



**THE DATASHEET OF
SN74LS368AD**



SN54365A THRU SN54368A, SN54LS365A THRU SN54LS368A SN74365A THRU SN74368A, SN74LS365A THRU SN74LS368A HEX BUS DRIVERS WITH 3-STATE OUTPUTS

DECEMBER 1983—REVISED MARCH 1988

- 3-State Outputs Drive Bus Lines or Buffer Memory Address Registers
 - Choice of True or Inverting Outputs
 - Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs
 - Dependable Texas Instruments Quality and Reliability
- '365A, '367A, 'LS365A, 'LS367A True Outputs
'366A, '368A, 'LS366A, 'LS368A Inverting Outputs

description

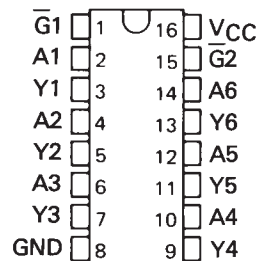
These Hex buffers and line drivers are designed specifically to improve both the performance and density of three-state memory address drivers, clock drivers, and bus oriented receivers and transmitters. The designer has choice of selected combinations of inverting and noninverting outputs, symmetrical \bar{G} (active-low control) inputs.

These devices feature high fan-out, improved fan-in, and can be used to drive terminated lines down to 133 ohms.

The SN54365A thru SN54368A and SN54LS365A thru SN54LS368A are characterized for operation over the full military temperature range of -55°C to 125°C . The SN74365A thru SN74368A and SN74LS365A thru SN74LS368A are characterized for operation from 0°C to 70°C .

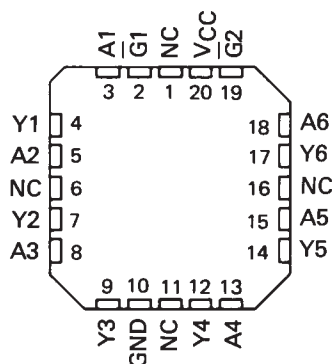
SN54365A, 366A, SN54LS365A, 366A . . . J PACKAGE
SN74365A, 366A . . . N PACKAGE
SN74LS365A, SN74LS366A . . . D OR N PACKAGE

(TOP VIEW)



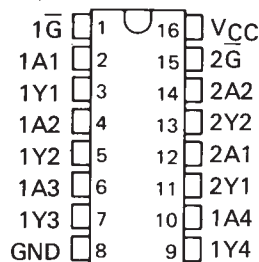
SN54LS365A, SN54LS366A . . . FK PACKAGE

(TOP VIEW)



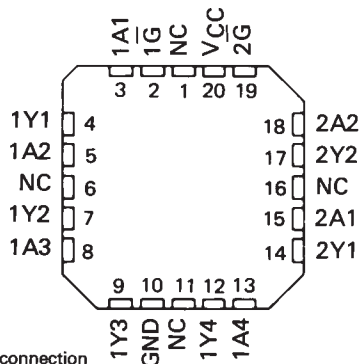
SN54367A, 368A, SN54LS367A, 368A . . . J PACKAGE
SN74367A, 368A . . . N PACKAGE
SN74LS367A, SN74LS368A . . . D OR N PACKAGE

(TOP VIEW)



SN54LS367A, SN54LS368A . . . FK PACKAGE

(TOP VIEW)



NC - No internal connection

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TTL Devices

PRODUCTION DATA documents contain information 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.

