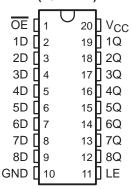
SCLS147E - DECEMBER 1982 - REVISED SEPTEMBER 2003

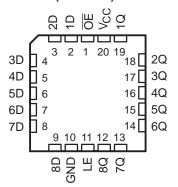
- Wide Operating Voltage Range of 2 V to 6 V
- High-Current 3-State Outputs Drive Bus Lines Directly or Up To 15 LSTTL Loads
- Low Power Consumption, 80-μA Max I<sub>CC</sub>

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



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

SN54HC573A . . . FK PACKAGE (TOP VIEW)



### 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.

#### ORDERING INFORMATION

TA	PACK	AGET	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	PDIP – N	Tube of 25	SN74HC573AN	SN74HC573AN
-40°C to 85°C	COIC DW	Tube of 40	SN74HC573ADW	LICETOA
	SOIC – DW	Reel of 2500	SN74HC573ADWR	HC573A
	SSOP – DB	Reel of 2000	SN74HC573ADBR	HC573A
	TSSOP – PW	Reel of 2000	SN74HC573APWR	HC573A
	1550P - 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

<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.



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### description/ordering information (continued)

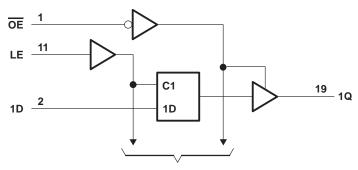
To ensure the high-impedance state during power up or power down,  $\overline{OE}$  should be tied to  $V_{CC}$  through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

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.

### 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

### logic diagram (positive logic)



To Seven Other Channels

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

Supply voltage range, V <sub>CC</sub>		0.5 V to 7 V
Input clamp current, $I_{IK}$ ( $V_I < 0$ or $V_I > V_{CC}$ ) (see	ee Note 1)	±20 mA
Output clamp current, IOK (VO < 0 or VO > VCO	C) (see Note 1)	±20 mA
Continuous output current, $I_O$ ( $V_O = 0$ to $V_{CC}$ )	- 	±35 mA
Continuous current through V <sub>CC</sub> or GND		±70 mA
Package thermal impedance, $\theta_{JA}$ (see Note 2):	: DB package	70°C/W
	DW package	58°C/W
	N package	69°C/W
	PW package	83°C/W
Storage temperature range, T <sub>stg</sub>		-65°C to 150°C

<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.



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### recommended operating conditions (see Note 3)

			SN	54HC57	3A	SN	74HC57	3A	LINUT
			MIN	NOM	MAX	MIN	NOM	MAX	UNIT
VCC	Supply voltage		2	5	6	2	5	6	V
		V <sub>CC</sub> = 2 V	1.5			1.5			
VIH	High-level input voltage	V <sub>CC</sub> = 4.5 V	3.15			3.15			V
		V <sub>CC</sub> = 6 V	4.2			4.2			
		V <sub>CC</sub> = 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 <sub>CC</sub> = 2 V			1000			1000	
t <sub>t</sub>	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)

	TEGT COMPLETIONS			Т	A = 25°C	;	SN54H	C573A	SN74HC	C573A	
PARAMETER	TEST CO	ONDITIONS	VCC	MIN	TYP	MAX	MIN	MAX	MIN	MAX	UNIT
			2 V	1.9	1.998		1.9		1.9		
		$I_{OH} = -20  \mu A$	4.5 V	4.4	4.499		4.4		4.4		
Voн	VI = VIH or VIL		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		
		$I_{OH} = -7.8 \text{ mA}$	6 V	5.48	5.8		5.2		5.34		
		I <sub>OL</sub> = 20 μA	2 V		0.002	0.1		0.1		0.1	
			4.5 V		0.001	0.1		0.1		0.1	
VOL	$V_I = V_{IH}$ or $V_{IL}$		6 V		0.001	0.1		0.1		0.1	V
		I <sub>OL</sub> = 6 mA	4.5 V		0.17	0.26		0.4		0.33	
		$I_{OL} = 7.8 \text{ mA}$	6 V		0.15	0.26		0.4		0.33	
lį	VI = VCC or 0		6 V		±0.1	±100		±1000		±1000	nA
loz	VO = VCC or 0	•	6 V		±0.01	±0.5		±10		±5	μΑ
Icc	$V_I = V_{CC}$ or 0,	IO = 0	6 V			8		160		80	μΑ
C <sub>i</sub>			2 V to 6 V		3	10		10		10	pF

### SN54HC573A, SN74HC573A OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

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## 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		
t <sub>w</sub>	Pulse duration, LE high	4.5 V	16		24		20		ns
		6 V	14		20		17		
		2 V	50		75		63		ns
tsu	Setup time, data before LE↓	4.5 V	10		15		13		
		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 pF (unless otherwise noted) (see Figure 1)

	FROM	то		T,	Δ = 25°C	;	SN54H	C573A	SN74H	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		
		OE Any Q	2 V		68	150		225		190	ns	
t <sub>en</sub>	ŌĒ		4.5 V		24	30		45		38		
			6 V		21	26		38		32		
			2 V		47	150		225		190		
<sup>t</sup> dis	ŌĒ	Any Q	4.5 V		23	30		45		38	ns	
			6 V		21	26		38		32		
			2 V	_	28	60		90		75		
t <sub>t</sub>		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

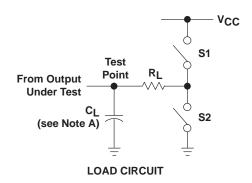
# switching characteristics over recommended operating free-air temperature range, $C_L$ = 150 pF (unless otherwise noted) (see Figure 1)

