

8-INPUT POSITIVE-NAND GATES

 Check for Samples: [SN54ALS30A](#), [SN54AS30](#), [SN74ALS30A](#), [SN74AS30](#)

FEATURES

- 8-Input Positive-NAND Gates
- Available in J, DW, N, and FK Packages

DESCRIPTION

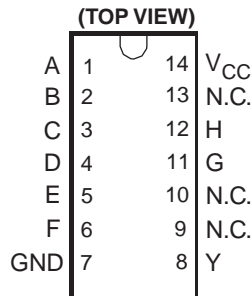
These devices contain an 8-input positive-NAND gate and perform the following Boolean functions in positive logic:

$$Y = \overline{A \cdot B \cdot C \cdot D \cdot E \cdot F \cdot G \cdot H}$$

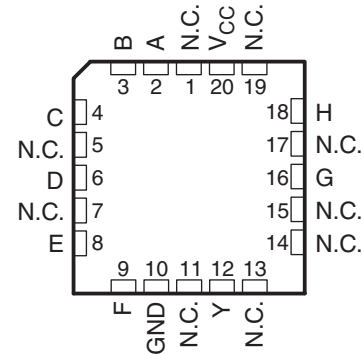
or

$$Y = \overline{A} + \overline{B} + \overline{C} + \overline{D} + \overline{E} + \overline{F} + \overline{G}$$

SN54ALS30A, SN54AS30 . . . J PACKAGE
SN74ALS30A, SN74AS30 . . . DW OR N PACKAGE
SN74AS30 . . . DB PACKAGE



SN54ALS30A, SN54AS30 . . . FK PACKAGE
(TOP VIEW)



N.C. – No internal connection

ORDERING INFORMATION

| T _A | PACKAGE ^{(1) (2)} | | ORDERABLE PART NUMBER | TOP-SIDE MARKING |
|----------------|----------------------------|---------------|-----------------------|------------------|
| 0°C to 70°C | PDIP – N | Tube | SN74ALS30AN | SN74ALS30AN |
| | | | SN74AS30N | SN74AS30N |
| | SOIC – D | Tube | SN74AS30AD | ALS30A |
| | | Tape and reel | SN74ALS30ADR | |
| | | Tube | SN74AS30D | AS30 |
| | | Tape and reel | SN74AS30DR | |
| SSOP – DB | Tape and reel | SN74AS30DBR | AS30 | |
| –55°C to 125°C | CDIP – J | Tube | SNJ54ALS30AJ | SNJ54ALS30AJ |
| | | | SNJ54AS30J | SNJ54AS30J |
| | LCCC –FK | Tube | SNJ54ALS30AFK | SNJ54ALS30AFK |
| | | | SNJ54AS30FK | SNJ54AS30FK |

(1) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.

(2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.

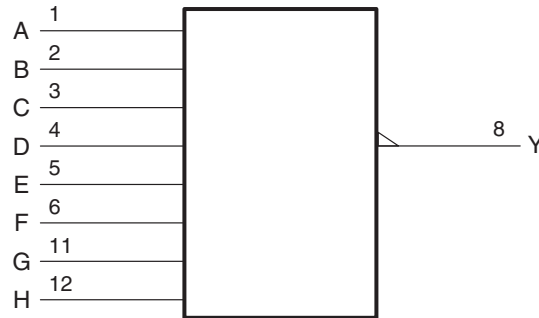


Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

Table 1. FUNCTION TABLE

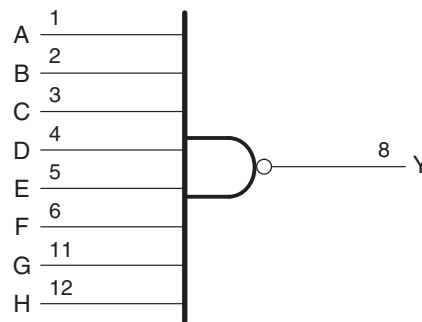
| INPUTS A–H | OUTPUT Y |
|----------------------|-------------|
| All inputs H | L |
| One or more inputs L | H |

LOGIC SYMBOL



A. This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12. Pin number shown are for the D, DB, J, and N packages.

LOGIC DIAGRAM (POSITIVE LOGIC)