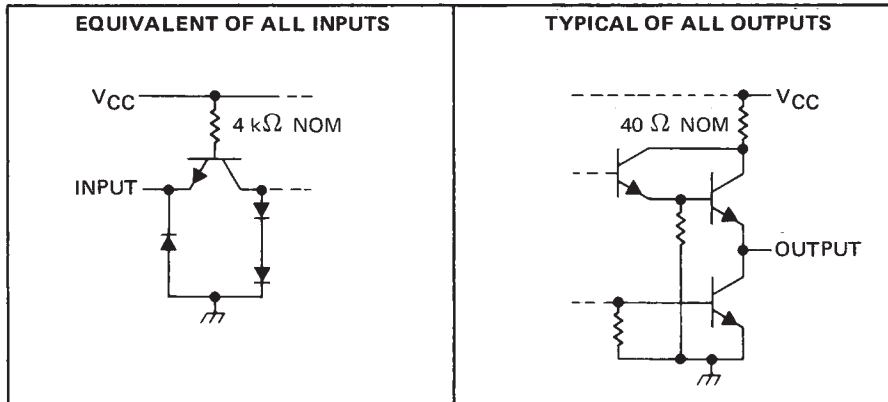
TEXAS
INSTRUMENTS

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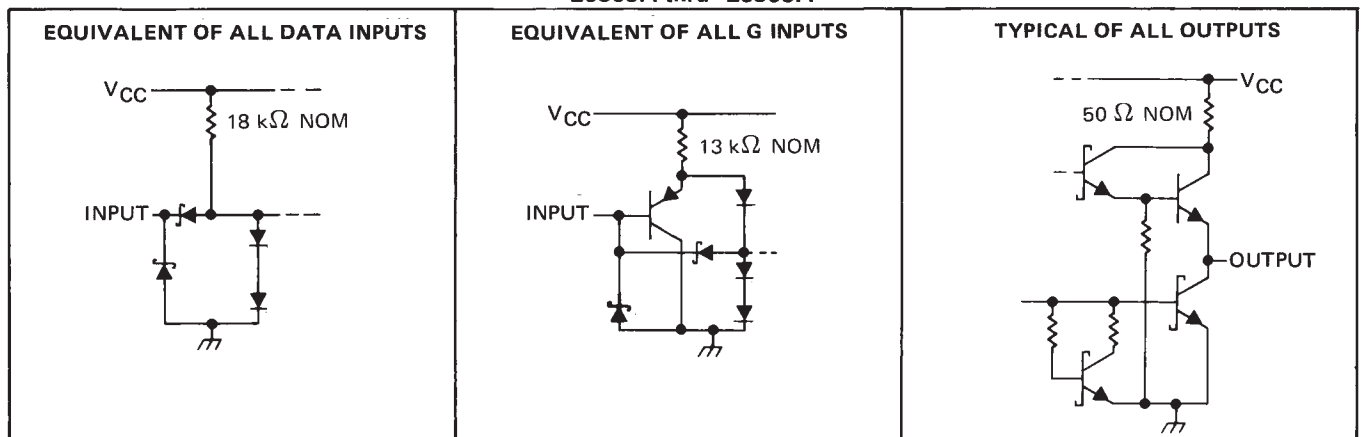
SN54365A THRU SN54368A, SN54LS365A THRU SN54LS368A SN74365A THRU SN74368A, SN74LS365A THRU SN74LS368A HEX BUS DRIVERS WITH 3-STATE OUTPUTS

