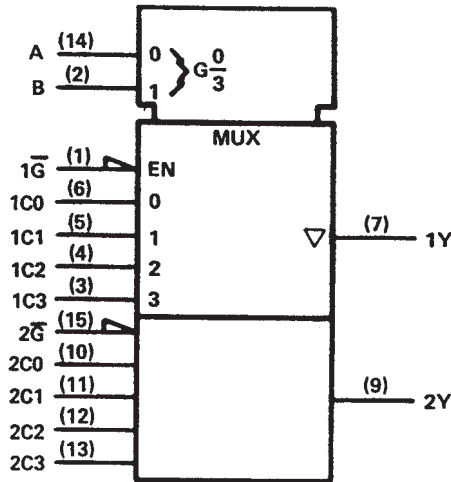


SN54LS253, SN54S253, SN74LS253, SN74S253 DUAL 4-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

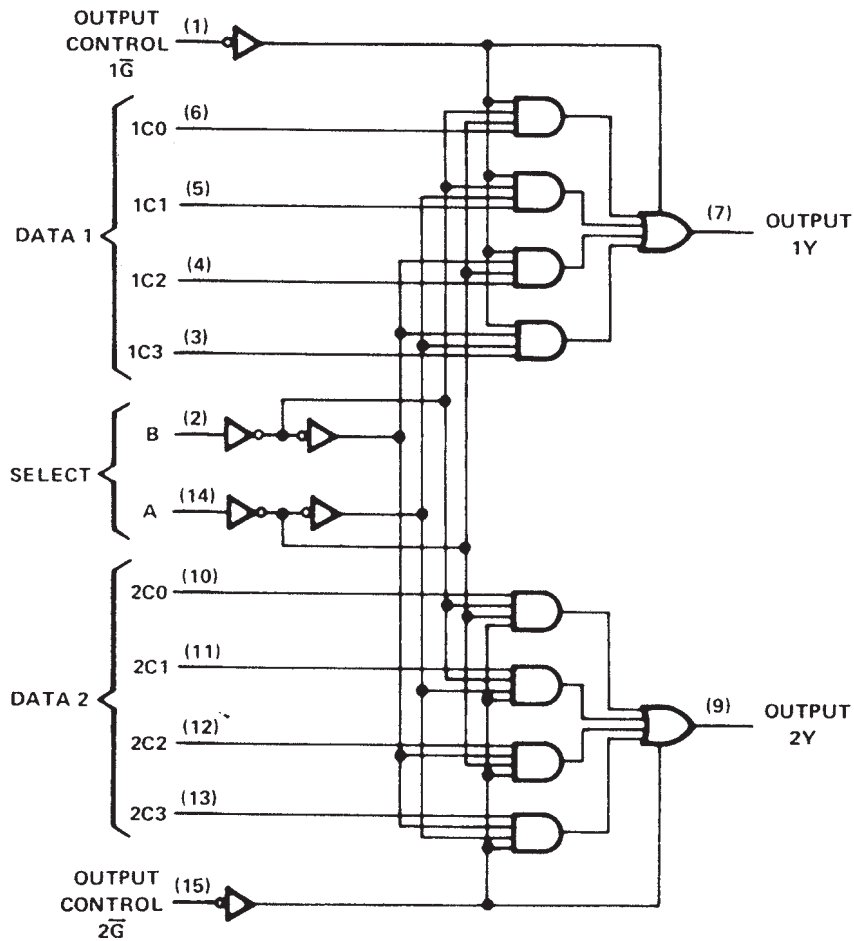
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logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



Pin numbers shown are for D, J, N, and W packages.

