

The SN5405 is obsolete and no longer is supplied.

SN54LS05, SN54S05 SN7405, SN74LS05, SN74S05 HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS

SDLS030A – DECEMBER 1983 – REVISED NOVEMBER 2003

- Package Options Include Plastic Small-Outline (D, NS), Shrink Small-Outline (DB), and Ceramic Flat (W) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) DIPs

- Dependable Texas Instrument Quality and Reliability

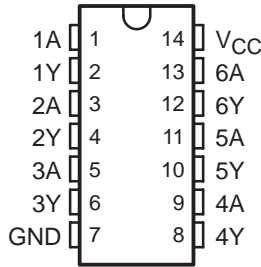
SN5405, SN54LS05, SN54S05 . . . J PACKAGE

SN7405 . . . N PACKAGE

SN74LS05 . . . D, DB, N, OR NS PACKAGE

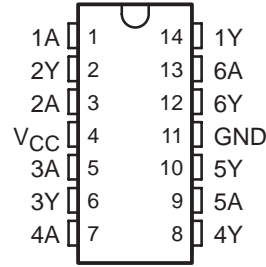
SN74S05 . . . D, N, OR NS PACKAGE

(TOP VIEW)



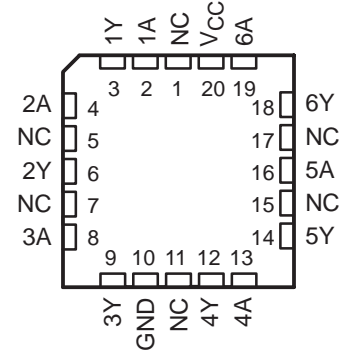
SN54LS05, SN54S05 . . . W PACKAGE

(TOP VIEW)



SN54LS05, SN54S05 . . . FK PACKAGE

(TOP VIEW)



NC – No internal connection

description/ordering information

These devices contain six independent inverters. To perform correctly, the open-collector outputs require pullup resistors. These devices may be connected to other open-collector outputs to implement active-low wired-OR or active-high wire-AND functions. Open-collector devices often are used to generate high V_{OH} levels.

ORDERING INFORMATION

| T_A | PACKAGE† | | ORDERABLE PART NUMBER | TOP-SIDE MARKING | |
|----------------|---------------|-------------|-----------------------|------------------|-----|
| 0°C to 70°C | PDIP – N | Tube | SN7405N | SN7405N | |
| | | | SN74LS05N | SN74LS05N | |
| | | | SN74S05N | SN74S05N | |
| | SOIC – D | Tube | SN74LS05D | LS05 | |
| | | | SN74LS05DR | | |
| | | | Tape and reel | SN74S05D | S05 |
| | | | | SN74S05DR | |
| SOP – NS | Tape and reel | SN74LS05NSR | 74LS05 | | |
| SSOP – DB | Tape and reel | SN74LS05DBR | LS05 | | |
| –55°C to 125°C | CDIP – J | Tube | SNJ54LS05J | SNJ54LS05J | |
| | | | SNJ54S05J | SNJ54S05J | |
| | CDIP – W | Tube | SNJ54LS05W | SNJ54LS05W | |
| | | | SNJ54S05W | SNJ54S05W | |
| | LCCC – FK | Tube | SNJ54LS05FK | SNJ54LS05FK | |
| SNJ54S05FK | | | SNJ54S05FK | | |

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



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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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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

SN54LS05, SN54S05
SN7405, SN74LS05, SN74S05
HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS

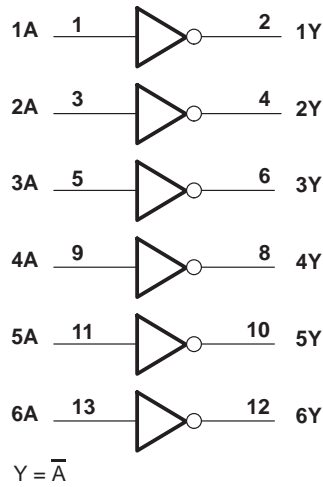
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FUNCTION TABLE
(each inverter)

| INPUT A | OUTPUT Y |
|------------|-------------|
| H | L |
| L | H |

logic diagram (positive logic)



Pin numbers shown are for the D, DB, J, N, and NS packages.