schematics of inputs and outputs

'365A thru '368A



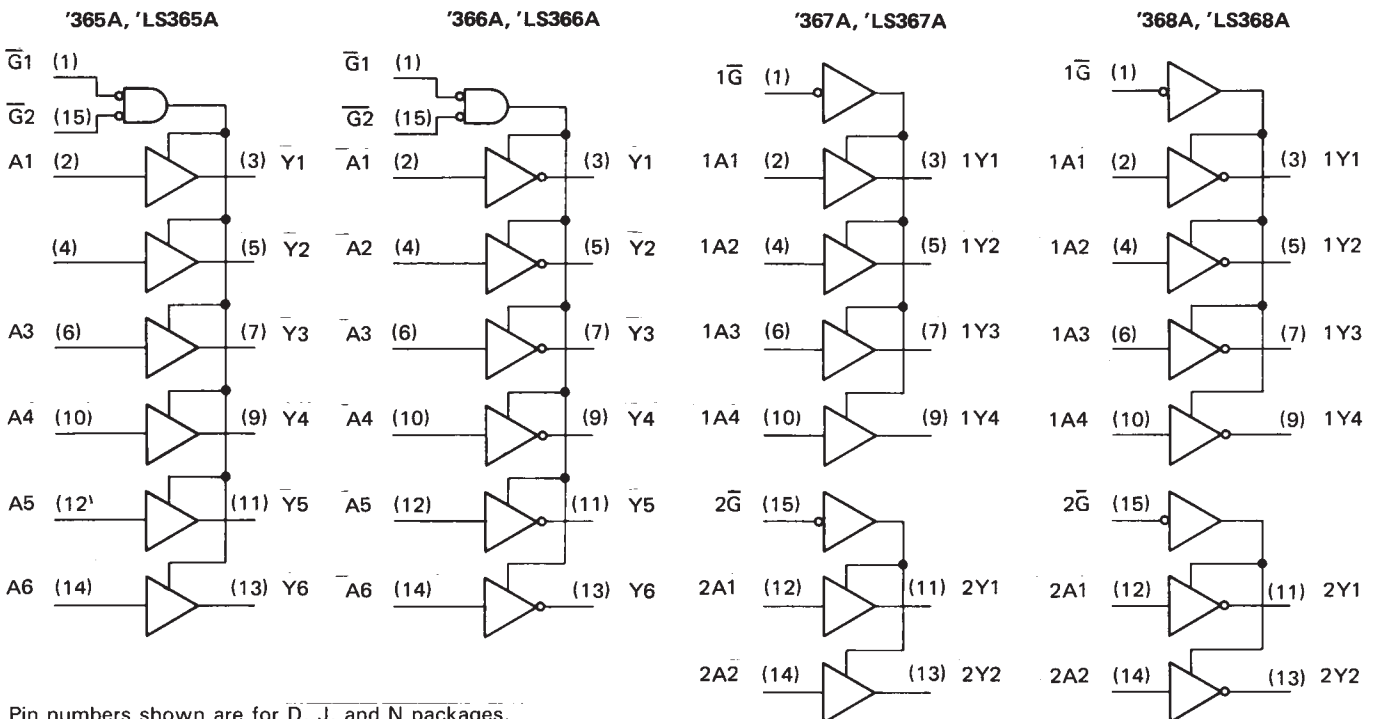
'LS365A thru 'LS368A



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TTL Devices

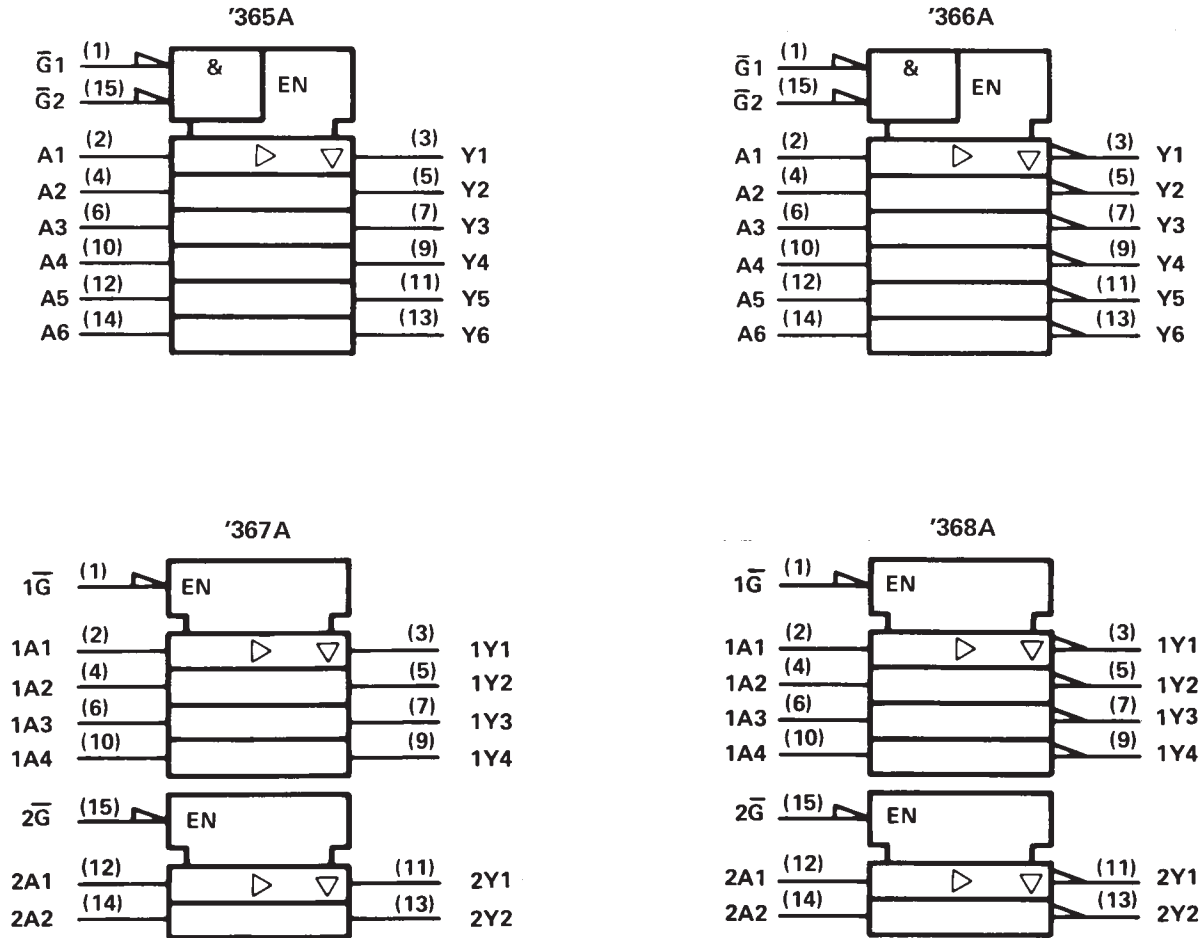
logic diagrams (positive logic)



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

**SN54365A THRU SN54368A, SN54LS365A THRU SN54LS368A
SN74365A THRU SN74368A, SN74LS365A THRU SN74LS368A
HEX BUS DRIVERS WITH 3-STATE OUTPUTS**

logic symbols†



†These symbols are in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.
Pin numbers shown are for D, J, and N packages.

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

| | |
|--|----------------|
| Supply voltage, V_{CC} (see Note 1) | 7 V |
| Input voltage: '365A, '366A, '367A, '368A | 5.5 V |
| 'LS365A, 'LS366A, 'LS367A, 'LS368A | 7 V |
| Voltage applied to a disabled 3-state output | 5.5 V |
| Operating free-air temperature: SN54' | -55°C to 125°C |
| SN74' | 0°C to 70°C |
| Storage temperature range | -65°C to 150°C |

NOTE 1: Voltage values are with respect to network ground terminal.

SN54365A, SN54367A
SN74365A, SN74367A
HEX BUS DRIVERS WITH 3-STATE OUTPUTS

recommended operating conditions

| | SN54365A SN54367A | | | SN74365A SN74367A | | | 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 | | | -5.2 | mA |
