

Single Low Noise Operational Amplifier

NE5534, SA5534, SE5534, NE5534A, SA5534A, SE5534A

The NE/SA/SE5534/5534A are single high-performance low noise operational amplifiers. Compared to other operational amplifiers, such as TL083, they show better noise performance, improved output drive capability, and considerably higher small-signal and power bandwidths.

This makes the devices especially suitable for application in high quality and professional audio equipment, in instrumentation and control circuits and telephone channel amplifiers. The op amps are internally compensated for gain equal to, or higher than, three. The frequency response can be optimized with an external compensation capacitor for various applications (unity gain amplifier, capacitive load, slew rate, low overshoot, etc.).

Features

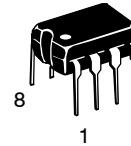
- Small-Signal Bandwidth: 10 MHz
- Output Drive Capability: 600 Ω , 10 V_{RMS} at V_S = ± 18 V
- Input Noise Voltage: 4 nV/ $\sqrt{\text{Hz}}$
- DC Voltage Gain: 100000
- AC Voltage Gain: 6000 at 10 kHz
- Power Bandwidth: 200 kHz
- Slew Rate: 13 V/ μs
- Large Supply Voltage Range: ± 3.0 to ± 20 V
- Pb-Free Packages are Available

Applications

- Audio Equipment
- Instrumentation and Control Circuits
- Telephone Channel Amplifiers
- Medical Equipment

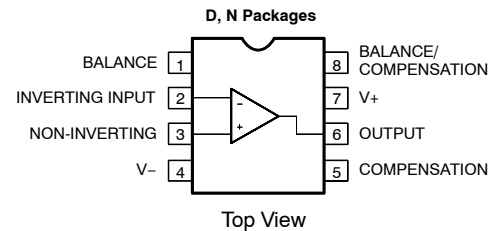


SOIC-8
D SUFFIX
CASE 751-07



PDIP-8
N SUFFIX
CASE 626-05

PIN CONNECTIONS



DEVICE MARKING INFORMATION

See general marking information in the device marking section on page 8 of this data sheet.

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 8 of this data sheet.

NOTE: Some of the devices on this data sheet have been **DISCONTINUED**. Please refer to the table on page 8.

