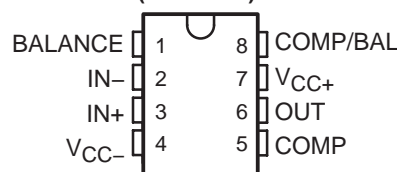


NE5534, NE5534A, SA5534, SA5534A LOW-NOISE OPERATIONAL AMPLIFIERS

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- Equivalent Input Noise Voltage . . .
3.5 nV/ $\sqrt{\text{Hz}}$ Typ
- Unity-Gain Bandwidth . . . 10 MHz Typ
- Common-Mode Rejection Ratio . . .
100 dB Typ
- High DC Voltage Gain . . . 100 V/mV Typ
- Peak-to-Peak Output Voltage Swing
32 V Typ With $V_{CC\pm} = \pm 18 \text{ V}$ and $R_L = 600 \Omega$
- High Slew Rate . . . 13 V/ μs Typ
- Wide Supply-Voltage Range $\pm 3 \text{ V}$ to $\pm 20 \text{ V}$
- Low Harmonic Distortion
- Offset Nulling Capability
- External Compensation Capability

NE5534, SA5534 . . . D (SOIC), P (PDIP),
OR PS (SOP) PACKAGE
NE5534A, SA5534A . . . D (SOIC) OR P (PDIP) PACKAGE
(TOP VIEW)



description/ordering information

The NE5534, NE5534A, SA5534, and SA5534A are high-performance operational amplifiers combining excellent dc and ac characteristics. Some of the features include very low noise, high output-drive capability, high unity-gain and maximum-output-swing bandwidths, low distortion, and high slew rate.

These operational amplifiers are compensated internally for a gain equal to or greater than three. Optimization of the frequency response for various applications can be obtained by use of an external compensation capacitor between COMP and COMP/BAL. The devices feature input-protection diodes, output short-circuit protection, and offset-voltage nulling capability with use of the BALANCE and COMP/BAL pins (see the *application circuit* diagram).

For the NE5534A and SA5534A, a maximum limit is specified for the equivalent input noise voltage.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

 **TEXAS
INSTRUMENTS**

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NE5534, NE5534A, SA5534. SA5534A LOW-NOISE OPERATIONAL AMPLIFIERS

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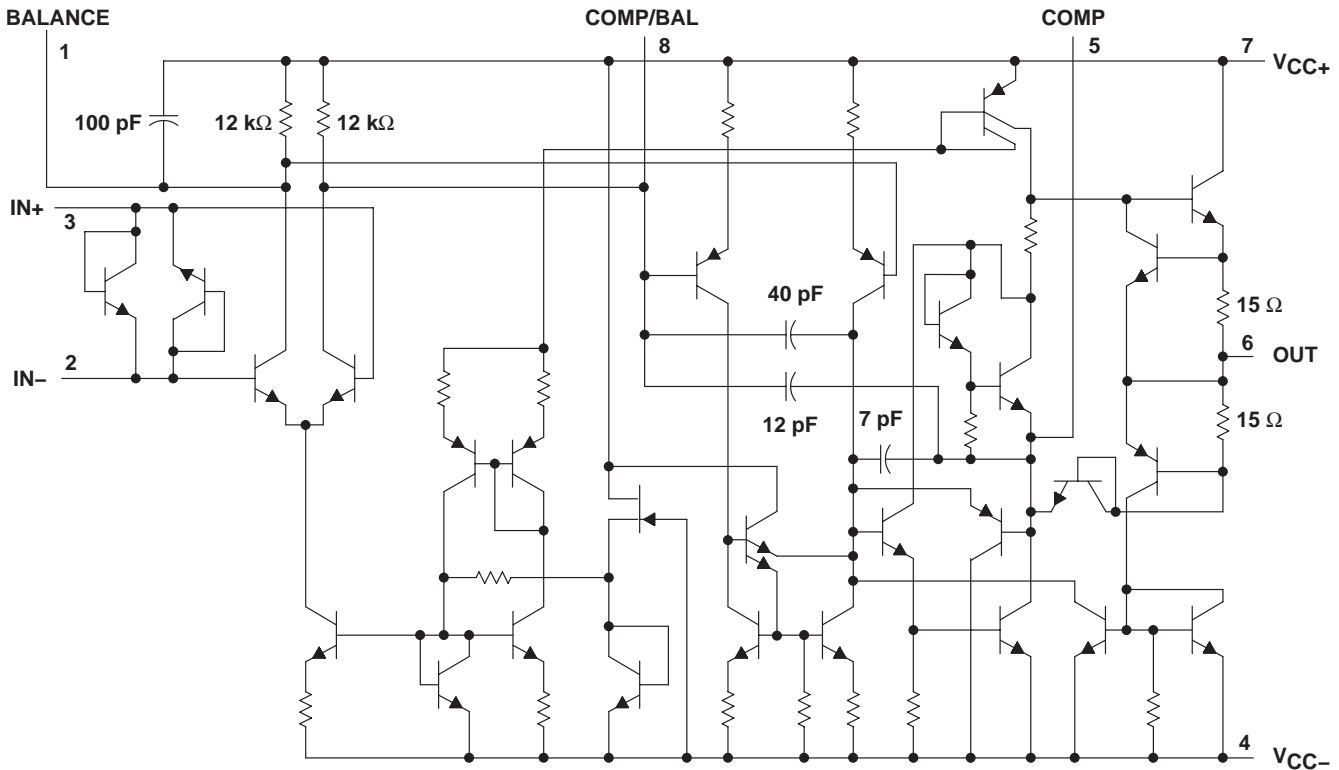
description/ordering information (continued)

