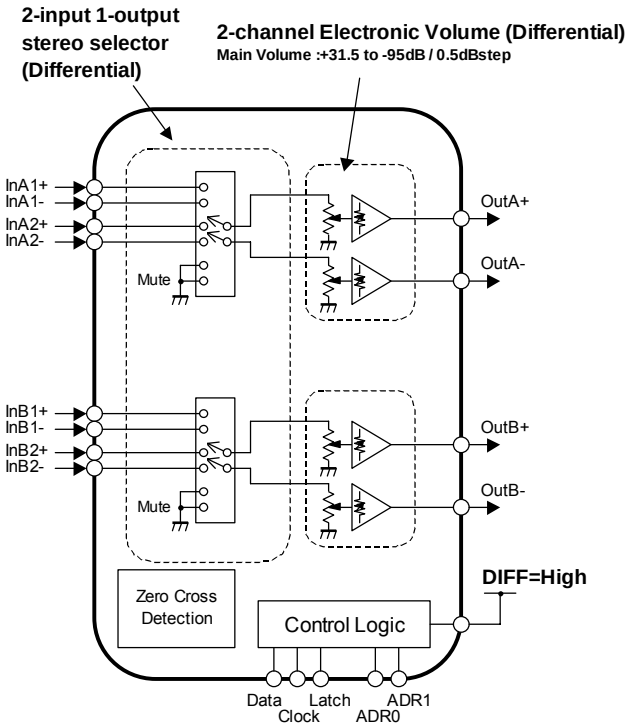
Application example 1

4-channel electronic volume
with 4-in 2-out stereo audio selector (DIFF pin = Low)



Application example 2

2-channel differential transmission electronic volume with 2-in 1-out stereo audio selector (DIFF pin = High)



■ **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, Volume=0dB)**

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	-	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% Volume=0dB	3.6	4.2	-	Vrms
Voltage Gain 1	G_{V1}	V_{IN}=2Vrms, f=1kHz Volume=0dB	-0.5	0	0.5	dB
Voltage Gain 2	G_{V2}	V_{IN}=100mVrms, f=1kHz Volume=+15dB	+14	+15	+16	dB
Voltage Gain Error 1	ΔG_{V1}	V_{IN}=2Vrms, f=1kHz Volume=0dB	-0.5	0	0.5	dB
Voltage Gain Error 2	ΔG_{V2}	V_{IN}=2Vrms, f=1kHz Volume=-60dB	-1.0	0	1.0	dB
Maximum Attenuation	A_{TT}	f=1kHz, V_{IN}=2Vrms Volume=-95dB, A-weight	-	-95	-	dB
Mute level	Mute	f=1kHz, V_{IN}=2Vrms Volume=Mute, A-weight	-	-120	-	dB
Cross Talk 1	CT1	f=1kHz,V_{IN}=2Vrms,A-weight Volume=0dB, Rg=0Ω	-	-115	-	dB
Cross Talk 2	CT2	f=20kHz, V_{IN} =2Vrms, Volume=0dB, Rg=0Ω	-	-95	-	dB
Channel Separation 1	CS1	f=1kHz, V_{IN} =2Vrms,A-weight Volume=0dB, Rg=0Ω Out1 vs. Out2	-	-120	-90	dB
Channel Separation 2	CS2	f=20kHz, V_{IN} =2Vrms, Volume=0dB, Rg=0Ω Out1 vs. Out2	-	-100	-	dB
Channel Separation 3	CS3	f=1kHz, V_{IN} =2Vrms,A-weight Volume=0dB, Rg=0Ω OutA vs. OutB	-	-120	-90	dB
Channel Separation 4	CS4	f=20kHz, V_{IN} =2Vrms, Volume=0dB, Rg=0Ω OutA vs. OutB	-	-100	-	dB
Input Impedance *	R_{IN}	Select Channel Input Terminal	15	20	-	kΩ

* Input Impedance is reduced by half (10kΩ 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,VOL=0dB, BW=400Hz-30kHz	-	0.001	-	%
Total Harmonic Distortion 2	T.H.D.2	f=10kHz, V_{IN} =200mVrms,VOL=0dB, BW=400Hz -30kHz	-	0.0015	-	%
Total Harmonic Distortion 3	T.H.D.3	f=1kHz, V_{IN} =2Vrms,VOL=0dB, BW=400Hz -30kHz	-	0.0007	-	%
Total Harmonic Distortion 4	T.H.D.4	f=10kHz, V_{IN} =2Vrms,VOL=0dB, BW=400Hz-30kHz	-	0.001	-	%
Total Harmonic Distortion 5	T.H.D.5	f=1kHz, V_{IN} =200mVrms, VOL=+15dB, BW=400Hz-30kHz	-	0.001	-	%
Total Harmonic Distortion 6	T.H.D.6	f=10kHz, V_{IN} =200mVrms, VOL=+15dB, BW=400Hz-30kHz	-	0.0015	-	%
Total Harmonic Distortion 7	T.H.D.7	f=1kHz, V_{IN} =2Vrms, VOL=-18dB, BW=400Hz-30kHz	-	0.0015	0.02	%
Total Harmonic Distortion 8	T.H.D.8	f=10kHz, V_{IN} =2Vrms, VOL=-18dB, BW=400Hz-30kHz	-	0.0015	-	%
Total Harmonic Distortion 9	T.H.D.9	f=1kHz, V_{IN} =1Vrms,VOL=0dB, BW=400Hz-30kHz, Differential transmission	-	0.0003	-	%
Total Harmonic Distortion 10	T.H.D.10	f=10kHz, V_{IN} =1Vrms,VOL=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

[CAUTION]
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