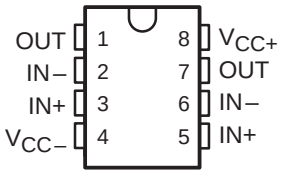
- **Equivalent Input Noise Voltage 5 nv/$\sqrt{Hz}$ Typ at 1 kHz**
- **Unity-Gain Bandwidth . . . 10 MHz Typ**
- **Common-Mode Rejection Ratio 100 dB Typ**
- **High DC Voltage Gain . . . 100 V/mV Typ**
- **Peak-to-Peak Output Voltage Swing 32 V Typ With $V_{CC\pm}$ = ±18 V and R_L = 600 Ω**
- **High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

P PACKAGE
(TOP VIEW)

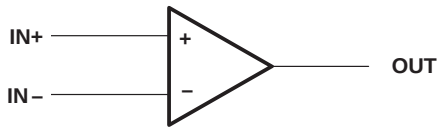


description

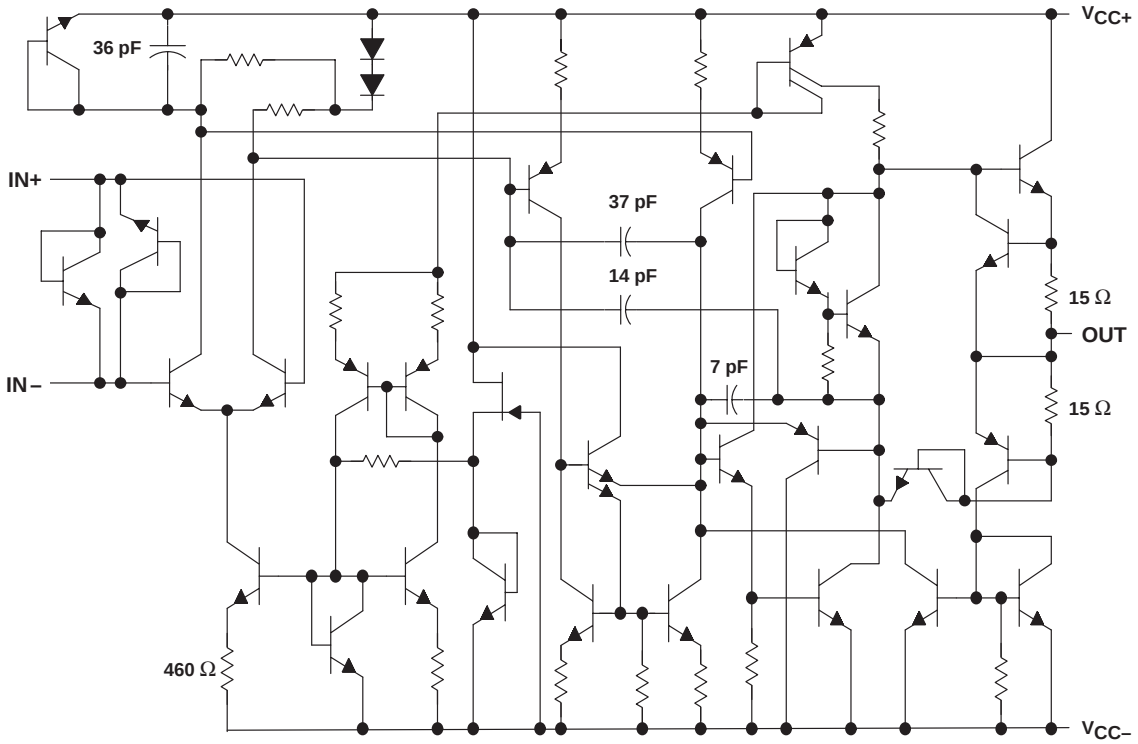
The NE5532 and NE5532A are monolithic high-performance operational amplifiers combining excellent dc and ac characteristics. They feature very low noise, high output drive capability, high unity-gain and maximum-output-swing bandwidths, low distortion, high slew rate, input-protection diodes, and output 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)



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	$T_A \le 25°C$ POWER RATING	OPERATING FACTOR ABOVE $T_A = 25°C$	$T_A = 70°C$ POWER RATING	$T_A = 85°C$ POWER RATING
P	1000 mW	8 mW/°C	640 mW	520 mW

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 V, T_A = 25°C (unless otherwise noted)

PARAMETER		TEST CONDITIONS†			MIN	TYP	MAX	UNIT
V_{IO}	Input offset voltage	V_O = 0	T_A = 25°C			0.5	4	mV
			T_A = Full range				5	
I_{IO}	Input offset current	T_A = 25°C				10	150	nA
		T_A = Full range					200	
I_{IB}	Input bias current	T_A = 25°C				200	800	nA
		T_A = Full range					1000	
V_{ICR}	Common-mode input voltage range				±12	±13		V
V_{OPP}	Maximum peak-to-peak output voltage swing	$R_L \geq 600\ \Omega$	$V_{CC\pm}$ = ±15 V		24	26		V
			$V_{CC\pm}$ = ±18 V		30	32		
A_{VD}	Large-signal differential voltage amplification	$R_L \geq 600\ \Omega$, V_O = ±10 V	T_A = 25°C		15	50		V/mV
			T_A = Full range		10			
		$R_L \geq 2\ k\Omega$, V_O = ±10 V	T_A = 25°C		25	100		
			T_A = Full range		15			
A_{vd}	Small-signal differential voltage amplification	f = 10 kHz				2.2		V/mV
B_{OM}	Maximum-output-swing bandwidth	R_L = 600 Ω	V_O = ±10 V			140		kHz
			$V_{CC\pm}$ = ±18 V,	V_O = ±14 V		100		
B_1	Unity-gain bandwidth	R_L = 600 Ω,	C_L = 100 pF			10		MHz
r_i	Input resistance				30	300		kΩ
z_o	Output impedance	A_{VD} = 30 dB,	R_L = 600 Ω,	f = 10 kHz		0.3		Ω
CMRR	Common-mode rejection ratio	$V_{IC} = V_{ICR}$ min			70	100		dB
k_{SVR}	Supply voltage rejection ratio ($\Delta V_{CC\pm}/\Delta V_{IO}$)	$V_{CC\pm}$ = ±9 V to ±15 V,		V_O = 0	80	100		dB
I_{OS}	Output short-circuit current					38		mA
I_{CC}	Total supply curent	V_O = 0,	No load			8	16	mA
	Crosstalk attenuation (V_{O1}/V_{O2})	V_{01} = 10 V peak,	f = 1 kHz			110		dB

† 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, $V_{CC\pm}$ = ±15 V, T_A = 25°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 mV, A_{VD} = 1, R_L = 600 Ω, C_L = 100 pF		10%			10%		
V_n	Equivalent input noise voltage	f = 30 Hz		8			8	10	nV/√Hz
		f = 1 kHz		5			5	6	
I_n	Equivalent input noise current	f = 30 Hz		2.7			2.7		pA/√Hz
		f = 1 kHz		0.7			0.7		

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