ORDERING INFORMATION

| TA | V _{IOMAX} AT 25°C | PACKAGE† | ORDERABLE PART NUMBER | TOP-SIDE MARKING | |
|---------------|----------------------------|----------|-----------------------|------------------|----------|
| 0°C to 70°C | 4 mV | PDIP (P) | Tube of 50 | NE5534P | NE5534P |
| | | | Tube of 50 | NE5534AP | NE5534AP |
| | | SOIC (D) | Tube of 75 | NE5534D | NE5534 |
| | | | Reel of 2500 | NE5534DR | |
| | | | Tube of 75 | NE5534AD | 5534A |
| | | | Reel of 2500 | NE5534ADR | |
| | | SOP (PS) | Reel of 2000 | NE5534PSR | N5534 |
| -40°C to 85°C | 4 mV | PDIP (P) | Tube of 50 | SA5534P | SA5534P |
| | | | Tube of 50 | SA5534AP | SA5534AP |
| | | SOIC (D) | Tube of 75 | SA5534D | SA5534 |
| | | | Reel of 2500 | SA5534DR | |
| | | | Tube of 75 | SA5534AD | SA5534A |
| | | | Reel of 2500 | SA5534ADR | |
| | | SOP (PS) | Tube of 80 | SA5534PS | SA5534 |
| | | | Reel of 2000 | SA5534PSR | |

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

schematic



All component values shown are nominal.

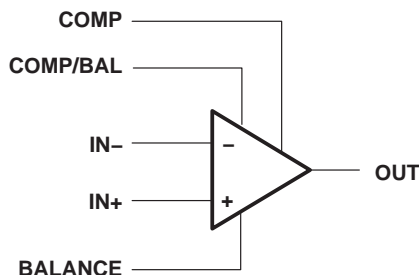


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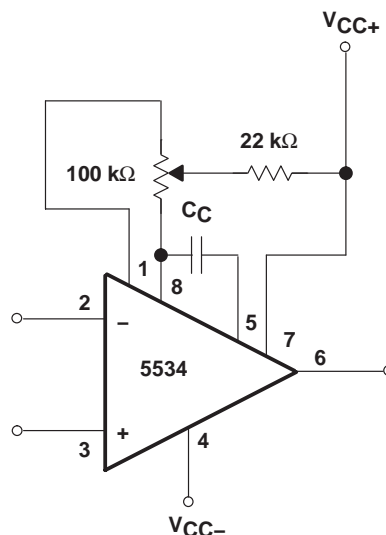
NE5534, NE5534A, SA5534. SA5534A LOW-NOISE OPERATIONAL AMPLIFIERS

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symbol



application circuit



Frequency Compensation and Offset-Voltage Nulling Circuit

absolute maximum ratings over operating free-air temperature range (unless otherwise noted)†

| | |
|---|----------------|
| Supply voltage: V_{CC+} (see Note 1) | 22 V |
| V_{CC-} (see Note 1) | -22 V |
| Input voltage either input (see Notes 1 and 2) | V_{CC+} |
| Input current (see Note 3) | ± 10 mA |
| Duration of output short circuit (see Note 4) | Unlimited |
| Package thermal impedance, θ_{JA} (see Notes 5 and 6): | |
| D package | 97°C/W |
| P package | 85°C/W |
| PS package | 95°C/W |
| Operating virtual junction temperature, T_J | 150°C |
| Storage temperature range, T_{stg} | -65°C to 150°C |

† Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

- NOTES:
- All voltage values, except differential voltages, are with respect to the midpoint between V_{CC+} and V_{CC-} .
 - The magnitude of the input voltage must never exceed the magnitude of the supply voltage.
 - Excessive current will flow if a differential input voltage in excess of approximately 0.6 V is applied between the inputs, unless some limiting resistance is used.
 - The output may be shorted to ground or to either power supply. Temperature and/or supply voltages must be limited to ensure the maximum dissipation rating is not exceeded.
 - Maximum power dissipation is a function of $T_J(\max)$, θ_{JA} , and T_A . The maximum allowable power dissipation at any allowable ambient temperature is $P_D = (T_J(\max) - T_A)/\theta_{JA}$. Operating at the absolute maximum T_J of 150°C can affect reliability.
 - The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions

| | | MIN | MAX | UNIT |
|-----------|--------------------------------------|-----------------|-----|------|
| V_{CC+} | Supply voltage | 5 | 15 | V |
| V_{CC-} | Supply voltage | -5 | -15 | V |
| T_A | Operating free-air temperature range | NE5534, NE5534A | 0 | 70 |
| | | SA5534, SA5534A | -40 | 85 |

NE5534, NE5534A, SA5534, SA5534A LOW-NOISE OPERATIONAL AMPLIFIERS

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electrical characteristics, $V_{CC\pm} = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$ (unless otherwise noted)

| PARAMETER | | TEST CONDITIONS† | | MIN | TYP | MAX | UNIT |
|-------------|--|---|---|----------|----------|------|------------|
| V_{IO} | Input offset voltage | $V_O = 0$, $R_S = 50\ \Omega$ | $T_A = 25^\circ\text{C}$ | 0.5 | 4 | | mV |
| | | | $T_A = \text{Full range}$ | | | 5 | |
| I_{IO} | Input offset current | $V_O = 0$ | $T_A = 25^\circ\text{C}$ | 20 | 300 | | nA |
| | | | $T_A = \text{Full range}$ | | | 400 | |
| I_{IB} | Input bias current | $V_O = 0$ | $T_A = 25^\circ\text{C}$ | 500 | 1500 | | nA |
| | | | $T_A = \text{Full range}$ | | | 2000 | |
| V_{ICR} | Common-mode input voltage range | | | ± 12 | ± 13 | | V |
| $V_{O(PP)}$ | Maximum peak-to-peak output voltage swing | $R_L \geq 600\ \Omega$ | $V_{CC\pm} = \pm 15\text{ V}$ | 24 | 26 | | V |
| | | | $V_{CC\pm} = \pm 18\text{ V}$ | 30 | 32 | | |
| A_{VD} | Large-signal differential voltage amplification | $V_O = \pm 10\text{ V}$, $R_L \geq 600\ \Omega$ | $T_A = 25^\circ\text{C}$ | 25 | 100 | | V/mV |
| | | | $T_A = \text{Full range}$ | 15 | | | |
| A_{vd} | Small-signal differential voltage amplification | $f = 10\text{ kHz}$ | $C_C = 0$ | | 6 | | V/mV |
| | | | $C_C = 22\text{ pF}$ | | 2.2 | | |
| B_{OM} | Maximum-output-swing bandwidth | $V_O = \pm 10\text{ V}$ | $C_C = 0$ | | 200 | | kHz |
| | | | $C_C = 22\text{ pF}$ | | 95 | | |
| | | $V_{CC\pm} = \pm 18\text{ V}$, $R_L \geq 600\ \Omega$, | $V_O = \pm 14\text{ V}$, $C_C = 22\text{ pF}$ | | 70 | | |
| B_1 | Unity-gain bandwidth | $C_C = 22\text{ pF}$, | $C_L = 100\text{ pF}$ | | 10 | | MHz |
| r_i | Input resistance | | | 30 | 100 | | k Ω |
| z_o | Output impedance | $A_{VD} = 30\text{ dB}$, $C_C = 22\text{ pF}$, | $R_L \geq 600\ \Omega$, $f = 10\text{ kHz}$ | | 0.3 | | Ω |
| CMRR | Common-mode rejection ratio | $V_O = 0$, $R_S = 50\ \Omega$ | $V_{IC} = V_{ICRmin}$, | 70 | 100 | | dB |
| k_{SVR} | Supply-voltage rejection ratio ($\Delta V_{CC}/\Delta V_{IO}$) | $V_{CC+} = \pm 9\text{ V to } \pm 15\text{ V}$, $V_O = 0$ | $R_S = 50\ \Omega$, | 80 | 100 | | dB |
| I_{OS} | Output short-circuit current | | | | 38 | | mA |
| I_{CC} | Supply current | $V_O = 0$, No load | $T_A = 25^\circ\text{C}$ | | 4 | 8 | mA |

† All characteristics are measured under open-loop conditions with zero common-mode input voltage, unless otherwise specified. For NE5534 and NE5534A, full range is 0°C to 70°C . For SA5534 and SA5534A, full range is -40°C to 85°C .

