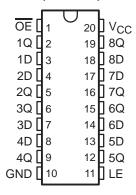
- State-of-the-Art EPIC-IIB™ BiCMOS Design Significantly Reduces Power Dissipation
- Latch-Up Performance Exceeds 500 mA Per JEDEC Standard JESD-17
- Typical V_{OLP} (Output Ground Bounce) < 1 V at V_{CC} = 5 V, T_A = 25°C
- High-Drive Outputs (–32-mA I_{OH}, 64-mA I_{OL})
- Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB), and Thin Shrink Small-Outline (PW) Packages, Ceramic Chip Carriers (FK), Ceramic Flat (W) Package, and Plastic (N) and Ceramic (J) DIPs

description

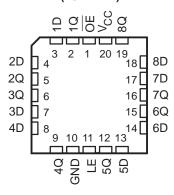
The eight latches of the 'ABT373 are transparent D-type latches. While the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is taken low, the Q outputs are latched at the logic levels set up at the D inputs.

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.

SN54ABT373 . . . J OR W PACKAGE SN74ABT373 . . . DB, DW, N, OR PW PACKAGE (TOP VIEW)



SN54ABT373 . . . FK PACKAGE (TOP VIEW)



OE does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

The SN54ABT373 is characterized for operation over the full military temperature range of –55°C to 125°C. The SN74ABT373 is characterized for operation from –40°C to 85°C.

FUNCTION TABLE (each latch)

	INPUTS	OUTPUT	
OE	LE	D	Q
L	Н	Н	Н
L	Н	L	L
L	L	Χ	Q ₀
Н	X	Χ	Z



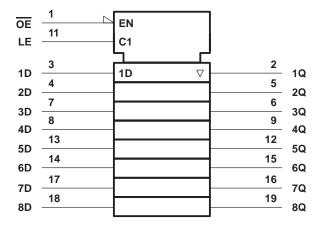
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TEXAS INSTRUMENTS

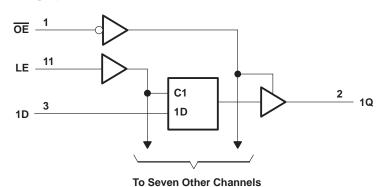
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logic symbol[†]



[†] 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 range, V _{CC}	0.5 V to 7 V
Input voltage range, V _I (see Note 1)	
Voltage range applied to any output in the high or pow	er-off state, V _O –0.5 V to 5.5 V
Current into any output in the low state, IO: SN54ABT	373 96 mA
SN74ABT	373 128 mA
Input clamp current, I _{IK} (V _I < 0)	–18 mA
Output clamp current, I _{OK} (V _O < 0)	–50 mA
Package thermal impedance, θ _{JA} (see Note 2): DB pa	ckage 115°C/W
DW pa	ackage 97°C/W
N pac	kage 67°C/W
PW pa	ackage 128°C/W
Storage temperature range, T _{stg}	–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.

^{2.} The package thermal impedance is calculated in accordance with EIA/JEDEC Std JESD51, except for through-hole packages, which use a trace length of zero.



NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.

recommended operating conditions (see Note 3)

			SN54A	BT373	SN74A	BT373	UNIT
			MIN	MAX	MIN	MAX	UNII
V _{CC} Supply voltage					4.5	5.5	V
VIH	V _{IH} High-level input voltage				2		V
VIL	V _{IL} Low-level input voltage					0.8	V
٧ _I	Input voltage		0	VCC	0	VCC	V
IOH	High-level output current			-24		-32	mA
loL	I _{OL} Low-level output current					64	mA
Δt/Δν	Input transition rise or fall rate Outputs enabled			5		5	ns/V
TA	A Operating free-air temperature				-40	85	°C

NOTE 3: Unused inputs must be held high or low to prevent them from floating.