**SN54LS05, SN54S05
SN7405, SN74LS05, SN74S05
HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS**

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recommended operating conditions

| | SN5405 | | | SN7405 | | | UNIT |
|---|--------|-----|-----|--------|-----|------|------|
| | MIN | NOM | MAX | MIN | NOM | MAX | |
| V _{CC} Supply voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| V _{IH} High-level input voltage | 2 | | | 2 | | | V |
| V _{IL} Low-level input voltage | | | 0.8 | | | 0.8 | V |
| V _{OH} High-level output voltage | | | 5.5 | | | 5.5 | V |
| I _{OL} Low-level output current | | | 16 | | | 16 | mA |
| T _A Operating free-air temperature | -55 | | 125 | 0 | | 70 | °C |

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS† | SN5405 | | | SN7405 | | | UNIT |
|------------------|--|--------|------|------|--------|------|------|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IK} | V _{CC} = MIN, I _I = -12 mA | | | -1.5 | | | -1.5 | V |
| I _{OH} | V _{CC} = MIN, V _{OH} = 5.5 V V _{IL} = 0.8 V V _{IL} = 0.7 V | | | | | | 0.25 | mA |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 16 mA | | 0.2 | 0.4 | | 0.2 | 0.4 | V |
| I _I | V _{CC} = MAX, V _I = 5.5 V | | | 1 | | | 1 | mA |
| I _{IH} | V _{CC} = MAX, V _I = 2.4 V | | | 40 | | | 40 | µA |
| I _{IL} | V _{CC} = MAX, V _I = 0.4 V | | | -1.6 | | | -1.6 | mA |
| I _{CCH} | V _{CC} = MAX, V _I = 0 V | | 6 | 12 | | 6 | 12 | mA |
| I _{CCL} | V _{CC} = MAX, V _I = 4.5 V | | 18 | 33 | | 18 | 33 | mA |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|------------------------|------------------------|-----|-----|-----|------|
| t _{PLH} | A | Y | R _L = 4 kΩ | C _L = 15 pF | | 40 | 55 | ns |
| t _{PHL} | | | R _L = 400 Ω | | | 8 | 15 | |



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SN54LS05, SN54S05
SN7405, SN74LS05, SN74S05
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recommended operating conditions

| | | SN54LS05 | | | SN74LS05 | | | UNIT |
|-----------------|--------------------------------|----------|-----|-----|----------|-----|------|------|
| | | MIN | NOM | MAX | MIN | NOM | MAX | |
| V _{CC} | Supply voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| V _{IH} | High-level input voltage | 2 | | | 2 | | | V |
| V _{IL} | Low-level input voltage | | | | 0.7 | | | V |
| V _{OH} | High-level output voltage | | | | 5.5 | | | V |
| I _{OL} | Low-level output current | | | | 4 | | | mA |
| T _A | Operating free-air temperature | -55 | | | 125 | | | °C |

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS† | SN54LS05 | | | SN74LS05 | | | UNIT |
|------------------|---|------------------------|------|-----|----------|------|-----|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IK} | V _{CC} = MIN, I _I = -18 mA | | | | -1.5 | | | V |
| I _{OH} | V _{CC} = MIN, V _{IL} = MAX, V _{OH} = 5.5 V | | | | 0.1 | | | mA |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V | I _{OL} = 4 mA | | | 0.25 | | | V |
| | | I _{OL} = 8 mA | | | 0.35 | | | |
| I _I | V _{CC} = MAX, V _I = 7 V | | | | 0.1 | | | mA |
| I _{IH} | V _{CC} = MAX, V _I = 2.7 V | | | | 20 | | | µA |
| I _{IL} | V _{CC} = MAX, V _I = 0.4 V | | | | -0.4 | | | mA |
| I _{CCH} | V _{CC} = MAX, V _I = 0 V | | | | 1.2 | | | mA |
| I _{CCL} | V _{CC} = MAX, V _I = 4.5 V | | | | 3.6 | | | mA |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see Figure 2)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|---|-----|-----|-----|------|
| t _{PLH} | A | Y | R _L = 2 kΩ, C _L = 15 pF | | | 32 | ns |
| t _{PHL} | | | | 17 | 28 | | |



