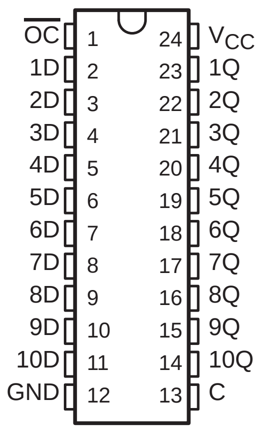
- **3-State Buffer-Type Outputs Drive Bus-Lines Directly**
- **Bus-Structured Pinout**
- **Provide Extra Bus Driving Latches Necessary for Wider Address/Data Paths or Buses with Parity**
- **Buffered Control Inputs to Reduce DC Loading**
- **Power-Up High-Impedance State**
- **Package Options Include Plastic Small Outline Packages, Both Plastic and Ceramic Chip Carriers, and Standard Plastic and Ceramic 300-mil DIPs**
- **Dependable Texas Instruments Quality and Reliability**

description

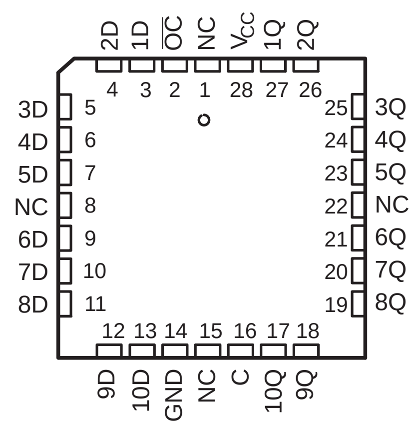
These 10-bit latches feature 3-state outputs designed specifically for driving highly-capacitive or relatively low-impedance loads. They are particularly suitable for implementing buffer registers, I/O ports, bidirectional bus drivers, and working registers.

The ten latches are transparent D-type. The ’ALS841 and ’AS841 have noninverting data (D) inputs. The ’ALS842 and ’AS842 have inverting $\overline{D}$ inputs.

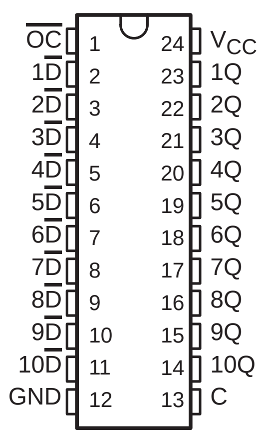
SN54ALS841, SN54AS841 . . . JT PACKAGE
SN74ALS841, SN74AS841 . . . DW OR NT PACKAGE
(TOP VIEW)



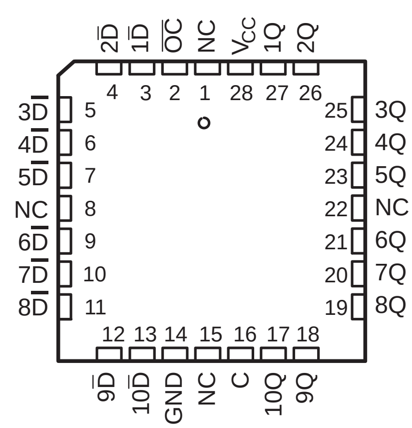
SN54ALS841, SN54AS841 . . . FK PACKAGE
SN74ALS841, SN74AS841 . . . FN PACKAGE
(TOP VIEW)



SN54ALS842, SN54AS842 . . . JT PACKAGE
SN74ALS842, SN74AS842 . . . DW OR NT PACKAGE
(TOP VIEW)



SN54ALS842, SN54AS842 . . . FK PACKAGE
SN74ALS842, SN74AS842 . . . FN PACKAGE
(TOP VIEW)



description (continued)

A buffered output control ($\overline{OC}$) input can be used to place the ten 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 does not affect the internal operation of the latches. Old data can be retained or new data can be entered while the outputs are off.

The -1 versions of the SN74ALS841 and SN74ALS842 parts are identical to the standard versions except that the recommended maximum I_{OL} is increased to 48 mA. There are no -1 versions of the SN54ALS841 and SN54ALS842.

