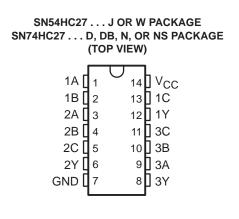
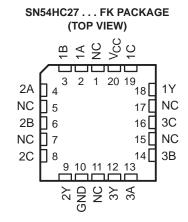
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- Wide Operating Voltage Range of 2 V to 6 V
- Outputs Can Drive Up To 10 LSTTL Loads
- Low Power Consumption, 20-μA Max I_{CC}



- Typical t_{pd} = 9 ns
- ±4-mA Output Drive at 5 V
- Low Input Current of 1 μA Max



NC - No internal connection

description/ordering information

The 'HC27 devices contain three independent 3-input NOR gates. They perform the Boolean function $Y = \overline{A} + \overline{B} + \overline{C}$ or $Y = \overline{A} \bullet \overline{B} \bullet \overline{C}$ in positive logic.

Τ _Α	PACKAGE		ORDERABLE PART NUMBER	TOP-SIDE MARKING						
	PDIP – N	Tube of 25	SN74HC27N	SN74HC27N						
–40°C to 85°C		Tube of 50	SN74HC27D							
	SOIC – D	Reel of 2500	SN74HC27DR	HC27						
		Reel of 250	SN74HC27DT							
	SOP – NS	Reel of 2000	SN74HC27NSR	HC27						
	SSOP – DB	Reel of 2000	SN74HC27DBR	HC27						
	CDIP – J	Tube of 25	SNJ54HC27J	SNJ54HC27J						
–55°C to 125°C	CFP – W	Tube of 150	SNJ54HC27W	SNJ54HC27W						
	LCCC – FK	Tube of 55	SNJ54HC27FK	SNJ54HC27FK						

ORDERING INFORMATION

[†] Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

FUNCTION TABLE	
(each gate)	

	INPUTS		OUTPUT
Α	В	С	Y
Н	Х	Х	L
Х	Н	Х	L
Х	Х	Н	L
L	L	L	Н



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logic diagram (positive logic)



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

Supply voltage range, V _{CC}		0.5 V to 7 V
Input clamp current, I_{IK} (V _I < 0 or V _I > V _{CC}) (see	e Note 1)	±20 mA
Output clamp current, I_{OK} (V _O < 0 or V _O > V _{CC})) (see Note 1)	±20 mA
Continuous output current, $I_O (V_O = 0 \text{ to } V_{CC})$.		±25 mA
Continuous current through V _{CC} or GND		±50 mA
Package thermal impedance, θ_{JA} (see Note 2):	D package	86°C/W
	DB package	96°C/W
	N package	80°C/W
	NS package	76°C/W
Storage temperature range, T _{stg}	•••••••••••••••••••••••••••••••••••••••	–65°C to 150°C

[†] 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.

NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

2. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions (see Note 3)

			S	N54HC2	7	S	N74HC2	7	UNIT	
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT	
VCC	Supply voltage		2	5	6	2	5	6	V	
		$V_{CC} = 2 V$	1.5			1.5				
VIH	VIH High-level input voltage	V _{CC} = 4.5 V	3.15			3.15			V	
		V _{CC} = 6 V	4.2			4.2				
		V _{CC} = 2 V			0.5			0.5		
VIL	Low-level input voltage	$V_{CC} = 4.5 V$			1.35			1.35	V	
		V _{CC} = 6 V			1.8			1.8		
VI	Input voltage		0		VCC	0		VCC	V	
VO	Output voltage		0		VCC	0		VCC	V	
		V _{CC} = 2 V			1000			1000		
$\Delta t/\Delta v$	Input transition rise/fall time	V _{CC} = 4.5 V			500			500	ns	
		V _{CC} = 6 V			400			400		
ТА	Operating free-air temperature		-55		125	-40		85	°C	

NOTE 3: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, Implications of Slow or Floating CMOS Inputs, literature number SCBA004.



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	TEST OF	NDITIONS	Mara	Т	A = 25°C	;	SN54HC27		SN74HC27		
PARAMETER	TEST CC	ONDITIONS	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
			2 V	1.9	1.998		1.9		1.9		
		I _{OH} = -20 μA	4.5 V	4.4	4.499		4.4		4.4		
Vон	$V_I = V_{IH} \text{ or } V_{IL}$		6 V	5.9	5.999		5.9		5.9		V
		$I_{OH} = -4 \text{ mA}$	4.5 V	3.98	4.3		3.7		3.84		
		I _{OH} = -5.2 mA	6 V	5.48	5.8		5.2		5.34		
		I _{OL} = 20 μA	2 V		0.002	0.1		0.1		0.1	
			4.5 V		0.001	0.1		0.1		0.1	
VOL	$V_I = V_{IH} \text{ or } V_{IL}$		6 V		0.001	0.1		0.1		0.1	V
		$I_{OL} = 4 \text{ mA}$	4.5 V		0.17	0.26		0.4		0.33	
		I _{OL} = 5.2 mA	6 V		0.15	0.26		0.4		0.33	
l	$V_{I} = V_{CC} \text{ or } 0$		6 V		±0.1	±100		±1000		±1000	nA
ICC	$V_{I} = V_{CC} \text{ or } 0,$	I ^O = 0	6 V			2		40		20	μA
Ci			2 V to 6 V		3	10		10		10	pF

