- Contain Eight Flip-Flops With Single-Rail Outputs
- Buffered Clock and Direct-Clear Inputs
- Individual Data Input to Each Flip-Flop
- Applications Include:

Buffer/Storage Registers Shift Registers Pattern Generators

 Package Options Include Plastic Small-Outline (DW) Packages, Ceramic Chip Carriers (FK), and Standard Plastic (N) and Ceramic (J) 300-mil DIPs

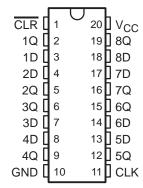
description

These octal positive-edge-triggered flip-flops utilize TTL circuitry to implement D-type flip-flop logic with a direct-clear (CLR) input.

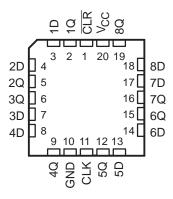
Information at the data (D) inputs meeting the setup-time requirements is transferred to the Q outputs on the positive-going edge of the clock (CLK) pulse. Clock triggering occurs at a particular voltage level and is not directly related to the transition time of the positive-going pulse. When CLK is at either the high or low level, the D input signal has no effect at the output.

The SN54ALS273 is characterized for operation over the full military temperature range of -55° C to 125°C. The SN74ALS273 is characterized for operation from 0°C to 70°C.

SN54ALS273 . . . J PACKAGE SN74ALS273 . . . DW OR N PACKAGE (TOP VIEW)



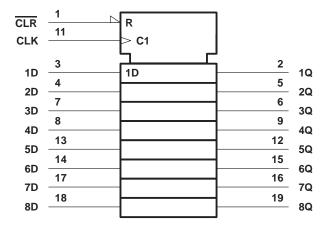
SN54ALS273 . . . FK PACKAGE (TOP VIEW)



FUNCTION TABLE (each flip-flop)

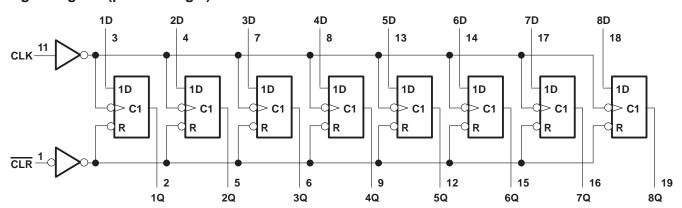
	INPUTS	OUTPUT				
CLR	CLK	D	Q			
L	Х	Χ	L			
Н	\uparrow	Н	Н			
Н	\uparrow	L	L			
Н	H or L	Χ	Q ₀			

logic symbol†



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

logic diagram (positive logic)



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

Supply voltage, V _{CC}		7 V
Input voltage, V _I		7 V
Operating free-air temperature range, T _A :	SN54ALS273	−55°C to 125°C
	SN74ALS273	0°C to 70°C
Storage temperature range		-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.



recommended operating conditions

			SN	SN54ALS273			74ALS2	73	UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT
Vсс	Supply voltage		4.5	5	5.5	4.5	5	5.5	V
VIH	High-level input voltage		2			2			V
V _{IL}	Low-level input voltage				0.7			0.8	V
IOH	High-level output current				-1			-2.6	mA
loL	Low-level output current				12			24	mA
fclock	Clock frequency		0		30	0		35	MHz
		CLR low	10			10			
t _W	Pulse duration	CLK high	16.5			14			ns
		CLK low	16.5			14			
+	Octor Core hafare OLIC	Data	10			10			ns
t _{su}	Setup time before CLK↑	CLR inactive state	15			15			115
t _h	Hold time, data after CLK↑		0			0			ns
TA	Operating free-air temperature		-55		125	0		70	°C