The SN54ALS841, SN54AS841, SN54ALS842, and SN54AS842 are characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ALS841, SN74AS841, SN74ALS842, and SN74AS842 are characterized for operation from 0°C to 70°C.

Function Tables

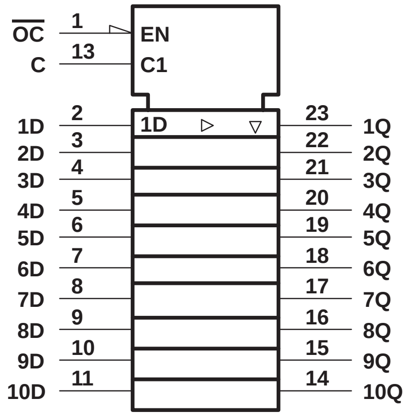
’ALS841, ’AS841

INPUTS			OUTPUT
$\overline{OC}$	C	D	Q
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

’ALS842, ’AS842

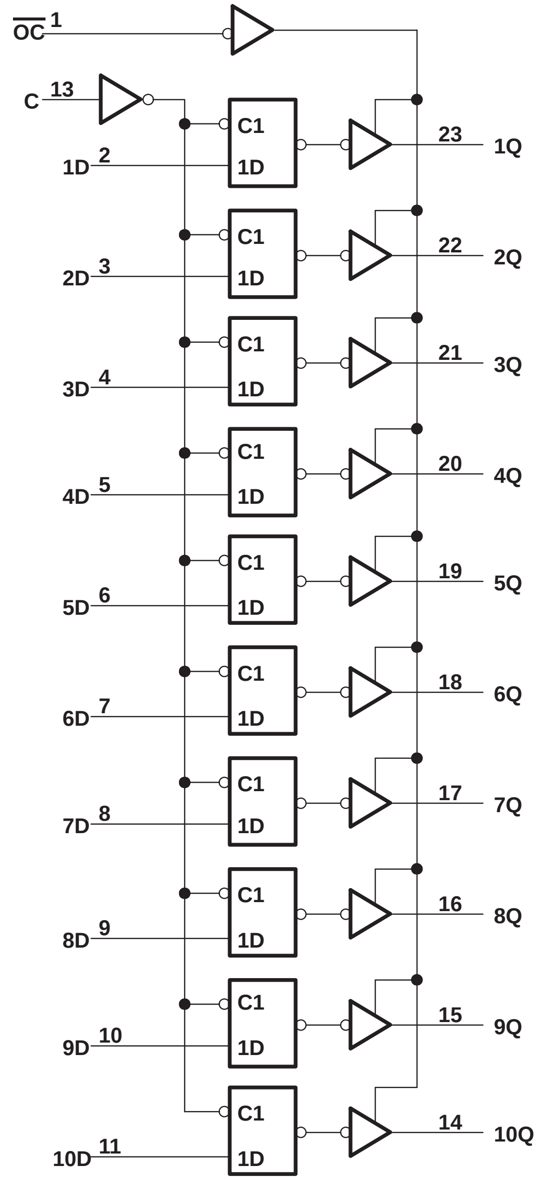
INPUTS			OUTPUT
$\overline{OC}$	C	$\overline{D}$	Q
L	H	H	L
L	H	L	H
L	L	X	Q_0
H	X	X	Z

’ALS841, ’AS841 logic symbol†



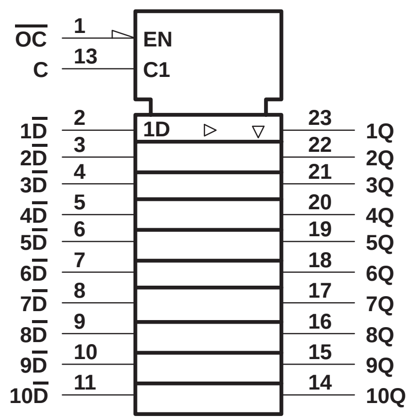
† This symbol is in accordance with ANSI/IEEE Std 91-1984 and EC Publication 617-12.

