

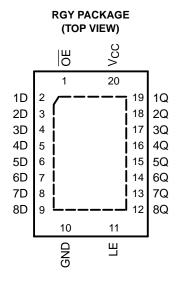
SCES574C-JUNE 2004-REVISED AUGUST 2005

### FEATURES

- Inputs Are TTL-Voltage Compatible
- 4.5-V to 5.5-V V<sub>cc</sub> Operation
- Typical t<sub>pd</sub> = 5.1 ns at 5 V
- Typical  $V_{OLP}$  (Output Ground Bounce) <0.8 V at  $V_{CC}$  = 5 V,  $T_A$  = 25°C
- Typical V<sub>OHV</sub> (Output V<sub>OH</sub> Undershoot) >2.3 V at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25°C
- Supports Mixed-Mode Voltage Operation on All Ports

DB, DGV, DW, NS, OR PW PACKAGE (TOP VIEW)										
OE [ 1D [ 2D [ 3D [ 4D [ 5D [ 7D [ 8D [ 6ND [	1 2 3 4 5 6 7 8 9 10	20 19 18 17 16 15 14 13 12 11	V <sub>CC</sub> 1Q 2Q 3Q 4Q 5Q 6Q 7Q 8Q LE							

- I<sub>off</sub> Supports Partial-Power-Down Mode Operation
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)



## **DESCRIPTION/ORDERING INFORMATION**

The SN74LV573AT is an octal transparent D-type latch. When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is low, the Q outputs are latched at the logic levels of the D inputs.

T <sub>A</sub>	P/	PACKAGE <sup>(1)</sup> Tape and reel Tube Tope and real	ORDERABLE PART NUMBER	TOP-SIDE MARKING	
	QFN – RGY	Tape and reel	SN74LV573ATRGYR	VV573	
1000 10 0500	SOIC – DW	Tube	SN74LV573ATDW	LV573AT	
	3010 - 010	Tape and reel	SN74LV573ATDWR	LVS/SAT	
	SOP – NS	Tape and reel	SN74LV573ATNSR	74LV573AT	
-40°C to 85°C	SSOP – DB	Tape and reel	SN74LV573ATDBR	LV573AT	
	TSSOP – PW	Tube	SN74LV573ATPW		
	1330P - PW	Tape and reel	SN74LV573ATPWR	– LV573AT	
	TVSOP – DGV Tape and reel		SN74LV573ATDGVR	LV573AT	

#### **ORDERING INFORMATION**

(1) 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.

## SN74LV573AT OCTAL TRANSPARENT D-TYPE LATCH WITH 3-STATE OUTPUTS

SCES574C-JUNE 2004-REVISED AUGUST 2005

#### TEXAS INSTRUMENTS www.ti.com

## **DESCRIPTION/ORDERING INFORMATION (CONTINUED)**

A buffered output-enable ( $\overline{OE}$ ) input can be used to place the eight outputs in either a normal logic state (high or low) 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.

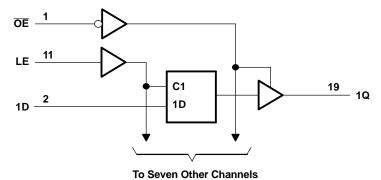
To ensure the high-impedance state during power up or power down,  $\overline{OE}$  shall be tied to V<sub>CC</sub> through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

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.

This device is fully specified for partial-power-down applications using I<sub>off</sub>. The I<sub>off</sub> circuitry disables the outputs, preventing damaging current backflow through the device when it is powered down.

