

SN5427, SN54LS27, SN7427, SN74LS27 TRIPLE 3-INPUT POSITIVE-NOR GATES

SDLS089

DECEMBER 1983—REVISED MARCH 1988

- Package Options Include Plastic "Small Outline" Packages, Ceramic Chip Carriers and Flat Packages, and Plastic and Ceramic DIPs

- Dependable Texas Instruments Quality and Reliability

description

These devices contain three independent 3-input NOR gates.

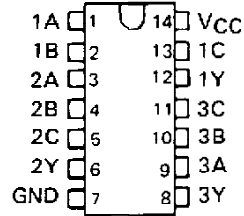
The SN5427 and SN54LS27 are characterized for operation over the full military temperature range of -55°C to 125°C. The SN7427 and SN74LS27 are characterized for operation from 0°C to 70°C.

SN5427, SN54LS27 . . . J OR W PACKAGE

SN7427 . . . N PACKAGE

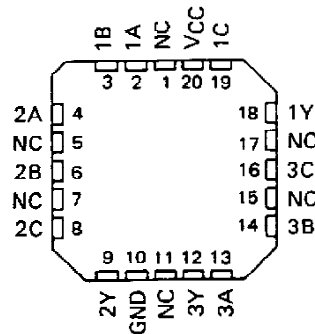
SN74LS27 . . . D OR N PACKAGE

(TOP VIEW)



SN54LS27 . . . FK PACKAGE

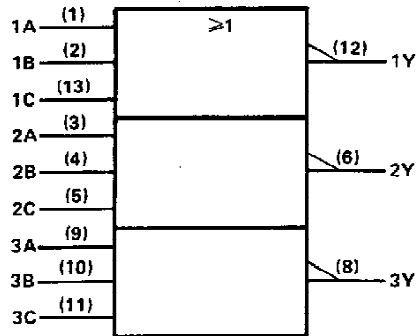
(TOP VIEW)



FUNCTION TABLE (each gate)

| INPUTS | | | OUTPUT |
|--------|---|---|--------|
| A | B | C | Y |
| H | X | X | L |
| X | H | X | L |
| X | X | H | L |
| L | L | L | H |

logic symbol†

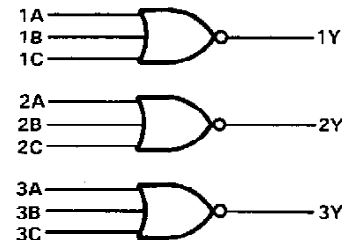


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

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

NC - No internal connection

logic diagram



positive logic

$$Y = A + B + C \text{ or } Y = \bar{A} \cdot \bar{B} \cdot \bar{C}$$

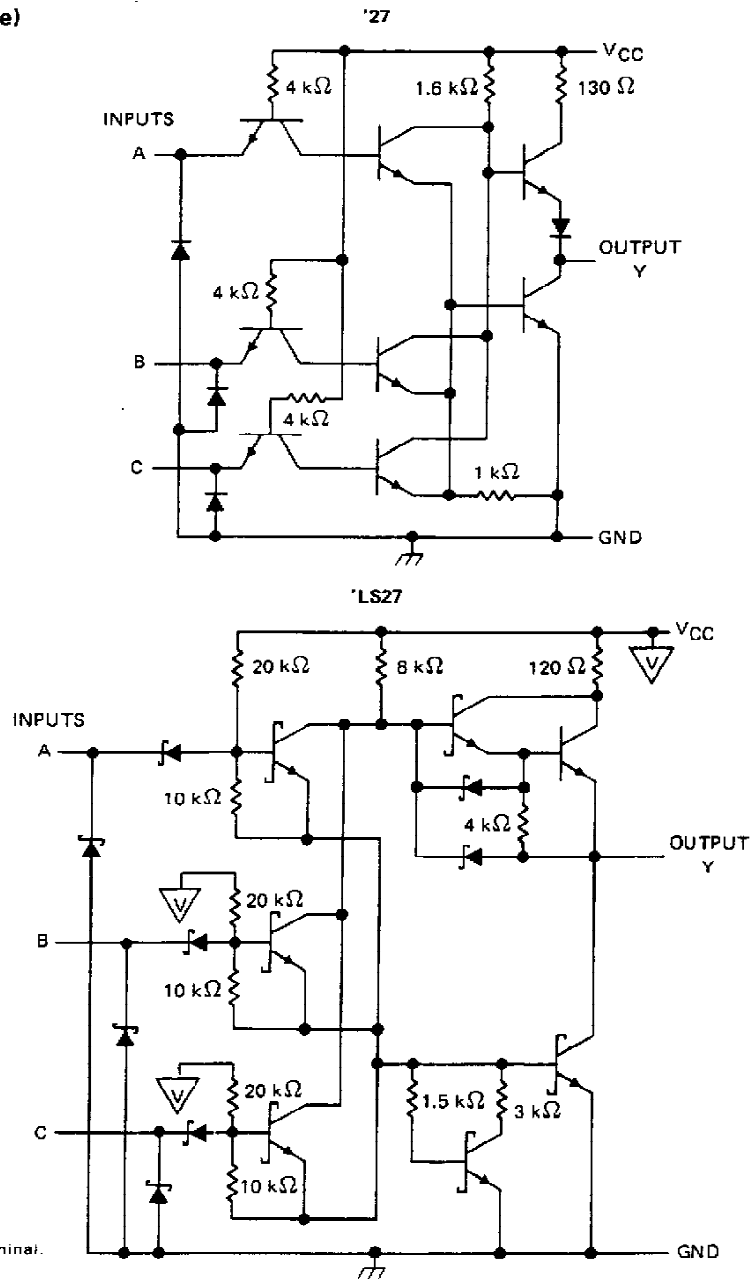
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TEXAS
INSTRUMENTS