’ALS841, ’AS841 logic diagram (positive logic)



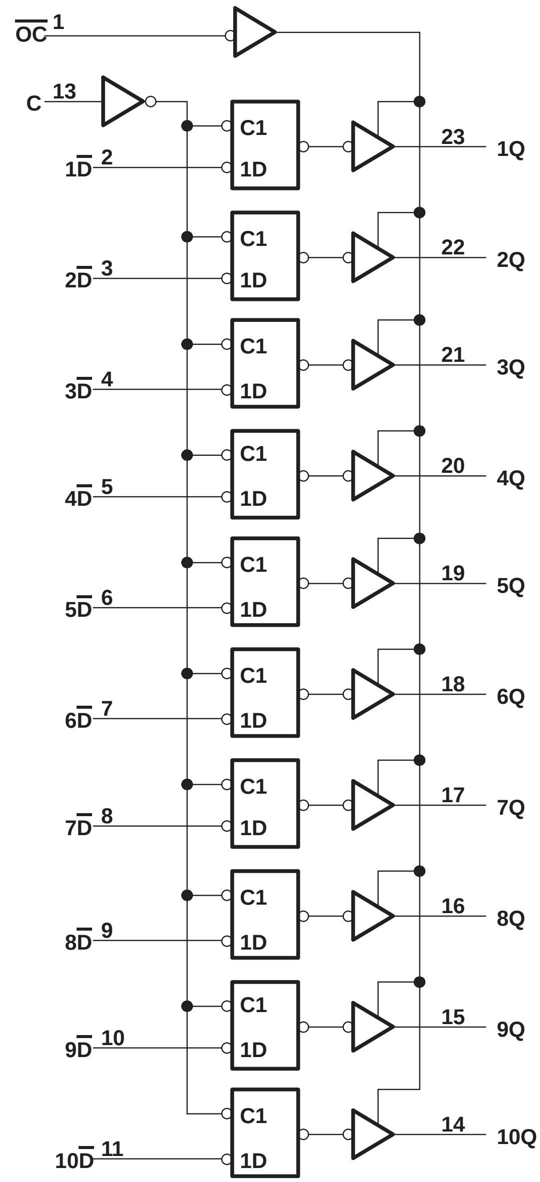
Pin numbers shown are for DW, JT, and NT packages.

’ALS842, ’AS842 logic symbol†



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

’ALS842, ’AS842 logic diagram (positive logic)



Pin numbers shown are for DW, JT, and NT packages.

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

Supply voltage, V_{CC}	7 V
Input voltage	7 V
Voltage applied to a disabled 3-state output	5.5 V
Operating free-air temperature range:	
SN54ALS841, SN54AS841, SN54ALS842, SN54AS842	–55°C to 125°C
SN74ALS841, SN74AS841, SN74ALS842, SN74AS842	0°C to 70°C
Storage temperature range	–65°C to 150°C

recommended operating conditions

		SN54ALS841			SN74ALS841			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
I_{OH}	High-level output current			–1			–2.6	mA
I_{OL}	Low-level output current			12			24	mA
							48†	
t_w	Pulse duration, C high	25			20			ns
t_{su}	Setup time, data before C↓	16			10			ns
t_h	Hold time,, data after C↓	7			5			ns
T_A	Operating free-air temperature	–55		125	0		70	°C

† The 48-mA limit applies only to the -1 versions and only if V_{CC} is maintained between 4.75 V and 5.25 V.