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SN7405, SN74LS05, SN74S05
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recommended operating conditions

| | SN54S05 | | | SN74S05 | | | UNIT |
|---|---------|-----|-----|---------|-----|------|------|
| | MIN | NOM | MAX | MIN | NOM | MAX | |
| V _{CC} Supply voltage | 4.5 | 5 | 5.5 | 4.75 | 5 | 5.25 | V |
| V _{IH} High-level input voltage | 2 | | | 2 | | | V |
| V _{IL} Low-level input voltage | | | 0.8 | | | 0.8 | V |
| V _{OH} High-level output voltage | | | 5.5 | | | 5.5 | V |
| I _{OL} Low-level output current | | | 20 | | | 20 | mA |
| T _A Operating free-air temperature | -55 | | 125 | 0 | | 70 | °C |

electrical characteristics over recommended operating free-air temperature range (unless otherwise noted)

| PARAMETER | TEST CONDITIONS† | | SN54S05 | | | SN74S05 | | | UNIT |
|------------------|------------------------|--|---------|------|------|---------|------|------|------|
| | | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IK} | V _{CC} = MIN, | I _I = -18 mA | | | -1.2 | | | -1.2 | V |
| I _{OH} | V _{CC} = MIN, | V _{OH} = 5.5 V | | | | | 0.25 | | mA |
| | | V _{IL} = 0.8 V | | | | | | | |
| | | V _{IL} = 0.7 V | | | 0.25 | | | | |
| V _{OL} | V _{CC} = MIN, | V _{IH} = 2 V, I _{OL} = 20 mA | | | 0.5 | | | 0.5 | V |
| I _I | V _{CC} = MAX, | V _I = 5.5 V | | | 1 | | | 1 | mA |
| I _{IH} | V _{CC} = MAX, | V _I = 2.7 V | | | 50 | | | 50 | µA |
| I _{IL} | V _{CC} = MAX, | V _I = 0.5 V | | | -2 | | | -2 | mA |
| I _{CCH} | V _{CC} = MAX, | V _I = 0 V | | 9 | 19.8 | | 9 | 19.8 | mA |
| I _{CCL} | V _{CC} = MAX, | V _I = 4.5 V | | 30 | 54 | | 30 | 54 | mA |