| I _{OL} Low-level output current | | | 32 | | | 32 | 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† | SN54365A SN54367A | | | SN74365A SN74367A | | | UNIT |
|-------------------|---|----------------------|------|------|----------------------|------|------|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IK} | V _{CC} = MIN, I _I = -12 mA | | | -1.5 | | | -1.5 | V |
| V _{OH} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = MAX | 2.4 | 3.3 | | 2.4 | 3.1 | | V |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OL} = 32 mA | | | 0.4 | | | 0.4 | V |
| I _{OZ} | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0.8 V, V _O = 2.4 V | | | 40 | | | 40 | μA |
| | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0.8 V, V _O = 0.4 V | | | -40 | | | -40 | |
| 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} | A Inputs V _{CC} = MAX, V _I = 0.5 V, Either \bar{G} input at 2 V | | | -40 | | | -40 | μA |
| | \bar{G} Inputs V _{CC} = MAX, V _I = 0.4 V, Both \bar{G} inputs at 0.4 V | | | -1.6 | | | -1.6 | |
| I _{OS} § | V _{CC} = MAX | -40 | | -130 | -40 | | -130 | mA |
| I _{CC} | V _{CC} = MAX, Data inputs = 0 V, Output controls = 4.5 V | | 65 | 85 | | 65 | 85 | 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.

