2Vrms Ground Referenced Stereo Line Amplifier with LPF

■GENERAL DESCRIPTION

The **NJU72010** is an audio line Amplifier .

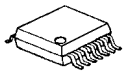
It can swing 2Vrms (5.6V peak-to-peak) signal at 3.3V operating voltage.

Ground-referenced outputs eliminate output coupling capacitor. The pop noise suppression circuit removes a pop noise at the power-on and power-off.

It is suitable for audio line interface of audio equipment which does not have over 9V regulator.

■PACKAGE OUTLINE

NJU72010RB2
MSOP10 (TVSP10)



NJU72010V
(SSOP14)

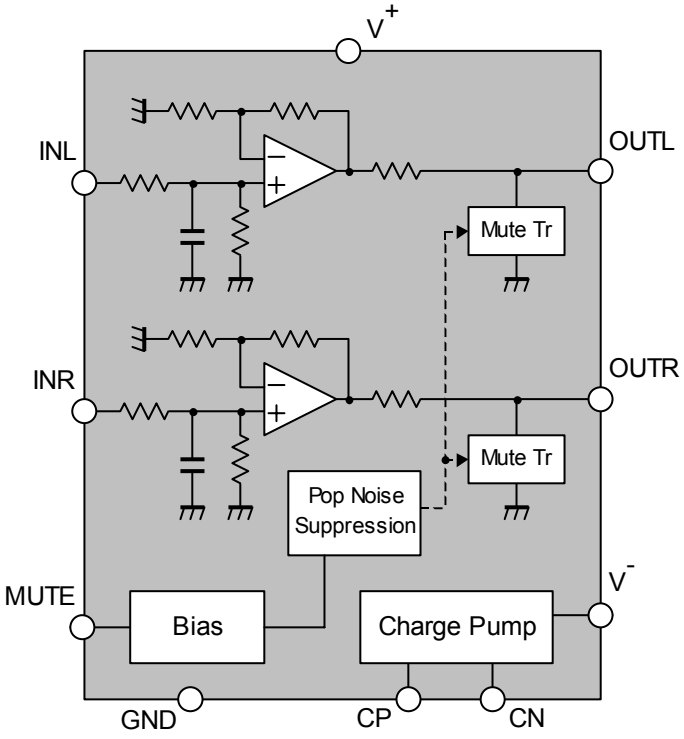
■APPLICATIONS

- Audio applications requiring 2Vrms outputs

■FEATURES

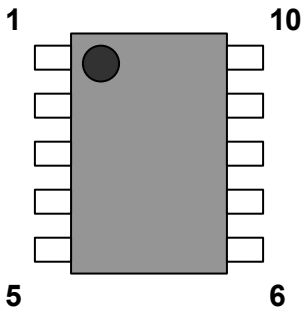
● Operating Voltage	+2.7 to +3.6V
● Operating Current	I_{DD}=5mA typ. at V^+=3.3V, R_L=47kΩ, No Signal
● Output Coupling Capacitor-less	
● Pop Noise Suppression Circuit	
● LPF	
● C-MOS Technology	
● Package Outline	MSOP10 (TVSP10)* SSOP14 *MEET JEDEC MO-187-DA / THIN TYPE

■BLOCK DIAGRAM



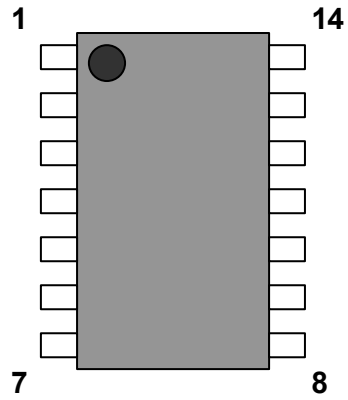
■PIN CONFIGURATION

MSOP10(TVSP10)



No.	Symbol	Function
1	INL	Lch Input
2	OUTL	Lch Output
3	V+	V+ Power Supply
4	CP	Flying Capacitor Positive Terminal
5	CN	Flying Capacitor Negative Terminal
6	V-	V- Power Supply
7	MUTE	Mute / Pop Noise Suppression
8	GND	Ground
9	OUTR	Rch Output
10	INR	Rch Input