NE5534, NE5534A, SA5534. SA5534A LOW-NOISE OPERATIONAL AMPLIFIERS

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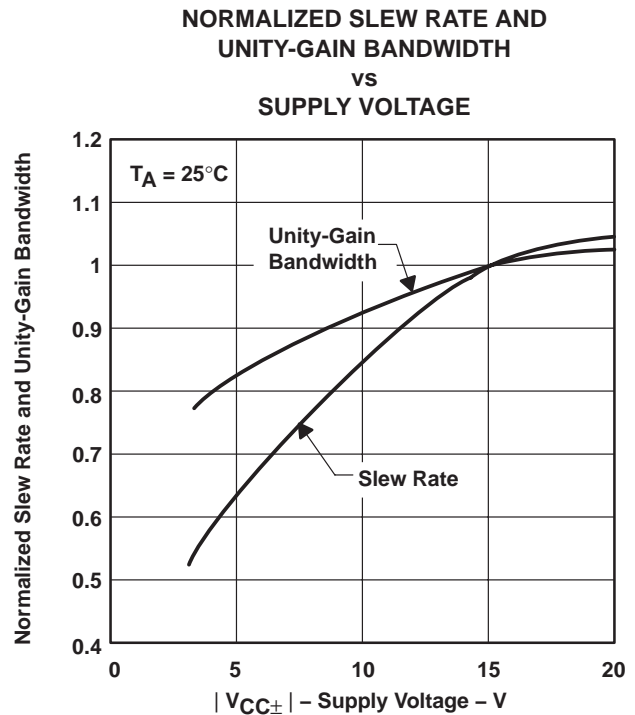
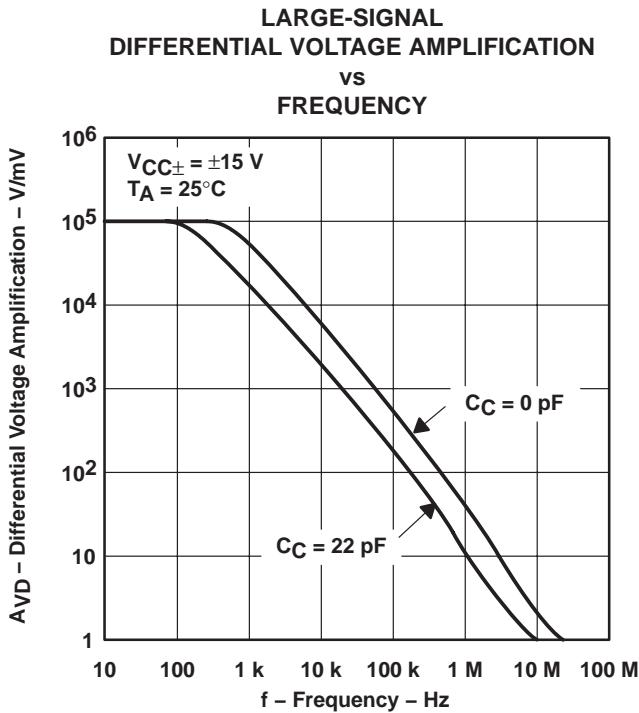
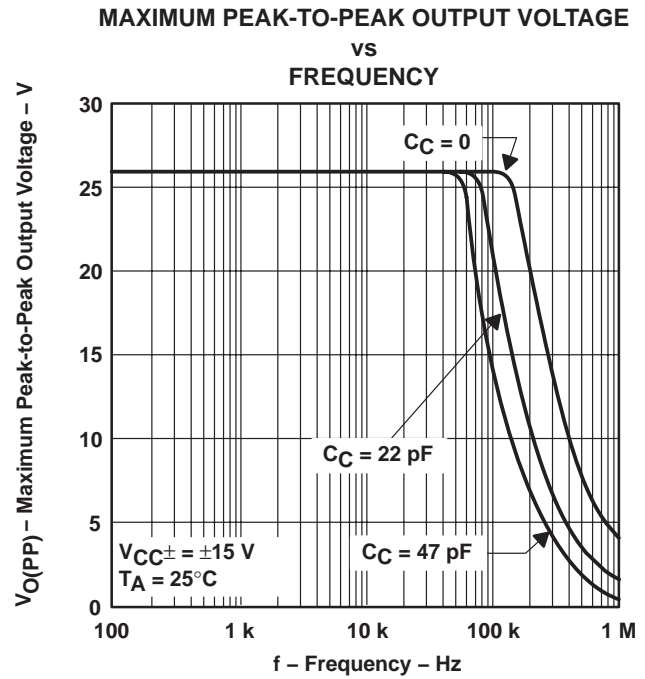
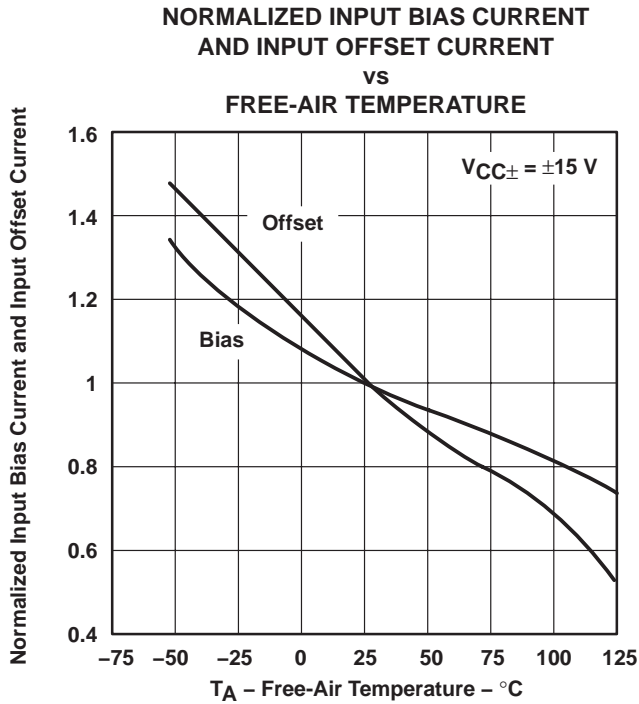
operating characteristics, $V_{CC} \pm = \pm 15\text{ V}$, $T_A = 25^\circ\text{C}$