NE5534, SA5534, SE5534, NE5534A, SA5534A, SE5534A

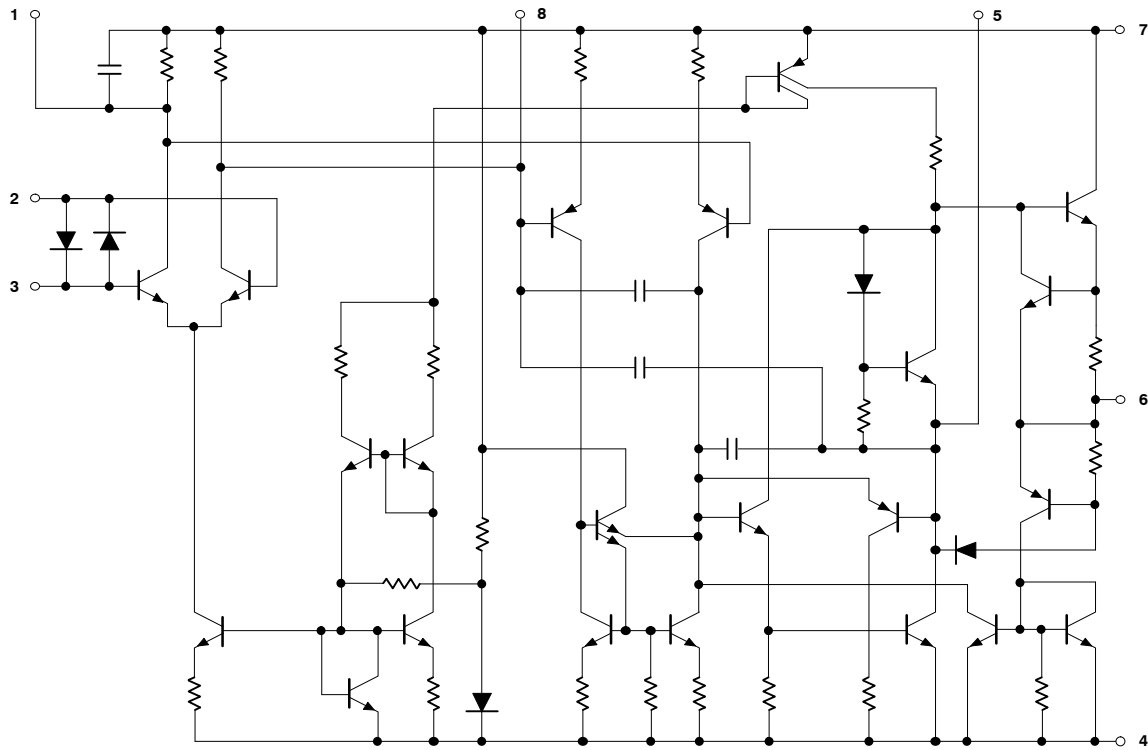


Figure 1. Equivalent Schematic

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage	V_S	± 22	V
Input Voltage	V_{IN}	$\pm V_{Supply}$	V
Differential Input Voltage (Note 1)	V_{DIFF}	± 0.5	V
Operating Temperature Range NE SA SE	T_{amb}	0 to +70 -40 to +85 -55 to +125	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C
Junction Temperature	T_j	150	°C
Power Dissipation at 25°C N Package D Package	P_D	1150 750	mW
Thermal Resistance, Junction-to-Ambient N Package D Package	$R_{\theta JA}$	130 158	°C/W
Output Short-Circuit Duration (Note 2)	–	Indefinite	–
Lead Soldering Temperature (10 sec max)	T_{slid}	230	°C

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

1. Diodes protect the inputs against overvoltage. Therefore, unless current-limiting resistors are used, large currents will flow if the differential input voltage exceeds 0.6 V. Maximum current should be limited to ± 10 mA.
2. Output may be shorted to ground at $V_S = \pm 15$ V, $T_{amb} = 25^\circ\text{C}$. Temperature and/or supply voltages must be limited to ensure dissipation rating is not exceeded.

NE5534, SA5534, SE5534, NE5534A, SA5534A, SE5534A

DC ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$; $V_S = \pm 15\text{ V}$, unless otherwise noted.) (Notes 3, 4 and 5)

Characteristic	Symbol	Test Conditions	NE/SA5534/5534A			SE5534/5534A			Unit
			Min	Typ	Max	Min	Typ	Max	
Offset Voltage	V_{OS}	Overtemperature	–	0.5	4.0	–	0.5	2.0	mV
			–	–	5.0	–	–	3.0	mV
	$\Delta V_{OS}/\Delta T$		–	5.0	–	–	5.0	–	$\mu\text{V}/^{\circ}\text{C}$
Offset Current	I_{OS}	Overtemperature	–	20	300	–	10	200	nA
			–	–	400	–	–	500	nA
	$\Delta I_{OS}/\Delta T$		–	200	–	–	200	–	$\text{pA}/^{\circ}\text{C}$
Input Current	I_B	Overtemperature	–	500	1500	–	400	800	nA
			–	–	2000	–	–	1500	nA
	$\Delta I_B/\Delta T$		–	5.0	–	–	5.0	–	$\text{nA}/^{\circ}\text{C}$
Supply Current Per Op Amp	I_{CC}	Overtemperature	–	4.0	8.0	–	4.0	6.5	mA
			–	–	10	–	–	9.0	
Common Mode Input Range	V_{CM}		± 12	± 13	–	± 12	± 13	–	V
Common Mode Rejection Ratio	CMRR		70	100	–	80	100	–	dB
Power Supply Rejection Ratio	PSRR		–	10	100	–	10	50	$\mu\text{V}/\text{V}$
Large-Signal Voltage Gain	A_{VOL}	$R_L \geq 600\ \Omega$, $V_O = \pm 10\text{ V}$	25	100	–	50	100	–	V/mV
		Overtemperature	15	–	–	25	–	–	
Output Swing	V_{OUT}	$R_L \geq 600\ \Omega$	± 12	± 13	–	± 12	± 13	–	V
		Overtemperature	± 10	± 12	–	± 10	± 12	–	
		$R_L \geq 600\ \Omega$; $V_S = \pm 18\text{ V}$	± 15	± 16	–	± 15	16	–	
		$R_L \geq 2.0\text{ k}\Omega$	± 13	± 13.5	–	± 13	± 13.5	–	
		Overtemperature	± 12	± 12.5	–	± 12	± 12.5	–	
Input Resistance	R_{IN}		30	100	–	50	100	–	k Ω
Output Short Circuit Current	I_{SC}		–	38	–	–	38	–	mA

3. For NE5534/5534A, $T_{MIN} = 0^{\circ}\text{C}$, $T_{MAX} = 70^{\circ}\text{C}$.

4. For SA5534/5534A, $T_{MIN} = -40^{\circ}\text{C}$, $T_{MAX} = +85^{\circ}\text{C}$.

5. For SE5534/5534A, $T_{MIN} = -55^{\circ}\text{C}$, $T_{MAX} = +125^{\circ}\text{C}$.



NE5534, SA5534, SE5534, NE5534A, SA5534A, SE5534A

AC ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$; $V_S = \pm 15\text{ V}$, unless otherwise noted.)