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

ABSOLUTE MAXIMUM RATINGS⁽¹⁾

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

| | | MIN | MAX | UNIT |
|---------------|--|------------|-----|------|
| V_{CC} | Supply voltage range | -0.5 | 7 | V |
| V_I | Input voltage range | -0.5 | 7 | V |
| θ_{JA} | Package thermal impedance ⁽²⁾ | D package | 86 | °C/W |
| | | DB package | 96 | |
| | | N package | 80 | |
| T_{stg} | Storage temperature range | -65 | 150 | °C |

- (1) Stresses beyond those listed under “absolute maximum ratings” may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under “recommended operating conditions” is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
- (2) The package thermal impedance is calculated in accordance with JESD 51-7.

RECOMMENDED OPERATING CONDITIONS

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

| | | MIN | NOM | MAX | UNIT |
|----------|--------------------------------|----------------------|-----|--------------------|------|
| V_{CC} | Supply voltage | 4.5 | 5 | 5.5 | V |
| V_{IH} | High-level input voltage | 2 | | | V |
| V_{IL} | Low-level input voltage | | | 0.8 ⁽¹⁾ | V |
| | | | | 0.7 ⁽²⁾ | |
| I_{OH} | High-level output current | 'ALS30A | | -0.4 | mA |
| | | 'AS30 | | -2 | |
| I_{OL} | Low-level output current | SN54ALS30A | | 4 | mA |
| | | SN74ALS30A | | 8 | |
| | | 'AS30 | | 20 | |
| T_A | Operating free-air temperature | SN54ALS30A, SN54AS30 | -55 | 125 | °C |
| | | SN74ALS30A, SN74AS30 | 0 | 70 | |

- (1) Applies to the 'AS30 and SN74ALS30A across the full operating temperature range, and SN54ALS30A over the temperature range of -55°C to 7°C.
 (2) Applies to the SN54ALS30A over the temperature range of 70°C to 125°C.

ELECTRICAL CHARACTERISTICS

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

| PARAMETER | TEST CONDITIONS | | MIN | TYP ⁽¹⁾ | MAX | UNIT |
|-------------|--|---------------------------|------------------|--------------------|--------------|------|
| V_{IK} | $V_{CC} = 4.5\text{ V}$, | $I_I = -18\text{ mA}$ | 'ALS30A 'AS30 | | -1.5 | V |
| V_{OH} | $V_{CC} = 4.5\text{ V to } 5.5\text{ V}$, | $I_{OH} = -0.4\text{ mA}$ | 'ALS30A | | $V_{CC} - 2$ | V |
| | | $I_{OH} = -2\text{ mA}$ | 'AS30 | | $V_{CC} - 2$ | |
| V_{OL} | $V_{CC} = 4.5\text{ V}$ | $I_{OL} = 4\text{ mA}$ | 'ALS30A | 0.25 | 0.4 | V |
| | | $I_{OL} = 8\text{ mA}$ | SN74ALS30A | 0.35 | 0.5 | |
| | | $I_{OL} = 20\text{ mA}$ | 'AS30 | 0.35 | 0.5 | |
| I_I | $V_{CC} = 5.5\text{ V}$, | $V_I = 7\text{ V}$ | | | 0.1 | mA |
| I_{IH} | $V_{CC} = 5.5\text{ V}$, | $V_I = 2.7\text{ V}$ | | | 20 | µA |
| I_{IL} | $V_{CC} = 5.5\text{ V}$, | $V_I = 0.4\text{ V}$ | 'ALS30A | | -0.1 | mA |
| | | | 'AS30 | | -0.5 | |
| $I_O^{(2)}$ | $V_{CC} = 5.5\text{ V}$, | $V_O = 2.25\text{ V}$ | SN54ALS30A | -20 | -112 | mA |
| | | | SN74ALS30A | -30 | -112 | |
| | | | 'AS30 | -30 | -112 | |
| I_{CCH} | $V_{CC} = 5.5\text{ V}$, | $V_I = 0\text{ V}$ | 'ALS30A | 0.22 | 0.36 | mA |
| | | | 'AS30 | 0.9 | 1.5 | |
| I_{CCL} | $V_{CC} = 5.5\text{ V}$, | $V_I = 4.5\text{ V}$ | 'ALS30A | 0.54 | 0.9 | mA |
| | | | 'AS30 | 3 | 4.9 | |

- (1) All typical values are at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$.
 (2) The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS} .

