- Generates Either Odd or Even Parity for Nine Data Lines
- Cascadable for n-Bits
- Can Be Used to Upgrade Existing Systems using MSI Parity Circuits
- Typical Data-to-Output Delay of Only 14 ns for 'S280 and 33 ns for 'LS280
- Typical Power Dissipation:

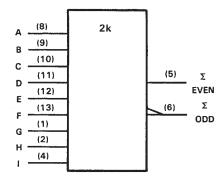
'LS280 . . . 80 mW 'S280 . . . 335 mW

FUNCTION TABLE

NUMBER OF INPUTS A	OUTPUTS				
THRU I THAT ARE HIGH	ΣΕVΕΝ	Σ ODD			
0, 2, 4, 6, 8	Н	L			
1, 3, 5, 7, 9	L	Н			

H = high level, L = low level

logic symbol†

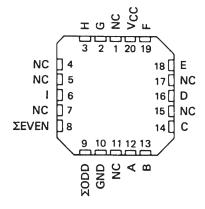


[†]This symbol is in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.

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

SN54LS280, SN54S280 . . . J OR W PACKAGE **SN74LS280, SN74S280...D OR N PACKAGE** (TOP VIEW) 14 VCC G □1 H \square_2 13 F 12 E NC □3 1 🛮 4 11D D ΣEVEN ☐5 10 C ΣODD ☐6 9 B GND 8

SN54LS280, SN54S280 . . . FK PACKAGE (TOP VIEW)



NC - No internal connection

description

These universal, monolithic, nine-bit parity generators/checkers utilize Schottky-clamped TTL high-performance circuitry and feature odd/even outputs to faciliate operation of either odd or even parity application. The word-length capability is easily expanded by cascading as shown under typical application data.

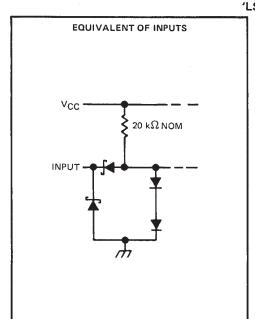
Series 54LS/74LS and Series 54S/74S parity generators/checkers offer the designer a trade-off between reduced power consumption and high performance. These devices can be used to upgrade the performance of most systems utilizing the '180 parity generator/checker. Although the 'LS280 and 'S280 are implemented without expander inputs, the corresponding function is provided by the availability of an input at pin 4 and the absence of any internal connection at pin 3. This permits the 'LS280 and 'S280 to be substituted for the '180 in existing designs to produce an identical function even if 'LS280's and 'S280's are mixed with existing '180's.

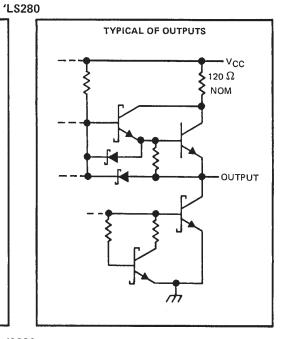
These devices are fully compatible with most other TTL circuits. All 'LS280 and 'S280 inputs are buffered to lower the drive requirements to one Series 54LS/74LS or Series 54S/74S standard load, respectively.

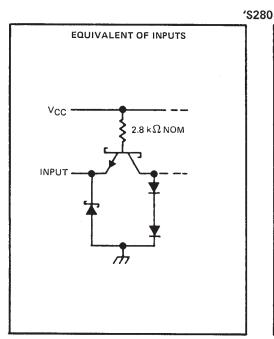
SN54LS280, SN54S280, SN74LS280, SN74S280 9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS

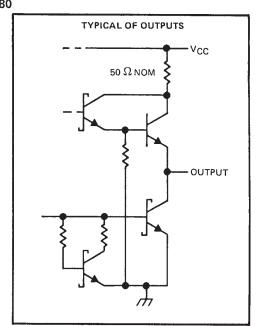
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schematics of inputs and outputs









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

Supply voltage (see Note 1)	7 V
Input voltage: 'LS280	
'S280	
Operating free-air temperature range: SN54'	– 55°C to 125°C
SN74'	0°C to 70°C
Storage temperature range	
NOTE 1: Voltage values are with respect to network ground terminal.	



SN54LS280, SN54S280, SN74LS280, SN74S280 9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS

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recommended operating conditions

		S	SN54LS280		SN74LS280			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	UNIT
Vcc	Supply voltage	4.5	5	5.5	4.75	5	5.25	V
VIH	High-level input voltage	2			2			V
٧ _L	Low-level input voltage			0.7			8.0	V
ЮН	High-level output current			- 0.4			- 0.4	mA
loL	Low-level output current			4			8	mA
TA	Operating free-air temperature	– 55		125	0		70	°C