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

PARAMETER	TEST CONDITIONS		SN54ALS841			SN74ALS841			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}	V_{CC} = 4.5 V,	I_I = –18 mA			–1.2			–1.2	V
V_{OH}	V_{CC} = 4.5 V to 5.5 V,	I_{OH} = –0.4 mA	V_{CC}–2			V_{CC}–2			V
	V_{CC} = 4.5 V,	I_{OH} = –1 mA	2.4	3.3					
	V_{CC} = 4.5 V,	I_{OH} = –2.6 mA				2.4	3.2		
V_{OL}	V_{CC} = 4.5 V,	I_{OL} = 12 mA		0.25	0.4		0.25	0.4	V
	V_{CC} = 4.5 V,	I_{OL} = 24 mA					0.35	0.5	
	V_{CC} = 4.75 V,	I_{OL} = 48 mA (–1 versions)					0.35	0.5	
I_{OZH}	V_{CC} = 5.5 V,	V_O = 2. 7 V			20			20	µA
I_{OZL}	V_{CC} = 5.5 V,	V_O = 0.4 V			–20			–20	µA
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_O = 2.7 V			20			20	µA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0 .4 V			–0.1			–0.1	mA
I_O§	V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	–30		–112	mA
I_{CC}	V_{CC} = 5.5 V	Outputs high		19	30		19	30	mA
		Outputs low		38	62		38	62	
		Outputs disabled		23	40		23	40	

‡ 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}.

’ALS841 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R_1 = 500 Ω, R_2 = 500 Ω, T_A = 25°C			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
			′ALS841			SN54ALS841		SN74ALS841		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	D	Q		8.5	11	2	15	2	13	ns
t_{PHL}				8.5	11	2	15	2	13	
t_{PLH}	C	Q		14	18	7	25	7	21	ns
t_{PHL}				17	23	8	30	8	26	
t_{PZH}	$\overline{OC}$	Q		7.5	10	2	14	2	12	ns
t_{PZL}				7.5	10	2	14	2	12	
t_{PHZ}	$\overline{OC}$	Q		6	8	2	12	2	10	ns
t_{PLZ}				7	9	2	14	2	12	

† The conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

recommended operating conditions

		SN54ALS842			SN74ALS842			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.7			0.8	V
I_{OH}	High-level output current			–1			–2.6	mA
I_{OL}	Low-level output current			12			24	mA
							48†	
t_w	Pulse duration, C high	25			20			ns
t_{su}	Setup time, data before C↓	16			10			ns
t_h	Hold time,, data after C↓	7			5			ns
T_A	Operating free-air temperature	–55		125	0		70	°C

† The 48-mA limit applies only to the –1 versions and only if V_{CC} is maintained between 4.75 V and 5.25 V.

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

PARAMETER	TEST CONDITIONS		SN54ALS842			SN74ALS842			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}	V_{CC} = 4.5 V,	I_I = –18 mA			–1.2			–1.2	V
V_{OH}	V_{CC} = 4.5 V to 5.5 V,	I_{OH} = –0.4 mA	V_{CC}–2			V_{CC}–2			V
	V_{CC} = 4.5 V,	I_{OH} = –1 mA	2.4	3.3					
	V_{CC} = 4.5 V,	I_{OH} = –2.6 mA				2.4	3.2		
V_{OL}	V_{CC} = 4.5 V,	I_{OL} = 12 mA		0.25	0.4		0.25	0.4	V
	V_{CC} = 4.5 V,	I_{OL} = 24 mA					0.35	0.5	
	V_{CC} = 4.75 V,	I_{OL} = 48 mA (-1 versions)					0.35	0.5	
I_{OZH}	V_{CC} = 5.5 V,	V_O = 2. 7 V			20			20	μA
I_{OZL}	V_{CC} = 5.5 V,	V_O = 0.4 V			–20			–20	μA
I_I	V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}	V_{CC} = 5.5 V,	V_O = 2.7 V			20			20	μA
I_{IL}	V_{CC} = 5.5 V,	V_I = 0.4 V			–0.1			–0.1	mA
I_O§	V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	–30		–112	mA
I_{CC}	V_{CC} = 5.5 V	Outputs high		20	35		20	35	mA
		Outputs low		48	74		48	74	
		Outputs disabled		27	44		27	44	

‡ 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}.

