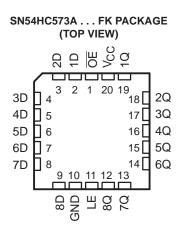
SCLS147E – DECEMBER 1982 – REVISED SEPTEMBER 2003

- Wide Operating Voltage Range of 2 V to 6 V
- High-Current 3-State Outputs Drive Bus Lines Directly or Up To 15 LSTTL Loads
- Low Power Consumption, 80-µA Max I<sub>CC</sub>

SN54HC573A . . . J OR W PACKAGE SN74HC573A . . . DB, DW, N, OR PW PACKAGE (TOP VIEW)

OE [	1	$\bigcirc_{20}$	Vcc
1D [	2	19	[] 1Q
2D [	3	18	] 2Q
3D [	4	17	] 3Q
4D [	5	16	] 4Q
5D [	6	15	] 5Q
6D [	7	14	] 6Q
7D [	8	13	] 7Q
8D [	9	12	] 8Q
GND [	10	11	LE

- Typical t<sub>pd</sub> = 21 ns
- ±6-mA Output Drive at 5 V
- Low Input Current of 1 µA Max
- Bus-Structured Pinout



#### description/ordering information

These octal transparent D-type 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.

While the latch-enable (LE) input is high, the Q outputs respond to the data (D) inputs. When LE is low, the outputs are latched to retain the data that was set up.

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 the 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 interface or pullup components.

TA	PACK	AGET	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube of 25	SN74HC573AN	SN74HC573AN
		Tube of 40	SN74HC573ADW	1105704
4000 10 0500	SOIC – DW	Reel of 2500	SN74HC573ADWR	HC573A
–40°C to 85°C	SSOP – DB	Reel of 2000	SN74HC573ADBR	HC573A
		Reel of 2000	SN74HC573APWR	1105704
	TSSOP – PW	Reel of 250	SN74HC573APWT	HC573A
	CDIP – J	Tube of 25	SNJ54HC573AJ	SNJ54HC573AJ
–55°C to 125°C	CFP – W	Tube of 150	SNJ54HC573AW	SNJ54HC573AW
	LCCC – FK	Tube of 55	SNJ54HC573AFK	SNJ54HC573AFK

#### **ORDERING INFORMATION**

<sup>†</sup> Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



Copyright © 2003, Texas Instruments Incorporated On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

SCLS147E - DECEMBER 1982 - REVISED SEPTEMBER 2003

## description/ordering information (continued)

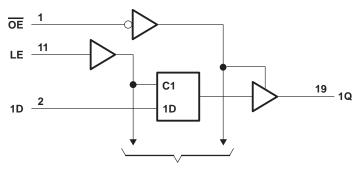
To ensure the high-impedance state during power up or power down, OE should be tied to V<sub>CC</sub> through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

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.

\_\_\_\_

	FUNCTI (eac	ON TAE h latch)									
	INPUTS										
OE	LE	D	Q								
L	Н	Н	Н								
L	Н	L	L								
L	L	Х	Q <sub>0</sub> Z								
Н	Х	Х	Z								

### logic diagram (positive logic)



**To Seven Other Channels** 

#### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>

Supply voltage range, V <sub>CC</sub>	
Input clamp current, $I_{IK}$ (V <sub>I</sub> < 0 or V <sub>I</sub> > V <sub>CC</sub> ) (see	Note 1) ±20 mA
	(see Note 1) ±20 mA
	±35 mA
	±70 mA
	DB package
-	DW package 58°C/W
1	V package
	PW package 83°C/W
Storage temperature range, T <sub>stg</sub>	

<sup>†</sup> 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.