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

PARAMETER	TEST CONDITIONS		SI	V54LS2	80	SN74LS280				
·Allancien		TEST CONDITIONS		MIN	TYP‡	MAX	MIN	TYP‡	MAX	UNIT
VIK	V _{CC} = MIN,	$I_1 = -18 \text{ mA}$				1.5			– 1.5	V
V _{OH}	V _{CC} = MIN, V _{IL} = MAX,	V _{IH} = 2 V, I _{OH} = - 0.4 m/	Α	2.5	3.4		2.7	3.4		٧
VOL	V _{CC} = MIN, V _{II} = MAX	V _{IH} = 2 V,	I _{OL} = 4 mA		0.25	0.4		0.25	0.4	V
l ₁	V _{CC} = MAX,	V ₁ = 7 V	1.05 0			0.1		0.00	0.1	mA
lін	V _{CC} = MAX,	V _I = 2.7 V				20		· · · · · · · · · · · · · · · · · · ·	20	μА
կլ	V _{CC} = MAX,	V _I = 0.4 V				- 0.4			- 0.4	mA
los§	V _{CC} = MAX			- 20		100	- 20		100	mA
Icc	V _{CC} = MAX,	See Note 2			16	27		16	27	mA

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

switching characteristics, $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$

PARAMETER¶	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
tPLH	Data	ΣEven	C15-5 B240		33	50	
^t PHL		2 Even	$C_L = 15 \text{ pF}, R_L = 2 \text{ k}\Omega,$ Inputs not under test at 0 V.		29	45	ns
^t PLH	Data	Σ Odd	See Note 3		23	35	
tPHL	5610	2 Odd See Note 3			31	50	ns

 $[\]P_{ ext{tp}_{LH}}$ \equiv propagation delay time, low-to-high-level output; $ext{tp}_{HL}$ \equiv propagation delay time, high-to-low-level output NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



[‡] 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 duration of the short circuit should not exceed one second.

NOTE 2: $I_{\mbox{\footnotesize{CC}}}$ is measured with all inputs grounded and all outputs open.

SN54LS280, SN54S280, SN74LS280, SN74S280 9-BIT ODD/EVEN PARITY GENERATORS/CHECKERS

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recommended operating conditions

	S	SN54S280			SN74S280		
	MIN	NOM	MAX	MIN	NOM	MAX	UNIT
Supply voltage, V _{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, IOH			-1			-1	mA
Low-level output current, IOL			20			20	mA
Operating free-air temperature, TA	-55		125	0		70	°C

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

	PARAMETER	TEST CONDITIONS†			TYP‡	MAX	UNIT
VIH	High-level input voltage			2			V
VIL	Low-level input voltage				***************************************	0.8	V
VIK	Input clamp voltage	V _{CC} = MIN, I _I = -18 mA				-1.2	V
Voн	High-level output voltage	VCC = MIN, VIH = 2 V,	SN54S'	2.5	3.4		.,
* OH	VOH Tright-level output voltage	$V_{1L} = 0.8 \text{ V}, I_{OH} = -1 \text{ mA}$	SN74S'	2.7	3.4		\ \
VOI	VOL Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V,	•			0.5	v
- 02		V _{IL} = 0.8 V, I _{OL} = 20 mA			0.5	"	
Ц	Input current at maximum input voltage	V _{CC} = MAX, V _I = 5.5 V				1	mA
[‡] IH	High-level input current	V _{CC} = MAX, V ₁ = 2.7 V				50	μА
IL	Low-level input current	V _{CC} = MAX, V _I = 0.5 V				-2	mA
los	Short-circuit output current§	V _{CC} = MAX		-40	*	-100	mA
		VMAY CNC	SN54S280		67	99	
Icc	Supply current		SN74S280		67	105	mA
.00	output current	V _{CC} = MAX, T _A = 125°C, See Note 2	SN54S280N			94	mA

 $^{^\}dagger_{\perp}$ For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

NOTE 2: I_{CC} is measured with all inputs grounded and all outputs open.

switching characteristics, $V_{CC} = 5 \text{ V}$, $T_A = 25^{\circ}\text{C}$

PARAMETER¶	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
tpLH	Data	Σ Even			14	21	
tPHL	Data	2 LVeII	$C_L = 15 \text{pF}, R_L = 280 \Omega,$ See Note 3		11.5	18	ns
tPLH	Data	Σ Odd			14	21	
t _{PHL}	Data	2 000			11.5	18	ns

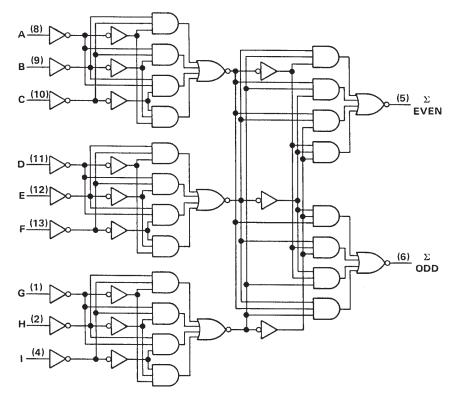
 $[\]P_{\text{tpLH}} = \text{propagation delay time, low-to-high-level output: } t_{\text{PHL}} = \text{propagation delay time, high-to-low-level output}$ NOTE 3: Load circuits and voltage waveforms are shown in Section 1.



