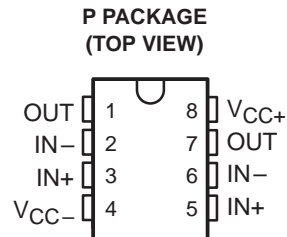


NE5532, NE5532A, NE5532I, NE5532AI DUAL LOW-NOISE OPERATIONAL AMPLIFIERS

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- **Equivalent Input Noise Voltage**
5 $\text{nv}/\sqrt{\text{Hz}}$ Typ at 1 kHz
- **Unity-Gain Bandwidth . . . 10 MHz Typ**
- **Common-Mode Rejection Ratio**
100 dB Typ
- **High DC Voltage Gain . . . 100 V/mV Typ**
- **Peak-to-Peak Output Voltage Swing**
32 V Typ With $V_{CC\pm} = \pm 18 \text{ V}$ and
 $R_L = 600 \Omega$
- **High Slew Rate . . . 9 V/ μs Typ**
- **Wide Supply Voltage Range . . . $\pm 3 \text{ V}$
to $\pm 20 \text{ V}$**
- **Designed to Be Interchangeable With**
Signetics NE5532 and NE5532A

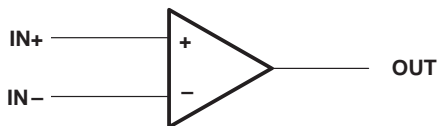


description

The NE5532 and NE5532A are monolithic high-performance operational amplifiers combining excellent dc and ac characteristics. They feature very low noise, high output drive capability, high unity-gain and maximum-output-swing bandwidths, low distortion, high slew rate, input-protection diodes, and output short-circuit protection. These operational amplifiers are internally compensated for unity-gain operation. The NE5532A has specified maximum limits for equivalent input noise voltage.

The NE5532 and NE5532A are characterized for operation from 0°C to 70°C. The NE5532I and NE5532AI are characterized for operation from -40°C to 85°C.

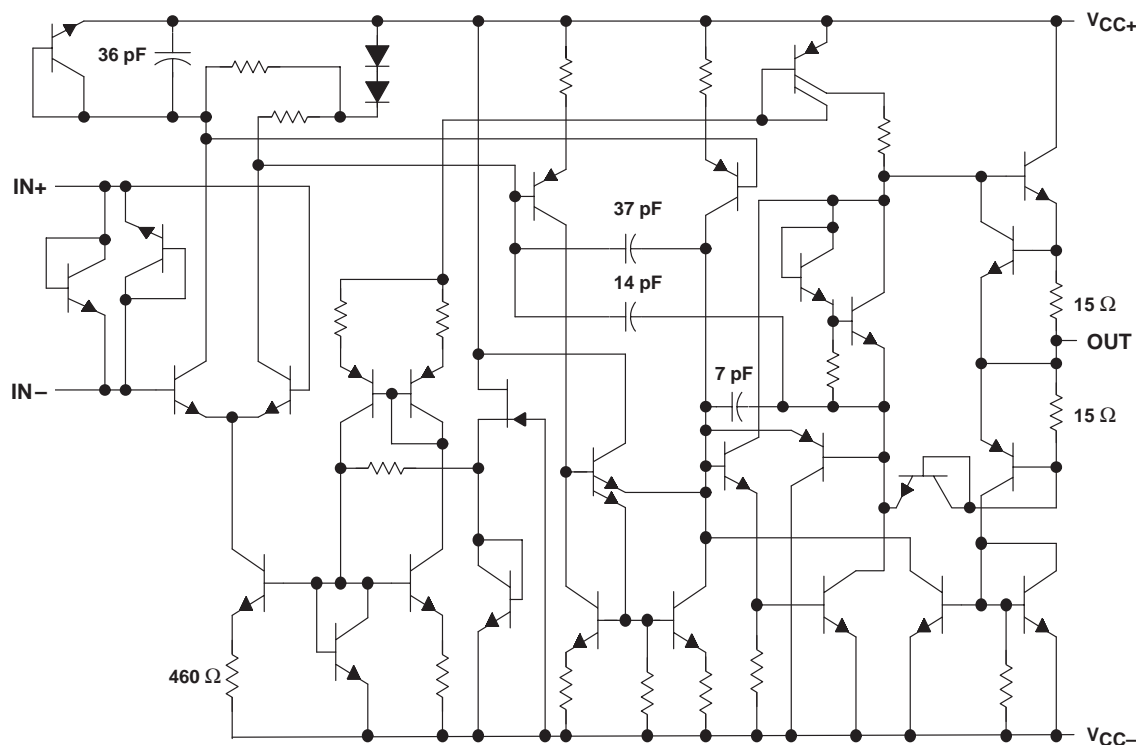
symbol (each amplifier)



NE5532, NE5532A, NE5532I, NE5532AI DUAL LOW-NOISE OPERATIONAL AMPLIFIERS

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schematic (each amplifier)



Component values shown are nominal.

