SDAS127 – APRIL 1987

- **Center V_{CC} and GND Configuration Provides Minimum Lead Inductance in High Current Switching Applications**
- **3-State Buffer-Type Outputs Drive Bus-Lines Directly**
- **Bus-Structured Pinout**
- **Provide Extra Bus Driving Latches Necessary for Wider Address/Data Paths or Buses With Parity**
- **Buffered Control Inputs to Reduce DC Loading**
- **Power-Up High Impedance**
- **Package Options Include Plastic DIPs. Use the ′AS843 for Plastic and Ceramic Chip Carriers and "Small Outline" Package Options**
- **Dependable Texas Instruments Quality and Reliability**

description

This 9-bit latch device features three-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.

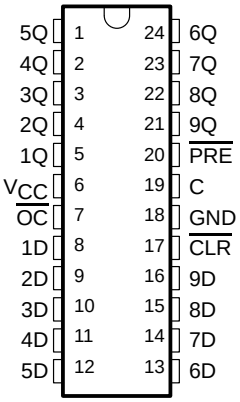
The nine latches are transparent D-type and have noninverting data (D) inputs.

A buffered output control ($\overline{OC}$) input can be used to place the nine outputs in either a normal logic state (high or low 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 the bus lines in a bus-organized system without need for interface or pullup components.

The output control ($\overline{OC}$) does not affect the internal operation of the flip-flops. Old data can be retained or new data can be entered while the outputs are off.

The SN74AS1843 is characterized for operation from 0°C to 70°C.

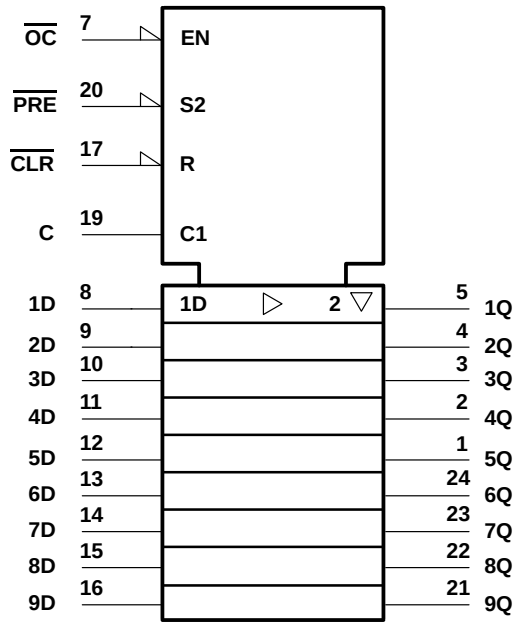
NT Package
(Top View)



FUNCTION TABLE

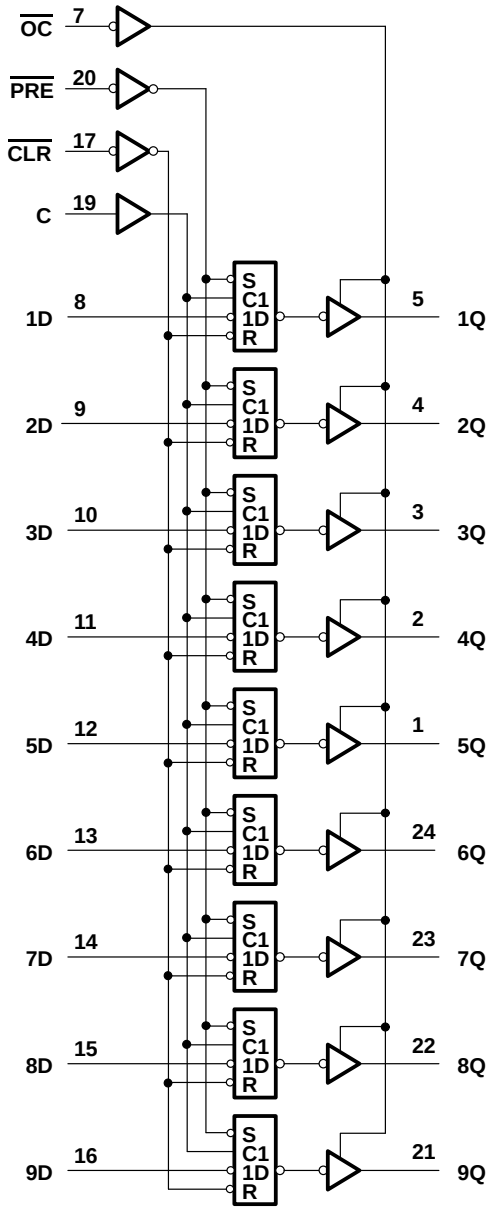
INPUTS					OUTPUT
$\overline{PRE}$	$\overline{CLR}$	$\overline{OC}$	C	D	Q
L	X	L	X	X	H
H	L	L	X	X	L
H	H	L	H	L	L
H	H	L	H	H	H
H	H	L	L	X	Q_O
X	X	H	X	X	Z