’ALS842 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX†				UNIT
			’ALS842			SN54ALS842		SN74ALS842		
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	D	Q		11	15	4	22	4	18	ns
t_{PHL}				8	11	3	17	3	13	
t_{PLH}	C	Q		17	23	8	31	8	27	ns
t_{PHL}				13	18	6	24	6	20	
t_{PZH}	$\overline{OC}$	Q		8	10	2	14	2	12	ns
t_{PZL}				8	11	2	14	2	12	
t_{PHZ}	$\overline{OC}$	Q		6	8	1	12	1	10	ns
t_{PLZ}				7	9	2	14	2	12	

† The conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

recommended operating conditions

		SN54AS841 SN54AS842			SN74AS841 SN74AS842			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	4.5	5	5.5	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			2			V
V_{IL}	Low-level input voltage			0.8			0.8	V
I_{OH}	High-level output current			–24			–24	mA
I_{OL}	Low-level output current			32			48	mA
t_w	Pulse duration, C high	5			4			ns
t_{su}	Setup time, data before C↓	3.5			2.5			ns
t_h	Hold time,, data after C↓	3.5			2.5			ns
T_A	Operating free-air temperature	–55		125	0		70	°C

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

PARAMETER		TEST CONDITIONS		SN54AS841 SN54AS842			SN74AS841 SN74AS842			UNIT
				MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V_{IK}		V_{CC} = 4.5 V,	I_I = –18 mA			–1.2			–1.2	V
V_{OH}		V_{CC} = 4.5 V to 5.5 V,	I_{OH} = – 2 mA	V_{CC}–2			V_{CC}–2			V
		V_{CC} = 4.5 V,	I_{OH} = –15 mA	2.4	3.2		2.4	3.2		
		V_{CC} = 4.5 V,	I_{OH} = –24 mA	2			2			
V_{OL}		V_{CC} = 4.5 V,	I_{OL} = 32 mA		0.25	0.5				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			50	µA
I_{OZL}		V_{CC} = 5.5 V,	V_O = 0.4 V			–50			–50	µA
I_I		V_{CC} = 5.5 V,	V_I = 7 V			0.1			0.1	mA
I_{IH}		V_{CC} = 5.5 V,	V_O = 2.7 V			20			20	µA
I_{IL}		V_{CC} = 5.5 V,	V_I = 0 .4 V			–0.5			–0.5	mA
I_O‡		V_{CC} = 5.5 V,	V_O = 2.25 V	–30		–112	–30		–112	mA
I_{CC}	’AS841	V_{CC} = 5.5 V	Outputs high		36	60		36	60	mA
			Outputs low		58	94		58	94	
			Outputs disabled		56	92		56	92	
	’AS842		Outputs high		38	62		38	62	
			Outputs low		60	97		60	97	
			Outputs disabled		58	95		58	95	

† 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}.

’AS841 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX†				UNIT
			SN54AS841		SN74AS841		
			MIN	MAX	MIN	MAX	
t_{PLH}	D	Q	1	8.5	1	6.5	ns
t_{PHL}			1	10	1	9	
t_{PLH}	C	Q	2	13	2	12	ns
t_{PHL}			2	13	2	12	
t_{PZH}	$\overline{OC}$	Q	2	13.5	2	10.5	ns
t_{PZL}			2	15	2	13.5	
t_{PHZ}	$\overline{OC}$	Q	1	10	1	8	ns
t_{PLZ}			1	10	1	8	

’AS842 switching characteristics (see Note 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX†				UNIT
			SN54AS842		SN74AS842		
			MIN	MAX	MIN	MAX	
t_{PLH}	D	Q	1	11	1	8.5	ns
t_{PHL}			1	10	1	9	
t_{PLH}	C	Q	2	13	2	12	ns
t_{PHL}			2	13	2	12	
t_{PZH}	$\overline{OC}$	Q	2	14.5	2	12	ns
t_{PZL}			2	15	2	12.5	
t_{PHZ}	$\overline{OC}$	Q	1	10	1	8	ns
t_{PLZ}			1	10	1	8	

† The conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.
NOTE 1: Load circuit and voltage waveforms are shown in Section 1.

IMPORTANT NOTICE