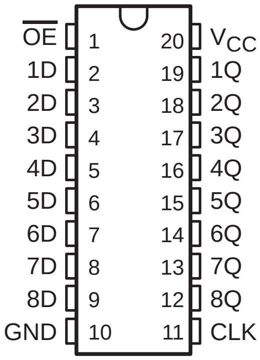
SN74LVC574
OCTAL EDGE-TRIGGERED D-TYPE FLIP-FLOP WITH 3-STATE OUTPUTS

SCAS301 – JANUARY 1993 – REVISED MARCH 1994

- ***EPIC*** **™ (Enhanced-Performance Implanted CMOS) Submicron Process**
- **Typical V_{OLP} (Output Ground Bounce) < 0.8 V at V_{CC} = 3.3 V, T_A = 25°C**
- **Typical V_{OHV} (Output V_{OH} Undershoot) > 2 V at V_{CC} = 3.3 V, T_A = 25°C**
- **Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB), and Thin Shrink Small-Outline (PW) Packages**

DB, DW, OR PW PACKAGE
(TOP VIEW)



description

This octal edge-triggered D-type flip-flop is designed for 2.7-V to 3.6-V V_{CC} operation.

The SN74LVC574 features 3-state outputs designed specifically for driving highly capacitive or relatively low-impedance loads. It is particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

On the positive transition of the clock (CLK) input, the Q outputs are set to the logic levels that were set up at the data (D) inputs.

A buffered output-enable ($\overline{OE}$) input can be used to place the eight outputs in either a normal logic state (high or low logic levels) or a high-impedance state. In the high-impedance state, the outputs neither load nor drive the bus lines significantly. The high-impedance state and increased drive provide the capability to drive bus lines without need for interface or pullup components.

The output-enable ($\overline{OE}$) input does not affect the internal operations of the flip-flops. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

The SN74LVC574 is characterized for operation from –40°C to 85°C.

FUNCTION TABLE
(each flip-flop)

INPUTS			OUTPUT
$\overline{OE}$	CLK	D	Q
L	↑	H	H
L	↑	L	L
L	L	X	Q_0
H	X	X	Z

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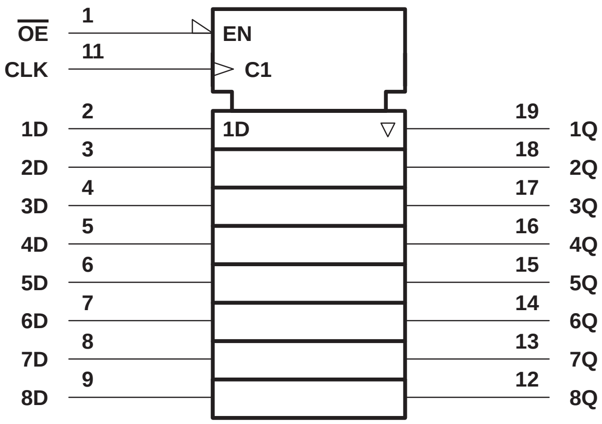
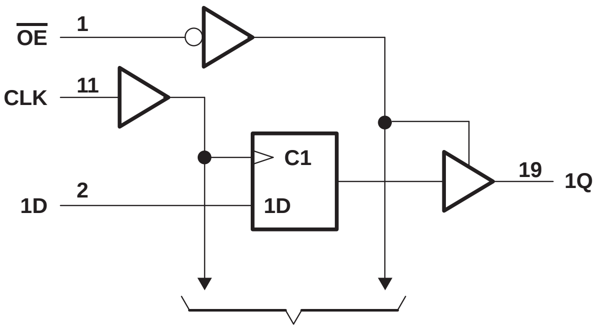
PRODUCT PREVIEW

logic symbol†



logic diagram (positive logic)



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

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

Supply voltage range, V_{CC}		–0.5 V to 4.6 V
Input voltage range, V_I		–0.5 V to 4.6 V
Output voltage range, V_O (see Note 1)		–0.5 V to V_{CC} + 0.5 V
Input clamp current, I_{IK} (V_I < 0)		–50 mA
Output clamp current, I_{OK} (V_O < 0 or V_O > V_{CC})		±50 mA
Continuous output current, I_O (V_O = 0 to V_{CC})		±50 mA
Continuous current through V_{CC} or GND		±100 mA
Maximum power dissipation at T_A = 55°C (in still air):	DB package	0.6 W
	DW package	1.6 W
	PW package	0.7 W
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.

NOTE 1: This value is limited to 4.6 V maximum.

recommended operating conditions (see Note 2)

			MIN	MAX	UNIT
V_{CC}	Supply voltage		2.7	3.6	V
V_{IH}	High-level input voltage	V_{CC} = 2.7 V to 3.6 V	2		V
V_{IL}	Low-level input voltage	V_{CC} = 2.7 V to 3.6 V		0.8	V
V_I	Input voltage		0	V_{CC}	V
V_O	Output voltage		0	V_{CC}	V
I_{OH}	High-level output current	V_{CC} = 2.7 V		–12	mA
		V_{CC} = 3 V		–24	
I_{OL}	Low-level output current	V_{CC} = 2.7 V		12	mA
		V_{CC} = 3 V		24	
Δt/Δv	Input transition rise or fall rate		0	10	ns/V
T_A	Operating free-air temperature		–40	85	°C

NOTE 2: Unused or floating inputs must be held high or low.

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

PARAMETER	TEST CONDITIONS	V_{CC}†	T_A = –40°C to 85°C		UNIT
			MIN	MAX	
V_{OH}	I_{OH} = –100 µA	MIN to MAX	V_{CC} – 0.2		V
	I_{OH} = – 12 mA	2.7 V	2.2		
		3 V	2.4		
	I_{OH} = – 24 mA	3 V	2		
V_{OL}	I_{OL} = 100 µA	MIN to MAX		0.2	V
	I_{OL} = 12 mA	2.7 V		0.4	
	I_{OL} = 24 mA	3 V		0.55	
I_I	V_I = V_{CC} or GND	3.6 V		±5	µA
I_{OZ}	V_O = V_{CC} or GND	3.6 V		±10	µA
I_{CC}	V_I = V_{CC} or GND, I_O = 0	3.6 V		20	µA
ΔI_{CC}	V_{CC} = 3 V to 3.6 V, One input at V_{CC} – 0.6 V, Other inputs at V_{CC} or GND			500	µA
C_i	V_I = V_{CC} or GND	3.3 V			pF
C_o	V_O = V_{CC} or GND	3.3 V			pF

† For conditions shown as MIN or MAX, use the appropriate values under recommended operating conditions.

PRODUCT PREVIEW

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