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

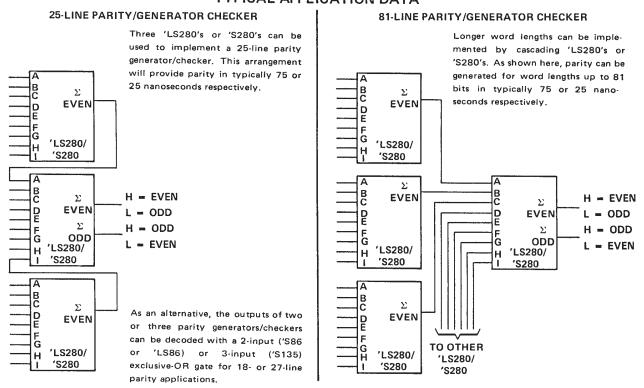
Not more than one output should be shorted at a time and duration of the short circuit should not exceed one second.

logic diagram (positive logic)



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

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Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
Low Power Wireless	www.ti.com/lpw	Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

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DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
Low Power Wireless	www.ti.com/lpw	Telephony	www.ti.com/telephony
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Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
Low Power Wireless	www.ti.com/lpw	Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless



PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³
JM38510/32901B2A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
JM38510/32901BCA	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
JM38510/32901BCA	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
JM38510/32901BDA	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type
JM38510/32901BDA	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type
SN54LS280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SN54LS280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SN54S280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SN54S280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SN74LS280D	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS280D	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS280DE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS280DE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280DRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN
SN74LS280J	OBSOLETE	CDIP	J	14		TBD	Call TI	Call TI
SN74LS280J	OBSOLETE	CDIP	J	14		TBD	Call TI	Call TI
SN74LS280N	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74LS280N	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74LS280N3	OBSOLETE	PDIP	N	14		TBD	Call TI	Call TI
SN74LS280N3	OBSOLETE	PDIP	N	14		TBD	Call TI	Call TI
SN74LS280NE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74LS280NE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74LS280NSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIN





9-Oct-2007

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Packag Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74LS280NSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS280NSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS280NSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS280NSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS280NSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S280D	OBSOLETE	SOIC	D	14		TBD	Call TI	Call TI
SN74S280D	OBSOLETE	SOIC	D	14		TBD	Call TI	Call TI
SN74S280N	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74S280N	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74S280N3	OBSOLETE	PDIP	N	14		TBD	Call TI	Call TI
SN74S280N3	OBSOLETE	PDIP	N	14		TBD	Call TI	Call TI
SN74S280NE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74S280NE4	ACTIVE	PDIP	N	14	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74S280NSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S280NSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S280NSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S280NSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S280NSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74S280NSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SNJ54LS280FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
SNJ54LS280FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
SNJ54LS280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SNJ54LS280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SNJ54LS280W	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type
SNJ54LS280W	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type
SNJ54S280FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
SNJ54S280FK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
SNJ54S280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SNJ54S280J	ACTIVE	CDIP	J	14	1	TBD	A42 SNPB	N / A for Pkg Type
SNJ54S280W	ACTIVE	CFP	W	14	1	TBD	A42	N / A for Pkg Type
SNJ54S280W	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.



PACKAGE OPTION ADDENDUM

9-Oct-2007

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)

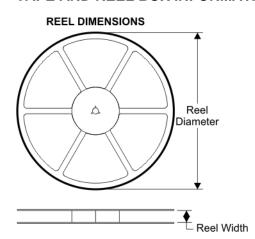
(3) MSL, Peak Temp. -- The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

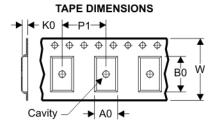
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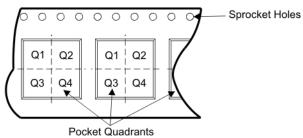
TAPE AND REEL BOX INFORMATION





	Dimension designed to accommodate the component width
	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

QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Device	Package	Pins		Reel Diameter (mm)	Reel Width (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LS280DR	D	14	SITE 41	330	16	6.5	9.0	2.1	8	16	Q1
SN74LS280NSR	NS	14	SITE 41	330	16	8.2	10.5	2.5	12	16	Q1
SN74S280NSR	NS	14	SITE 41	330	16	8.2	10.5	2.5	12	16	Q1





Device	Package	Pins	Site	Length (mm)	Width (mm)	Height (mm)
SN74LS280DR	D	14	SITE 41	346.0	346.0	33.0
SN74LS280NSR	NS	14	SITE 41	346.0	346.0	33.0
SN74S280NSR	NS	14	SITE 41	346.0	346.0	33.0

14 LEADS SHOWN



- 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



FK (S-CQCC-N**)

28 TERMINAL SHOWN

LEADLESS CERAMIC CHIP CARRIER



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. The terminals are gold plated.
- E. Falls within JEDEC MS-004



N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- 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 PACKAGE



- 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 .006 (0,15) per end.
- Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
- E. Reference JEDEC MS-012 variation AB.



MECHANICAL DATA

NS (R-PDSO-G**)

14-PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



- 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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