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

2. The package thermal impedance is calculated in accordance with JESD 51-7.



SCLS147E - DECEMBER 1982 - REVISED SEPTEMBER 2003

#### recommended operating conditions (see Note 3)

			SN	SN	74HC573	3A	UNIT		
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT
VCC	Supply voltage		2	5	6	2	5	6	V
		$V_{CC} = 2 V$	1.5			1.5			
VIH	High-level input voltage	V <sub>CC</sub> = 4.5 V	3.15			3.15			V
		$V_{CC} = 6 V$	4.2			4.2			
		$V_{CC} = 2 V$			0.5			0.5	
VIL	Low-level input voltage	V <sub>CC</sub> = 4.5 V			1.35			1.35	V
		V <sub>CC</sub> = 6 V			1.8			1.8	
VI	Input voltage		0		VCC	0		VCC	V
VO	Output voltage		0		VCC	0		VCC	V
		$V_{CC} = 2 V$			1000			1000	
tt	Input transition (rise and fall) time	V <sub>CC</sub> = 4.5 V			500			500	ns
		V <sub>CC</sub> = 6 V			400			400	
TA	Operating free-air temperature		-55		125	-40		85	°C

NOTE 3: All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, Implications of Slow or Floating CMOS Inputs, literature number SCBA004.

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

	7507.00			Т	A = 25°C	;	SN54H	C573A	SN74H	C573A	
PARAMETER	TEST CO	ONDITIONS	Vcc	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
			2 V	1.9	1.998		1.9		1.9		
		I <sub>OH</sub> = -20 μA	4.5 V	4.4	4.499		4.4		4.4		
VOH	$V_I = V_{IH} \text{ or } V_{IL}$		6 V	5.9	5.999		5.9		5.9		V
		$I_{OH} = -6 \text{ mA}$	4.5 V	3.98	4.3		3.7		3.84		
		I <sub>OH</sub> = -7.8 mA	6 V	5.48	5.8		5.2		5.34		
			2 V		0.002	0.1		0.1		0.1	
		I <sub>OL</sub> = 20 μA	4.5 V		0.001	0.1		0.1		0.1	
V <sub>OL</sub>	$V_{I} = V_{IH} \text{ or } V_{IL}$		6 V		0.001	0.1		0.1		0.1	V
		IOL = 6 mA	4.5 V		0.17	0.26		0.4		0.33	
		I <sub>OL</sub> = 7.8 mA	6 V		0.15	0.26		0.4		0.33	
lį	$V_I = V_{CC} \text{ or } 0$		6 V		±0.1	±100		±1000		±1000	nA
IOZ	VO = ACC  or  0		6 V		±0.01	±0.5		±10		±5	μΑ
ICC	$V_I = V_{CC} \text{ or } 0,$	IO = 0	6 V			8		160		80	μΑ
Ci			2 V to 6 V		3	10		10		10	pF



SCLS147E - DECEMBER 1982 - REVISED SEPTEMBER 2003

timing requirements over recommended operating free-air temperature range (unless otherwise noted)

			T <sub>A</sub> = 2	25°C	SN54H	C573A	SN74H	C573A	
		vcc	MIN	MAX	MIN	MAX	MIN	MAX	UNIT
		2 V	80		120		100		
tw	Pulse duration, LE high	4.5 V	16		24		20		ns
		6 V	14		20		17		
		2 V	50		75		63		
t <sub>su</sub>	Setup time, data before LE $\downarrow$	4.5 V	10		15		13		ns
		6 V	9		13		11		
		2 V	20		24		24		
th	Hold time, data after LE $\downarrow$	4.5 V	5		5		5		ns
		6 V	5		5		5		

# switching characteristics over recommended operating free-air temperature range, $C_L = 50 \text{ pF}$ (unless otherwise noted) (see Figure 1)

	FROM	то		Т	<b>₄ = 25°</b> Ω	;	SN54H	C573A	SN74H0	C573A																			
PARAMETER	(INPUT)	(OUTPUT)	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT																		
			2 V		77	175		265		220																			
	D	Q	4.5 V		26	35		53		44																			
			6 V		23	30		45		38																			
<sup>t</sup> pd			2 V		87	175		265		220	ns																		
	LE	Any Q	4.5 V		27	35		53		44																			
			6 V		23	30		45		38																			
			2 V		68	150		225		190																			
ten	OE	Any Q	4.5 V		24	30		45		38	ns																		
			6 V		21	26		38		32																			
			2 V		47	150		225		190																			
<sup>t</sup> dis	OE	Any Q	4.5 V		23	30		45		38	ns																		
			6 V		21	26		38		32																			
			2 V		28	60		90		75																			
tt		Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	4.5 V		8	12		18		15	ns
			6 V		6	10		15		13																			