§ Not more than one output should be shorted at a time.

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT | |
|------------------|--------------|-------------|--|-----|-----|---|------|----|
| t _{PLH} | Any | Y | R _L = 400 Ω, C _L = 50 pF | | | 16 | ns | |
| t _{PHL} | | | | | | 22 | ns | |
| t _{PZH} | | | | | | 35 | ns | |
| t _{PZL} | | | | | | 37 | ns | |
| t _{PHZ} | | | | | | | 11 | ns |
| t _{PLZ} | | | | | | R _L = 400 Ω, C _L = 5 pF | | |

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

SN54366A, SN54368A
SN74366A, SN74368A
HEX BUS DRIVERS WITH 3-STATE OUTPUTS

recommended operating conditions

| | SN54366A SN54368A | | | SN74366A SN74368A | | | 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 | | | -5.2 | mA |
| I _{OL} Low-level output current | | | 32 | | | 32 | 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† | SN54366A SN54368A | | | SN74366A SN74368A | | | UNIT |
|-------------------|---|----------------------|------|------|----------------------|------|------|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| V _{IK} | V _{CC} = MIN, I _I = -12 mA | | | -1.5 | | | -1.5 | V |
| V _{OH} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OH} = MAX | 2.4 | 3.3 | | 2.4 | 3.1 | | V |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OL} = 32 mA | | | 0.4 | | | 0.4 | V |
| I _{OZ} | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0.8 V, V _O = 2.4 V | | | 40 | | | 40 | μA |
| | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = 0.8 V, V _O = 0.4 V | | | -40 | | | -40 | |
| 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} | A Inputs V _{CC} = MAX, V _I = 0.5 V, Either \bar{G} input at 2 V | | | -40 | | | -40 | μA |
| | \bar{G} Inputs V _{CC} = MAX, V _I = 0.4 V, Both \bar{G} inputs at 0.4 V | | | -1.6 | | | -1.6 | |
| I _{OS} § | V _{CC} = MAX | | | -40 | | | -130 | mA |
| I _{CC} | V _{CC} = MAX, Data inputs = 0 V, Output controls = 4.5 V, | | | 59 | | | 77 | 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.

§ Not more than one output should be shorted at a time.

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

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT | |
|------------------|--------------|-------------|--|-----|-----|-----|------|----|
| t _{PLH} | Any | Y | R _L = 400 Ω, C _L = 50 pF | | | 17 | ns | |
| t _{PHL} | | | | | | 16 | ns | |
| t _{PZH} | | | | | | 35 | ns | |
| t _{PZL} | | | | | | 37 | ns | |
| t _{PHZ} | | | R _L = 400 Ω, C _L = 5 pF | | | | 11 | ns |
| t _{PLZ} | | | | | | | 27 | ns |