| PARAMETER | | TEST CONDITIONS | NE5534, SA5534 | NE5534A, SA5534A | | | UNIT |
|-----------|--------------------------------|---|-------------------|------------------|-----|-----|------------------------------|
| | | | TYP | MIN | TYP | MAX | |
| SR | Slew rate | $C_C = 0$ | 13 | 13 | | | V/ μ s |
| | | $C_C = 22\text{ pF}$ | 6 | 6 | | | |
| t_r | Rise time | $V_I = 50\text{ mV}$, $A_{VD} = 1$, $R_L = 600\ \Omega$, $C_C = 22\text{ pF}$ | 20 | 20 | | | ns |
| | Overshoot factor | $C_L = 100\text{ pF}$ | 20 | 20 | | | % |
| | Rise time | $V_I = 50\text{ mV}$, $A_{VD} = 1$, $R_L = 600\ \Omega$, $C_C = 47\text{ pF}$ | 50 | 50 | | | ns |
| | Overshoot factor | $C_L = 500\text{ pF}$ | 35 | 35 | | | % |
| V_n | Equivalent input noise voltage | $f = 30\text{ Hz}$ | 7 | 5.5 | 7 | | $\text{nV}/\sqrt{\text{Hz}}$ |
| | | $f = 1\text{ kHz}$ | 4 | 3.5 | 4.5 | | |
| I_n | Equivalent input noise current | $f = 30\text{ Hz}$ | 2.5 | 1.5 | | | $\text{pA}/\sqrt{\text{Hz}}$ |
| | | $f = 1\text{ kHz}$ | 0.6 | 0.4 | | | |
| \bar{F} | Average noise figure | $R_S = 5\text{ k}\Omega$, $f = 10\text{ Hz to }20\text{ kHz}$ | | 0.9 | | | dB |