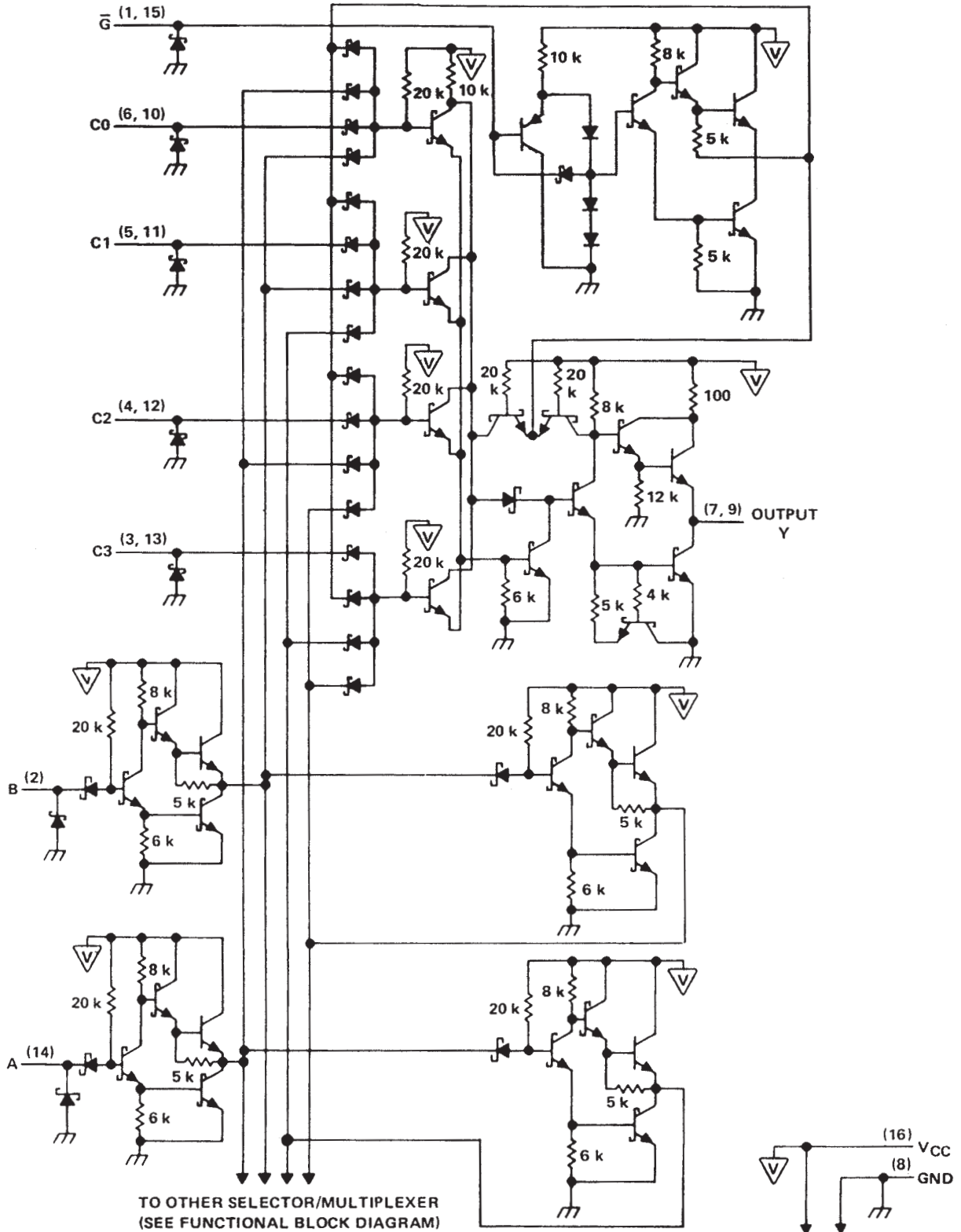


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SN54LS253, SN54S253, SN74LS253, SN74S253 DUAL 4-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

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schematic (each selector/multiplexer, and the common select section)



Pin numbers shown are for D, J, N, and W packages.

SN54LS253, SN54S253, SN74LS253, SN74S253 DUAL 4-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

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recommended operating conditions

| | SN54LS253 | | | SN74LS253 | | | 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 | | | 0.8 | | | V |
| I _{OH} High-level output current | -1 | | | -2.6 | | | mA |
| I _{OL} Low-level output current | 4 | | | 8 | | | 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† | SN54LS253 | | SN74LS253 | | UNIT |
|-------------------|--------------------------------------------------------------------------------------------|------------------------|-------|-----------|------|------|
| | | MIN | TYP ‡ | MAX | MIN | |
| V _{IK} | V _{CC} = MIN, I _I = -18 mA | -1.5 | | -1.5 | | V |
| V _{OH} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = MAX, I _{OH} = MAX | 2.4 | 3.4 | 2.4 | 3.1 | V |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = MAX | I _{OL} = 4 mA | | 0.25 | 0.4 | V |
| | | I _{OL} = 8 mA | | 0.25 0.5 | | |
| I _{OZ} | V _{CC} = MAX, V _{IH} = 2 V | V _O = 2.7 V | | 20 | | μA |
| | | V _O = 0.4 V | | -20 | | |
| I _I | V _{CC} = MAX, V _I = 7 V | 0.1 | | 0.1 | | mA |
| I _{IH} | V _{CC} = MAX, V _I = 2.7 V | 20 | | 20 | | μA |
| I _{IL} | V _{CC} = MAX, V _I = 0.4 V | G̅ | | -0.2 | | mA |
| | | All other | | -0.4 | | |
| I _{OS} § | V _{CC} = MAX | -30 | -130 | -30 | -130 | mA |
| I _{CC} | V _{CC} = MAX, See Note 2 | Condition A | | 7 | 12 | mA |
| | | Condition B | | 8.5 | 14 | |

† 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.