SWITCHING CHARACTERISTICS

 over recommended operating conditions (unless otherwise noted (see [Figure 1](#)))

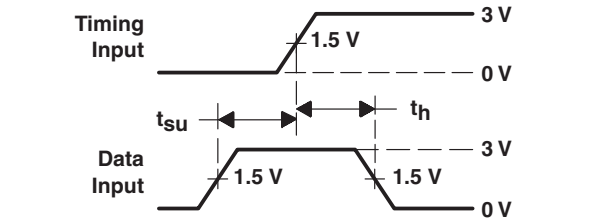
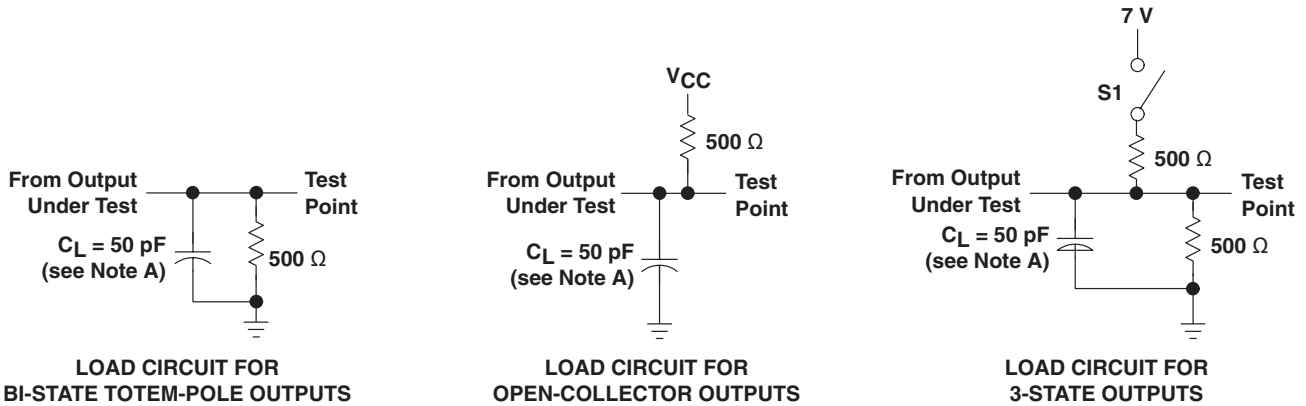
| PARAMETER | FROM (INPUT) | TO (OUTPUT) | | MIN | MAX | UNIT |
|-----------|---------------------------|-------------|------------|-----|-----|------|
| t_{PLH} | A, B, C, D, E, F, G, or H | Y | SN54ALS30A | 3 | 15 | ns |
| | | | SN74ALS30A | 3 | 10 | |
| | | | SN54AS30 | 1 | 5.5 | |
| | | | SN74AS30 | 1 | 5 | |

SWITCHING CHARACTERISTICS (continued)

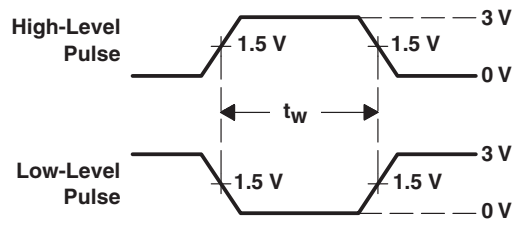
over recommended operating conditions (unless otherwise noted (see [Figure 1](#)))

| PARAMETER | FROM (INPUT) | TO (OUTPUT) | | MIN | MAX | UNIT |
|------------------|---------------------------|-------------|------------|-----|-----|------|
| t _{PHL} | A, B, C, D, E, F, G, or H | Y | SN54ALS30A | 3 | 15 | ns |
| | | | SN74ALS30A | 3 | 12 | |
| | | | SN54AS30 | 1 | 5 | |
| | | | SN74AS30 | 1 | 4.5 | |