NE5534, NE5534A, SA5534. SA5534A LOW-NOISE OPERATIONAL AMPLIFIERS

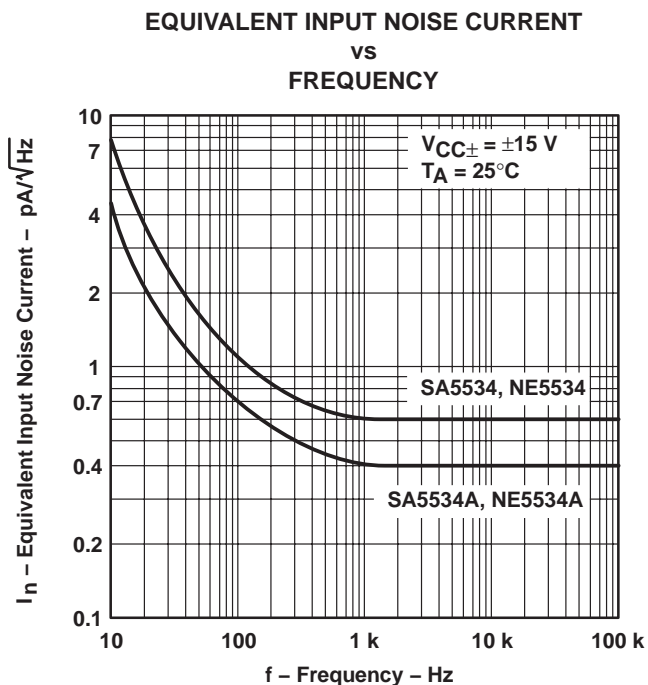
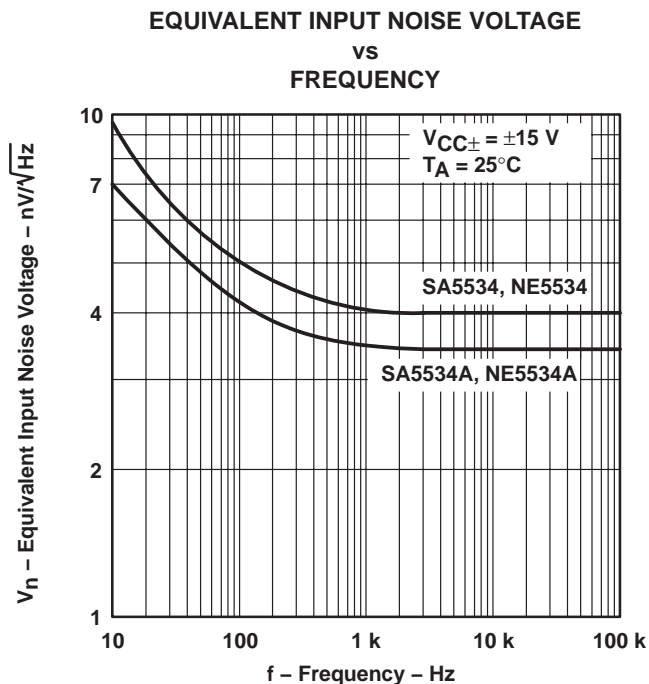
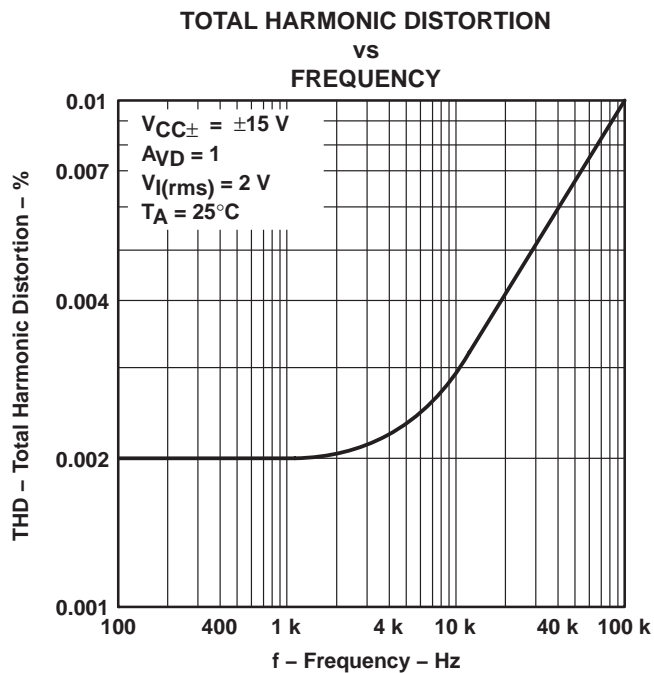
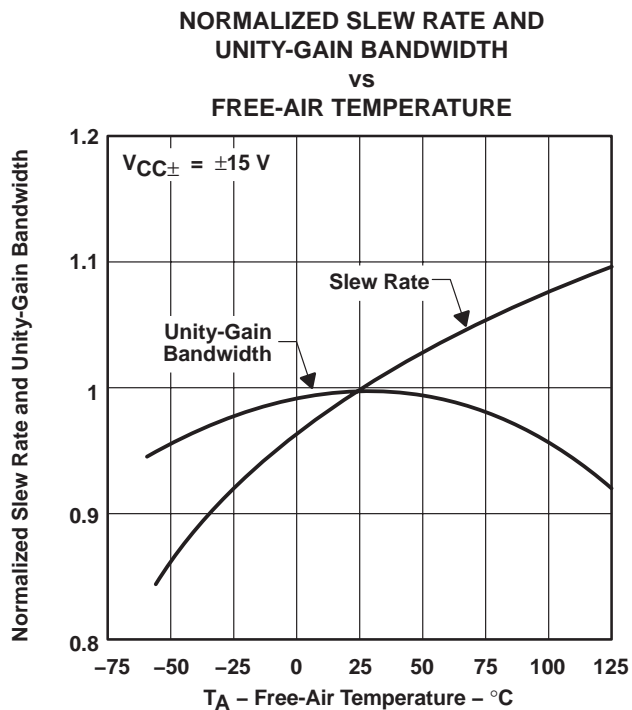
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TYPICAL CHARACTERISTICS†



† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

TYPICAL CHARACTERISTICS†



† Data at high and low temperatures are applicable only within the rated operating free-air temperature ranges of the various devices.