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

DADAMETED	TEST C	TEST CONDITIONS			73	SN	UNIT		
PARAMETER	1231 0	CNUTTIONS	MIN	TYP [†]	MAX	MIN	TYP	MAX	UNII
VIK	$V_{CC} = 4.5 V,$	$I_{I} = -18 \text{ mA}$			-1.5			-1.5	V
	$V_{CC} = 4.5 \text{ V to } 5.5 \text{ V},$	$I_{OH} = -0.4 \text{ mA}$	V _{CC} -2	2		V _{CC} -2	!		
VOH	VCC = 4.5 V	$I_{OH} = -1 \text{ mA}$	2.4	3.3					V
	VCC = 4.5 V	$I_{OH} = -2.6 \text{ mA}$				2.4	3.2		
\/a:	V00 - 4 5 V	I _{OL} = 12 mA		0.25	0.4		0.25	0.4	V
VOL	V _{CC} = 4.5 V	I _{OL} = 24 mA					0.35	0.5	V
ΙĮ	V _{CC} = 5.5 V,	V _I = 7 V			0.1			0.1	mA
lіН	V _{CC} = 5.5 V,	V _I = 2.7 V			20			20	μΑ
I _{IL}	$V_{CC} = 5.5 \text{ V},$	V _I = 0.4 V			-0.2			-0.2	mA
lo [‡]	$V_{CC} = 5.5 V,$	V _O = 2.25 V	-20		-112	-30		-112	mA
Іссн	V _{CC} = 5.5 V			11	20		11	20	mA
ICCL	V _{CC} = 5.5 V			19	29		19	29	mA



[†] All typical values are at V_{CC} = 5 V, T_A = 25°C. ‡ The output conditions have been chosen to produce a current that closely approximates one half of the true short-circuit output current, I_{OS}.

SN54ALS273, SN74ALS273 OCTAL D-TYPE FLIP-FLOPS WITH CLEAR

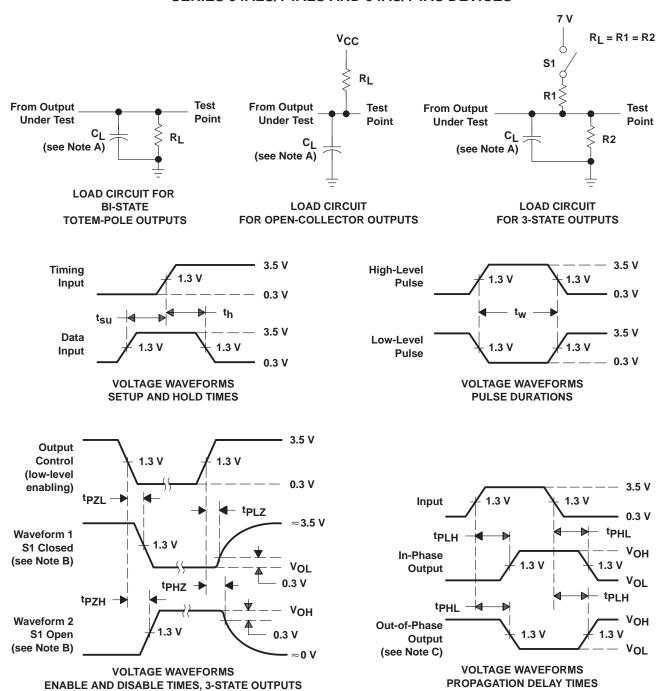
SDAS218A – APRIL 1982 – REVISED DECEMBER 1994

switching characteristics (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _C C _L R _L T _A	V,	UNIT		
			SN54A	LS273	SN74ALS273		
			MIN	MAX	MIN	MAX	
fmax			30		35		MHz
t _{PHL}	CLR	Any Q	4	24	4	18	ns
t _{PLH}	CLK	Any	2	20	2	12	ns
^t PHL	CLK	Any Q	3	17	3	15	115

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

PARAMETER MEASUREMENT INFORMATION SERIES 54ALS/74ALS AND 54AS/74AS DEVICES



NOTES: 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_{Γ} = 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



