DUAL HIGH PERFORMANCE OPERATIONAL AMPLIFIER — SE/NE5512

DESCRIPTION

The 5512 series of high performance operational amplifier 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

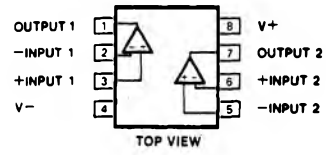
- AC amplifiers
- RC active filters
- Transducer amplifiers
- DC gain block
- Battery operation
- Instrumentation amplifiers

FEATURES

- Low input bias < ±20nA
- Low input offset current < ±20nA
- Low input offset voltage < 1mV
- Low V_{OS} temperature drift 5μV/°C
- Low input bias temperature drift 40pA/°C
- Low input voltage noise 30nV/√Hz
- Low supply current 1.5mA/amp
- High slew rate 1.0V/μs
- High CMRR 100dB
- High input impedance 100MΩ
- High PSRR 110dB
- High differential input voltage limit
- No cross-over distortion
- Indefinite output short circuit protection
- Internally compensated for unity gain
- 600Ω drive capability

PIN CONFIGURATIONS

FE,N PACKAGE

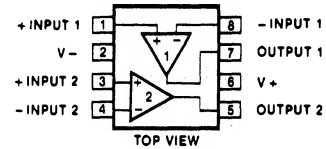


TOP VIEW

ORDER NUMBERS

SE/NE5512FE SE/NE5512N

D^3 PACKAGE



TOP VIEW

ORDER NUMBER

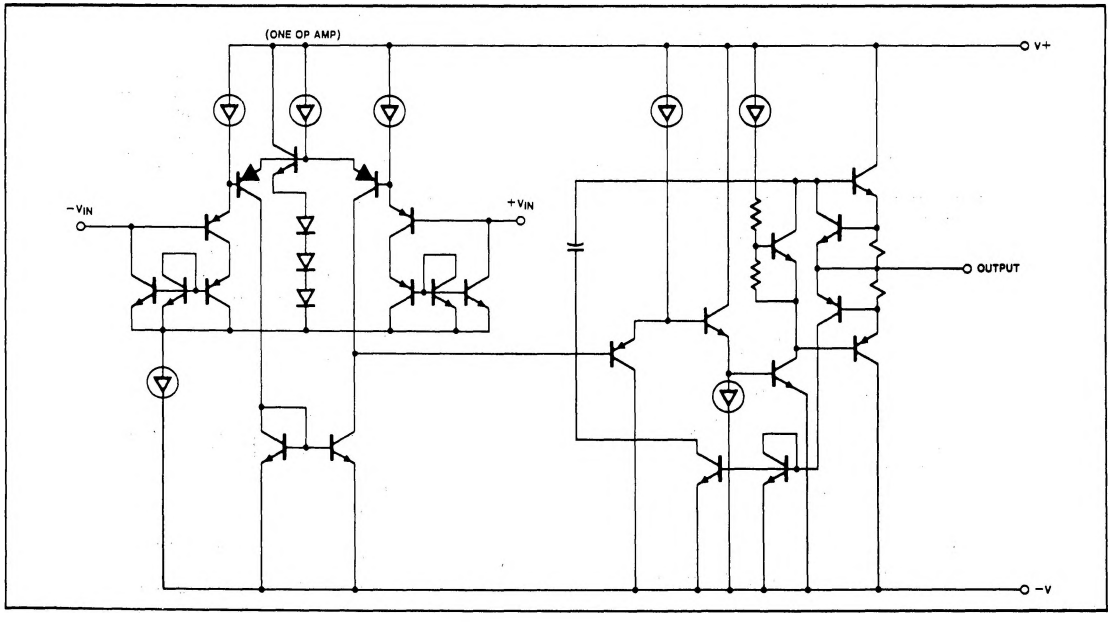
NE5512D

NOTES:
1. SOL - Released in large SO package only.
2. SOL and non-standard pinout.
3. SO and non-standard pinouts.

