

NE/SA/SE5512 Dual High-Performance Operational Amplifier

Product Specification

Linear Products

DESCRIPTION

The 5512 series of high-performance operational amplifiers provides very good input characteristics. These amplifiers feature low input bias and voltage characteristics such as a 108 op amp with improved CMRR and a high differential input voltage limit achieved through the use of a bias cancellation and PNP input circuits with collector-to-emitter clamping. The output characteristics are like those of a 741 op amp with improved slew rate and drive capability, yet have low supply quiescent current.

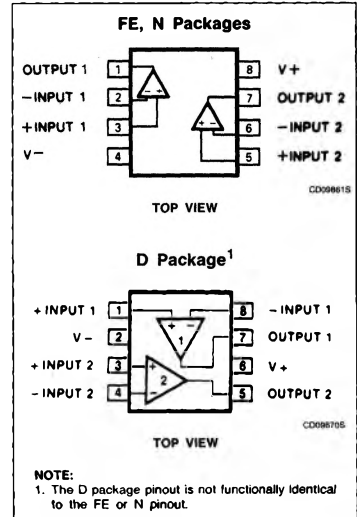
APPLICATIONS

- AC amplifiers
- RC active filters
- Transducer amplifiers
- DC gain block
- Battery operation
- Instrumentation amplifiers

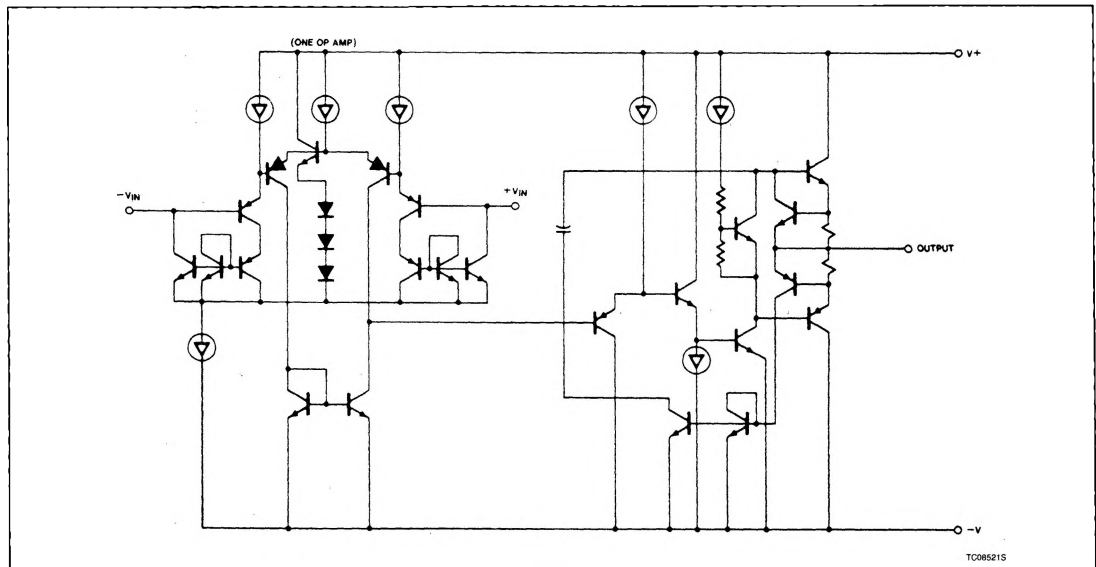
FEATURES

- Low input bias $< \pm 20\text{nA}$
- Low input offset current $< \pm 20\text{nA}$
- Low input offset voltage $< 1\text{mV}$
- Low V_{OS} temperature drift $5\mu\text{V}/^\circ\text{C}$
- Low input bias temperature drift $40\text{pA}/^\circ\text{C}$
- Low input voltage noise $30\text{nV}/\sqrt{\text{Hz}}$
- Low supply current $1.5\text{mA}/\text{amp}$
- High slew rate $1.0\text{V}/\mu\text{s}$
- High CMRR 100dB
- High input impedance $100\text{M}\Omega$
- High PSRR 110dB
- High differential input voltage limit
- No crossover distortion
- Indefinite output short circuit protection
- Internally-compensated for unity gain
- 600Ω drive capability
- MIL-STD processing available

PIN CONFIGURATIONS



EQUIVALENT SCHEMATIC



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ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE
8-Pin Plastic SO	0°C to +70°C	NE5512D
8-Pin Ceramic DIP	0°C to +70°C	NE5512FE
8-Pin Plastic DIP	0°C to +70°C	NE5512N
8-Pin Plastic SO	-40°C to +85°C	SA5512D
8-Pin Plastic DIP	-40°C to +85°C	SA5512N
8-Pin Ceramic DIP	-55°C to +125°C	SE5512FE
8-Pin Plastic DIP	-55°C to +125°C	SE5512N

