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Quad high-performance operational amplifier NE/SE5514

DESCRIPTION

The NE/SE5514 family of quad operational amplifiers sets new standards in bipolar quad amplifier performance. The amplifiers feature low input bias current and low offset voltages. Pinout is identical to LM324/LM348 which facilitates direct product substitution for improved system performance in dual supply applications. Output characteristics are similar to a μA741 with improved slew and drive capability.

FEATURES

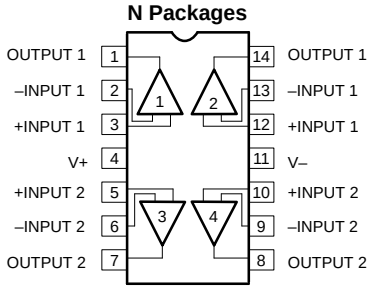
- Low input bias current: < ±3nA
- Low input offset current: < ±3nA
- Low input offset voltage:<1mV
- Low supply current: 1.5mA/A
- 1V/μs slew rate
- High input impedance: 100MΩ
- High common-mode impedance: 10GΩ
- Internal compensation for unity gain
- 600Ω drive capability ($7V_{RMS}$)

APPLICATIONS

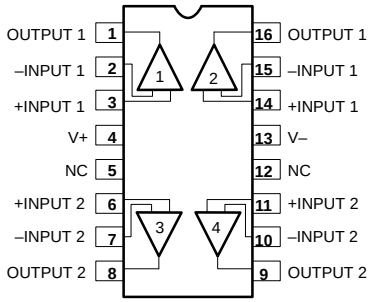
- AC amplifiers
- RC active filters
- Transducer amplifiers
- DC gain block
- Instrumentation amplifier

PIN CONFIGURATIONS

N Packages



D Package[1]