ABSOLUTE MAXIMUM RATINGS

	Parameter	Rating	Unit
V_{CC}	Supply Voltage	±16	V
V_D	Power dissipation	500	mW
T_A	Operating temperature range		
	NE5512	0 to 70	°C
	SE5512	−55 to +125	°C
T_{STG}	Storage temperature range	−65 to +150	°C
T_{SOLD}	Lead temperature soldering	300	°C

EQUIVALENT SCHEMATIC



DUAL HIGH PERFORMANCE OPERATIONAL AMPLIFIER SE/NE5512

ELECTRICAL PERFORMANCE CHARACTERISTICS $V_{CC} = \pm 15V$, F.R. = −55°C to +125°C (SE), 0°C to +70°C (NE)

	PARAMETER	TEST CONDITIONS	SE5512			NE5512			UNIT
			Min	Typ	Max	Min	Typ	Max	
V_{OS}	Input offset voltage	$R_S = 100\Omega$							
		$T_A = +25°C$		0.7	2		1	5	mV
		T_A = F.R.		1	3		1.5	6	
ΔV_{OS}		Over Temp.		4			5		μV/°C
I_{OS}	Input offset current	$R_S = 100k\Omega$							
		$T_A = +25°C$		3	10		6	20	nA
		T_A = F.R.		4	20		8	30	
ΔI_{OS}		Over Temp.		30			40		pA/°C
I_B	Input bias current	$R_S = 100k\Omega$							
		$T = +25°C$		3	10		6	20	nA
		T_A = F.R.		4	20		8	30	
ΔI_B		Over Temp.		30			40		pA/°C
R_{IN}	Input resistance differential	$T_A = 25°C$		100			100		MΩ
V_{CM}	Input common mode range	$T_A = 25°C$	±13.5	±13.7		±13.5	±13.7		V
		T_A = F.R.	±13	±13.2		±13	±13.2		
CMRR	Input common-mode rejection ratio	$V_{CC} = \pm 15V$ $V_{IN} = \pm 13.5V$ (RM) $T_A = 25°C$ $V_{IN} = \pm 13V$ (F.R.) T_A = F.R.	70	100		70	100		dB
A_{VOL} GAIN	Large-signal voltage gain	$R_L = 2k\Omega$ $T_A = 25°C$	50	200		50	200		V/mV
		$V_O = \pm 10V$ T_A = F.R.	25			25			
S.R.	Slew rate	$T_A = 25°C$	0.6	1			1		V/μs
GBW	Small-signal unity gain bandwidth	$T_A = 25°C$		3			3		MHz
θ_M	Phase margin	$T_A = 25°C$		45			45		Degree
V_{OUT}	Output voltage swing	$R_L = 2k\Omega$							
		$T_A = 25°C$	±13	±13.5		±13	±13.5		V
		T_A = F.R.	±12.5	±13		±12.5	±13		
V_{OUT}	Output voltage swing	$R_L = 600\Omega$*							
		$T_A = 25°C$	±10	±11.5		±10	±11.5		V
		T_A = F.R.	±7.5	±9		±8	±9		
I_{CC}	Power supply current	R_L = Open							
		$T_A = 25°C$		3.4	5		3.4	5	mA
		T_A = F.R.		3.6	5.5		3.6	5.5	
P_{SRR}	Power supply rejection ratio	$T_A = 25°C$	80	110		80	110		dB
		T_A = F.R.	80	100		80	100		
AA	Amplifier to amplifier coupling	f = 1kHz to 20kHz $T_A = 25°C$		−120			−120		dB
HD	Total harmonic distortion	f = 10kHz $T_A = 25°C$ $V_O = 7V_{RMS}$		0.01			0.01		%
V_{IN_N}	Input noise voltage	f = 1kHz $T_A = 25°C$		30			30		nV/$\sqrt{Hz}$
I_{IN_N}	Input noise current	f = 1kHz $T_A = 25°C$		.2			.2		pA/$\sqrt{Hz}$
I_{SC}	Short circuit	$\pm 15V$ $T_A = 25°C$		40			40		mA

NOTE
For operation at elevated temperature, N package must be derated based on a thermal resistance of 120°/W junction to ambient. Thermal resistance of the FE package is 125°/W.

***For additional information, consult the Applications Section.**