Characteristic	Symbol	Test Conditions	NE/SA5534/5534A			SE5534/5534A			Unit
			Min	Typ	Max	Min	Typ	Max	
Output Resistance	R_{OUT}	$A_V = 30\text{ dB}$ closed-loop $f = 10\text{ kHz}$; $R_L = 600\ \Omega$; $C_C = 22\text{ pF}$	–	0.3	–	–	0.3	–	Ω
Transient Response		Voltage-follower, $V_{IN} = 50\text{ mV}$ $R_L = 600\ \Omega$, $C_C = 22\text{ pF}$, $C_L = 100\text{ pF}$							
Rise Time	t_R		–	20	–	–	20	–	ns
Overshoot	–		–	20	–	–	20	–	%
Transient Response		$V_{IN} = 50\text{ mV}$, $R_L = 600\ \Omega$, $C_C = 47\text{ pF}$, $C_L = 500\text{ pF}$							
Rise Time	t_R		–	50	–	–	50	–	ns
Overshoot	–		–	35	–	–	35	–	%
Gain	A_V	$f = 10\text{ kHz}$, $C_C = 0$ $f = 10\text{ kHz}$, $C_C = 22\text{ pF}$	–	6.0 2.2	–	–	6.0 2.2	–	V/mV
Gain Bandwidth Product	GBW	$C_C = 22\text{ pF}$, $C_L = 100\text{ pF}$	–	10	–	–	10	–	MHz
Slew Rate	SR	$C_C = 0$ $C_C = 22\text{ pF}$	–	13 6.0	–	–	13 6.0	–	V/ μs
Power Bandwidth	–	$V_{OUT} = \pm 10\text{ V}$, $C_C = 0\text{ pF}$ $V_{OUT} = \pm 10\text{ V}$, $C_C = 22\text{ pF}$ $V_{OUT} = \pm 14\text{ V}$, $R_L = 600\ \Omega$, $C_C = 22\text{ pF}$, $V_{CC} = \pm 18\text{ V}$	–	200 95 70	–	–	200 95 70	–	kHz

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$; $V_S = 15\text{ V}$, unless otherwise noted.)

Characteristic	Symbol	Test Conditions	NE/SA/SE5534			NE/SA/SE5534A			Unit
			Min	Typ	Max	Min	Typ	Max	
Input Noise Voltage	V_{NOISE}	$f_O = 30\text{ Hz}$ $f_O = 1.0\text{ kHz}$	–	7.0 4.0	–	–	5.5 3.5	7.0 4.5	nV/ $\sqrt{\text{Hz}}$
Input Noise Current	I_{NOISE}	$f_O = 30\text{ Hz}$ $f_O = 1.0\text{ kHz}$	–	2.5 0.6	–	–	1.5 0.4	–	pA/ $\sqrt{\text{Hz}}$
Broadband Noise Figure	–	$f = 10\text{ Hz}$ to 20 kHz; $R_S = 5.0\text{ k}\Omega$	–	–	–	–	0.9	–	dB
Channel Separation	–	$f = 1.0\text{ kHz}$; $R_S = 5.0\text{ k}\Omega$	–	110	–	–	110	–	dB