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

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TTL Devices



**SN54LS365A, SN54LS367A
SN74LS365A, SN74LS367A
HEX BUS DRIVERS WITH 3-STATE OUTPUTS**

recommended operating conditions

| | SN54LS365A SN54LS367A | | | SN74LS365A SN74LS367A | | | 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 | | | 12 | | | 24 | 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† | SN54LS365A SN54LS367A | | SN74LS365A SN74LS367A | | UNIT | | |
|-------------------|--|---|------|--------------------------|------|------|------|-----|
| | | MIN | TYP‡ | MAX | MIN | | TYP‡ | MAX |
| 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 | 3.3 | | 2.4 | 3.1 | V | |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = MAX, I _{OL} = 12 mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OL} = 24 mA | | | | | 0.35 | 0.5 | |
| I _{OZ} | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = MAX, V _O = 2.4 V | | | 20 | | 20 | μA | |
| | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = MAX, V _O = 0.4 V | | | -20 | | -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} | A Inputs | V _{CC} = MAX, V _I = 0.5 V, Either \bar{G} input at 2 V | | | -20 | | -20 | μA |
| | | V _{CC} = MAX, V _I = 0.4 V, Both \bar{G} inputs at 0.4 V | | | -0.4 | | -0.4 | |
| | \bar{G} Inputs | V _{CC} = MAX, V _I = 0.4 V | | | -0.2 | | -0.2 | mA |
| I _{OS} § | V _{CC} = MAX | -40 | | -225 | -40 | | -225 | mA |
| I _{CC} | V _{CC} = MAX, Data inputs = 0 V, Output controls = 4.5 V, | | 14 | 24 | | 14 | 24 | 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.

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

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TTL Devices

SN54LS365A, SN54LS367A
SN74LS365A, SN74LS367A
HEX BUS DRIVERS WITH 3-STATE OUTPUTS

switching characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ (see note 2)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT | |
|-----------|-----------------|----------------|--|-----|-----|-----|------|----|
| t_{PLH} | Any | Y | $R_L = 667\ \Omega$, $C_L = 45\text{ pF}$ | | 10 | 16 | ns | |
| t_{PHL} | | | | | 9 | 22 | ns | |
| t_{PZH} | | | | | 19 | 35 | ns | |
| t_{PZL} | | | | | 24 | 40 | ns | |
| t_{PHZ} | | | $R_L = 667\ \Omega$, $C_L = 5\text{ pF}$ | | | | 30 | ns |
| t_{PLZ} | | | | | | | 35 | ns |

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

**SN54LS366A, SN54LS368A
SN74LS366A, SN74LS368A
HEX BUS DRIVERS WITH 3-STATE OUTPUTS**

recommended operating conditions

| | SN54LS366A SN54LS368A | | | SN74LS366A SN74LS368A | | | 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 | | | 12 | | | 24 | mA |
| T _A Operating free-air temperature | -55 | | 125 | 0 | | 70 | °C |

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

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TTL Devices

| PARAMETER | TEST CONDITIONS† | SN54LS366A SN54LS368A | | | SN74LS366A SN74LS368A | | | UNIT |
|-------------------|--|---|------|------|--------------------------|------|------|------|
| | | MIN | TYP‡ | MAX | MIN | TYP‡ | MAX | |
| 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 | 3.3 | | 2.4 | 3.1 | | V |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = MAX, I _{OL} = 12 mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = 0.8 V, I _{OL} = 24 mA | | | | | 0.35 | 0.5 | |
| I _{OZ} | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = MAX, V _O = 2.4 V | | | 20 | | | 20 | μA |
| | V _{CC} = MAX, V _{IH} = 2 V, V _{IL} = MAX, V _O = 0.4 V | | | -20 | | | -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} | A Inputs | V _{CC} = MAX, V _I = 0.5 V, Either \bar{G} input at 2 V | | | -20 | | -20 | μA |
| | | V _{CC} = MAX, V _I = 0.4 V, Both \bar{G} inputs at 0.4 V | | | -0.4 | | -0.4 | |
| | \bar{G} Inputs | V _{CC} = MAX, V _I = 0.4 V | | | -0.2 | | -0.2 | mA |
| I _{OS} § | V _{CC} = MAX | -40 | | -225 | -40 | | -225 | mA |
| I _{CC} | V _{CC} = MAX, Data inputs = 0 V, Output controls = 4.5 V, | | 12 | 21 | | 12 | 21 | 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.