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

DADAMETED	TEST CONDITIONS			Т	A = 25°C	;	SN54A	BT373	SN74ABT373		LINIT
PARAMETER				MIN	TYP [†]	MAX	MIN	MAX	MIN	MAX	UNIT
VIK	$V_{CC} = 4.5 V$,	$I_{I} = -18 \text{ mA}$				-1.2		-1.2		-1.2	V
	$V_{CC} = 4.5 V$,	$I_{OH} = -3 \text{ mA}$		2.5			2.5		2.5		
\/	V _{CC} = 5 V,	$I_{OH} = -3 \text{ mA}$		3			3		3		V
VOH	V _{CC} = 4.5 V	$I_{OH} = -24 \text{ mA}$		2			2				V
	vCC = 4.5 v	$I_{OH} = -32 \text{ mA}$		2*					2		
Voi	V00 = 45 V	I _{OL} = 48 mA				0.55		0.55			V
VOL	V _{CC} = 4.5 V I _{OL} = 64 mA					0.55*				0.55	V
V _{hys}					100						mV
lį	$V_{CC} = 5.5 \text{ V},$	$V_I = V_{CC}$ or GND				±1		±1		±1	μΑ
lozh	$V_{CC} = 5.5 \text{ V},$	$V_0 = 2.7 \text{ V}$				10‡		10‡		10‡	μΑ
lozL	$V_{CC} = 5.5 \text{ V},$	$V_0 = 0.5 V$				-10 [‡]		-10 [‡]		-10 [‡]	μΑ
l _{off}	$V_{CC} = 0$,	V_I or $V_O \le 4.5 \text{ V}$				±100				±100	μΑ
ICEX	$V_{CC} = 5.5 \text{ V},$	$V_0 = 5.5 \text{ V}$	Outputs high			50		50		50	μΑ
ΙΟ§	$V_{CC} = 5.5 \text{ V},$	$V_0 = 2.5 \text{ V}$		-50	-100	-180	-50	-180	-50	-180	mA
	.,	0	Outputs high		1	250		250		250	μΑ
Icc	$V_{CC} = 5.5 \text{ V}, \text{ I}_{C}$ $V_{I} = V_{CC} \text{ or G}$		Outputs low		24	30		30		30	mA
	11-166 91 9115		Outputs disabled		0.5	250		250		250	μΑ
ΔICC¶	V _{CC} = 5.5 V, C Other inputs at	one input at 3.4 V, V _{CC} or GND				1.5		1.5		1.5	mA
C _i	V _I = 2.5 V or 0.5 V				3						pF
Co	$V_0 = 2.5 \text{ V or } 0$).5 V			6						pF

 $[\]begin{tabular}{l}^*$ On products compliant to MIL-PRF-38535, this parameter does not apply.



[†] All typical values are at $V_{CC} = 5 \text{ V}$.

[‡]This data sheet limit may vary among suppliers.

[§] Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

[¶] This is the increase in supply current for each input that is at the specified TTL voltage level rather than V_{CC} or GND.

SN54ABT373, SN74ABT373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

SCBS155D - JANUARY 1991 - REVISED MAY 1997

timing requirements over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)

					SN54A	BT373		
				V _{CC} = T _A = 2	= 5 V, 25°C	MIN	MAX	UNIT
				MIN	MAX			
t _W	t _W Pulse duration, LE high					3.3		ns
t			High			2.5		ns
t _{SU} Setup time, data before LE↓		L	.ow	2.2		2.5		113
t _h	Hold time, data after LE↓	Н	ligh or low	2.2		2.5		ns

timing requirements over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted) (see Figure 1)

				SN74A	BT373		
			V _C (; = 5 V, = 25°C	MIN	MAX	UNIT
			MIN	I MAX	1		
t _W	Pulse duration, LE high		3.3	3	3.3		ns
	Cotion time and the before I.E.	High	1.9	1.9			ns
t _{Su} Setup time, data before LE↓		Low	1.5	;	1.5		115
t _h	Hold time, data after LE↓	High or I	ow 1		1		ns