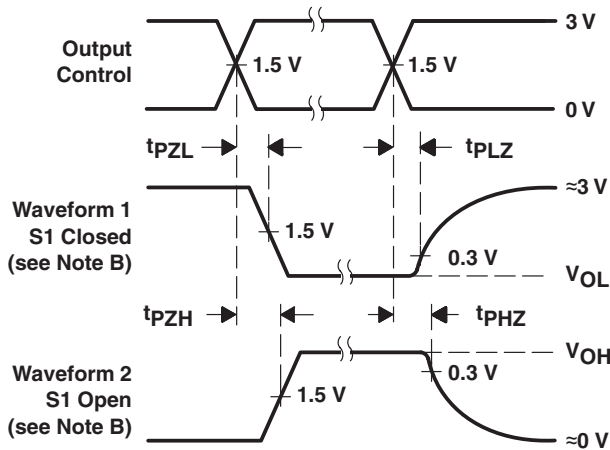
PARAMETER MEASUREMENT INFORMATION



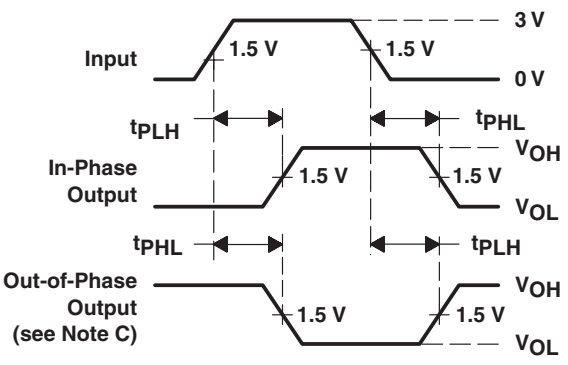
VOLTAGE WAVEFORMS SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS PULSE DURATIONS



VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES, 3-STATE OUTPUTS



VOLTAGE WAVEFORMS PROPAGATION DELAY TIMES

- A. C_L includes probe and jig capacitance.
- B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
- C. When measuring propagation delay items of 3-state outputs, switch S1 is open.
- D. All input pulses have the following characteristics: $PRR \leq 1$ MHz, $t_r = t_f = 2$ ns, duty cycle = 50%.
- E. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuits and Voltage Waveforms

REVISION HISTORY

| Changes from Original (April 2009) to Revision E | Page |
|--|------|
| • Updated ORDERING INFORMATION table. | 1 |

PACKAGING INFORMATION

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead finish/ Ball material (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|----------------------------|--------------------------------------|----------------------|--------------|-------------------------------------|-------------------------|
| 5962-86837012A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | 5962-86837012A SNJ54ALS 30AFK | Samples |
| 5962-8683701DA | ACTIVE | CFP | W | 14 | 1 | TBD | Call TI | N / A for Pkg Type | -55 to 125 | 5962-8683701DA SNJ54ALS30AW | Samples |
| 5962-9755801QCA | ACTIVE | CDIP | J | 14 | 1 | TBD | SNPB | N / A for Pkg Type | -55 to 125 | 5962-9755801QC A SNJ54AS30J | Samples |
| JM38510/37004B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 37004B2A | Samples |
| JM38510/37004BCA | ACTIVE | CDIP | J | 14 | 1 | TBD | SNPB | N / A for Pkg Type | -55 to 125 | JM38510/ 37004BCA | Samples |
| M38510/37004B2A | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | JM38510/ 37004B2A | Samples |
| M38510/37004BCA | ACTIVE | CDIP | J | 14 | 1 | TBD | SNPB | N / A for Pkg Type | -55 to 125 | JM38510/ 37004BCA | Samples |
| SN54ALS30AJ | ACTIVE | CDIP | J | 14 | 1 | TBD | SNPB | N / A for Pkg Type | -55 to 125 | SN54ALS30AJ | Samples |
| SN74ALS30AD | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | ALS30A | Samples |
| SN74ALS30ADB | ACTIVE | SSOP | DB | 14 | 80 | Green (RoHS & no Sb/Br) | NIPDAU | Level-1-260C-UNLIM | | G30A | Samples |
| SN74ALS30ADBE4 | ACTIVE | SSOP | DB | 14 | 80 | Green (RoHS & no Sb/Br) | NIPDAU | Level-1-260C-UNLIM | | G30A | Samples |
| SN74ALS30ADR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | ALS30A | Samples |
| SN74ALS30ADRE4 | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | ALS30A | Samples |
| SN74ALS30AN | ACTIVE | PDIP | N | 14 | 25 | Green (RoHS & no Sb/Br) | NIPDAU | N / A for Pkg Type | 0 to 70 | SN74ALS30AN | Samples |
| SN74AS30D | ACTIVE | SOIC | D | 14 | 50 | Green (RoHS & no Sb/Br) | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | AS30 | Samples |

