### SDLS089

- 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.

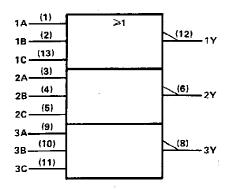
The SN5427 and SN54LS27 are characterized for operation over the full military temperature range of -55 °C to 125 °C. The SN7427 and SN74LS27 are characterized for operation from 0 °C to 70 °C.

#### FUNCTION TABLE (each gate)

11	NPUT	s	OUTPUT
А	B	С	Y
Н	х	x	Ļ
х	Н	x	L
х	х	н	L
L	L	L	н

logic symbol<sup>†</sup>

÷,

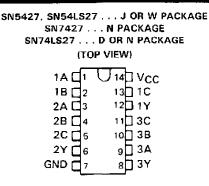


<sup>†</sup> This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

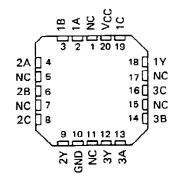
Pin numbers shown are for D, J, N, and W packages.

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

DECEMBER 1983-REVISED MARCH 1988

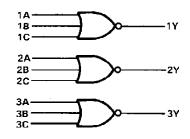


SN54LS27 .... FK PACKAGE (TOP VIEW)



NC - No internal connection

#### logic diagram



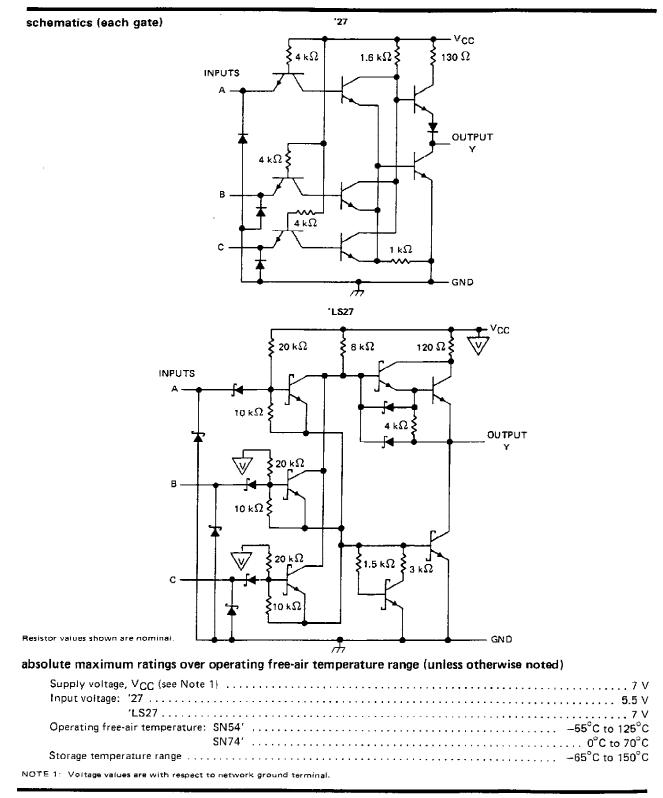
positive logic

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

PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Taxas Instruments standard warranty. Production pracessing does not necessarily include testing of all parameters.

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





### recommended operating conditions

			SN5427			SN7427			
		MIN	NOM	MAX	MIN	NOM	MAX	UNIT	
V <sub>CC</sub>	Supply voltage	4.5	5	5.5	4.75	5	5.25	v	
VIH	High-level input voltage	2			2			v	
V <sub>IL</sub>	Low-level input voltage			0,8			0.8	v	
I <sub>ОН</sub>	High-level output current			0.8			- 0.8	mA	
¦0∟	Low-level output current			16			16	mΑ	
Т <sub>А</sub>	Operating free-air temperature	- 55		125	0		70	°c	