SN54ABT373, SN74ABT373 OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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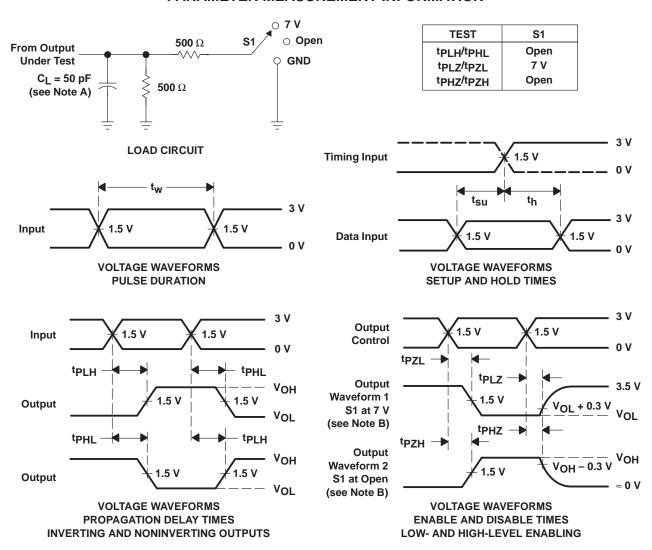
switching characteristics over recommended ranges of supply voltage and operating free-air temperature, C_L = 50 pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)		CC = 5 V A = 25°C	/, ;	MIN	MAX	UNIT
			MIN	TYP	MAX			
^t PLH	D	Q	1.9	3.9	5.4	1.3	6.8	ns
t _{PHL}	В	Q	2.2	4.2	5.7	2	7	115
t _{PLH}	LE	Q	2.2	4.6	6.1	1.8	7.7	ns
t _{PHL}	LL	Q	3.2	5.2	6.7	2.5	7.7	115
^t PZH	ŌĒ	= 0	1.2	3.2	5.5	1	6.2	ns
t _{PZL}	OE .	Q	2	4.7	6.2	1.5	7.2	115
^t PHZ	ŌĒ	Q	2.5	4.9	6.4	2.4	8	ns
t _{PLZ}	OE OE	~	2	4.5	6	2	7	115

switching characteristics over recommended ranges of supply voltage and operating free-air temperature, $C_L = 50$ pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)		C = 5 V \ = 25°C	/, ;	MIN	MAX	UNIT
			MIN	TYP	MAX			
t _{PLH}	D	Q	1.9	3.9	5.4	1.9	5.9	no
t _{PHL}	D	Ų Ų	2.2	4.2	5.7	2.2	6.2	ns
^t PLH	LE	Q	2.2	4.6	6.1	2.2	6.6	ns
t _{PHL}	LL		3.2	5.2	6.7	3.2	7.2	115
^t PZH	ŌĒ	Q	1.2	3.2	4.7	1.2	5.2	no
t _{PZL}	OE .	Q	2.7	4.7	6.2	2.7	6.7	ns
t _{PHZ}	ŌĒ	Q	2.5	4.9	6.4	2.5	6.9	nc
t _{PLZ}	OE OE	Q	2	4.5	6	2	6.5	ns

PARAMETER MEASUREMENT INFORMATION



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. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, Z_{Q} = 50 Ω , t_{f} \leq 2.5 ns, t_{f} \leq 2.5 ns.
- D. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms









PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
5962-9321801Q2A	ACTIVE	LCCC	FK	20	1	TBD	Call TI	N / A for Pkg Type
5962-9321801QRA	ACTIVE	CDIP	J	20	1	TBD	Call TI	N / A for Pkg Type
5962-9321801QSA	ACTIVE	CFP	W	20	1	TBD	Call TI	N / A for Pkg Type
SN74ABT373DBLE	OBSOLETE	SSOP	DB	20		TBD	Call TI	Call TI
SN74ABT373DBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373DBRE4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373DW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373DWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373DWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74ABT373NE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74ABT373NSR	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373NSRE4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373PW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373PWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373PWLE	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI
SN74ABT373PWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ABT373PWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SNJ54ABT373FK	ACTIVE	LCCC	FK	20	1	TBD	Call TI	N / A for Pkg Type
SNJ54ABT373J	ACTIVE	CDIP	J	20	1	TBD	Call TI	N / A for Pkg Type
SNJ54ABT373W	ACTIVE	CFP	W	20	1	TBD	Call TI	N / A for Pkg Type

⁽¹⁾ The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

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.

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

⁽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.



PACKAGE OPTION ADDENDUM

12-Jan-2006

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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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-F20)

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 GDFP2-F20



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.



DW (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS-013 variation AC.



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.



DB (R-PDSO-G**)

PLASTIC SMALL-OUTLINE

28 PINS SHOWN



NOTES: 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.

D. Falls within JEDEC MO-150

PW (R-PDSO-G**)

14 PINS SHOWN

PLASTIC SMALL-OUTLINE PACKAGE



NOTES: 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.

D. Falls within JEDEC MO-153

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