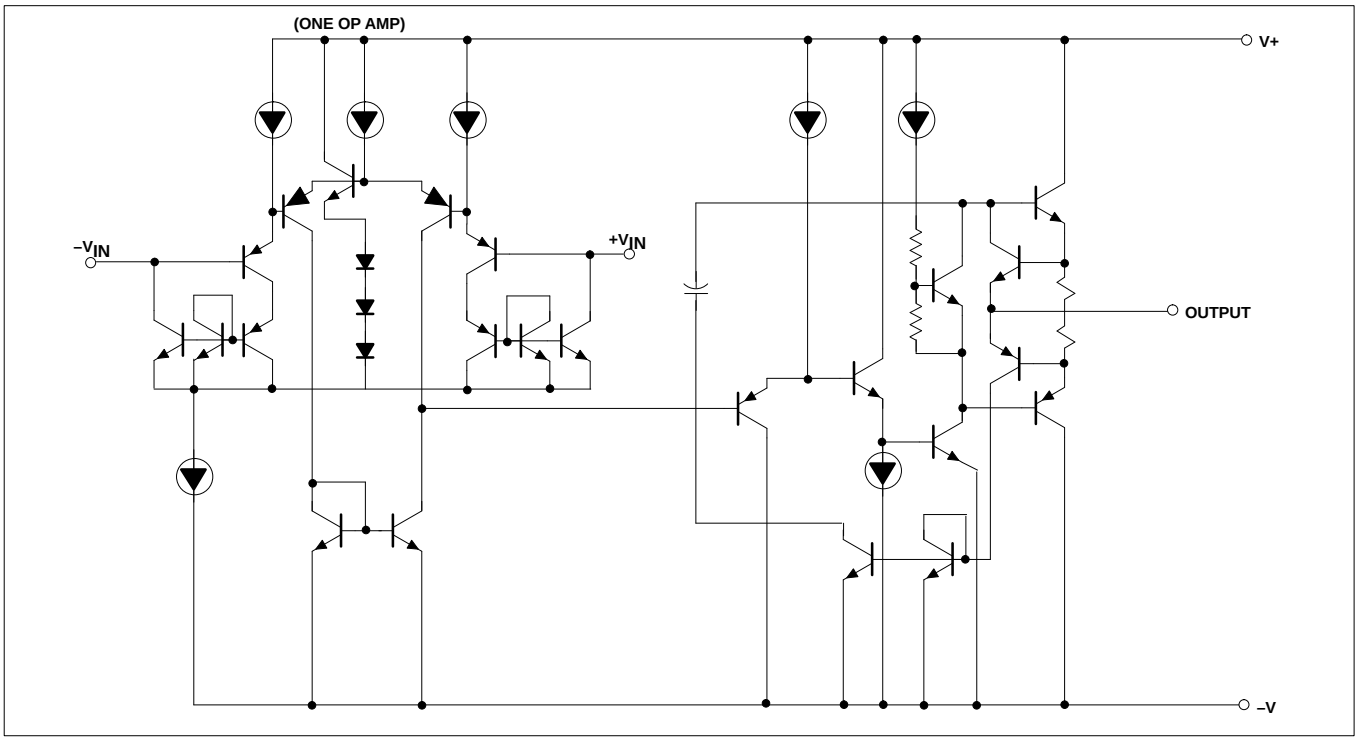


NOTE:
1. SOL - Released in 16-lead large SO package only. Pinout is different than N package.

ORDERING INFORMATION

DESCRIPTION	TEMPERATURE RANGE	ORDER CODE	DWG #
16-Pin Plastic Small Outline Large (SOL) package	0 to +70°C	NE5514D	0171B
14-Pin Plastic Dual In-Line Package (DIP)	0 to +70°C	NE5514N	0405B
14-Pin Plastic Dual In-Line Package (DIP)	-55 to +125°C	SE5514N	0405B

EQUIVALENT SCHEMATIC



ABSOLUTE MAXIMUM RATINGS

SYMBOL	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	
T_{STG}	Storage temperature range	-65 to +150	°C
T_{SOLD}	Lead soldering temperature (10sec max)	300	°C
T_A	Operating ambient temperature range		
	NE5514	0 to 70	°C
	SE5514	-55 to +125	°C
P_{MAX}	Maximum power dissipation		
	T_A=25°C (still-air)[1]		
	N package	1420	mW
	D package	1250	mW

NOTES:

1. The following derating factors should be applied above 25°C
   N package at 11.4mW/°C
   D package at 10.0mW/°C

ELECTRICAL CHARACTERISTICS

V_{CC} = ±15V, T_A = 25°C unless otherwise specified.

SYMBOL	PARAMETER	TEST CONDITIONS	SE5514			NE5514			UNIT
			Min	Typ	Max	Min	Typ	Max	
V_{OS}	Input offset voltage	R_S=100Ω, T_A=+25°C Over temp.		0.7 1	2 3		1 1.5	5 6	mV
ΔV_{OS}		Over temp.		4			5		µV/°C
I_{OS}	Input offset current	R_S=100kΩ, T_A=+25°C Over temp.		3 4	10 20		6 8	20 30	nA
ΔI_{OS}		Over temp.		30			40		pA/°C
I_{BIAS}	Input bias current	R_S=100kΩ, T_A=+25°C Over temp.		3 4	10 20		6 8	20 30	nA
ΔI_{BIAS}		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 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}=±15V, V_{IN}=±13.5V @ T_A=25°C V_{IN}=±13V @ Over temp.	70	100		70	100		dB
A_V	Large-signal voltage gain	R_L=2kΩ, T_A=25°C V_O = ±10V, Over temp.	50 25	200		50 25	200		V/mV
SR	Slew rate	T_A=25°C	0.6	1		0.6	1		V/µs
GBW	Small-signal unity gain band-width	T_A=25°C		3			3		MHz
θ_M	Phase margin	T_A=25°C		45			45		Deg
V_{OUT}	Output voltage swing	R_L=2kΩ, T_A=25°C Over temp.	±13 ±12.5	±13.5 ±13		±13 ±12.5	±13.5 ±13		V
V_{OUT}	Output voltage swing	R_L=600Ω[1], T_A=25°C Over temp.	±10 ±7.5	±11.5 ± 9		±10 ± 8	±11.5 ± 9		V
I_{CC}	Power supply current	R_L=Open, T_A=25°C Over temp.		6 7	10 12		6 7	10 12	mA
PSRR	Power supply rejection ratio	±5V ≤ V_{CC} ≤ ±15V Over temp.	80	110		80	110		dB
AA	Amplifier to amplifier coupling	f=1kHz to 20kHz, T_A=25°C		-120			-120		dB
THD	Total harmonic distortion	f=10kHz, T_A=25°C V_O=7V_{RMS}		0.01			0.01		%
V_{NOISE}	Input noise voltage	f=1kHz, T_A=25°C		30			30		nV/√Hz
I_{SC}	Short-circuit current	T_A=25°C	10	40	60	10	40	60	mA

NOTES:
1. Not to exceed maximum power dissipation.