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31-Oct-2025

PACKAGING INFORMATION

Orderable part number	Status (1)	Material type	Package Pins	Package qty Carrier	RoHS (3)	Lead finish/ Ball material	MSL rating/ Peak reflow	Op temp (°C)	Part marking (6)
84136012A	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	84136012A SNJ54ALS 273FK
8413601RA	Active	Production	CDIP (J) 20	20 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8413601RA SNJ54ALS273J
8413601SA	Active	Production	CFP (W) 20	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8413601SA SNJ54ALS273W
SN54ALS273J	Active	Production	CDIP (J) 20	20 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54ALS273J
SN54ALS273J.A	Active	Production	CDIP (J) 20	20 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	SN54ALS273J
SN74ALS273DW	Obsolete	Production	SOIC (DW) 20	-	-	Call TI	Call TI	0 to 70	ALS273
SN74ALS273DWR	Active	Production	SOIC (DW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	ALS273
SN74ALS273DWR.A	Active	Production	SOIC (DW) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	ALS273
SN74ALS273N	Active	Production	PDIP (N) 20	20 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74ALS273N
SN74ALS273N.A	Active	Production	PDIP (N) 20	20 TUBE	Yes	NIPDAU	N/A for Pkg Type	0 to 70	SN74ALS273N
SN74ALS273NSR	Active	Production	SOP (NS) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	ALS273
SN74ALS273NSR.A	Active	Production	SOP (NS) 20	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	0 to 70	ALS273
SNJ54ALS273FK	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	84136012A SNJ54ALS 273FK
SNJ54ALS273FK.A	Active	Production	LCCC (FK) 20	55 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	84136012A SNJ54ALS 273FK
SNJ54ALS273J	Active	Production	CDIP (J) 20	20 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8413601RA SNJ54ALS273J
SNJ54ALS273J.A	Active	Production	CDIP (J) 20	20 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8413601RA SNJ54ALS273J
SNJ54ALS273W	Active	Production	CFP (W) 20	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8413601SA SNJ54ALS273W
SNJ54ALS273W.A	Active	Production	CFP (W) 20	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8413601SA SNJ54ALS273W

⁽¹⁾ Status: For more details on status, see our product life cycle.

PACKAGE OPTION ADDENDUM

www.ti.com 31-Oct-2025

(2) Material type: When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) RoHS values: Yes, No, RoHS Exempt. See the TI RoHS Statement for additional information and value definition.

(4) Lead finish/Ball material: Parts 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.

(5) MSL rating/Peak reflow: The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) Part marking: There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

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OTHER QUALIFIED VERSIONS OF SN54ALS273, SN74ALS273:

Catalog: SN74ALS273

Military: SN54ALS273

NOTE: Qualified Version Definitions:

Catalog - TI's standard catalog product

• Military - QML certified for Military and Defense Applications

PACKAGE MATERIALS INFORMATION

www.ti.com 23-Jul-2025

TAPE AND REEL INFORMATION





A0	Dimension designed to accommodate the component width
В0	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



*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
SN74ALS273DWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
SN74ALS273NSR	SOP	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1

PACKAGE MATERIALS INFORMATION

www.ti.com 23-Jul-2025



*All dimensions are nominal

Device	Package Type	Package Type Package Drawing Pins SPQ		Length (mm)	Width (mm)	Height (mm)	
SN74ALS273DWR	SOIC	DW	20	2000	356.0	356.0	45.0
SN74ALS273NSR	SOP	NS	20	2000	356.0	356.0	45.0

PACKAGE MATERIALS INFORMATION

www.ti.com 23-Jul-2025

TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
84136012A	FK	LCCC	20	55	506.98	12.06	2030	NA
8413601SA	W	CFP	20	25	506.98	26.16	6220	NA
SN74ALS273N	N	PDIP	20	20	506	13.97	11230	4.32
SN74ALS273N.A	N	PDIP	20	20	506	13.97	11230	4.32
SNJ54ALS273FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54ALS273FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54ALS273W	W	CFP	20	25	506.98	26.16	6220	NA
SNJ54ALS273W.A	W	CFP	20	25	506.98	26.16	6220	NA

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.



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.

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary. Refer to the product data sheet for package details.



INSTRUMENTS www.ti.com

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.





SOIC



- 1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.

 2. This drawing is subject to change without notice.

 3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not
- exceed 0.15 mm per side.
- 4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm per side.
- 5. Reference JEDEC registration MS-013.



SOIC



NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.



SOIC



NOTES: (continued)

- 8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
- 9. Board assembly site may have different recommendations for stencil design.



W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



- A. All linear dimensions are in inches (millimeters).
- 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 GDFP2—F20



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