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

PARAMETER		TEST CONDIT			SN5427	,				
TANAMETEN				MIN	TYP ‡	MAX	MIN	түр‡	MAX	UNIT
Vik	V <sub>CC</sub> = MIN,	l <sub>1</sub> = – 12 mA				- 1.5			- 1.5	v
⊻он	V <sub>CC</sub> = MIN,	V <sub>IL</sub> = 0.8 V,	I <sub>OH</sub> = - 0.8 mA	2.4	3.4		2,4	3.4		v
Vol	V <sub>CC</sub> = MIN,	V <sub>IH</sub> = 2 V,	I <sub>OL</sub> = 16 mA		0.2	0.4		0.2	0.4	v
ţ <sub>I</sub>	V <sub>CC</sub> = MAX,	V <sub>1</sub> = 5.5 V				1			1	mA
ін	V <sub>CC</sub> = MAX,	V <sub>1</sub> = 2.4 V			-	40			40	μA
կլ	V <sub>CC</sub> = MAX,	Vi = 0.4 V				- 1.6			- 1.6	mA
los §	V <sub>CC</sub> = MAX			- 20		- 55	- 18		- 55	ΜM
<sup>I</sup> ССН	VCC = MAX,	VI = 0 V			10	16		10	16	mA
ICCL	V <sub>CC</sub> = 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.

2

‡ All typical values are at  $V_{CC} = 5 V$ ,  $T_A = 25^{\circ}C$ . § 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, $V_{CC} = 5 V$ , $T_A = 25^{\circ}C$ (see note 3)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CON	DITIONS	MIN	түр	мах	UNIT
tPLH	A, B or C	v	R <sub>L</sub> = 400 Ω,	C1 = 15 pF		10	15	ns
tpHL	A, 5 0 C		···L - 400 32,	of - 19 th		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

		s	SN54LS27			SN74LS27			
	·····	MIN	NOM	MAX	MIN	NOM	MAX	UNIT	
V <sub>CC</sub> Si	upply voltage	4.5	5	5.5	4.75	5	5.25	v	
V <sub>IH</sub> H	igh-level input voltage	2			2			v	
VIL La	ow-level input voltage			0.7			0.8	V	
IOH H	igh-level output current			- 0.4			- 0.4	mΑ	
IOL LO	ow-level output current			4			В	mA	
	perating free-air temperature	- 55		125	0		70	°c	

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

			SN54LS	27	S	LINIT				
PARAMETER		TEST CONDI	TIONS T	MIN	TYP‡	MAX	MIN	TYP ‡	MAX	UNIT
Viк	V <sub>CC</sub> = MIN.	lı = 18 mA				- 1.5			- 1.5	v
Vон	V <sub>CC</sub> = MIN,	V <sub>IL</sub> = MAX,	l <sub>OH</sub> ≐ – 0.4 mA	2.5	3.4		2.7	3.4		v
	VCC = MIN,	V <sub>1H</sub> = 2 V,	loL = 4 mA		0.25	0.4		0.25	0.4	v
VOL	V <sub>CC</sub> = MIN,	V <sub>IH</sub> = 2 V,	lOL = 8 mA					0.35	0.5	Ŷ
lj lj	V <sub>CC</sub> = MAX,	V1 = 7 V	· · · · · · · · · · · · · · · · · · ·			0.1			0.1	mA
Чн	VCC = MAX,	VI ≈ 2.7 V				20			20	μA
lι.	V <sub>CC</sub> = MAX,	V <sub>I</sub> ≠ 0.4 V				- 0.4			- 0.4	mA
IOS §	V <sub>CC</sub> = MAX			- 20		- 100	20		- 100	mA
Іссн	V <sub>CC</sub> = MAX,	V  = 0 V			2	4		2	4	mА
<sup>I</sup> CCL	VCC = MAX,	See Note 2			3.4	6.8		3.4	6.8	mA

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	түр	МАХ	UNIT	
tplh	A, B or C	v	$R_L = 2 k \Omega, \qquad C_l = 15$	- <b>F</b>		10	15	пs
<sup>t</sup> ₽HL	A, B OF C	· · ·		С <sub>L</sub> = 15 рF		10	15	ns

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





11-Apr-2013

### **PACKAGING INFORMATION**

Orderable Device	Status	Package Type		Pins		Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Top-Side Markings	Samples
	(1)		Drawing		Qty	(2)		(3)		(4)	
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	Ν	14		TBD	Call TI	Call TI	0 to 70		
SN7427N	OBSOLETE	PDIP	Ν	14		TBD	Call TI	Call TI	0 to 70		



