QUAD HIGH PERFORMANCE OP AMP — SE/NE5514

DESCRIPTION

The SE/NE5514 family of Quad Operational Amplifiers sets new standards in Bipolar Quad Amplifier Performance. The amplifiers feature low input bias current and low offset voltages. Pin-out is identical to LM324/LM348 which facilitates direct product substitution for improved system performance. Output characteristics are similar to a μA741 with improved slew and drive capability.

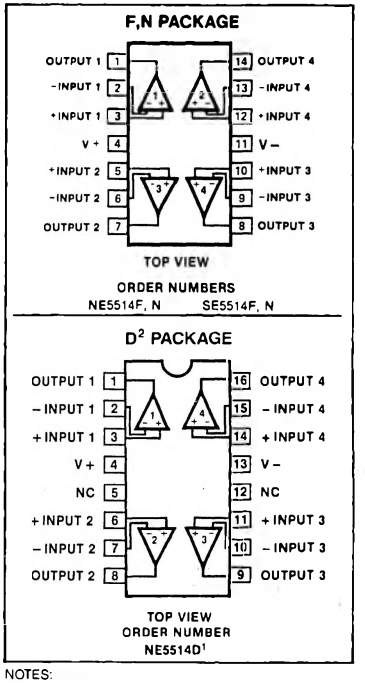
FEATURES

- Low input bias current: $< \pm 3$nA
- Low input offset current: $< \pm 3$nA
- Low input offset voltage: < 1mV
- Low supply current: 1.5mA/Amp
- 1 V/μsec slew rate
- High input impedance: 100MΩ
- High common mode impedance: 10GΩ
- Internal compensation for unity gain
- 600Ω drive capability (7 Vrms)

APPLICATIONS

- AC amplifiers
- RC active filters
- Transducer amplifiers
- DC gain block
- Instrumentation amplifier

PIN CONFIGURATION

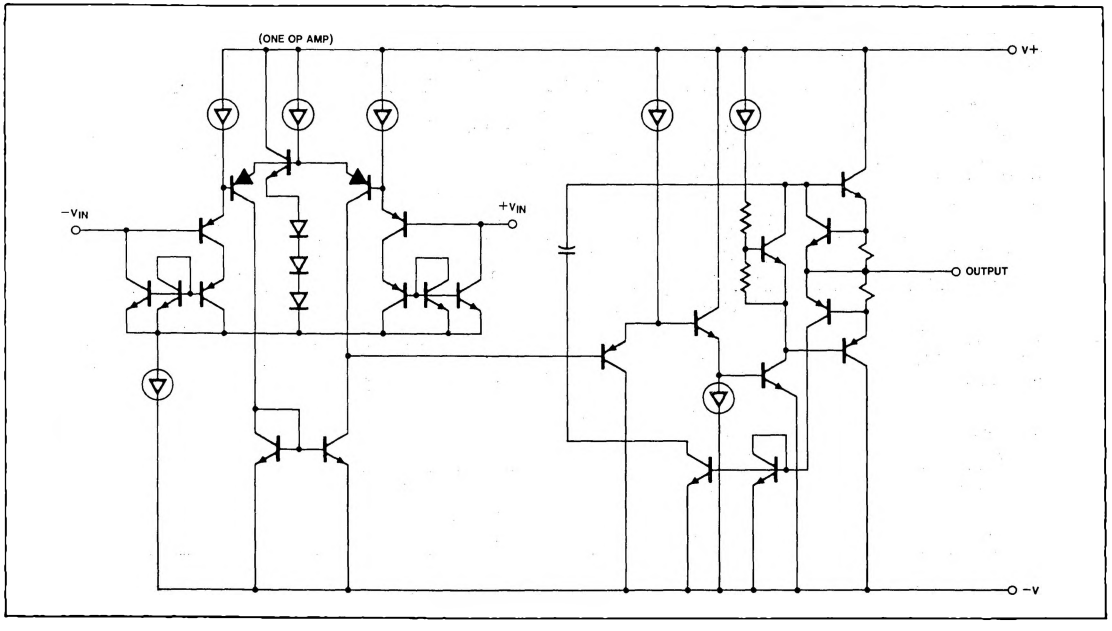


NOTES:
1. SOL - Released in large SO package only.
2. SOL and non-standard pinout.
3. SO and non-standard pinouts.

ABSOLUTE MAXIMUM RATINGS

PARAMETER		RATING	UNIT
V_{CC}	Supply voltage	± 16	V
V_{DIFF}	Differential input voltage	32	V
V_{IN}	Input voltage	0 to 32	V
	Output short to ground	Continuous	
TS	Storage temperature range	−65 to +150	°C
T_{SOLD}	Lead soldering temperature	300	°C
T_A	Operating temperature range		
	NE5514	0 to 70	°C
	SE5514	−55 to +125	°C

EQUIVALENT SCHEMATIC



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

PARAMETER		TEST CONDITIONS	SE5514			NE5514			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	$R_S = 100k\Omega$, $T_A = +25°C$,		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	$T_A = 25°C$, T_A = F.R.	±13.5 ±13	±13.7 ±13.2		±13.5 ±13	±13.7 ±13.2		V
CMRR	Input common-mode rejection ratio	$V_{CC} = \pm 15V$, $V_{IN} = \pm 13.5V$ (RM), $T_A = 25°C$, $V_{IN} = \pm 13V$ (F.R.), T_A = F.R.	70	100		70	100		dB
AVOL GAIN	Large-signal voltage gain	$R_L = 2k\Omega$, $T_A = 25°C$ $V_C = \pm 10V$, T_A = F.R.	50 25	200		50 25			V/mV
S.R.	Slew rate	$T_A = 25°C$	0.6	1		0.6	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		Degr
V_{OUT}	Output voltage swing	$R_L = 2k\Omega$, $T_A = 25°C$, T_A = F.R.	±13 ±12.5	±13.5 ±13		±13 ±12.5	±13.5 ±13		V
V_{OUT}	Output voltage swing	$R_L = 600\Omega$*, $T_A = 25°C$, T_A = F.R.	±10 ±7.5	±11.5 ±9		±10 ±8	±11.5 ±9		V
I_{CC}	Power supply current	R_L = Open, $T_A = 25°C$, T_A = F.R.		6 7	10 12		6 7	10 12	mA
PSRR	Power supply rejection ratio	$T_A = 25°C$, T_A = F.R.	80 80	110 100		80 80	110 100		dB
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 = 7VRMS		0.01			0.01		%
V_{INN}	Input-noise voltage	f = 1kHz, $T_A = 25°C$		30			30		nV/√Hz
I_{SC}	Short Circuit	$T_A = 25°C$	10	40	60	10	40	60	mA

NOTE
*For operation at elevated temperature, N package must be derated based on a thermal resistance of 95°C/W junction to ambient.

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