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

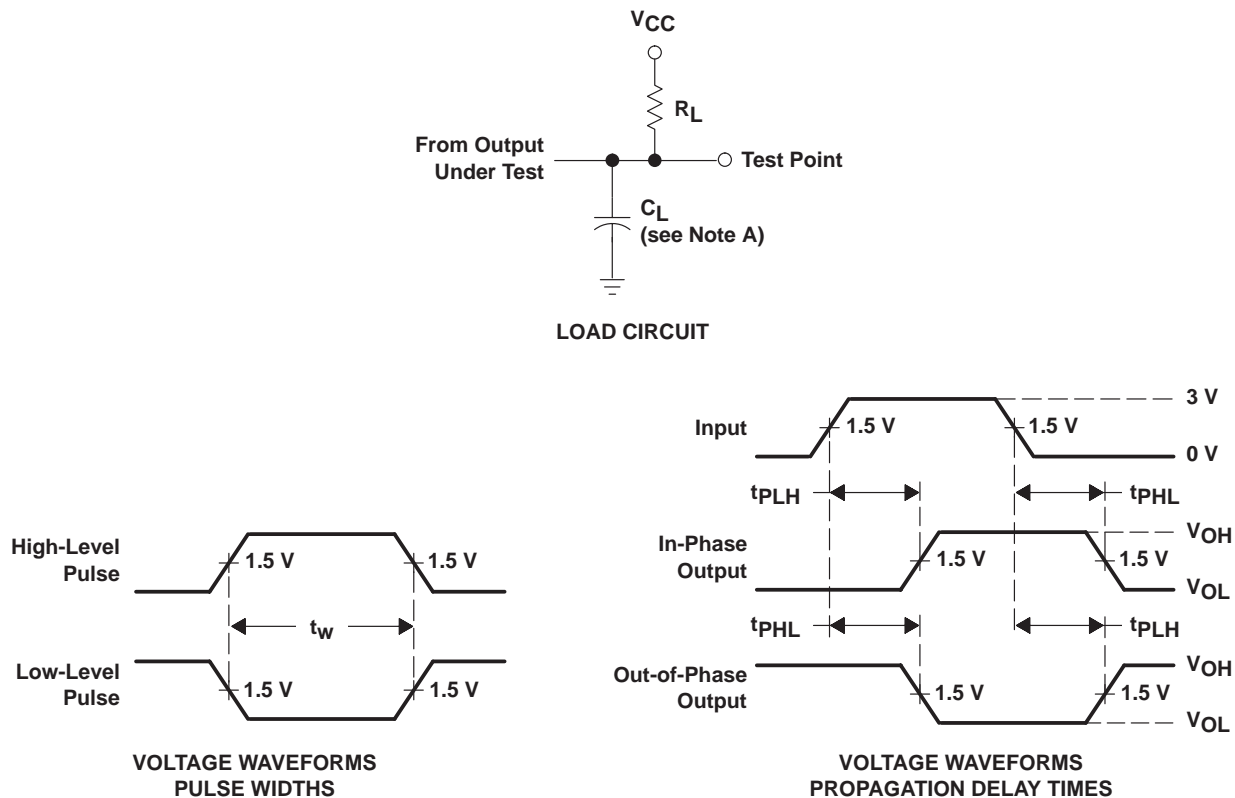
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see Figure 1)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|------------------------|------------------------|-----|-----|-----|------|
| t _{PLH} | A | Y | R _L = 280 Ω | C _L = 15 pF | 2 | 5 | 7.5 | ns |
| t _{PHL} | | | | | 2 | 4.5 | 7 | |
| t _{PLH} | | | | C _L = 50 pF | 7.5 | ns | | |
| t _{PHL} | | | | | 7 | | | |



PARAMETER MEASUREMENT INFORMATION
SERIES 54/74 AND 54S/74S DEVICES



- NOTES: A. C_L includes probe and jig capacitance.
 B. In the examples above, the phase relationships between inputs and outputs have been chosen arbitrarily.
 C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1$ MHz, $Z_O = 50 \Omega$, and:
 For Series 54/74, $t_r \leq 7$ ns, $t_f \leq 7$ ns.
 For Series 54S/74S, $t_r \leq 2.5$ ns, $t_f \leq 2.5$ ns.
 D. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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SN7405, SN74LS05, SN74S05
HEX INVERTERS WITH OPEN-COLLECTOR OUTPUTS**

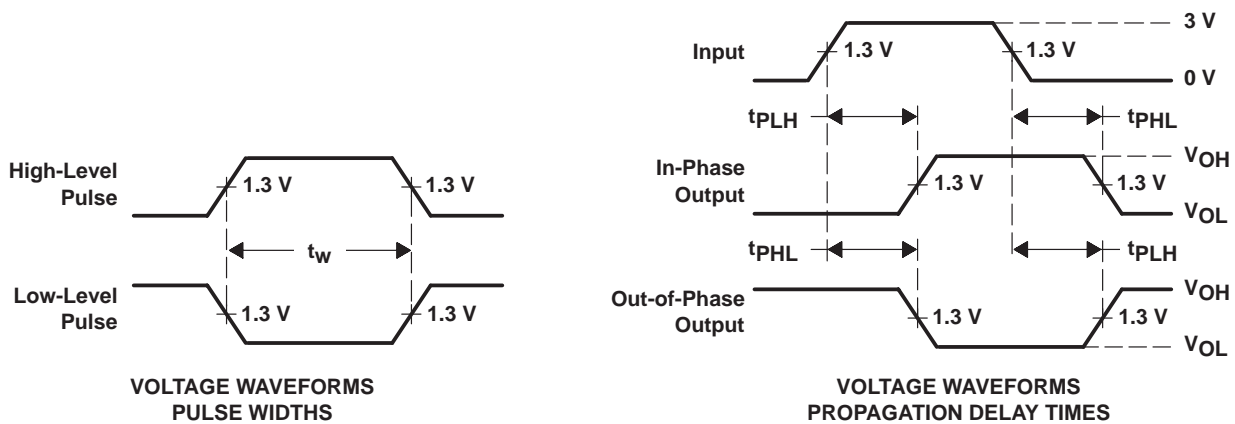
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**PARAMETER MEASUREMENT INFORMATION
SERIES 54LS/74LS DEVICES**