ABSOLUTE MAXIMUM RATINGS

SYMBOL	PARAMETER	RATING	UNIT
V _{CC}	Supply voltage	± 16	V
P _D MAX	Maximum power dissipation, T _A = 25°C (still air) ¹ FE package N package D package	850 1212 800	mW mW mW
T _A	Operating ambient temperature range NE5512 SA5512 SE5512	0 to +70 -40 to +85 -55 to +125	°C °C °C
T _{STG}	Storage temperature range	-65 to +150	°C
T _{SOLD}	Lead soldering temperature (10sec max)	300	°C

NOTE:

1. The following derating factors should be applied above 25°C:
 FE package at 6.8mW/°C
 N package at 9.7mW/°C
 D package at 6.4mW/°C

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ELECTRICAL PERFORMANCE CHARACTERISTICS $V_{CC} = \pm 15V$, $T_A = 25^\circ C$ over temperature range, unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	SE5512			NE/SA5512			UNIT
			Min	Typ	Max	Min	Typ	Max	
V_{OS}	Input offset voltage	$R_S = 100\Omega$ $T_A = +25^\circ C$ Over temp.		0.7 1 4	2 3		1 1.5 5	5 6	mV
$\Delta V_{OS}/\Delta T$									$\mu V/^\circ C$
I_{OS}	Input offset current	$R_S = 100k\Omega$ $T_A = +25^\circ C$ Over temp.		3 4 30	10 20		6 8 40	20 30	nA
$\Delta I_{OS}/\Delta T$									$pA/^\circ C$
I_{BIAS}	Input bias current	$R_S = 100k\Omega$ $T_A = +25^\circ C$ Over temp.		3 4 30	10 20		6 8 40	20 30	nA
$\Delta I_{BIAS}/\Delta T$									$pA/^\circ C$
R_{IN}	Input resistance differential	$T_A = 25^\circ C$		100			100		M Ω
V_{CM}	Input common mode range	$T_A = 25^\circ C$ Over temp.	± 13.5 ± 13	± 13.7 ± 13.2		± 13.5 ± 13	± 13.7 ± 13.2		V
CMRR	Input common-mode rejection ratio	$V_{CC} = \pm 15V$ $V_{IN} = \pm 13.5V$ $T_A = 25^\circ C$ $V_{IN} = \pm 13V$ Over temp.	70	100		70	100		dB
A_V	Large-signal voltage gain	$R_L = 2k\Omega$ $T_A = 25^\circ C$ $V_O = \pm 10V$ over temp.	50 25	200		50 25	200		V/mV
SR	Slew rate	$T_A = 25^\circ C$	0.6	1			1		V/ μs
GBW	Small-signal unity gain bandwidth	$T_A = 25^\circ C$		3			3		MHz
θ_M	Phase margin	$T_A = 25^\circ C$		45			45		degree
V_{OUT}	Output voltage swing	$R_L = 2k\Omega$ $T_A = 25^\circ C$ Over temp.	± 13 ± 12.5	± 13.5 ± 13		± 13 ± 12.5	± 13.5 ± 13		V
V_{OUT}	Output voltage swing	$R_L = 600\Omega^1$ $T_A = 25^\circ C$ Over temp.	± 10 ± 7.5	± 11.5 ± 9		± 10 ± 8	± 11.5 ± 9		V
I_{CC}	Power supply current	$R_L = \text{Open}$ $T_A = 25^\circ C$ Over temp.		3.4 3.6	5 5.5		3.4 3.6	5 5.5	mA
PSRR	Power supply rejection ratio	$T_A = 25^\circ C$ Over temp.	80 80	110 100		80 80	110 100		dB
AA	Amplifier-to-amplifier coupling	$f = 1kHz$ to $20kHz$, $T_A = 25^\circ C$		-120			-120		dB
THD	Total harmonic distortion	$f = 10kHz$ $T_A = 25^\circ C$ $V_O = 7V_{RMS}$		0.01			0.01		%
V_{NOISE}	Input noise voltage	$f = 1kHz$ $T_A = 25^\circ C$		30			30		nV/ $\sqrt{Hz}$
I_{NOISE}	Input noise current	$f = 1kHz$ $T_A = 25^\circ C$		0.2			0.2		pA/ $\sqrt{Hz}$
I_{SC}	Short-circuit current	$\pm 15V$, $T_A = 25^\circ C$		40			40		mA

NOTE:

1. Not to exceed maximum package power dissipation.