POST OFFICE BOX 225012 • DALLAS, TEXAS 75266

SN5427, SN54LS27, SN7427, SN74LS27 TRIPLE 3-INPUT POSITIVE-NOR GATES

schematics (each gate)



Resistor values shown are nominal.

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

| | |
|---------------------------------------|----------------|
| Supply voltage, V_{CC} (see Note 1) | 7 V |
| Input voltage: '27 | 5.5 V |
| 'LS27 | 7 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.



POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

SN5427, SN7427 TRIPLE 3-INPUT POSITIVE-NOR GATES

recommended operating conditions

| | SN5427 | | | SN7427 | | | 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 | | | -0.8 | | | -0.8 | mA |
| 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 † | SN5427 | | | SN7427 | | | UNIT |
|------------|---|--------|-------|------|--------|-------|------|------|
| | | MIN | TYP ‡ | MAX | MIN | TYP ‡ | MAX | |
| V_{IK} | $V_{CC} = \text{MIN}$, $I_I = -12 \text{ mA}$ | | | -1.5 | | | -1.5 | V |
| V_{OH} | $V_{CC} = \text{MIN}$, $V_{IL} = 0.8 \text{ V}$, $I_{OH} = -0.8 \text{ mA}$ | 2.4 | 3.4 | | 2.4 | 3.4 | | V |
| V_{OL} | $V_{CC} = \text{MIN}$, $V_{IH} = 2 \text{ V}$, $I_{OL} = 16 \text{ mA}$ | | 0.2 | 0.4 | | 0.2 | 0.4 | V |
| I_I | $V_{CC} = \text{MAX}$, $V_I = 5.5 \text{ V}$ | | | 1 | | | 1 | mA |
| I_{IH} | $V_{CC} = \text{MAX}$, $V_I = 2.4 \text{ V}$ | | | 40 | | | 40 | μA |
| I_{IL} | $V_{CC} = \text{MAX}$, $V_I = 0.4 \text{ V}$ | | | -1.6 | | | -1.6 | mA |
| $I_{OS} §$ | $V_{CC} = \text{MAX}$ | -20 | | -55 | -18 | | -55 | mA |
| I_{CCH} | $V_{CC} = \text{MAX}$, $V_I = 0 \text{ V}$ | | 10 | 16 | | 10 | 16 | mA |
| I_{CCL} | $V_{CC} = \text{MAX}$, See Note 2 | | 16 | 26 | | 16 | 26 | mA |

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

‡ All typical values are at $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$.

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

NOTE 2: One input at 4.5 V, all others at GND.

switching characteristics, $V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$ (see note 3)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | MIN | TYP | MAX | UNIT |
|-----------|--------------|-------------|--|-----|-----|-----|------|
| t_{PLH} | A, B or C | Y | $R_L = 400 \Omega$, $C_L = 15 \text{ pF}$ | | 10 | 15 | ns |
| t_{PHL} | | | | | 7 | 11 | ns |

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



SN54LS27, SN74LS27

TRIPLE 3-INPUT POSITIVE-NOR GATES

recommended operating conditions

| | SN54LS27 | | | SN74LS27 | | | 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 | | | -0.4 | | | -0.4 | 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 † | SN54LS27 | | | SN74LS27 | | | 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 _{IL} = MAX, I _{OH} = -0.4 mA | 2.5 | 3.4 | | 2.7 | 3.4 | | V |
| V _{OL} | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 4 mA | | 0.25 | 0.4 | | 0.25 | 0.4 | V |
| | V _{CC} = MIN, V _{IH} = 2 V, I _{OL} = 8 mA | | | | | 0.35 | 0.5 | |
| 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 | | | -0.4 | | | -0.4 | mA |
| I _{OS} § | V _{CC} = MAX | -20 | | -100 | -20 | | -100 | mA |
| I _{CCH} | V _{CC} = MAX, V _I = 0 V | | 2 | 4 | | 2 | 4 | mA |
| I _{CCL} | V _{CC} = MAX, See Note 2 | | 3.4 | 6.8 | | 3.4 | 6.8 | 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.