| Orderable Device | Status (1) | Package Type | Package Drawing | Pins | Package Qty | Eco Plan (2) | Lead finish/ Ball material (6) | MSL Peak Temp (3) | Op Temp (°C) | Device Marking (4/5) | Samples |
|------------------|---------------|--------------|-----------------|------|-------------|-------------------------|--------------------------------------|----------------------|--------------|-----------------------------------|-------------------------|
| SN74AS30DR | ACTIVE | SOIC | D | 14 | 2500 | Green (RoHS & no Sb/Br) | NIPDAU | Level-1-260C-UNLIM | 0 to 70 | AS30 | Samples |
| SN74AS30N | ACTIVE | PDIP | N | 14 | 25 | Green (RoHS & no Sb/Br) | NIPDAU | N / A for Pkg Type | 0 to 70 | SN74AS30N | Samples |
| SNJ54ALS30AFK | ACTIVE | LCCC | FK | 20 | 1 | TBD | POST-PLATE | N / A for Pkg Type | -55 to 125 | 5962-86837012A SNJ54ALS30AFK | Samples |
| SNJ54ALS30AJ | ACTIVE | CDIP | J | 14 | 1 | TBD | SNPB | N / A for Pkg Type | -55 to 125 | SNJ54ALS30AJ | Samples |
| SNJ54ALS30AW | ACTIVE | CFP | W | 14 | 1 | TBD | Call TI | N / A for Pkg Type | -55 to 125 | 5962-8683701DA SNJ54ALS30AW | Samples |
| SNJ54AS30J | ACTIVE | CDIP | J | 14 | 1 | TBD | SNPB | N / A for Pkg Type | -55 to 125 | 5962-9755801QC A SNJ54AS30J | 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 finish/Ball material - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

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OTHER QUALIFIED VERSIONS OF SN54ALS30A, SN54AS30, SN74ALS30A, SN74AS30 :

- Catalog: [SN74ALS30A](#), [SN74AS30](#)
- Military: [SN54ALS30A](#), [SN54AS30](#)

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 |
|--------------|--------------|-----------------|------|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| SN74ALS30ADR | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 16.0 | Q1 |
| SN74AS30DR | SOIC | D | 14 | 2500 | 330.0 | 16.4 | 6.5 | 9.0 | 2.1 | 8.0 | 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) |
|--------------|--------------|-----------------|------|------|-------------|------------|-------------|
| SN74ALS30ADR | SOIC | D | 14 | 2500 | 367.0 | 367.0 | 38.0 |
| SN74AS30DR | SOIC | D | 14 | 2500 | 367.0 | 367.0 | 38.0 |

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

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

J 14

GENERIC PACKAGE VIEW
CDIP - 5.08 mm max height
CERAMIC DUAL IN LINE PACKAGE



Images above are just a representation of the package family, actual package may vary.
Refer to the product data sheet for package details.

4040083-5/G

J0014A



PACKAGE OUTLINE

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



4214771/A 05/2017

NOTES:

- All controlling linear dimensions are in inches. Dimensions in brackets are in millimeters. Any dimension in brackets or parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
- 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 and on press ceramic glass frit seal only.
- Falls within MIL-STD-1835 and GDIP1-T14.