# SN54HC573A, SN74HC573A **OCTAL TRANSPARENT D-TYPE LATCHES** WITH 3-STATE OUTPUTS SCLS147E – DECEMBER 1982 – REVISED SEPTEMBER 2003

# switching characteristics over recommended operating free-air temperature range, $C_L = 150 \text{ pF}$ (unless otherwise noted) (see Figure 1)

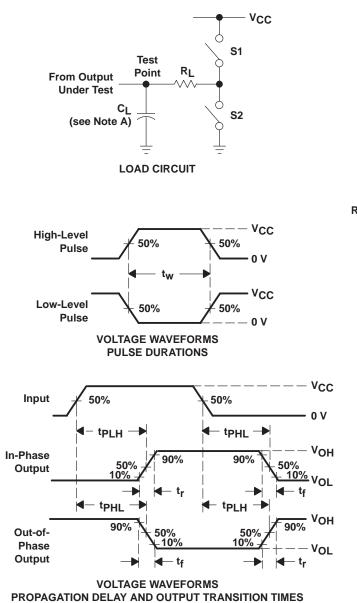
	FROM	то		Τį	<b>₄ = 25°C</b>	;	SN54H0	C573A	SN74H	C573A																										
PARAMETER	(INPUT)	(OUTPUT)	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT																									
			2 V		95	200		300		250																										
	D	Q	4.5 V		33	40		60		50																										
			6 V		21	34		51		43																										
<sup>t</sup> pd			2 V		103	225		335		285	ns																									
	LE	Any Q	4.5 V		33	45		67		57																										
			6 V		29	38		57		48																										
			2 V		85	200		300		250																										
<sup>t</sup> en	OE	Any Q	Any Q	4.5 V		29	40		60		50	ns																								
			6 V		26	34		51		43																										
			2 V		60	210		315		265																										
tt		Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	Any Q	4.5 V		17	42		63		53	ns
			6 V		14	36		53		45																										

## operating characteristics, $T_A = 25^{\circ}C$

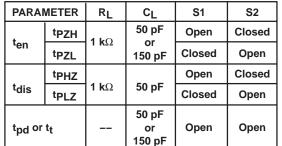
	PARAMETER	TEST CONDITIONS	TYP	UNIT
Cpd	Power dissipation capacitance per latch	No load	50	pF

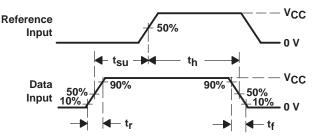


SCLS147E - DECEMBER 1982 - REVISED SEPTEMBER 2003

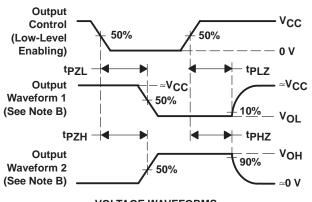


#### PARAMETER MEASUREMENT INFORMATION



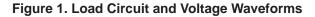


VOLTAGE WAVEFORMS SETUP AND HOLD AND INPUT RISE AND FALL TIMES



VOLTAGE WAVEFORMS ENABLE AND DISABLE TIMES FOR 3-STATE OUTPUTS

- NOTES: A. CL includes probe and test-fixture 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. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR  $\leq$  1 MHz, Z<sub>O</sub> = 50  $\Omega$ , t<sub>f</sub> = 6 ns, t<sub>f</sub> = 6 ns.
  - D. The outputs are measured one at a time with one input transition per measurement.
  - E.  $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .
  - F.  $t_{PZL}$  and  $t_{PZH}$  are the same as  $t_{en}$ .
  - G. tPLH and tPHL are the same as tpd.