SSOP14



No.	Symbol	Function
1	NC	NC
2	INL	Lch Input
3	OUTL	Lch Output
4	V+	V+ Power Supply
5	CP	Flying Capacitor Positive Terminal
6	CN	Flying Capacitor Negative Terminal
7	NC	NC
8	NC	NC
9	V-	V- Power Supply
10	MUTE	Mute / Pop Noise Suppression
11	GND	Ground
12	OUTR	Rch Output
13	INR	Rch Input
14	NC	NC

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

PARAMETER	SYMBOL	RATING	UNIT
Supply Voltage	V^+	+4	V
Power Dissipation	P_D	MSOP10(TVSP10) : 530(Note1) SSOP14 : 550(Note1)	mW
Maximum Input Voltage	V_{IMAX}	$-V^+$ -0.3 ~ V^+ +0.3	V
Operating Temperature Range	Topr	-40 ~ +85	°C
Storage Temperature Range	Tstg	-40 ~ +125	°C

(Note1) EIA/JEDEC STANDARD Test board (76.2x114.3x1.6mm, 2layer, FR-4) mounting

■**RECOMMENDED OPERATING CONDITIONS**

(Ta=25°C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	V^+		2.7	3.3	3.6	V

■**ELECTRICAL CHARACTERISTICS**

(Ta=25°C, V^+=3.3V, f=1kHz, Vin=1Vrms, MUTE=OFF, R_L=47kΩ unless otherwise specified)

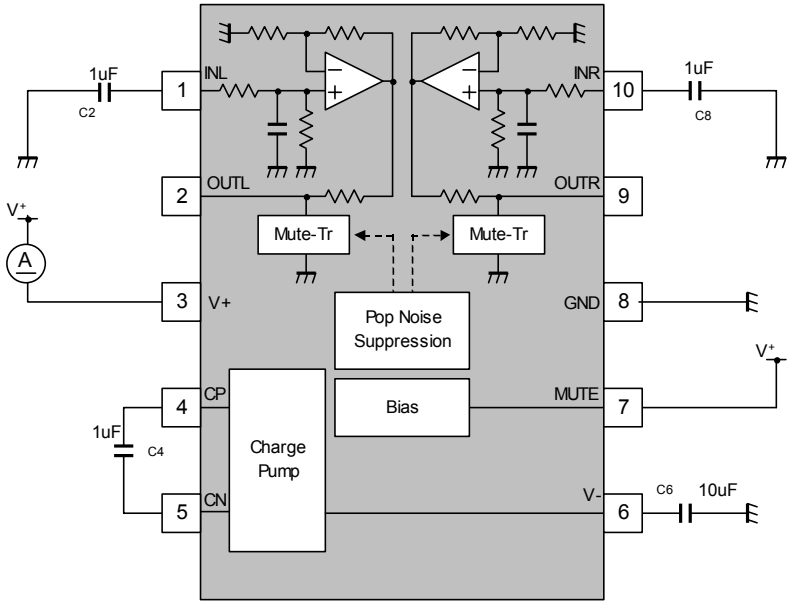
PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Current	I_{DD}	No signal	-	5	10	mA
Output Gain	G_V		5.2	6.2	7.2	dB
Output Gain Error	ΔG_V		-0.5	0	0.5	dB
Maximum Output Voltage Level	V_{OMAX}	THD=1%	-	2.3	-	Vrms
Mute Level	V_{MUTE}	MUTE=ON, BW:400Hz-22kHz	-	-110	-	dB
Equivalent Input Noise Voltage	V_{NO}	Rg=0Ω, BW:400Hz-22kHz	-	-106	-	dB
Total Harmonic Distortion	THD	BW:400Hz-22kHz	-	0.003	-	%
Channel Separation	CS	Rg=600Ω	80	-	-	dB
Cut-off Frequency	f_C	2^{nd} order LPF	100	150	200	kHz
Output Offset Voltage	V_{OS}	Rg=0Ω	-	1	5	mV
Power Supply Rejection Ratio	PSRR	Vripple=1kHz / 100mVrms	-	45	-	dB
Output Impedance	R_{OUT}		-	300	-	Ω

