

## SINGLE-SUPPLY LOW POWER DUAL OPERATIONAL AMPLIFIER

### ■ GENERAL DESCRIPTION

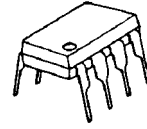
The NJM2132 is a general purpose single supply low power dual operational amplifier.

The features of low operating current, wide and low operating voltage, high input impedance, and single supply operation are suitable for battery operated items.

### ■ FEATURES

- Operating Voltage ( +2.7V~+32V )
- Low Operating Current ( 180 $\mu$ A typ. @  $V^+$ =5V, each amplifier )
- Slew Rate ( 2.1V/ $\mu$ s typ. )
- Gain Bandwidth Product ( 1.8MHz typ. )
- Bipolar Technology
- Package Outline DIP8, DMP8, SSOP8, SIP8

### ■ PACKAGE OUTLINE



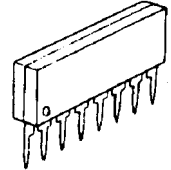
NJM2132D



NJM2132M

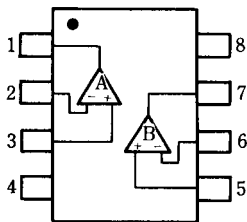


NJM2132V

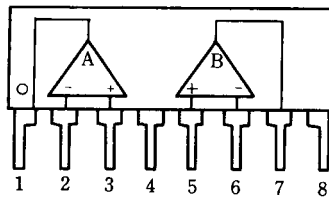


NJM2132L

### ■ PIN CONFIGURATION



NJM2132D  
NJM2132M  
NJM2132V

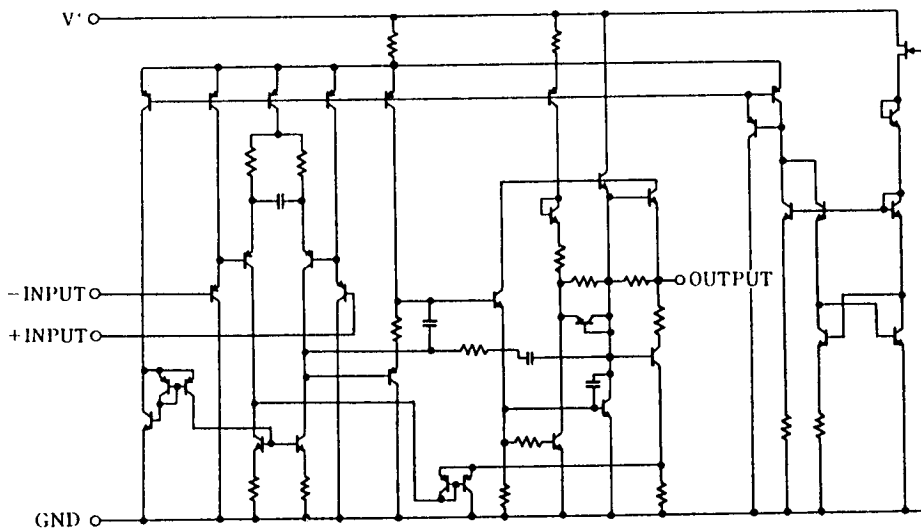


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### PIN FUNCTION

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

### ■ EQUIVALENT CIRCUIT ( 1/2 Shown )



# NJM2132

## ■ ABSOLUTE MAXIMUM RATINGS

( Ta=25°C )

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V^+$	36	V
Differential Input Voltage	$V_{ID}$	$\pm 36$	V
Input Voltage	$V_{IC}$	-0.3~+36 ( note )	V
Power Dissipation	$P_D$	( DIP8 ) 500 ( DMP8 ) 300 ( SSOP8 ) 250 ( SIP8 ) 800	mW
Operating Temperature Range	$T_{opr}$	-40~+85	°C
Storage Temperature Range	$T_{stg}$	-50~+125	°C

( note ) When the supply voltage is less than +36V, the absolute maximum input voltage is equal to the supply voltage.

## ■ ELECTRICAL CHARACTERISTICS

(  $V^+V^-=\pm 15V, Ta=25^\circ C$  )

PARAMETER	SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Operating Voltage	$V^+$	Single Supply	+2.7		+32	V
Input Offset Voltage	$V_{IO}$	$R_S=0\Omega$ $V^+=+5V, V^-=0V, R_S=0\Omega$	-	2.0	4.5	mV
$V_{IO}$ Drift	$\Delta V_{IO}/T$	$R_S=0\Omega$	-	10	-	$\mu V/^\circ C$
Input Offset Current	$I_{IO}$		-	5	20	nA
Input Bias Current	$I_B$		-	20	100	nA
Large Signal Voltage Gain	$A_V$	$R_L \geq 10k\Omega, V_O = \pm 10V$	94	114	-	dB
Input Common Mode Voltage Range	$V_{ICM}$		-15~+13.5	-	-	V
Common Mode Rejection Ratio	CMR	$R_S \leq 10k\Omega$	80	90	-	dB
Supply Voltage Rejection Ratio	SVR	$R_S = 100\Omega$	80	100	-	dB
Maximum Output Voltage Swing	$V_{OM}$	$R_L = 10k\Omega$	$\pm 13.6$	$\pm 14.2$	-	V
	$+V_{OM}$	$V^+=+5V, V^-=0V$	3.5	4.3	-	
	$-V_{OM}$	$R_L = 10k\Omega$	-	0.05	0.15	
Operating Current	$I_{CC}$	$R_L = \infty$ ( all Amp. ) $V^+=+5V, V^-=0V$	-	440	500	$\mu A$
Output Source Current	$I_{SOURCE}$	$V_{IN}^+ = 1V, V_{IN}^- = 0V$	3.0	5.0	-	mA
Output Sink Current	$I_{SINK}$	$V_{IN}^+ = 0V, V_{IN}^- = 1V$	15	27	-	mA
Input Resistance	$R_{IN}$		-	300	-	M $\Omega$
Input Capacitance	$C_i$		-	0.8	-	pF
Close Loop Output Impedance	$Z_O$	$f = 1.0MHz$	-	100	-	$\Omega$
Equivalent Input Noise Voltage	$e_n$	$R_S = 100\Omega, f = 1kHz$	-	32	-	$nV/\sqrt{Hz}$
Slew Rate	SR	$R_L = 10k\Omega$	-	2.1	-	V/ $\mu s$
Gain Bandwidth Product	GB	$f = 100kHz$	-	1.8	-	MHz
Power Bandwidth	$BW_P$	$A_V = +1.0, R_L = 10k\Omega$ $V_O = 20V_{P-P}, THD = 5\%$	-	35	-	kHz
Phase Margin	$\phi_M$	$R_L = 10k\Omega$	-	60	-	deg.
Amplitude Margin	$A_m$	$R_L = 10k\Omega, C_L = 100pF$	-	45	-	dB
		$R_L = 10k\Omega, C_L = 100pF$	-	15	-	dB
Total Harmonic Distortion	THD	$A_V = +10, R_L = 10k\Omega$ $f = 10kHz, 2 \leq V_O \leq 20V_{P-P}$	-	0.03	-	%
Channel Separation	CS	$f = 10kHz, Input Referred$	-	120	-	dB

**[CAUTION]**

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