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

SN54LS366A, SN54LS368A
SN74LS366A, SN74LS368A
HEX BUS DRIVERS WITH 3-STATE OUTPUTS

switching characteristics, $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$ (see note 2)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------|-----------------|----------------|---|-----|-----|-----|------|
| t_{PLH} | Any | Y | $R_L = 667\ \Omega$, $C_L = 45\ \text{pF}$ | 7 | | 15 | ns |
| t_{PHL} | | | | 12 | | 18 | ns |
| t_{PZH} | | | | 18 | | 35 | ns |
| t_{PZL} | | | | 28 | | 45 | ns |
| t_{PHZ} | | | $R_L = 667\ \Omega$, $C_L = 5\ \text{pF}$ | | | 32 | ns |
| t_{PLZ} | | | | | | 35 | ns |

NOTE 2: 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 (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|-------------------------|----------------------|--------------|-------------------------|-------------------------|
| JM38510/32201B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 32201B2A | Samples |
| JM38510/32201BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32201BEA | Samples |
| JM38510/32201BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32201BEA | Samples |
| JM38510/32203B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 32203B2A | Samples |
| JM38510/32203B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 32203B2A | Samples |
| JM38510/32203BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BEA | Samples |
| JM38510/32203BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BEA | Samples |
| JM38510/32203BFA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BFA | Samples |
| JM38510/32203BFA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BFA | Samples |
| M38510/32201B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 32201B2A | Samples |
| M38510/32201B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 32201B2A | Samples |
| M38510/32201BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32201BEA | Samples |
| M38510/32201BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32201BEA | Samples |
| M38510/32203B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 32203B2A | Samples |
| M38510/32203B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 32203B2A | Samples |
| M38510/32203BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BEA | Samples |
| M38510/32203BEA | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BEA | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|----------------------------|-------------------------|----------------------|--------------|-------------------------|-------------------------|
| M38510/32203BFA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BFA | Samples |
| M38510/32203BFA | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 32203BFA | Samples |
| SN54LS365AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS365AJ | Samples |
| SN54LS365AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS365AJ | Samples |
| SN54LS366AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS366AJ | Samples |
| SN54LS366AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS366AJ | Samples |
| SN54LS367AJ | ACTIVE | CDIP | J | 16 | 25 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS367AJ | Samples |
| SN54LS367AJ | ACTIVE | CDIP | J | 16 | 25 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS367AJ | Samples |
| SN54LS368AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS368AJ | Samples |
| SN54LS368AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS368AJ | Samples |
| SN74LS365AD | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS365A | Samples |
| SN74LS365AD | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS365A | Samples |
| SN74LS365ADR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS365A | Samples |
| SN74LS365ADR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS365A | Samples |
| SN74LS365AN | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS365AN | Samples |
| SN74LS365AN | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS365AN | Samples |
| SN74LS365ANSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS365A | Samples |
| SN74LS365ANSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS365A | Samples |
| SN74LS367AD | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS367A | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|--------------------|------|----------------|----------------------------|-------------------------|----------------------|--------------|-------------------------|-------------------------|
| SN74LS367AD | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS367A | Samples |
| SN74LS367ADR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS367A | Samples |
| SN74LS367ADR | ACTIVE | SOIC | D | 16 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS367A | Samples |
| SN74LS367AN | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS367AN | Samples |
| SN74LS367AN | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS367AN | Samples |
| SN74LS367ANE4 | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS367AN | Samples |
| SN74LS367ANE4 | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS367AN | Samples |
| SN74LS367ANSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS367A | Samples |
| SN74LS367ANSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS367A | Samples |
| SN74LS368AD | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS368A | Samples |
| SN74LS368AD | ACTIVE | SOIC | D | 16 | 40 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS368A | Samples |
| SN74LS368AN | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS368AN | Samples |
| SN74LS368AN | ACTIVE | PDIP | N | 16 | 25 | Green (RoHS & no Sb/Br) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS368AN | Samples |
| SN74LS368ANSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS368A | Samples |
| SN74LS368ANSR | ACTIVE | SO | NS | 16 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS368A | Samples |
| SNJ54LS365AFK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS 365AFK | Samples |
| SNJ54LS365AFK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS 365AFK | Samples |
| SNJ54LS365AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS365AJ | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-----------------|-------------------------|----------------------|--------------|-------------------------|-------------------------|
| SNJ54LS365AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS365AJ | Samples |
| SNJ54LS366AFK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS366AFK | Samples |
| SNJ54LS366AFK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS366AFK | Samples |
| SNJ54LS366AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS366AJ | Samples |
| SNJ54LS366AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS366AJ | Samples |
| SNJ54LS367AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS367AJ | Samples |
| SNJ54LS367AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS367AJ | Samples |
| SNJ54LS368AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS368AJ | Samples |
| SNJ54LS368AJ | ACTIVE | CDIP | J | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS368AJ | Samples |
| SNJ54LS368AW | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS368AW | Samples |
| SNJ54LS368AW | ACTIVE | CFP | W | 16 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS368AW | Samples |