TYPICAL PERFORMANCE CHARACTERISTICS

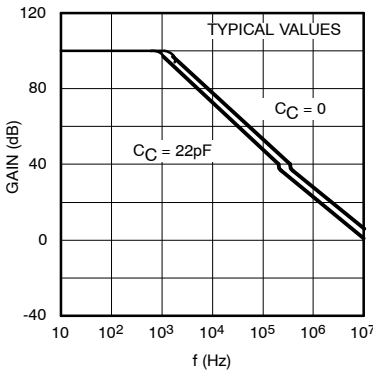


Figure 2. Open-Loop Frequency Response

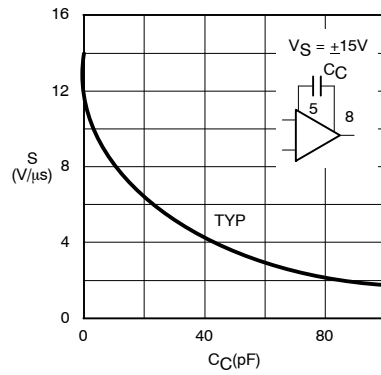


Figure 3. Slew Rate as a Function of Compensation Capacitance

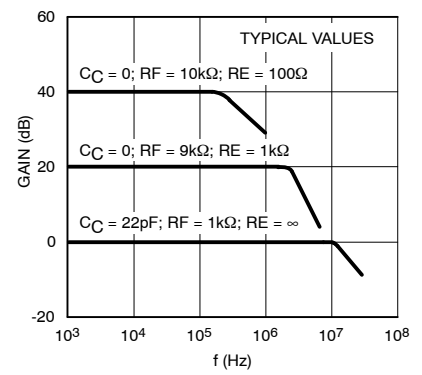


Figure 4. Closed-Loop Frequency Response

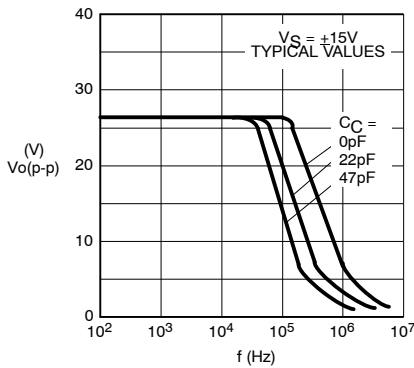


Figure 5. Large-Signal Frequency Response

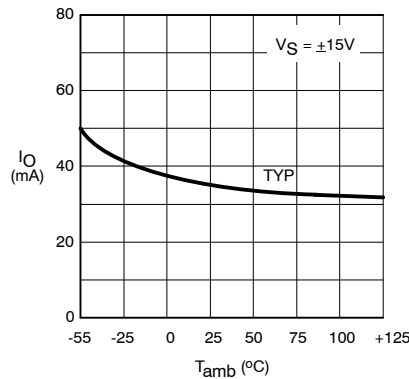


Figure 6. Output Short-Circuit Current

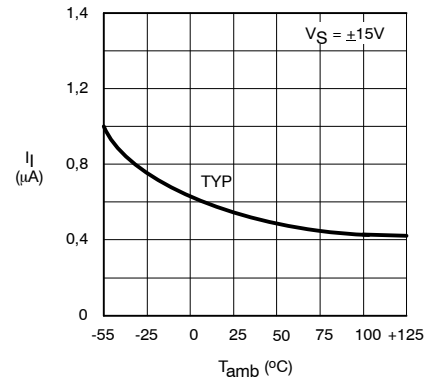


Figure 7. Input Bias Current

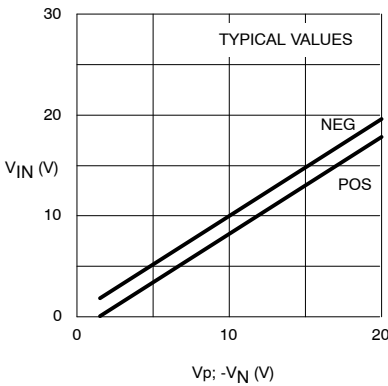


Figure 8. Input Common-Mode Voltage Range

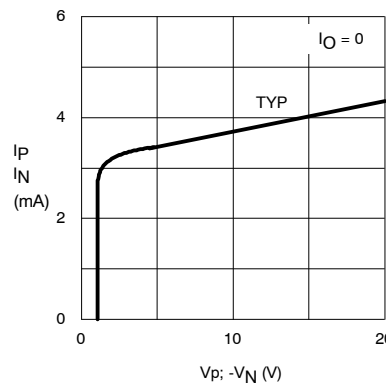


Figure 9. Supply Current Per Op Amp

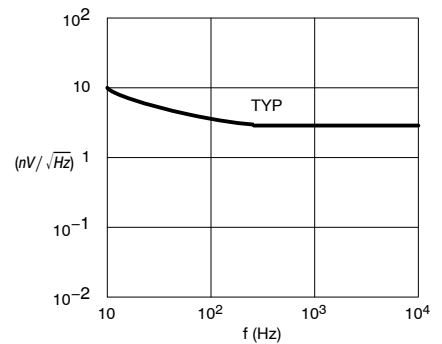


Figure 10. Input Noise Voltage Density

TYPICAL PERFORMANCE CHARACTERISTICS

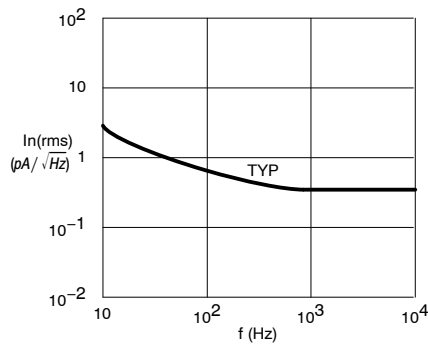


Figure 11. Input Noise Current Density

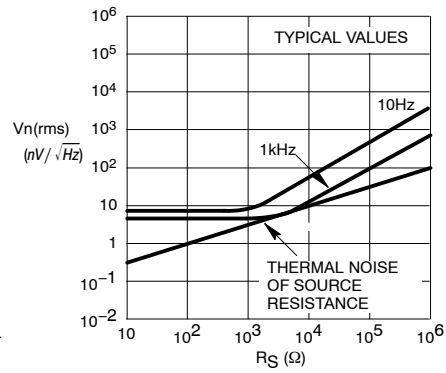


Figure 12. Total Input Noise Density