11-Jul-2015

## **PACKAGING INFORMATION**

Orderable Device	Status	Package Type	•	Pins	•	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking	Samples
	(1)		Drawing		Qty	(2)	(6)	(3)		(4/5)	
5962-8512801VRA	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	5962-8512801VR A	Samples
										SNV54HC573AJ	
5962-8512801VSA	LIFEBUY	CFP	W	20	25	TBD	A42	N / A for Pkg Type	-55 to 125	5962-8512801VS A	
										SNV54HC573AW	
85128012A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	85128012A SNJ54HC 573AFK	Samples
8512801RA	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	8512801RA SNJ54HC573AJ	Samples
8512801SA	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	8512801SA SNJ54HC573AW	Samples
JM38510/65406BRA	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	JM38510/ 65406BRA	Samples
M38510/65406BRA	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	JM38510/ 65406BRA	Samples
SN54HC573AJ	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	SN54HC573AJ	Samples
SN74HC573ADBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573ADW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573ADWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573ADWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573ADWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573AN	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-40 to 85	SN74HC573AN	Samples
SN74HC573AN3	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI	-40 to 85		
SN74HC573ANE4	ACTIVE	PDIP	Ν	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-40 to 85	SN74HC573AN	Samples
SN74HC573APWLE	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI	-40 to 85		



11-Jul-2015

Orderable Device	Status	Package Type	Package	Pins	Package	Eco Plan	Lead/Ball Finish	MSL Peak Temp	Op Temp (°C)	Device Marking	Samples
	(1)		Drawing		Qty	(2)	(6)	(3)		(4/5)	
SN74HC573APWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573APWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573APWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SN74HC573APWT	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC573A	Samples
SNJ54HC573AFK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type	-55 to 125	85128012A SNJ54HC 573AFK	Samples
SNJ54HC573AJ	ACTIVE	CDIP	J	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	8512801RA SNJ54HC573AJ	Samples
SNJ54HC573AW	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type	-55 to 125	8512801SA SNJ54HC573AW	Samples

<sup>(1)</sup> 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.

(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.

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 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)

<sup>(3)</sup> MSL, Peak Temp. - The Moisture Sensitivity Level rating according to the JEDEC industry standard classifications, and peak solder temperature.

<sup>(4)</sup> There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.



#### www.ti.com

# PACKAGE OPTION ADDENDUM

11-Jul-2015

<sup>(5)</sup> Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

<sup>(6)</sup> Lead/Ball Finish - Orderable Devices may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead/Ball Finish values may wrap to two lines if the finish value exceeds the maximum column width.

**Important Information and Disclaimer:**The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

#### OTHER QUALIFIED VERSIONS OF SN54HC573A, SN54HC573A-SP, SN74HC573A :

- Catalog: SN74HC573A, SN54HC573A
- Automotive: SN74HC573A-Q1, SN74HC573A-Q1
- Military: SN54HC573A
- Space: SN54HC573A-SP

NOTE: Qualified Version Definitions:

- Catalog TI's standard catalog product
- Automotive Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Military QML certified for Military and Defense Applications
- Space Radiation tolerant, ceramic packaging and qualified for use in Space-based application

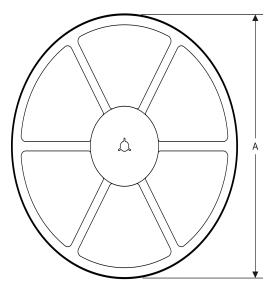
# PACKAGE MATERIALS INFORMATION

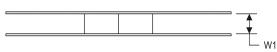
www.ti.com

#### TAPE AND REEL INFORMATION

#### REEL DIMENSIONS

TEXAS INSTRUMENTS





TAPE AND REEL INFORMATION

#### TAPE DIMENSIONS



A0	Dimension designed to accommodate the component width
B0	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

*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
SN74HC573ADBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74HC573ADWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
SN74HC573APWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
SN74HC573APWT	TSSOP	PW	20	250	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

TEXAS INSTRUMENTS

www.ti.com

# PACKAGE MATERIALS INFORMATION

14-Jul-2012



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74HC573ADBR	SSOP	DB	20	2000	367.0	367.0	38.0
SN74HC573ADWR	SOIC	DW	20	2000	367.0	367.0	45.0
SN74HC573APWR	TSSOP	PW	20	2000	367.0	367.0	38.0
SN74HC573APWT	TSSOP	PW	20	250	367.0	367.0	38.0

J (R-GDIP-T\*\*) 14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



NOTES: 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



- NOTES: A. All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice. В.
  - 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



LEADLESS CERAMIC CHIP CARRIER

FK (S-CQCC-N\*\*) 28 TERMINAL SHOWN



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. Falls within JEDEC MS-004



# N (R-PDIP-T\*\*)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



NOTES:

- 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).
- $\triangle$  The 20 pin end lead shoulder width is a vendor option, either half or full width.