■**CONTROL CHARACTERISTICS**

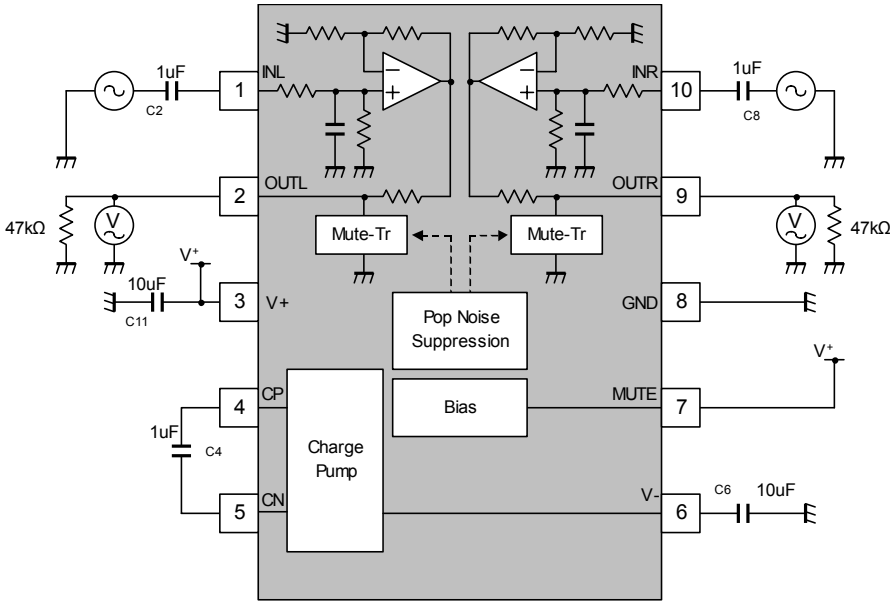
(Ta=25°C, V^+=3.3V, R_L=47kΩ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Mute terminal High	MuteH	Mute=OFF	$0.8V^+$	-	V^+	V
Mute terminal Low	MuteL	Mute=ON	0	-	$0.2V^+$	V

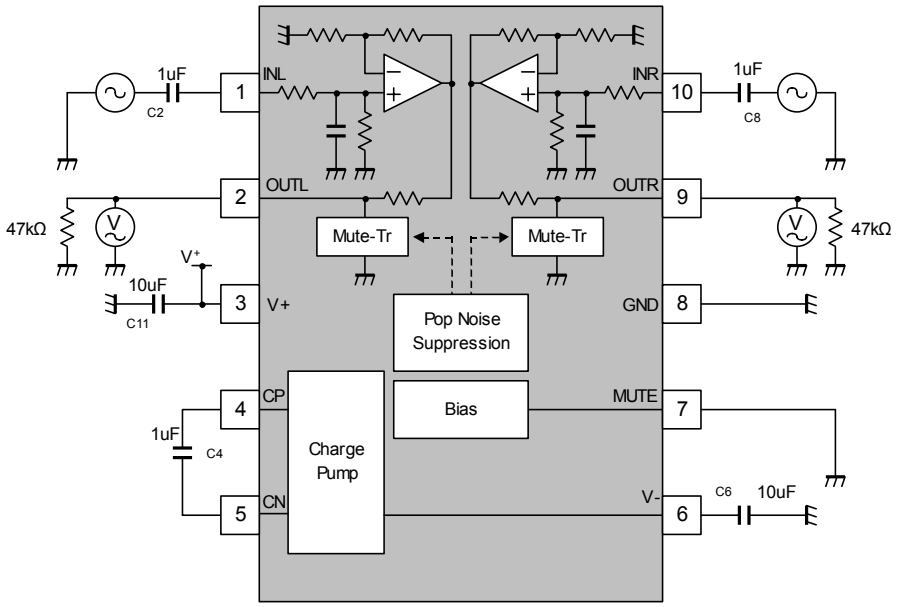
■**TEST CIRCUIT (I_{DD})**



■**TEST CIRCUIT** (G_V, V_{OMAX}, THD)



■**TEST CIRCUIT** (V_{MUTE})



■**TEST CIRCUIT** (V_{NO})
V_{NO}=(measurement)-Gv1