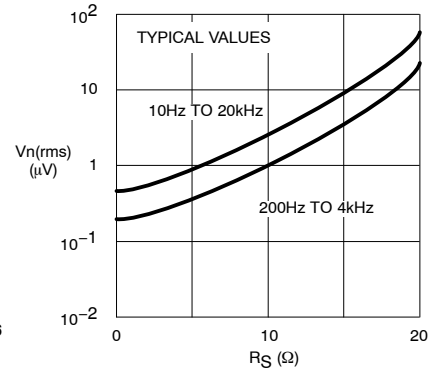


Figure 13. Broadband Input Noise Voltage

TEST LOAD CIRCUITS

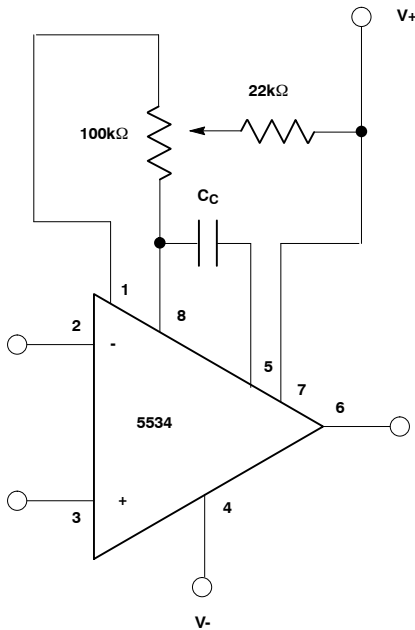


Figure 14. Frequency Compensation and Offset Voltage Adjustment Circuit

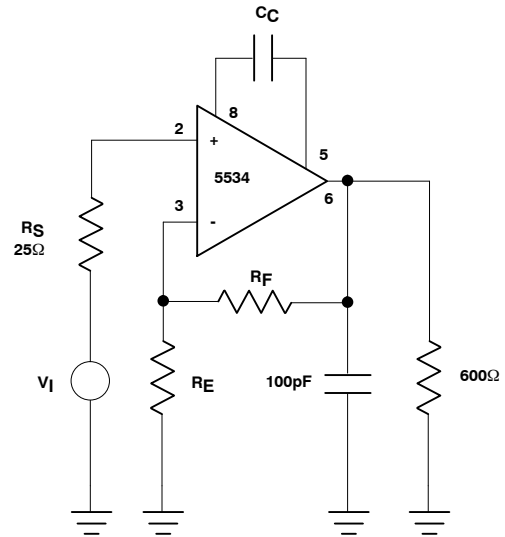


Figure 15. Closed-Loop Frequency Response

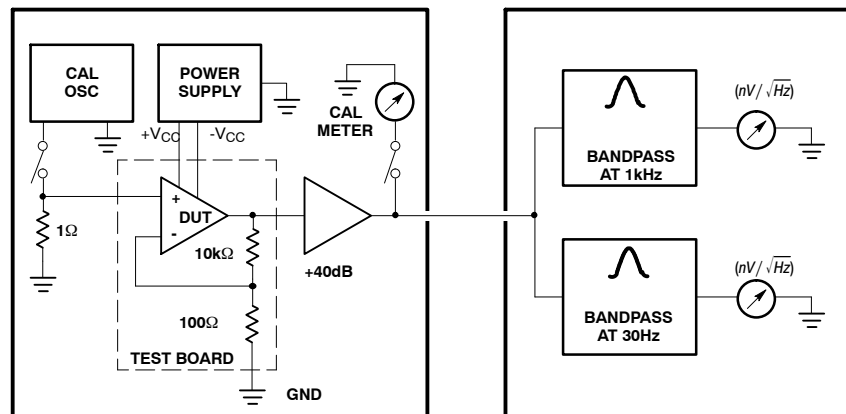
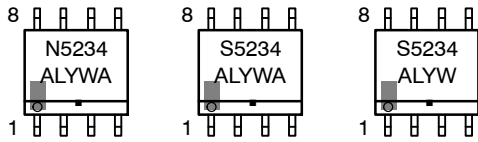


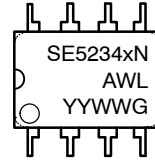
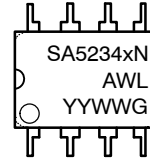
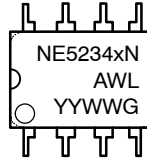
Figure 16. Noise Test Block Diagram

NE5534, SA5534, SE5534, NE5534A, SA5534A, SE5534A

MARKING DIAGRAMS



SOIC-8
D SUFFIX
CASE 751



PDIP-8
N SUFFIX
CASE 626

x = Blank or A
A = Assembly Location
WL, L = Wafer Lot
YY, Y = Year
WW, W = Work Week
G or ■ = Pb-Free Package

ORDERING INFORMATION

Device	Description	Temperature Range	Shipping†
SA5534ADR2G	8-Pin Plastic Small Outline (SO-8) Package (Pb-Free)	-40 to +85°C	2500 / Tape & Reel

DISCONTINUED (Note 6)