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} (see Note 1) . . . . . 7 V
Input voltage . . . . . 7 V
Voltage applied to a disabled 3-state output . . . . . 5.5 V
Operating free-air temperature range . . . . . 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. This is a stress rating only, and functional operation of the device at these or any other conditions beyond those indicated in the “Recommended Operating Conditions” section of this specification is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTE 1: All voltage values are with respect to GND.

recommended operating conditions

			MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage		4.5	5	5.5	V
V_{IH}	High-level input voltage		2			V
V_{IL}	Low-level input voltage				0.8	V
I_{OH}	High-level output current				–24	mA
I_{OL}	Low-level output current				48	mA
t_w	Pulse duration, enable C high	$\overline{CLR}$ or $\overline{PRE}$ low	4			ns
		C high	4			
t_{su}	Setup time, data before enable C ↓		2.5			ns
t_h	Hold time, data after enable C ↓		2.5			ns
t_r	Recovery time	$\overline{PRE}$	15			ns
		$\overline{CLR}$	14			
T_A	Operating free-air temperature		0		70	°C

electrical characteristics over full ranges of recommended operating conditions (unless otherwise noted)

PARAMETER	TEST CONDITIONS		MIN	TYP†	MAX	UNIT
V_{IK}	V_{CC} = 4.5 V,	I_I = – 18 mA			–1.2	V
V_{OH}	V_{CC} = 4.5 V,	I_{OH} = – 2 mA	V_{CC} –2			V
	V_{CC} = 4.5 V,	I_{OH} = – 15 mA	2.4	3.2		
	V_{CC} = 4.5 V,	I_{OH} = – 24 mA	2			
V_{OL}	V_{CC} = 4.5 V,	I_{OL} = 32 mA				V
	V_{CC} = 4.5 V,	I_{OL} = 48 mA		0.35	0.5	
I_{OZH}	V_{CC} = 5.5 V,	V_O = 2.7 V			50	µA
I_{OZL}	V_{CC} = 5.5 V,	V_O = 0.4 V			–50	µA
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_I = 2.7 V			20	µA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.4 V			–.05	mA
I_O‡	V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	mA
I_{CC}	V_{CC} = 5.5 V,	Output high		37	62	mA
		Output low		56	92	
		Outputs disabled		56	92	

† 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}.

switching characteristics over recommended ranges of supply voltage and free-air temperature (see Note 2)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R_1 = 500 Ω, R_2 = 500 Ω, T_A = MIN to MAX		UNIT
			MIN	MAX	
t_{PLH}	D	Q	1	6.5	ns
t_{PHL}			1	9	
t_{PLH}	C	Q	2	12	ns
t_{PHL}			2	12	
t_{PLH}	$\overline{PRE}$	Q	2	10	ns
t_{PHL}	$\overline{CLR}$	Q	2	13	ns
t_{PZH}	$\overline{OC}$	Q	2	10.5	ns
t_{PZL}			2	13.5	
t_{PHZ}	$\overline{OC}$	Q	1	8	ns
t_{PLZ}			1	8	

NOTE 2: Load circuit and voltage waveforms are shown in Section 1 of the *ALS/AS Logic Data Book, 1986*.

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