NE5534, NE5534A, SA5534. SA5534A LOW-NOISE OPERATIONAL AMPLIFIERS

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TYPICAL CHARACTERISTICS

TOTAL EQUIVALENT INPUT NOISE VOLTAGE vs SOURCE RESISTANCE

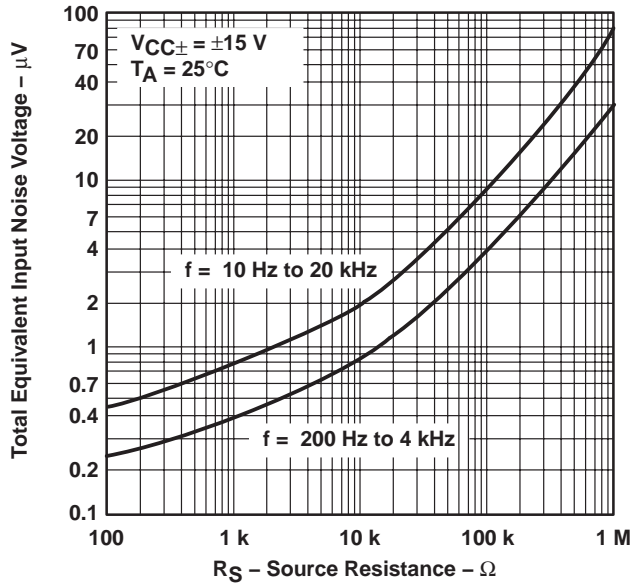


Figure 9

PACKAGING INFORMATION

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| NE5534AD | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534ADE4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534ADG4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534ADR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534ADRE4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534ADRG4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534AJG | OBSOLETE | CDIP | JG | 8 | | TBD | Call TI | Call TI |
| NE5534AP | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| NE5534APE4 | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| NE5534D | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534DE4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534DG4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534DR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534DRE4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534DRG4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| NE5534IP | OBSOLETE | PDIP | P | 8 | | TBD | Call TI | Call TI |
| NE5534P | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| NE5534PE4 | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| NE5534PSR | ACTIVE | SO | PS | 8 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| NE5534PSRE4 | ACTIVE | SO | PS | 8 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| NE5534PSRG4 | ACTIVE | SO | PS | 8 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SA5534AD | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534ADE4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534ADG4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534ADR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534ADRE4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| | | | | | | no Sb/Br) | | |
| SA5534ADRG4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534AP | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SA5534APE4 | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SA5534D | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534DE4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534DG4 | ACTIVE | SOIC | D | 8 | 75 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534DR | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534DRE4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534DRG4 | ACTIVE | SOIC | D | 8 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-2-260C-1 YEAR |
| SA5534P | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SA5534PE4 | ACTIVE | PDIP | P | 8 | 50 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SA5534PS | ACTIVE | SO | PS | 8 | 80 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SA5534PSE4 | ACTIVE | SO | PS | 8 | 80 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SA5534PSG4 | ACTIVE | SO | PS | 8 | 80 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SA5534PSR | ACTIVE | SO | PS | 8 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SA5534PSRE4 | ACTIVE | SO | PS | 8 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SA5534PSRG4 | ACTIVE | SO | PS | 8 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBSELETE: TI has discontinued the production of the device.

⁽²⁾ Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

⁽³⁾ MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

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TAPE AND REEL INFORMATION



QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|-----------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| NE5534ADR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |
| NE5534DR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |
| NE5534PSR | SO | PS | 8 | 2000 | 330.0 | 16.4 | 8.2 | 6.6 | 2.5 | 12.0 | 16.0 | Q1 |
| SA5534ADR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |
| SA5534DR | SOIC | D | 8 | 2500 | 330.0 | 12.4 | 6.4 | 5.2 | 2.1 | 8.0 | 12.0 | Q1 |
| SA5534PSR | SO | PS | 8 | 2000 | 330.0 | 16.4 | 8.2 | 6.6 | 2.5 | 12.0 | 16.0 | Q1 |