NE5534AD	8-Pin Plastic Small Outline (SO-8) Package	0 to +70°C	98 Units / Rail
NE5534ADG	8-Pin Plastic Small Outline (SO-8) Package (Pb-Free)	0 to +70°C	98 Units / Rail
NE5534ADR2	8-Pin Plastic Small Outline (SO-8) Package	0 to +70°C	2500 / Tape & Reel
NE5534ADR2G	8-Pin Plastic Small Outline (SO-8) Package (Pb-Free)	0 to +70°C	2500 / Tape & Reel
NE5534AN	8-Pin Plastic Dual In-Line Package (PDIP-8)	0 to +70°C	50 Units / Rail
NE5534ANG	8-Pin Plastic Dual In-Line Package (PDIP-8) (Pb-Free)	0 to +70°C	50 Units / Rail
NE5534D	8-Pin Plastic Small Outline (SO-8) Package	0 to +70°C	98 Units / Rail
NE5534DG	8-Pin Plastic Small Outline (SO-8) Package (Pb-Free)	0 to +70°C	98 Units / Rail
NE5534DR2	8-Pin Plastic Small Outline (SO-8) Package	0 to +70°C	2500 / Tape & Reel
NE5534DR2G	8-Pin Plastic Small Outline (SO-8) Package (Pb-Free)	0 to +70°C	2500 / Tape & Reel
NE5534N	8-Pin Plastic Dual In-Line Package (PDIP-8)	0 to +70°C	50 Units / Rail
NE5534NG	8-Pin Plastic Dual In-Line Package (PDIP-8) (Pb-Free)	0 to +70°C	50 Units / Rail
SA5534AD	8-Pin Plastic Small Outline (SO-8) Package	-40 to +85°C	98 Units / Rail
SA5534ADG	8-Pin Plastic Small Outline (SO-8) Package (Pb-Free)	-40 to +85°C	98 Units / Rail
SA5534ADR2	8-Pin Plastic Small Outline (SO-8) Package	-40 to +85°C	2500 / Tape & Reel
SA5534AN	8-Pin Plastic Dual In-Line Package (PDIP-8)	-40 to +85°C	50 Units / Rail
SA5534ANG	8-Pin Plastic Dual In-Line Package (PDIP-8) (Pb-Free)	-40 to +85°C	50 Units / Rail
SA5534N	8-Pin Plastic Dual In-Line Package (PDIP-8)	-40 to +85°C	50 Units / Rail
SA5534NG	8-Pin Plastic Dual In-Line Package (PDIP-8) (Pb-Free)	-40 to +85°C	50 Units / Rail
SE5534AN	8-Pin Plastic Dual In-Line Package (PDIP-8)	-55 to +125°C	50 Units / Rail
SE5534ANG	8-Pin Plastic Dual In-Line Package (PDIP-8) (Pb-Free)	-55 to +125°C	50 Units / Rail
SE5534N	8-Pin Plastic Dual In-Line Package (PDIP-8)	-55 to +125°C	50 Units / Rail
SE5534NG	8-Pin Plastic Dual In-Line Package (PDIP-8) (Pb-Free)	-55 to +125°C	50 Units / Rail

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, [BRD8011/D](#).

6. **DISCONTINUED:** These devices are not recommended for new design. Please contact your onsemi representative for information. The most current information on these devices may be available on www.onsemi.com.

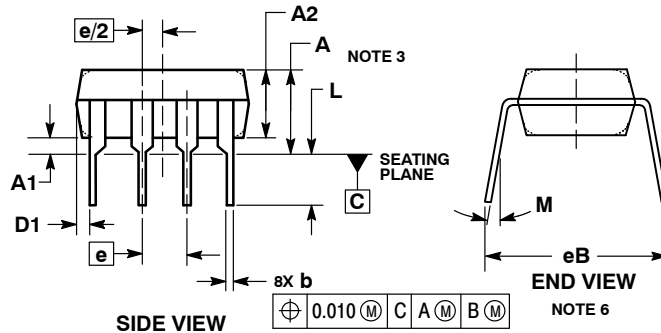
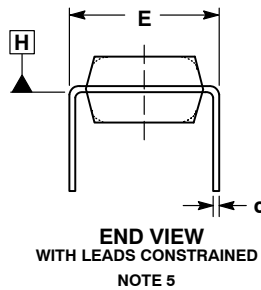
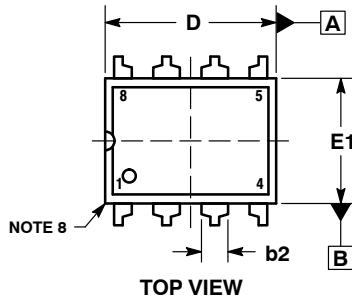




SCALE 1:1

PDIP-8
CASE 626-05
ISSUE P

DATE 22 APR 2015

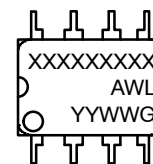


NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. DIMENSIONS A, A1 AND L ARE MEASURED WITH THE PACKAGE SEATED IN JEDEC SEATING PLANE GAUGE GS-3.
4. DIMENSIONS D, D1 AND E1 DO NOT INCLUDE MOLD FLASH OR PROTRUSIONS. MOLD FLASH OR PROTRUSIONS ARE NOT TO EXCEED 0.10 INCH.
5. DIMENSION E IS MEASURED AT A POINT 0.015 BELOW DATUM PLANE H WITH THE LEADS CONSTRAINED PERPENDICULAR TO DATUM C.
6. DIMENSION eB IS MEASURED AT THE LEAD TIPS WITH THE LEADS UNCONSTRAINED.
7. DATUM PLANE H IS COINCIDENT WITH THE BOTTOM OF THE LEADS, WHERE THE LEADS EXIT THE BODY.
8. PACKAGE CONTOUR IS OPTIONAL (ROUNDED OR SQUARE CORNERS).

