

## SINGLE SUPPLY DUAL AMPLIFIER

### GENERAL DESCRIPTION

The NJM12904 is single-supply dual operational amplifier, which can operate from 2V supply. The features are low offset voltage, low bias current, and drive TTL or DTL circuit directly. The package lineup is DIP, DMP and others compact, which is SON, so that the NJM12904 is suitable for audio for low voltage operation and any other kind of signal amplifier.

### PACKAGE OUTLINE



NJM12904D



NJM12904M



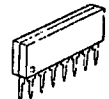
NJM12904E



NJM12904V



NJM12904R

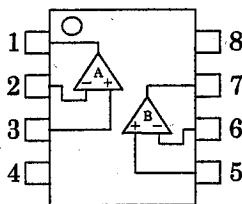


NJM12904L

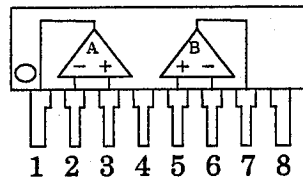
### FEATURES

- Operating Voltage (+2V~+14V)
- Slew Rate (0.7V/ $\mu$ s typ.)
- Operating Current (0.7mA typ.)
- Bipolar Technology
- Package Outline DIP8, DMP8, EMP8, SSOP8, VSP8, SIP8, SON(PRELIMINARY)

### PIN CONFIGURATION



NJM12904D/12904M  
 NJM12904E/12904V/12904R  
 NJM12904x(PRELIMINARY)

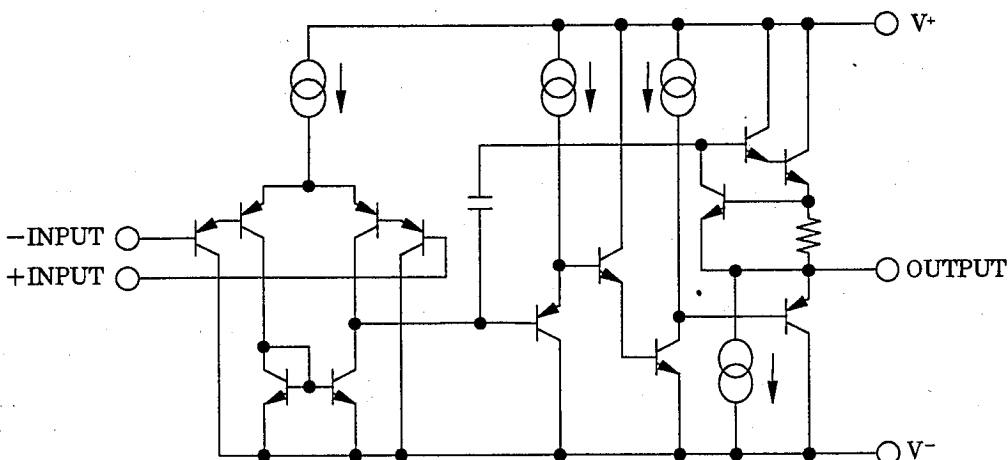


NJM12904L

### PIN FUNCTION

1. A OUTPUT
2. A -INPUT
3. A +INPUT
4. GND
5. B +INPUT
6. B -INPUT
7. B OUTPUT
8. V<sup>+</sup>

### EQUIVALENT CIRCUIT (1/2Shown)



**■ ABSOLUTE MAXIMUM RATING**

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V <sup>+</sup>	15	V
Differential Input Voltage	V <sub>ID</sub>	14	V
Input Voltage	V <sub>IC</sub>	-0.3~+14	V
Power Dissipation	P <sub>D</sub>	(DIP8) 500 (DMP8) 300 (EMP8) 300 (SSOP8) 250 (VSP8) 320 (SIP8) 800 (SON8) U.D.	mW
Operating Temperature Range	Topr	-40~+85	°C
Storage Temperature Range	Tstg	-50~+125	°C

**■ ELECTRICAL CHARACTERISTICS (V<sup>+</sup>=5V, Ta=25°C)**

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	Vopr		2	—	14	V
Input Offset Voltage	V <sub>IO</sub>	R <sub>S</sub> =0Ω	—	1	5	mV
Input Offset Current	I <sub>IO</sub>		—	5	50	nA
Input Bias Current	I <sub>B</sub>		—	20	150	nA
Large Signal Voltage Swing	A <sub>V</sub>	R <sub>L</sub> ≥2kΩ	—	100	—	dB
Maximum Output Voltage Range	V <sub>OM</sub>	R <sub>L</sub> =2kΩ	3.5	—	—	V
Input Common Mode Voltage Range	V <sub>ICM</sub>		0~3.5	—	—	V
Common Mode Rejection Ratio	CMR		—	85	—	dB
Supply Voltage Rejection Ratio	SVR		—	100	—	dB
Output Source Current	I <sub>SOURCE</sub>	V <sub>IN</sub> <sup>+</sup> =1V, V <sub>IN</sub> <sup>-</sup> =0V	20	40	—	mA
Output Sink Current	I <sub>SINK</sub>	V <sub>IN</sub> <sup>+</sup> =0V, V <sub>IN</sub> <sup>-</sup> =1V	8	20	—	mA
Channel Separation	CS	f=1k~20kHz	—	120	—	dB
Operating Current	I <sub>CC</sub>	R <sub>L</sub> =∞	—	0.7	1.2	mA
Slew Rate	SR		—	0.7	—	V/μs
Gain Bandwidth Product	GB		—	1.5	—	MHz

## MEMO

[CAUTION]

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