# PACKAGE OPTION ADDENDUM

11-Apr-2013

Orderable Device	Status	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Top-Side Markings	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	Ν	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS27N	Samples
SN74LS27N	ACTIVE	PDIP	Ν	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS27N	Samples
SN74LS27N3	OBSOLETE	PDIP	Ν	14		TBD	Call TI	Call TI	0 to 70		
SN74LS27N3	OBSOLETE	PDIP	Ν	14		TBD	Call TI	Call TI	0 to 70		
SN74LS27NE4	ACTIVE	PDIP	Ν	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	0 to 70	SN74LS27N	Samples
SN74LS27NE4	ACTIVE	PDIP	Ν	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



# PACKAGE OPTION ADDENDUM

11-Apr-2013

Orderable Device	Status	Package Type	Package	Pins	Package	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Top-Side Markings	Samples
	(1)		Drawing		Qty	(2)		(3)		(4)	
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	E CFP	W	14		TBD	Call TI	Call TI	-55 to 125		
SNJ5427W	OBSOLETE	E 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

<sup>(1)</sup> 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.



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## PACKAGE OPTION ADDENDUM

11-Apr-2013

**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)

<sup>(3)</sup> 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

# PACKAGE MATERIALS INFORMATION

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### TAPE AND REEL INFORMATION

### REEL DIMENSIONS

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TAPE AND REEL INFORMATION

#### 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

*A	Il dimensions are nominal												
	Device	Package Type	Package Drawing		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

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# PACKAGE MATERIALS INFORMATION

14-Jul-2012



\*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

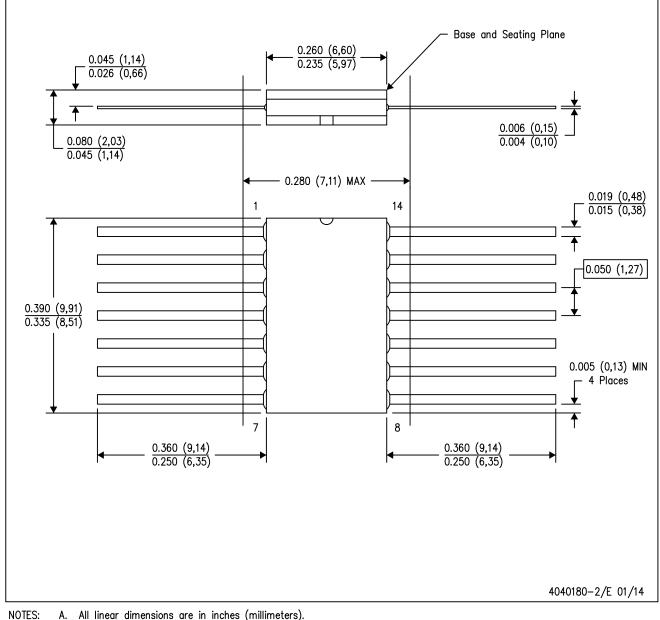


NOTES: A. All linear dimensions are in inches (millimeters).

- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



- A. All linear dimensions are in inches (millimeters).
  - B. This drawing is subject to change without notice.
  - C. This package can be hermetically sealed with a ceramic lid using glass frit.
  - D. Index point is provided on cap for terminal identification only.
  - E. Falls within MIL STD 1835 GDFP1-F14 and JEDEC MO-092AB



LEADLESS CERAMIC CHIP CARRIER

FK (S-CQCC-N\*\*) 28 TERMINAL SHOWN



NOTES: A. All linear dimensions are in inches (millimeters).

B. This drawing is subject to change without notice.

C. This package can be hermetically sealed with a metal lid.

D. 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).
- $\triangle$  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.





NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. 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.
  E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



### MECHANICAL DATA

### PLASTIC SMALL-OUTLINE PACKAGE

### 0,51 0,35 ⊕0,25⊛ 1,27 8 14 0,15 NOM 5,60 8,20 5,00 7,40 $\bigcirc$ Gage Plane ₽ 0,25 7 1 1,05 0,55 0-10 Δ 0,15 0,05 Seating Plane — 2,00 MAX 0,10PINS \*\* 14 16 20 24 DIM 10,50 10,50 12,90 15,30 A MAX A MIN 9,90 9,90 12,30 14,70 4040062/C 03/03

NOTES: A. All linear dimensions are in millimeters.

NS (R-PDSO-G\*\*)

**14-PINS SHOWN** 

- 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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