NOTE 2: One input at 4.5 V, all others at GND.

switching characteristics, V_{CC} = 5 V, T_A = 25°C (see note 3)

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | TEST CONDITIONS | | MIN | TYP | MAX | UNIT |
|------------------|--------------|-------------|------------------------|------------------------|-----|-----|-----|------|
| t _{PLH} | A, B or C | Y | R _L = 2 kΩ, | C _L = 15 pF | | 10 | 15 | ns |
| t _{PHL} | | | | | 10 | 15 | | |

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

TEXAS
INSTRUMENTS

POST OFFICE BOX 655012 • DALLAS, TEXAS 75265

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Top-Side Markings (4) | Samples |
|------------------|---------------|--------------|--------------------|------|----------------|-----------------|------------------|----------------------|--------------|--------------------------|-------------------------|
| JM38510/00404BCA | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI | -55 to 125 | | |
| JM38510/30302B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30302B2A | Samples |
| JM38510/30302B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30302B2A | Samples |
| JM38510/30302BCA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BCA | Samples |
| JM38510/30302BCA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BCA | Samples |
| JM38510/30302BDA | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BDA | Samples |
| JM38510/30302BDA | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BDA | Samples |
| M38510/30302B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30302B2A | Samples |
| M38510/30302B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 30302B2A | Samples |
| M38510/30302BCA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BCA | Samples |
| M38510/30302BCA | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BCA | Samples |
| M38510/30302BDA | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BDA | Samples |
| M38510/30302BDA | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | JM38510/ 30302BDA | Samples |
| SN5427J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SN5427J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SN54LS27J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS27J | Samples |
| SN54LS27J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SN54LS27J | Samples |
| SN7427N | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN7427N | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI | 0 to 70 | | |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Top-Side Markings (4) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-------------------------|------------------|----------------------|--------------|--------------------------|-------------------------|
| SN74LS27D | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27D | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DE4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DE4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DG4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DG4 | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DRE4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DRE4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DRG4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27DRG4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | LS27 | Samples |
| SN74LS27N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS27N | Samples |
| SN74LS27N | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS27N | Samples |
| SN74LS27N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74LS27N3 | OBSOLETE | PDIP | N | 14 | | TBD | Call TI | Call TI | 0 to 70 | | |
| SN74LS27NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS27N | Samples |
| SN74LS27NE4 | ACTIVE | PDIP | N | 14 | 25 | Pb-Free (RoHS) | CU NIPDAU | N / A for Pkg Type | 0 to 70 | SN74LS27N | Samples |
| SN74LS27NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS27 | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead/Ball Finish | MSL Peak Temp (3) | Op Temp (°C) | Top-Side Markings (4) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-------------------------|------------------|----------------------|--------------|--------------------------|-------------------------|
| SN74LS27NSR | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS27 | Samples |
| SN74LS27NSRE4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS27 | Samples |
| SN74LS27NSRE4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS27 | Samples |
| SN74LS27NSRG4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS27 | Samples |
| SN74LS27NSRG4 | ACTIVE | SO | NS | 14 | 2000 | Green (RoHS & no Sb/Br) | CU NIPDAU | Level-1-260C-UNLIM | 0 to 70 | 74LS27 | Samples |
| SNJ5427J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ5427J | OBSOLETE | CDIP | J | 14 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ5427W | OBSOLETE | CFP | W | 14 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ5427W | OBSOLETE | CFP | W | 14 | | TBD | Call TI | Call TI | -55 to 125 | | |
| SNJ54LS27FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS 27FK | Samples |
| SNJ54LS27FK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | SNJ54LS 27FK | Samples |
| SNJ54LS27J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS27J | Samples |
| SNJ54LS27J | ACTIVE | CDIP | J | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS27J | Samples |
| SNJ54LS27W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS27W | Samples |
| SNJ54LS27W | ACTIVE | CFP | W | 14 | 1 | TBD | A42 | N / A for Pkg Type | -55 to 125 | SNJ54LS27W | 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) 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.

⁽⁴⁾ Multiple Top-Side Markings will be inside parentheses. Only one Top-Side 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 Top-Side Marking for that device.

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OTHER QUALIFIED VERSIONS OF SN5427, SN54LS27, SN7427, SN74LS27 :

● Catalog: [SN7427](#), [SN74LS27](#)

● Military: [SN5427](#), [SN54LS27](#)

NOTE: Qualified Version Definitions:

● Catalog - TI's standard catalog product

● Military - QML certified for Military and Defense Applications

TAPE AND REEL INFORMATION
REEL DIMENSIONS

TAPE DIMENSIONS


| | |
|----|---|
| A0 | Dimension designed to accommodate the component width |
| B0 | Dimension designed to accommodate the component length |
| K0 | Dimension designed to accommodate the component thickness |
| W | Overall width of the carrier tape |
| P1 | Pitch between successive cavity centers |

TAPE AND REEL INFORMATION

*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 |
|-------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74LS27DR | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74LS27NSR | 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) |
|-------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74LS27DR | SOIC | D | 14 | 2500 | 367.0 | 367.0 | 38.0 |
| SN74LS27NSR | SO | NS | 14 | 2000 | 367.0 | 367.0 | 38.0 |

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-F14)

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 GDFP1-F14

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



- 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-G14)

PLASTIC SMALL OUTLINE



- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 -  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.
 -  Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 - E. Reference JEDEC MS-012 variation AB.

D (R-PDSO-G14)

PLASTIC SMALL OUTLINE



4211283-3/E 08/12

- 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.

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