FUNCTION TABLE (EACH LATCH)													
	INPUTS OUTPUTS												
OE	LE	D	Q										
L	Н	Н	Н										
L	н	L	L										
L	L	Х	<b>Q</b> <sub>0</sub>										
Н	Х	Х	Z										

### LOGIC DIAGRAM (POSTIVE LOGIC)



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## Absolute Maximum Ratings<sup>(1)</sup>

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

			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage range		-0.5	7	V
VI	Input voltage range <sup>(2)</sup>		-0.5	7	V
Vo	Voltage range applied to any output in the high-impedan	ce or power-off state <sup>(2)</sup>	-0.5	7	V
Vo	Output voltage range applied in the high or low state <sup>(2)(3)</sup>	3)	-0.5	$V_{CC} + 0.5$	V
I <sub>IK</sub>	Input clamp current	V <sub>1</sub> < 0		-20	mA
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> < 0		-50	mA
I <sub>O</sub>	Continuous output current	$V_{O} = 0$ to $V_{CC}$		±35	mA
	Continuous current through V <sub>CC</sub> or GND			±70	mA
		DB package <sup>(4)</sup>		70	
		DGV package <sup>(4)</sup>		92	
0	Decks we theread introduces	DW package <sup>(4)</sup>		58	00000
$\theta_{JA}$	Package thermal impedance	NS package <sup>(4)</sup>		60	°C/W
		PW package <sup>(4)</sup>		83	
		RGYpackage <sup>(5)</sup>		37	
T <sub>stg</sub>	Storage temperature range		-65	150	°C

(1) 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 input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.

(3) This value is limited to 5.5 V maximum.

(4) The package thermal impedance is calculated in accordance with JESD 51-7.

(5) The package thermal impedance is calculated in accordance with JESD 51-5.

### **Recommended Operating Conditions**<sup>(1)</sup>

			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage		4.5	5.5	V
V <sub>IH</sub>	High-level input voltage	$V_{CC}$ = 4.5 V to 5.5 V	2		V
VIL	Low-level input voltage	$V_{CC}$ = 4.5 V to 5.5 V		0.8	V
VI	Input voltage		0	5.5	V
.,	Output voltage	High or low state	0	V <sub>CC</sub>	V
Vo		3-state	0	5.5	V
I <sub>OH</sub>	High-level output current	$V_{CC}$ = 4.5 V to 5.5 V		-16	mA
I <sub>OL</sub>	Low-level output current	$V_{CC}$ = 4.5 V to 5.5 V		16	mA
$\Delta t/\Delta v$	Input transition rise or fall rate	$V_{CC}$ = 4.5 V to 5.5 V		20	ns/V
T <sub>A</sub>	Operating free-air temperature		-40	85	°C

 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.

## SN74LV573AT OCTAL TRANSPARENT D-TYPE LATCH WITH 3-STATE OUTPUTS

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### TEXAS INSTRUMENTS www.ti.com

#### **Electrical Characteristics**

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

PARAMETER	TEST CONDITIONS	v <sub>cc</sub>	Т,	₄ = 25°C		T <sub>A</sub> = to 85		UNIT
			MIN	TYP	MAX	MIN	MAX	
\/	I <sub>OH</sub> = -50 μA	4.5 V	4.4	4.5		4.4		V
V <sub>OH</sub>	$I_{OH} = -16 \text{ mA}$	4.5 V	3.8			3.8		v
N/	I <sub>OL</sub> = 50 μA	4.5 V		0	0.1		0.1	V
V <sub>OL</sub>	I <sub>OL</sub> = 16 mA	4.5 V			0.55		0.55	v
I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	0 to 5.5 V			±0.1		±1	μΑ
I <sub>OZ</sub>	$V_{O} = V_{CC}$ or GND	5.5 V			±0.25		±2.5	μΑ
I <sub>CC</sub>	$V_{I} = V_{CC} \text{ or } GND, \qquad I_{O} = 0$	5.5 V			2		20	μΑ
$\Delta I_{CC}^{(1)}$	One input at 3.4 V, Other inputs at V <sub>CC</sub> or GND	5.5 V			1.35		1.5	mA
I <sub>off</sub>	$V_{I} \text{ or } V_{O} = 0 \text{ to } 5.5 \text{ V}$	0			0.5		5	μΑ
Ci	$V_{I} = V_{CC} \text{ or } GND$			4.5				pF

(1) This is the increase in supply current for each input at one of the specified TTL voltage levels, rather than 0 V or V<sub>CC</sub>.