LOAD CIRCUIT



- NOTES: A. C_L includes probe and jig capacitance.
 B. In the examples above, the phase relationships between inputs and outputs have been chosen arbitrarily.
 C. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1$ MHz, $Z_O = 50 \Omega$, $t_r \leq 1.5$ ns, $t_f \leq 2.6$ ns.
 D. The outputs are measured one at a time with one input transition per measurement.

Figure 2. Load Circuit and Voltage Waveforms

PACKAGING INFORMATION

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| JM38510/07003BDA | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |
| JM38510/07004BCA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN54LS05J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN54S05J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SN7405D | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI |
| SN7405DR | OBSOLETE | SOIC | D | 14 | | TBD | Call TI | Call TI |
| SN7405N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN7405N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN7405NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74LS05D | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DBLE | OBSOLETE | SSOP | DB | 14 | | TBD | Call TI | Call TI |
| SN74LS05DBR | ACTIVE | SSOP | DB | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DBRE4 | ACTIVE | SSOP | DB | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DBRG4 | ACTIVE | SSOP | DB | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DE4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DG4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DRE4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05DRG4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74LS05N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN74LS05NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74LS05NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74LS05NSRG4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05D | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05DE4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05DG4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05DR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05DRE4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|
| | | | | | | no Sb/Br) | | |
| SN74S05DRG4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74S05N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI |
| SN74S05NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type |
| SN74S05NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05NSRE4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SN74S05NSRG4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM |
| SNJ54LS05FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54LS05J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54LS05W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |
| SNJ54S05FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type |
| SNJ54S05J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 SNPB | N / A for Pkg Type |
| SNJ54S05W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type |

⁽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.

OBSOLETE: 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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OTHER QUALIFIED VERSIONS OF SN54LS05, SN54S05, SN7405, SN74LS05, SN74S05 :

- Military: [SN5405](#)

NOTE: Qualified Version Definitions:

- Military - QML certified for Military and Defense Applications

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 |
|-------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LS05DBR | SSOP | DB | 14 | 2000 | 330.0 | 16.4 | 8.2 | 6.6 | 2.5 | 12.0 | 16.0 | Q1 |
| SN74LS05DR | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74LS05NSR | SO | NS | 14 | 2000 | 330.0 | 16.4 | 8.2 | 10.5 | 2.5 | 12.0 | 16.0 | Q1 |
| SN74S05DR | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74S05NSR | SO | NS | 14 | 2000 | 330.0 | 16.4 | 8.2 | 10.5 | 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) |
|-------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LS05DBR | SSOP | DB | 14 | 2000 | 346.0 | 346.0 | 33.0 |
| SN74LS05DR | SOIC | D | 14 | 2500 | 346.0 | 346.0 | 33.0 |
| SN74LS05NSR | SO | NS | 14 | 2000 | 346.0 | 346.0 | 33.0 |
| SN74S05DR | SOIC | D | 14 | 2500 | 346.0 | 346.0 | 33.0 |
| SN74S05NSR | SO | NS | 14 | 2000 | 346.0 | 346.0 | 33.0 |

DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



- 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.
 D. Falls within JEDEC MO-150

FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



- 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 metal lid.
 - D. The terminals are gold plated.
 - E. Falls within JEDEC MS-004

MECHANICAL DATA

NS (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- 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.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



4040180-2/D 07/03

- 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 only.
 - E. Falls within MIL STD 1835 GDFP1-F14 and JEDEC MO-092AB

D (R-PDSO-G14)

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 AB.

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - $\triangle C$ Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
 - $\triangle D$ The 20 pin end lead shoulder width is a vendor option, either half or full width.

4040049/E 12/2002

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