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	---	0.210	---	5.33
A1	0.015	---	0.38	---
A2	0.115	0.195	2.92	4.95
b	0.014	0.022	0.35	0.56
b2	0.060 TYP	---	1.52 TYP	---
C	0.008	0.014	0.20	0.36
D	0.355	0.400	9.02	10.16
D1	0.005	---	0.13	---
E	0.300	0.325	7.62	8.26
E1	0.240	0.280	6.10	7.11
e	0.100 BSC	---	2.54 BSC	---
eB	---	0.430	---	10.92
L	0.115	0.150	2.92	3.81
M	---	10°	---	10°

GENERIC
MARKING DIAGRAM*



- XXXX = Specific Device Code
A = Assembly Location
WL = Wafer Lot
YY = Year
WW = Work Week
G = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

STYLE 1:

- PIN 1. AC IN
2. DC + IN
3. DC - IN
4. AC IN
5. GROUND
6. OUTPUT
7. AUXILIARY
8. V_{CC}

DOCUMENT NUMBER:	98ASB42420B	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	PDIP-8	PAGE 1 OF 1

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.



SCALE 1:1

SOIC-8 NB
CASE 751-07
ISSUE AK

DATE 16 FEB 2011



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.
6. 751-01 THRU 751-06 ARE OBSOLETE. NEW STANDARD IS 751-07.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.80	5.00	0.189	0.197
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.053	0.069
D	0.33	0.51	0.013	0.020
G	1.27 BSC		0.050 BSC	
H	0.10	0.25	0.004	0.010
J	0.19	0.25	0.007	0.010
K	0.40	1.27	0.016	0.050
M	0°	8°	0°	8°
N	0.25	0.50	0.010	0.020
S	5.80	6.20	0.228	0.244

GENERIC
MARKING DIAGRAM*


XXXXXX = Specific Device Code
A = Assembly Location
L = Wafer Lot
Y = Year
W = Work Week
▪ = Pb-Free Package

XXXXXX = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
▪ = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

DOCUMENT NUMBER:	98ASB42564B	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	SOIC-8 NB	PAGE 1 OF 2

onsemi and onsemi are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves the right to make changes without further notice to any products herein. onsemi makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