### **Timing Requirements**

over recommended operating free-air temperature range, V<sub>CC</sub> = 5 V  $\pm$  0.5 V (unless otherwise noted) (see Figure 1)

		$T_A = 25^{\circ}C$ MIN MAX		T <sub>A</sub> = -4 to 85	UNIT	
				MIN	MAX	
t <sub>w</sub>	Pulse duration, LE high	6.5		8.5		ns
t <sub>su</sub>	Setup time, data before LE $\downarrow$	1.5		1.5		ns
t <sub>h</sub>	Hold time, data after LE $\downarrow$	3.5		3.5		ns

### **Switching Characteristics**

over recommended operating free-air temperature range,  $V_{CC}$  = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	т,	₄ = 25°C	;	T <sub>A</sub> = to 85		UNIT
	(INPOT)	(001201)	CAPACITANCE	MIN	TYP	MAX	MIN	MAX	
t <sub>PLH</sub>	D	Q	C <sub>L</sub> = 15 pF	2.6	5.1	8.5	1	9.5	ns
t <sub>PHL</sub>	D		$O_L = 15 \text{ pm}$	3	5.1	8.5	1	9.5	115
t <sub>PLH</sub>	LE	Q	C <sub>L</sub> = 15 pF	3	7.7	12.3	1	14.5	ns
t <sub>PHL</sub>	LL	Q L	$O_L = 15 \text{ pm}$	3.5	7.7	12.3	1	14.5	115
t <sub>PZH</sub>	ŌĒ	Q	C <sub>L</sub> = 15 pF	3	6.3	10.9	1	12.5	20
t <sub>PZL</sub>	UE	Q	$C_L = 15 \text{ pr}$	3.3	6.3	10.9	1	12.5	ns
t <sub>PHZ</sub>	ŌĒ	Q	C <sub>L</sub> = 15 pF	2.8	5.5	8	1	11	ns
t <sub>PLZ</sub>	UE	Q	$C_L = 15 \text{ pr}$	1.6	5.4	8	1	9.5	115
t <sub>PLH</sub>	D	Q	$C_{L} = 50 \text{ pF}$	3.7	5.9	9.5	1	10.5	20
t <sub>PHL</sub>	D	Q	$C_L = 50 \text{ pr}$	5.5	5.9	9.5	1	10.5	ns
t <sub>PLH</sub>	LE	Q	C <sub>L</sub> = 50 pF	4.3	8.5	13.3	1	14.5	20
t <sub>PHL</sub>	LE	Q	$C_{L} = 50 \text{ pr}$	5.9	8.5	13.3	1	14.5	ns
t <sub>PZH</sub>	ŌĒ	Q	C <sub>L</sub> = 50 pF	4.5	7.1	11.9	1	13.5	20
t <sub>PZL</sub>	UE	Q	$O_L = 50 \text{ pr}$	5.4	7.1	11.9	1	13.5	ns
t <sub>PHZ</sub>	ŌĒ	0	C = 50  pF	3.3	8.8	11.2	1	12	20
t <sub>PLZ</sub>	UE	Q	C <sub>L</sub> = 50 pF	2.6	8.8	11.2	1	12	ns
t <sub>sk(o)</sub>			$C_L = 50 \text{ pF}$			1.5		1.5	ns

## Noise Characteristics<sup>(1)</sup>

 $V_{CC} = 5 \text{ V}, \text{ C}_{L} = 50 \text{ pF}$ 

		Τ <sub>4</sub>	T <sub>A</sub> = 25°C		UNIT
		MIN TYP		MAX	
V <sub>OL(P)</sub>	Quiet output, maximum dynamic V <sub>OL</sub>		1.1	1.5	V
V <sub>OL(V)</sub>	Quiet output, minimum dynamic V <sub>OL</sub>		-1.1	-1.5	V
V <sub>OH(V)</sub>	Quiet output, maximum dynamic V <sub>OH</sub>		4		V
V <sub>IH(D)</sub>	High-level dynamic input voltage	2			V
V <sub>IL(D)</sub>	Low-level dynamic input voltage			0.8	V

(1) Characteristics are for surface-mount packages only.