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

switching characteristics over recommended operating free-air temperature range, $C_L = 50 \text{ pF}$ (unless otherwise noted) (see Figure 1)

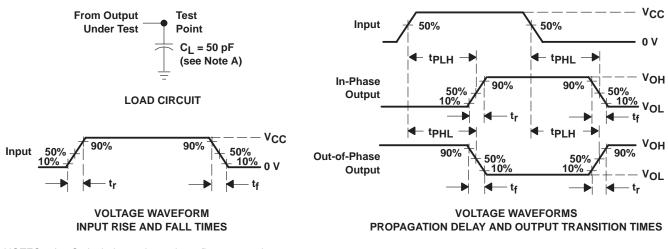
PARAMETER	FROM	то	Vee	Τį	λ = 25°C	;	SN54	HC27	SN74	IC27	UNIT		
FARAWIETER	(INPUT)	(OUTPUT)	Vcc	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT		
			2 V		35	90		135		115			
^t pd	A, B, or C	Y	4.5 V		10	18		27		23	ns		
					6 V		9	15		23		20	
			2 V		27	75		110		95			
tt		Y	4.5 V		7	15		22		19	ns		
			6 V		6	13		19		16			

operating characteristics, $T_A = 25^{\circ}C$

	PARAMETER	TEST CONDITIONS	TYP	UNIT
Cpd	Power dissipation capacitance per gate	No load	25	pF



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PARAMETER MEASUREMENT INFORMATION

NOTES: A. CL includes probe and test-fixture capacitance.

- B. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, Z_Q = 50 Ω , t_r = 6 ns, t_f = 6 ns.
- C. The outputs are measured one at a time with one input transition per measurement.
- D. t_{PLH} and t_{PHL} are the same as t_{pd} .

Figure 1. Load Circuit and Voltage Waveforms



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15-Oct-2009

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
5962-8404201VCA	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type
5962-8404201VDA	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type
84042012A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
8404201CA	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type
8404201DA	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type
JM38510/65102BCA	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type
SN54HC27J	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type
SN74HC27D	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DBR	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DBRE4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DBRG4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DT	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DTE4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27DTG4	ACTIVE	SOIC	D	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27N	ACTIVE	PDIP	Ν	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HC27NE4	ACTIVE	PDIP	Ν	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HC27NSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27NSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC27NSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SNJ54HC27FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
SNJ54HC27J	ACTIVE	CDIP	J	14	1	TBD	A42	N / A for Pkg Type
SNJ54HC27W	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type

(1) The marketing status values are defined as follows:
 ACTIVE: Product device recommended for new designs.
 LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.





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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.

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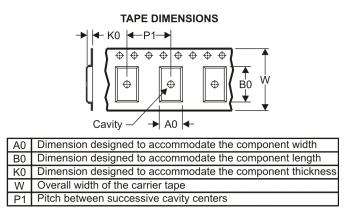
PACKAGE MATERIALS INFORMATION

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TAPE AND REEL INFORMATION





QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*All 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
SN74HC27DBR	SSOP	DB	14	2000	330.0	16.4	8.2	6.6	2.5	12.0	16.0	Q1
SN74HC27DR	SOIC	D	14	2500	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74HC27DT	SOIC	D	14	250	330.0	16.4	6.5	9.0	2.1	8.0	16.0	Q1
SN74HC27NSR	SO	NS	14	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1

TEXAS INSTRUMENTS

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PACKAGE MATERIALS INFORMATION

20-Aug-2010



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74HC27DBR	SSOP	DB	14	2000	346.0	346.0	33.0
SN74HC27DR	SOIC	D	14	2500	346.0	346.0	33.0
SN74HC27DT	SOIC	D	14	250	346.0	346.0	33.0
SN74HC27NSR	SO	NS	14	2000	346.0	346.0	33.0

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.



MECHANICAL DATA

MSSO002E - JANUARY 1995 - REVISED DECEMBER 2001

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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RFID	www.ti-rfid.com	Wireless	www.ti.com/wireless-apps
RF/IF and ZigBee® Solutions	www.ti.com/lprf		

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