(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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".

RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

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

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

⁽⁵⁾ Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

⁽⁶⁾ Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

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OTHER QUALIFIED VERSIONS OF SN54LS365A, SN54LS367A, SN54LS368A, SN74LS365A, SN74LS367A, SN74LS368A :

- Catalog: [SN74LS365A](#), [SN74LS367A](#), [SN74LS368A](#)
- Military: [SN54LS365A](#), [SN54LS367A](#), [SN54LS368A](#)

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 |
|---------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LS365ADR | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74LS365ANSR | SO | NS | 16 | 2000 | 330.0 | 16.4 | 8.2 | 10.5 | 2.5 | 12.0 | 16.0 | Q1 |
| SN74LS367ADR | SOIC | D | 16 | 2500 | 330.0 | 16.4 | 6.5 | 10.3 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74LS368ANSR | 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) |
|---------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LS365ADR | SOIC | D | 16 | 2500 | 333.2 | 345.9 | 28.6 |
| SN74LS365ANSR | SO | NS | 16 | 2000 | 367.0 | 367.0 | 38.0 |
| SN74LS367ADR | SOIC | D | 16 | 2500 | 333.2 | 345.9 | 28.6 |
| SN74LS368ANSR | SO | NS | 16 | 2000 | 367.0 | 367.0 | 38.0 |

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN

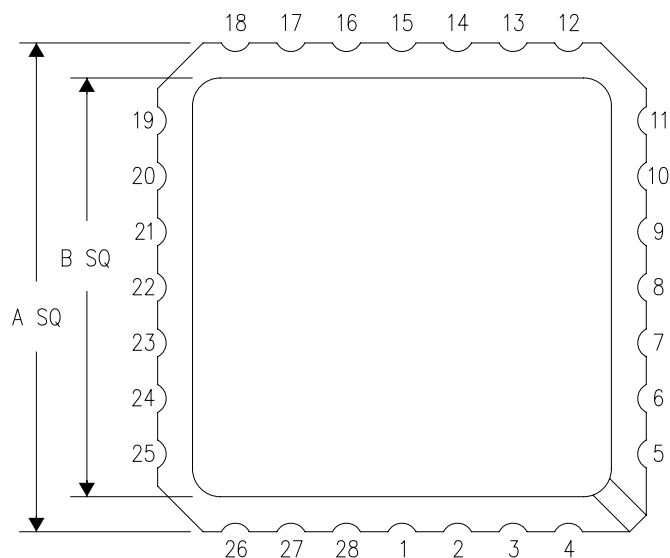


- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
 - The 20 pin end lead shoulder width is a vendor option, either half or full width.

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

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



4040047-6/M 06/11

- 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.

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



- NOTES:
- All linear dimensions are in millimeters.
 - This drawing is subject to change without notice.
 - Publication IPC-7351 is recommended for alternate designs.
 - Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
 - Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

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-F16)

CERAMIC DUAL FLATPACK



- 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 GDFP2-F16

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.

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