## **Operating Characteristics**

 $V_{CC} = 5 \text{ V}, \text{ T}_{A} = 25^{\circ}\text{C}$ 

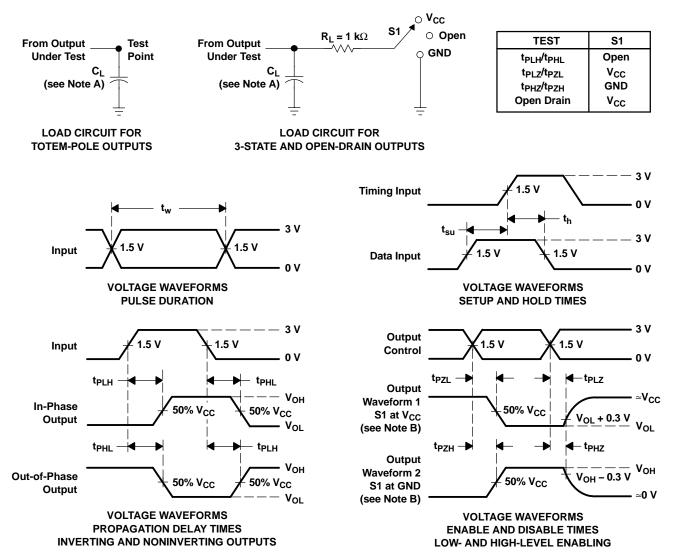
	PARAMETER		TEST CO	NDITIONS	TYP	UNIT
C <sub>pd</sub>	Power dissipation capacitance	Outputs enabled	C <sub>L</sub> = 50 pF,	f = 10 MHz	8	pF

## SN74LV573AT OCTAL TRANSPARENT D-TYPE LATCH WITH 3-STATE OUTPUTS

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#### PARAMETER MEASUREMENT INFORMATION



NOTES: A. CL 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  $\leq$  1 MHz, Z<sub>Q</sub> = 50  $\Omega$ , t<sub>f</sub>  $\leq$  3 ns, t<sub>f</sub>  $\leq$  3 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.  $t_{PHL}$  and  $t_{PLH}$  are the same as  $t_{pd}$ .
- H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuits and Voltage Waveforms

4-Jun-2007

### **PACKAGING INFORMATION**

**i** 

**TEXAS** TRUMENTS www.ti.com

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	e Eco Plan <sup>(2)</sup>	Lead/Ball Finish	MSL Peak Temp <sup>(3)</sup>
SN74LV573ATDBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDBRE4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDBRG4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDGVR	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDGVRE4	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDGVRG4	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATDWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATNSR	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATNSRE4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATNSRG4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATPW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATPWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATPWG4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATPWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATPWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATPWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV573ATRGYR	ACTIVE	QFN	RGY	20	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR
SN74LV573ATRGYRG4	ACTIVE	QFN	RGY	20	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1 YEAR

(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.

(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.

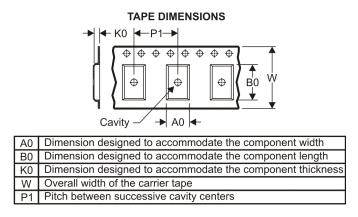
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## TAPE AND REEL INFORMATION





## QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE

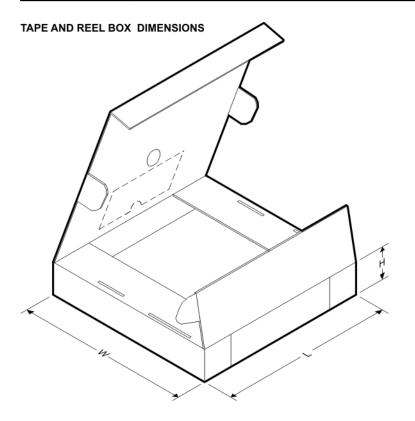


*All dimensions are nominal												
Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LV573ATDBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74LV573ATDGVR	TVSOP	DGV	20	2000	330.0	12.4	7.0	5.6	1.6	8.0	12.0	Q1
SN74LV573ATDWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
SN74LV573ATNSR	SO	NS	20	2000	330.0	24.4	8.2	13.0	2.5	12.0	24.0	Q1
SN74LV573ATPWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1
SN74LV573ATRGYR	QFN	RGY	20	1000	180.0	12.4	3.8	4.8	1.6	8.0	12.0	Q1



# PACKAGE MATERIALS INFORMATION

5-Aug-2008



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74LV573ATDBR	SSOP	DB	20	2000	346.0	346.0	33.0
SN74LV573ATDGVR	TVSOP	DGV	20	2000	346.0	346.0	29.0
SN74LV573ATDWR	SOIC	DW	20	2000	346.0	346.0	41.0
SN74LV573ATNSR	SO	NS	20	2000	346.0	346.0	41.0
SN74LV573ATPWR	TSSOP	PW	20	2000	346.0	346.0	33.0
SN74LV573ATRGYR	QFN	RGY	20	1000	190.5	212.7	31.8

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



MTSS001C - JANUARY 1995 - REVISED FEBRUARY 1999

# PW (R-PDSO-G\*\*)

#### PLASTIC SMALL-OUTLINE PACKAGE

14 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-153



### PLASTIC SMALL-OUTLINE PACKAGE

#### 0,51 0,35 ⊕0,25⊛ 1,27 8 14 0,15 NOM 5,60 8,20 5,00 7,40 $\bigcirc$ Gage Plane ₽ 0,25 7 1 1,05 0,55 0°-10° Δ 0,15 0,05 Seating Plane — 2,00 MAX 0,10PINS \*\* 14 16 20 24 DIM 10,50 10,50 12,90 15,30 A MAX A MIN 9,90 9,90 12,30 14,70 4040062/C 03/03

NOTES: A. All linear dimensions are in millimeters.

NS (R-PDSO-G\*\*)

**14-PINS SHOWN** 

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.



PLASTIC SMALL-OUTLINE

MPDS006C - FEBRUARY 1996 - REVISED AUGUST 2000

### DGV (R-PDSO-G\*\*)

24 PINS SHOWN



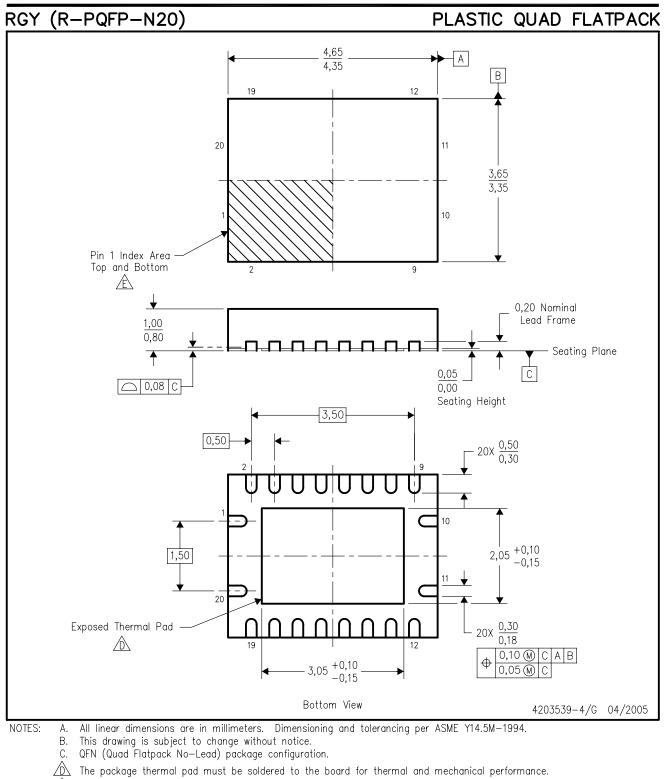
NOTES: A. All linear dimensions are in millimeters.