TAPE AND REEL BOX DIMENSIONS

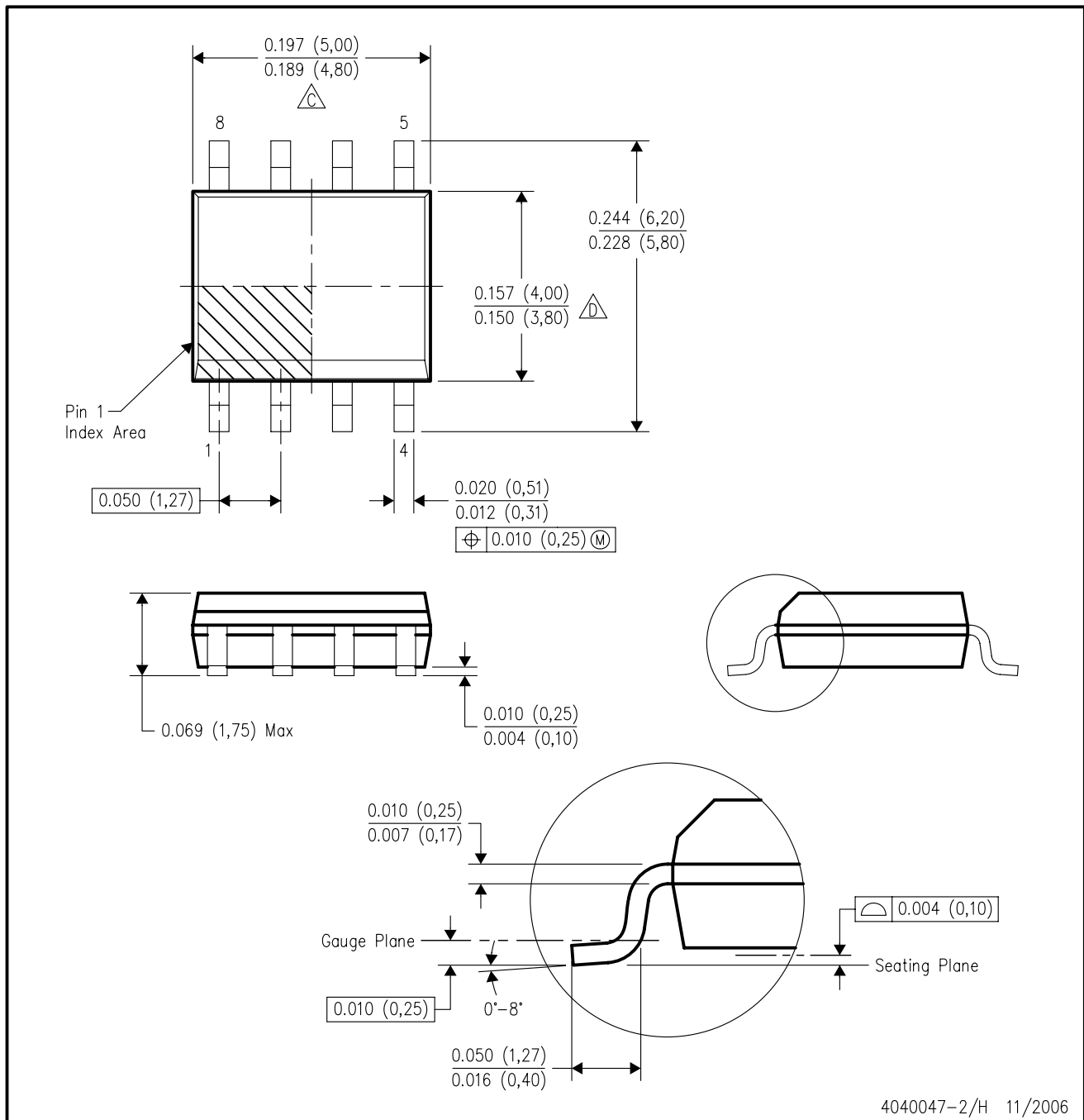


*All dimensions are nominal

| Device | Package Type | Package Drawing | Pins | SPQ | Length (mm) | Width (mm) | Height (mm) |
|-----------|--------------|-----------------|------|------|-------------|------------|-------------|
| NE5534ADR | SOIC | D | 8 | 2500 | 340.5 | 338.1 | 20.6 |
| NE5534DR | SOIC | D | 8 | 2500 | 340.5 | 338.1 | 20.6 |
| NE5534PSR | SO | PS | 8 | 2000 | 346.0 | 346.0 | 33.0 |
| SA5534ADR | SOIC | D | 8 | 2500 | 340.5 | 338.1 | 20.6 |
| SA5534DR | SOIC | D | 8 | 2500 | 340.5 | 338.1 | 20.6 |
| SA5534PSR | SO | PS | 8 | 2000 | 346.0 | 346.0 | 33.0 |

D (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
 - E. Reference JEDEC MS-012 variation AA.

MECHANICAL DATA

PS (R-PDSO-G8)

PLASTIC SMALL-OUTLINE PACKAGE



- NOTES:
- A. All linear dimensions are in millimeters.
 - B. This drawing is subject to change without notice.
 - C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

P (R-PDIP-T8)

PLASTIC DUAL-IN-LINE



4040082/D 05/98

- NOTES: A. All linear dimensions are in inches (millimeters).
 B. This drawing is subject to change without notice.
 C. Falls within JEDEC MS-001

For the latest package information, go to http://www.ti.com/sc/docs/package/pkg_info.htm



JG (R-GDIP-T8)

CERAMIC DUAL-IN-LINE



- NOTES: A. All linear dimensions are in inches (millimeters).
 B. This drawing is subject to change without notice.
 C. This package can be hermetically sealed with a ceramic lid using glass frit.
 D. Index point is provided on cap for terminal identification.
 E. Falls within MIL STD 1835 GDIP1-T8

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