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)

Supply voltage, V_{CC+} (see Note 1)	22 V
Supply voltage, V_{CC-} (see Note 1)	-22 V
Input voltage, either input (see Notes 1 and 2)	$V_{CC\pm}$
Input current (see Note 3)	± 10 mA
Duration of output short circuit (see Note 4)	unlimited
Continuous total power dissipation	See Dissipation Rating Table
Operating free-air temperature range: NE5532, NE5532A	0°C to 70°C
NE5532I, NE5532AI	-40°C to 85°C
Storage temperature range	-65°C to 150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C

- NOTES: 1. All voltage values, except differential voltages, are with respect to the midpoint between V_{CC+} and V_{CC-} .
 2. The magnitude of the input voltage must never exceed the magnitude of the supply voltage.
 3. Excessive input current will flow if a differential input voltage in excess of approximately 0.6 V is applied between the inputs unless some limiting resistance is used.
 4. The output may be shorted to ground or either power supply. Temperature and/or supply voltages must be limited to ensure the maximum dissipation rating is not exceeded.

DISSIPATION RATING TABLE

PACKAGE	$T_A \leq 25^\circ\text{C}$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25^\circ\text{C}$	$T_A = 70^\circ\text{C}$ POWER RATING	$T_A = 85^\circ\text{C}$ POWER RATING
P	1000 mW	8 mW/°C	640 mW	520 mW



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NE5532, NE5532A, NE5532I, NE5532AI DUAL LOW-NOISE OPERATIONAL AMPLIFIERS

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recommended operating conditions

	MIN	NOM	MAX	UNIT
Supply voltage, V_{CC+}	5		15	V
Supply voltage, V_{CC-}	-5		-15	V

electrical characteristics, $V_{CC\pm} = +15\text{ V}$, $T_A = 25^\circ\text{C}$ (unless otherwise noted)

PARAMETER		TEST CONDITIONS†		MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	$V_O = 0$	$T_A = 25^\circ\text{C}$	0.5	4		mV
			$T_A = \text{Full range}$			5	
I_{IO}	Input offset current	$T_A = 25^\circ\text{C}$		10	150		nA
		$T_A = \text{Full range}$				200	
I_{IB}	Input bias current	$T_A = 25^\circ\text{C}$		200	800		nA
		$T_A = \text{Full range}$				1000	
V_{ICR}	Common-mode input voltage range			± 12	± 13		V
V_{OPP}	Maximum peak-to-peak output voltage swing	$R_L \geq 600\ \Omega$	$V_{CC\pm} = \pm 15\text{ V}$	24	26		V
			$V_{CC\pm} = \pm 18\text{ V}$	30	32		
A_{VD}	Large-signal differential voltage amplification	$R_L \geq 600\ \Omega$, $V_O = \pm 10\text{ V}$	$T_A = 25^\circ\text{C}$	15	50		V/mV
			$T_A = \text{Full range}$	10			
		$R_L \geq 2\text{ k}\Omega$, $V_O = \pm 10\text{ V}$	$T_A = 25^\circ\text{C}$	25	100		
			$T_A = \text{Full range}$	15			
A_{vd}	Small-signal differential voltage amplification	$f = 10\text{ kHz}$		2.2		V/mV	
B_{OM}	Maximum-output-swing bandwidth	$R_L = 600\ \Omega$	$V_O = \pm 10\text{ V}$	140			kHz
			$V_{CC\pm} = \pm 18\text{ V}$, $V_O = \pm 14\text{ V}$	100			
B_1	Unity-gain bandwidth	$R_L = 600\ \Omega$,	$C_L = 100\text{ pF}$	10			MHz
r_i	Input resistance			30	300		k Ω
z_o	Output impedance	$A_{VD} = 30\text{ dB}$, $R_L = 600\ \Omega$, $f = 10\text{ kHz}$		0.3			Ω
CMRR	Common-mode rejection ratio	$V_{IC} = V_{ICR\text{ min}}$		70	100		dB
k_{SVR}	Supply voltage rejection ratio ($\Delta V_{CC\pm}/\Delta V_{IO}$)	$V_{CC\pm} = \pm 9\text{ V to } \pm 15\text{ V}$, $V_O = 0$		80	100		dB
I_{OS}	Output short-circuit current			38			mA
I_{CC}	Total supply current	$V_O = 0$, No load		8	16		mA
		Crosstalk attenuation (V_{O1}/V_{O2})		$V_{O1} = 10\text{ V peak}$, $f = 1\text{ kHz}$		110	

† All characteristics are measured under open-loop conditions with zero common-mode input voltage unless otherwise specified. Full range for T_A is 0°C to 70°C for NE5532/NE5532A and -40°C to 85°C for NE5532I/NE5532AI.

operating characteristics, $V_{CC\pm} = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	NE5532/NE5532I			NE5532A/NE5532AI			UNIT
		MIN	TYP	MAX	MIN	TYP	MAX	
SR	Slew rate at unity gain		9		9		V/ μs	
	Overshoot factor	$V_I = 100\text{ mV}$, $R_L = 600\ \Omega$,		10%	10%			
V_n	Equivalent input noise voltage	$f = 30\text{ Hz}$		8	8	10	nV/ $\sqrt{\text{Hz}}$	
		$f = 1\text{ kHz}$		5	5	6		
I_n	Equivalent input noise current	$f = 30\text{ Hz}$		2.7	2.7		pA/ $\sqrt{\text{Hz}}$	
		$f = 1\text{ kHz}$		0.7	0.7			



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