B. This drawing is subject to change without notice.

- C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
- D. Falls within JEDEC: 24/48 Pins MO-153

14/16/20/56 Pins – MO-194





- Pin 1 identifiers are located on both top and bottom of the package and within the zone indicated. The Pin 1 identifiers are either a molded, marked, or metal feature.
- F. Package complies to JEDEC MO-241 variation BC.





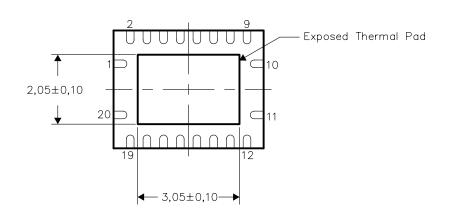
# THERMAL PAD MECHANICAL DATA

#### THERMAL INFORMATION

This package incorporates an exposed thermal pad that is designed to be attached directly to an external heatsink. The thermal pad must be soldered directly to the printed circuit board (PCB). After soldering, the PCB can be used as a heatsink. In addition, through the use of thermal vias, the thermal pad can be attached directly to the appropriate copper plane shown in the electrical schematic for the device, or alternatively, can be attached to a special heatsink structure designed into the PCB. This design optimizes the heat transfer from the integrated circuit (IC).

For information on the Quad Flatpack No-Lead (QFN) package and its advantages, refer to Application Report, Quad Flatpack No-Lead Logic Packages, Texas Instruments Literature No. SCBA017. This document is available at www.ti.com.

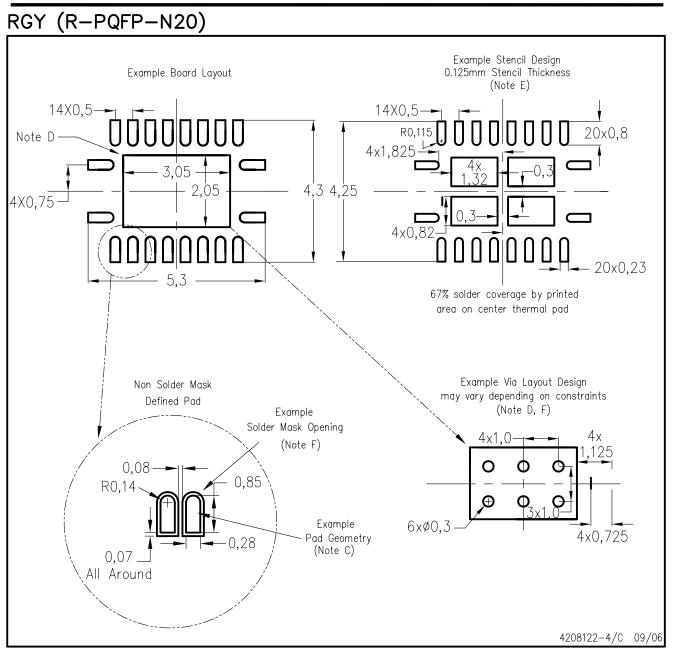
The exposed thermal pad dimensions for this package are shown in the following illustration.





NOTE: All linear dimensions are in millimeters

Exposed Thermal Pad Dimensions



NOTES: A. All linear dimensions are in millimeters.

- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. This package is designed to be soldered to a thermal pad on the board. Refer to Application Note, Quad Flat-Pack Packages, Texas Instruments Literature No. SCBA017, SLUA271, and also the Product Data Sheets for specific thermal information, via requirements, and recommended board layout. These documents are available at www.ti.com <a href="http://www.ti.com">http://www.ti.com</a>.
- E. 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 stencil design considerations.
- F. Customers should contact their board fabrication site for minimum solder mask web tolerances between signal pads.



DW (R-PDSO-G20)

PLASTIC SMALL-OUTLINE PACKAGE



NOTES: 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.



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