§ Not more than one output should be shorted at a time, and duration for the short-circuit should exceed one second.

NOTE 2: I_{CC} is measured with the outputs open under the following conditions:

- A. All inputs grounded.
- B. Output control at 4.5 V, all inputs grounded.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------|----------------|-------------|--------------------------------------------------------------|-----|-----|-----|------|
| t _{PLH} | Data | Y | C _L = 15 pF, R _L = 2 kΩ, See Note 3 | 17 | 25 | ns | |
| t _{PHL} | | | | 13 | 20 | | |
| t _{PLH} | Select | Y | | 30 | 45 | ns | |
| t _{PHL} | | | | 21 | 32 | | |
| t _{PZH} | Output Control | Y | | 15 | 28 | ns | |
| t _{PZL} | | | | 15 | 23 | | |
| t _{PHZ} | Output Control | Y | C _L = 5 pF, R _L = 2 kΩ, See Note 3 | 27 | 41 | ns | |
| t _{PLZ} | | | | 18 | 27 | | |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



SN54LS253, SN54S253, SN74LS253, SN74S253 DUAL 4-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS WITH 3-STATE OUTPUTS

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recommended operating conditions

| | SN54S253 | | | SN74S253 | | | 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 | |
| I _{OH} High-level output current | -2 | | | -6.5 | | | mA | |
| I _{OL} Low-level output current | 20 | | | 20 | | | mA | |
| T _A Operating free-air temperature | -55 | | | 0 | | | 70 | °C |

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

| PARAMETER | TEST CONDITIONS† | MIN | TYP‡ | MAX | UNIT |
|------------------|------------------------------------------------------------------------------------------------|------------------------|-------|-----|------|
| V _{IK} | V _{CC} = MIN, I _I = -18 mA | -1.2 | | | V |
| V _{OH} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = MAX | Series 54S | 2.5 | 3.4 | V |
| | | Series 74S | 2.7 | 3.4 | |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OL} = 20 mA | 0.5 | | | V |
| I _{OZ} | V _{CC} = MAX, V _{IH} = 2 V | V _O = 2.4 V | 50 | | μA |
| | | V _O = 0.5 V | -50 | | |
| I _I | V _{CC} = MAX, V _I = 5.5 V | 1 | | | mA |
| I _{IH} | V _{CC} = MAX, V _I = 2.7 V | 50 | | | μA |
| I _{IL} | V _{CC} = MAX, V _I = 0.5 V | \bar{G} = 0.8 V | -2 | | mA |
| | | \bar{G} = 2 V | -0.25 | | |
| I _{OS§} | V _{CC} = MAX | -40 | -100 | | mA |
| I _{CC} | V _{CC} = MAX, See Note 2 | Condition A | 45 | 70 | mA |
| | | Condition B | 65 | 85 | |

† 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.

Not more than one output should be shorted at a time and duration of short-circuit should not exceed one second.

NOTE 2: I_{CC} is measured with the outputs open under the following conditions:

- A. All inputs grounded.
- B. Output control at 4.5 V, all inputs grounded.

switching characteristics, V_{CC} = 5 V, T_A = 25°C

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|---------------------------------------|------------------------|------|------|------|
| t _{PLH} | Data | Y | R _L = 280 Ω, See Note 3 | C _L = 15 pF | 6 | 9 | ns |
| t _{PHL} | | | | | 6 | 9 | |
| t _{PLH} | Select | Y | | | 11.5 | 18 | ns |
| t _{PHL} | | | | | 12 | 18 | |
| t _{PZH} | Output | Y | | | 11 | 16.5 | ns |
| t _{PZL} | Control | | | | 12 | 18 | |
| t _{PHZ} | Output | Y | R _L = 280 Ω, See Note 3 | C _L = 5 pF | 6.5 | 9.5 | ns |
| t _{PLZ} | Control | | | | 10 | 15 | |

NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



PACKAGING INFORMATION

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/ Ball Finish | MSL Peak Temp ⁽³⁾ | Samples (Requires Login) |
|------------------|-----------------------|--------------|-----------------|------|-------------|----------------------------|----------------------|------------------------------|-----------------------------|
| 76017012A | ACTIVE | LCCC | FK | 20 | 1 | TBD | Call TI | Call TI | |
| 7601701EA | ACTIVE | CDIP | J | 16 | 1 | TBD | Call TI | Call TI | |
| 7601701EA | ACTIVE | CDIP | J | 16 | 1 | TBD | Call TI | Call TI | |
| 7601701FA | ACTIVE | CFP | W | 16 | 1 | TBD | Call TI | Call TI | |
| 7601701FA | ACTIVE | CFP | W | 16 | 1 | TBD | Call TI | Call TI | |
| JM38510/30908B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | |
| JM38510/30908B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | |
| JM38510/30908BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| JM38510/30908BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| JM38510/30908BFA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| JM38510/30908BFA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| SN54LS253J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| SN54LS253J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| SN74LS253D | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253D | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DE4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DE4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DG4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DG4 | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DRE4 | ACTIVE | SOIC | D | 16 | 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⁾ | Samples (Requires Login) |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|-------------------|------------------------------|--------------------------|
| SN74LS253DRE4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DRG4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253DRG4 | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | |
| SN74LS253J | OBSOLETE | CDIP | J | 16 | | TBD | Call TI | Call TI | |
| SN74LS253N | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | |
| SN74LS253N | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | |
| SN74LS253N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | |
| SN74LS253N3 | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | |
| SN74LS253NE4 | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | |
| SN74LS253NE4 | ACTIVE | PDIP | N | 16 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | |
| SN74LS253NSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253NSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253NSRE4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253NSRE4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253NSRG4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74LS253NSRG4 | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | |
| SN74S253N | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | |
| SN74S253N | OBSOLETE | PDIP | N | 16 | | TBD | Call TI | Call TI | |
| SNJ54LS253FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | |
| SNJ54LS253FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | |
| SNJ54LS253J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| SNJ54LS253J | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | |
| SNJ54LS253W | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | |

| Orderable Device | Status ⁽¹⁾ | Package Type | Package Drawing | Pins | Package Qty | Eco Plan ⁽²⁾ | Lead/Ball Finish | MSL Peak Temp ⁽³⁾ | Samples (Requires Login) |
|------------------|-----------------------|--------------|-----------------|------|-------------|-------------------------|------------------|------------------------------|--------------------------|
| SNJ54LS253W | ACTIVE | CFP | W | 16 | 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.

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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OTHER QUALIFIED VERSIONS OF SN54LS253, SN74LS253 :

● Catalog: [SN74LS253](#)

● Military: [SN54LS253](#)

NOTE: Qualified Version Definitions:

● Catalog - TI's standard catalog product

- 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 |
|--------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LS253DR | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74LS253NSR | SO | NS | 16 | 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) |
|--------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LS253DR | SOIC | D | 16 | 2500 | 333.2 | 345.9 | 28.6 |
| SN74LS253NSR | SO | NS | 16 | 2000 | 346.0 | 346.0 | 33.0 |

J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



| DIM \ PINS ** | 14 | 16 | 18 | 20 |
|---------------|------------------------|------------------------|------------------------|------------------------|
| A | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC | 0.300 (7,62) BSC |
| B MAX | 0.785 (19,94) | .840 (21,34) | 0.960 (24,38) | 1.060 (26,92) |
| B MIN | — | — | — | — |
| C MAX | 0.300 (7,62) | 0.300 (7,62) | 0.310 (7,87) | 0.300 (7,62) |
| C MIN | 0.245 (6,22) | 0.245 (6,22) | 0.220 (5,59) | 0.245 (6,22) |



4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package is hermetically sealed with a ceramic lid using glass frit.
 - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
 - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F16)

CERAMIC DUAL FLATPACK



4040180-3/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-F16 and JEDEC MO-092AC

FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN



| NO. OF TERMINALS ** | A | | B | |
|---------------------|------------------|------------------|------------------|------------------|
| | MIN | MAX | MIN | MAX |
| 20 | 0.342 (8,69) | 0.358 (9,09) | 0.307 (7,80) | 0.358 (9,09) |
| 28 | 0.442 (11,23) | 0.458 (11,63) | 0.406 (10,31) | 0.458 (11,63) |
| 44 | 0.640 (16,26) | 0.660 (16,76) | 0.495 (12,58) | 0.560 (14,22) |
| 52 | 0.740 (18,78) | 0.761 (19,32) | 0.495 (12,58) | 0.560 (14,22) |
| 68 | 0.938 (23,83) | 0.962 (24,43) | 0.850 (21,6) | 0.858 (21,8) |
| 84 | 1.141 (28,99) | 1.165 (29,59) | 1.047 (26,6) | 1.063 (27,0) |



4040140/D 01/11

- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package can be hermetically sealed with a metal lid.
 - Falls within JEDEC MS-004

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



4040049/E 12/2002

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

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



- 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 0.006 (0,15) each side.
 - D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 - E. Reference JEDEC MS-012 variation AC.

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.

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