DW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.

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.



# LAND PATTERN DATA



NOTES:

A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Refer to IPC7351 for alternate board design.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



PW (R-PDSO-G20)

PLASTIC SMALL OUTLINE



NOTES:

A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M-1994.  $\beta$ . This drawing is subject to change without notice.

Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.

Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.

E. Falls within JEDEC MO-153



## LAND PATTERN DATA



NOTES: Α. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
  C. Publication IPC-7351 is recommended for alternate design.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.



# **MECHANICAL DATA**

MSSO002E - JANUARY 1995 - REVISED DECEMBER 2001

## 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



#### **IMPORTANT NOTICE**

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, enhancements, improvements and other changes to its semiconductor products and services per JESD46, latest issue, and to discontinue any product or service per JESD48, latest issue. Buyers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All semiconductor products (also referred to herein as "components") are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its components to the specifications applicable at the time of sale, in accordance with the warranty in TI's terms and conditions of sale of semiconductor products. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by applicable law, testing of all parameters of each component is not necessarily performed.

TI assumes no liability for applications assistance or the design of Buyers' products. Buyers are responsible for their products and applications using TI components. To minimize the risks associated with Buyers' products and applications, Buyers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any patent right, copyright, mask work right, or other intellectual property right relating to any combination, machine, or process in which TI components or services are used. Information published by TI regarding third-party products or services does not constitute a license to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of significant portions of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI components or services with statements different from or beyond the parameters stated by TI for that component or service voids all express and any implied warranties for the associated TI component or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

Buyer acknowledges and agrees that it is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its products, and any use of TI components in its applications, notwithstanding any applications-related information or support that may be provided by TI. Buyer represents and agrees that it has all the necessary expertise to create and implement safeguards which anticipate dangerous consequences of failures, monitor failures and their consequences, lessen the likelihood of failures that might cause harm and take appropriate remedial actions. Buyer will fully indemnify TI and its representatives against any damages arising out of the use of any TI components in safety-critical applications.

In some cases, TI components may be promoted specifically to facilitate safety-related applications. With such components, TI's goal is to help enable customers to design and create their own end-product solutions that meet applicable functional safety standards and requirements. Nonetheless, such components are subject to these terms.

No TI components are authorized for use in FDA Class III (or similar life-critical medical equipment) unless authorized officers of the parties have executed a special agreement specifically governing such use.

Only those TI components which TI has specifically designated as military grade or "enhanced plastic" are designed and intended for use in military/aerospace applications or environments. Buyer acknowledges and agrees that any military or aerospace use of TI components which have *not* been so designated is solely at the Buyer's risk, and that Buyer is solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI has specifically designated certain components as meeting ISO/TS16949 requirements, mainly for automotive use. In any case of use of non-designated products, TI will not be responsible for any failure to meet ISO/TS16949.

Products		Applications			
Audio	www.ti.com/audio	Automotive and Transportation	www.ti.com/automotive		
Amplifiers	amplifier.ti.com	Communications and Telecom	www.ti.com/communications		
Data Converters	dataconverter.ti.com	Computers and Peripherals	www.ti.com/computers		
DLP® Products	www.dlp.com	Consumer Electronics	www.ti.com/consumer-apps		
DSP	dsp.ti.com	Energy and Lighting	www.ti.com/energy		
Clocks and Timers	www.ti.com/clocks	Industrial	www.ti.com/industrial		
Interface	interface.ti.com	Medical	www.ti.com/medical		
Logic	logic.ti.com	Security	www.ti.com/security		
Power Mgmt	power.ti.com	Space, Avionics and Defense	www.ti.com/space-avionics-defense		
Microcontrollers	microcontroller.ti.com	Video and Imaging	www.ti.com/video		
RFID	www.ti-rfid.com				
OMAP Applications Processors	www.ti.com/omap	TI E2E Community	e2e.ti.com		
Wireless Connectivity	www.ti.com/wirelessconnectivity				

Mailing Address: Texas Instruments, Post Office Box 655303, Dallas, Texas 75265 Copyright © 2015, Texas Instruments Incorporated