SOIC-8 NB
CASE 751-07
ISSUE AK

DATE 16 FEB 2011

STYLE 1: PIN 1. EMITTER 2. COLLECTOR 3. COLLECTOR 4. EMITTER 5. EMITTER 6. BASE 7. BASE 8. EMITTER	STYLE 2: PIN 1. COLLECTOR, DIE, #1 2. COLLECTOR, #1 3. COLLECTOR, #2 4. COLLECTOR, #2 5. BASE, #2 6. EMITTER, #2 7. BASE, #1 8. EMITTER, #1	STYLE 3: PIN 1. DRAIN, DIE #1 2. DRAIN, #1 3. DRAIN, #2 4. DRAIN, #2 5. GATE, #2 6. SOURCE, #2 7. GATE, #1 8. SOURCE, #1	STYLE 4: PIN 1. ANODE 2. ANODE 3. ANODE 4. ANODE 5. ANODE 6. ANODE 7. ANODE 8. COMMON CATHODE
STYLE 5: PIN 1. DRAIN 2. DRAIN 3. DRAIN 4. DRAIN 5. GATE 6. GATE 7. SOURCE 8. SOURCE	STYLE 6: PIN 1. SOURCE 2. DRAIN 3. DRAIN 4. SOURCE 5. SOURCE 6. GATE 7. GATE 8. SOURCE	STYLE 7: PIN 1. INPUT 2. EXTERNAL BYPASS 3. THIRD STAGE SOURCE 4. GROUND 5. DRAIN 6. GATE 3 7. SECOND STAGE Vd 8. FIRST STAGE Vd	STYLE 8: PIN 1. COLLECTOR, DIE #1 2. BASE, #1 3. BASE, #2 4. COLLECTOR, #2 5. COLLECTOR, #2 6. EMITTER, #2 7. EMITTER, #1 8. COLLECTOR, #1
STYLE 9: PIN 1. EMITTER, COMMON 2. COLLECTOR, DIE #1 3. COLLECTOR, DIE #2 4. EMITTER, COMMON 5. EMITTER, COMMON 6. BASE, DIE #2 7. BASE, DIE #1 8. EMITTER, COMMON	STYLE 10: PIN 1. GROUND 2. BIAS 1 3. OUTPUT 4. GROUND 5. GROUND 6. BIAS 2 7. INPUT 8. GROUND	STYLE 11: PIN 1. SOURCE 1 2. GATE 1 3. SOURCE 2 4. GATE 2 5. DRAIN 2 6. DRAIN 2 7. DRAIN 1 8. DRAIN 1	STYLE 12: PIN 1. SOURCE 2. SOURCE 3. SOURCE 4. GATE 5. DRAIN 6. DRAIN 7. DRAIN 8. DRAIN
STYLE 13: PIN 1. N.C. 2. SOURCE 3. SOURCE 4. GATE 5. DRAIN 6. DRAIN 7. DRAIN 8. DRAIN	STYLE 14: PIN 1. N-SOURCE 2. N-GATE 3. P-SOURCE 4. P-GATE 5. P-DRAIN 6. P-DRAIN 7. N-DRAIN 8. N-DRAIN	STYLE 15: PIN 1. ANODE 1 2. ANODE 1 3. ANODE 1 4. ANODE 1 5. CATHODE, COMMON 6. CATHODE, COMMON 7. CATHODE, COMMON 8. CATHODE, COMMON	STYLE 16: PIN 1. EMITTER, DIE #1 2. BASE, DIE #1 3. EMITTER, DIE #2 4. BASE, DIE #2 5. COLLECTOR, DIE #2 6. COLLECTOR, DIE #2 7. COLLECTOR, DIE #1 8. COLLECTOR, DIE #1
STYLE 17: PIN 1. VCC 2. V2OUT 3. V1OUT 4. TXE 5. RXE 6. VEE 7. GND 8. ACC	STYLE 18: PIN 1. ANODE 2. ANODE 3. SOURCE 4. GATE 5. DRAIN 6. DRAIN 7. CATHODE 8. CATHODE	STYLE 19: PIN 1. SOURCE 1 2. GATE 1 3. SOURCE 2 4. GATE 2 5. DRAIN 2 6. MIRROR 2 7. DRAIN 1 8. MIRROR 1	STYLE 20: PIN 1. SOURCE (N) 2. GATE (N) 3. SOURCE (P) 4. GATE (P) 5. DRAIN 6. DRAIN 7. DRAIN 8. DRAIN
STYLE 21: PIN 1. CATHODE 1 2. CATHODE 2 3. CATHODE 3 4. CATHODE 4 5. CATHODE 5 6. COMMON ANODE 7. COMMON ANODE 8. CATHODE 6	STYLE 22: PIN 1. I/O LINE 1 2. COMMON CATHODE/VCC 3. COMMON CATHODE/VCC 4. I/O LINE 3 5. COMMON ANODE/GND 6. I/O LINE 4 7. I/O LINE 5 8. COMMON ANODE/GND	STYLE 23: PIN 1. LINE 1 IN 2. COMMON ANODE/GND 3. COMMON ANODE/GND 4. LINE 2 IN 5. LINE 2 OUT 6. COMMON ANODE/GND 7. COMMON ANODE/GND 8. LINE 1 OUT	STYLE 24: PIN 1. BASE 2. EMITTER 3. COLLECTOR/ANODE 4. COLLECTOR/ANODE 5. CATHODE 6. CATHODE 7. COLLECTOR/ANODE 8. COLLECTOR/ANODE
STYLE 25: PIN 1. VIN 2. N/C 3. REXT 4. GND 5. IOUT 6. IOUT 7. IOUT 8. IOUT	STYLE 26: PIN 1. GND 2. dv/dt 3. ENABLE 4. ILIMIT 5. SOURCE 6. SOURCE 7. SOURCE 8. VCC	STYLE 27: PIN 1. ILIMIT 2. OVLO 3. UVLO 4. INPUT+ 5. SOURCE 6. SOURCE 7. SOURCE 8. DRAIN	STYLE 28: PIN 1. SW_TO_GND 2. DASIC_OFF 3. DASIC_SW_DET 4. GND 5. V_MON 6. VBULK 7. VBULK 8. VIN
STYLE 29: PIN 1. BASE, DIE #1 2. EMITTER, #1 3. BASE, #2 4. EMITTER, #2 5. COLLECTOR, #2 6. COLLECTOR, #2 7. COLLECTOR, #1 8. COLLECTOR, #1	STYLE 30: PIN 1. DRAIN 1 2. DRAIN 1 3. GATE 2 4. SOURCE 2 5. SOURCE 1/DRAIN 2 6. SOURCE 1/DRAIN 2 7. SOURCE 1/DRAIN 2 8. GATE 1		

DOCUMENT NUMBER:	98ASB42564B	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.
DESCRIPTION:	SOIC-8 NB	PAGE 2 OF 2

onsemi and **onsemi** are trademarks of Semiconductor Components Industries, LLC dba **onsemi** or its subsidiaries in the United States and/or other countries. **onsemi** reserves the right to make changes without further notice to any products herein. **onsemi** makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. **onsemi** does not convey any license under its patent rights nor the rights of others.

onsemi, **Onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

ADDITIONAL INFORMATION

TECHNICAL PUBLICATIONS:

Technical Library: www.onsemi.com/design/resources/technical-documentation
onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at
www.onsemi.com/support/sales