EXAMPLE BOARD LAYOUT

J0014A

CDIP - 5.08 mm max height

CERAMIC DUAL IN LINE PACKAGE



LAND PATTERN EXAMPLE
NON-SOLDER MASK DEFINED
SCALE: 5X



4214771/A 05/2017

D (R-PDSO-G14)

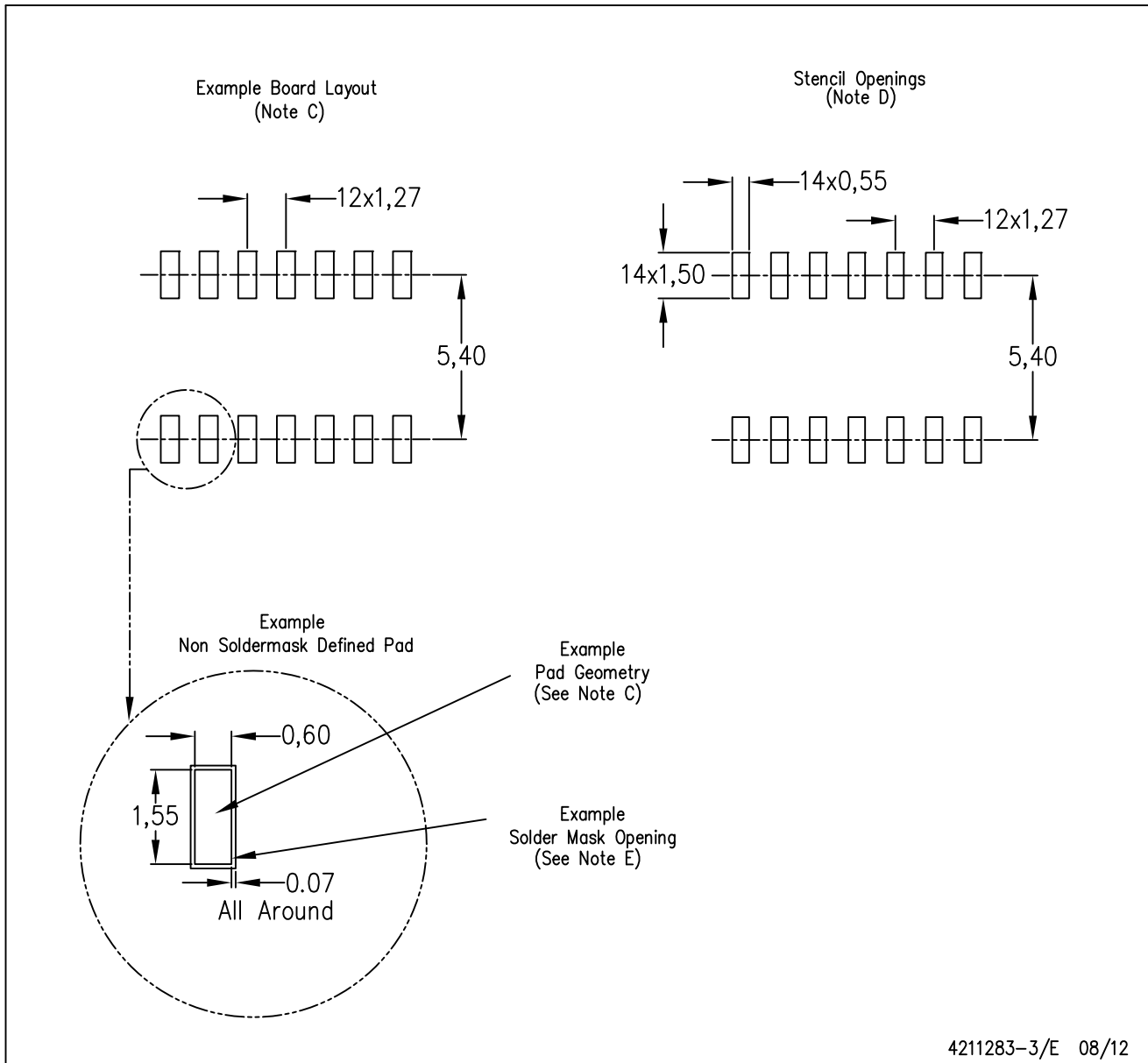
PLASTIC SMALL OUTLINE



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

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.

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

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