242445	FROM	то	,,	T	չ = 25°C	;	SN54H0	C573A	SN74H0	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															
<sup>t</sup> pd			6 V		21	34		51		43															
		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															
t <sub>en</sub>	ŌĒ	Any Q	4.5 V		29	40		60		50	ns														
			6 V		26	34		51		43															
		Any Q	2 V		60	210		315		265															
t <sub>t</sub>			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
			6 V		14	36		53		45															

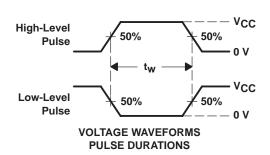
### operating characteristics, $T_A = 25^{\circ}C$

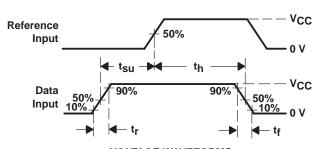
	PARAMETER	TEST CONDITIONS	TYP	UNIT
C <sub>pd</sub>	Power dissipation capacitance per latch	No load	50	pF

#### PARAMETER MEASUREMENT INFORMATION

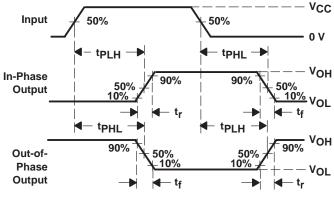


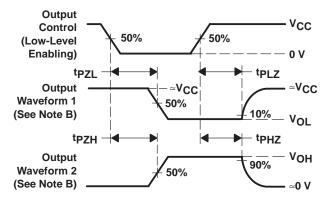
PARAI	PARAMETER		CL	S1	S2	
tPZH		<b>1 k</b> Ω	50 pF	Open	Closed	
ten t	1 kΩ or 150 pF		Closed	Open		
	tPHZ			Open	Closed	
<sup>t</sup> dis	tPLZ	<b>1 k</b> Ω	50 pF	Closed	Open	
t <sub>pd</sub> or t <sub>t</sub>			50 pF or 150 pF	Open	Open	





VOLTAGE WAVEFORMS
SETUP AND HOLD AND INPUT RISE AND FALL TIMES





VOLTAGE WAVEFORMS
PROPAGATION DELAY AND OUTPUT TRANSITION TIMES

VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES FOR 3-STATE OUTPUTS

NOTES: A. C<sub>L</sub> 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. tpl 7 and tpH7 are the same as tdis.
- F. tpzL and tpzH are the same as ten.
- G. tpLH and tpHL are the same as tpd.

Figure 1. Load Circuit and Voltage Waveforms





### **PACKAGING INFORMATION**

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>
5962-8512801VRA	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
5962-8512801VSA	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type
85128012A	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
8512801RA	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
8512801SA	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type
JM38510/65406BRA	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
SN54HC573AJ	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
SN74HC573ADBR	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADBRE4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADBRG4	ACTIVE	SSOP	DB	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573ADWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573AN	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HC573AN3	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI
SN74HC573ANE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN74HC573APWLE	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI
SN74HC573APWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573APWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573APWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573APWT	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573APWTE4	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74HC573APWTG4	ACTIVE	TSSOP	PW	20	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SNJ54HC573AFK	ACTIVE	LCCC	FK	20	1	TBD	POST-PLATE	N / A for Pkg Type
SNJ54HC573AJ	ACTIVE	CDIP	J	20	1	TBD	A42 SNPB	N / A for Pkg Type
SNJ54HC573AW	ACTIVE	CFP	W	20	1	TBD	A42	N / A for Pkg Type

 $<sup>^{(1)}</sup>$  The marketing status values are defined as follows:



### PACKAGE OPTION ADDENDUM

9-Oct-2007

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)

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

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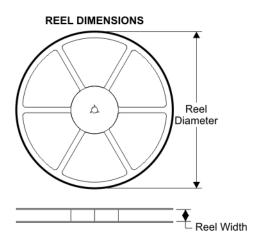
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

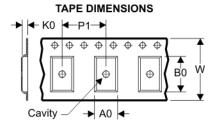




i.com 4-Oct-2007

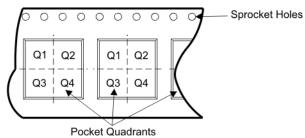
### TAPE AND REEL BOX INFORMATION





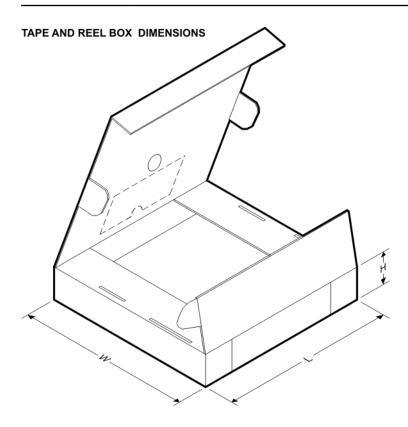
	40	Dimension designed to accommodate the component width
	30	Dimension designed to accommodate the component length
Ŀ	<b>&lt;</b> 0	Dimension designed to accommodate the component thickness
		Overall width of the carrier tape
П	Ρ1	Pitch between successive cavity centers

### QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



Device	Package	Pins	Site	Reel Diameter (mm)	Reel Width (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74HC573ADBR	DB	20	SITE 41	330	16	8.2	7.5	2.5	12	16	Q1
SN74HC573ADWR	DW	20	SITE 41	330	24	10.8	13.0	2.7	12	24	Q1
SN74HC573APWR	PW	20	SITE 41	330	16	6.95	7.1	1.6	8	16	Q1





Device	Package		Site	Length (mm)	Width (mm)	Height (mm)	
SN74HC573ADBR	DB	20	SITE 41	346.0	346.0	33.0	
SN74HC573ADWR	DW	20	SITE 41	346.0	346.0	41.0	
SN74HC573APWR	PW	20	SITE 41	346.0	346.0	33.0	

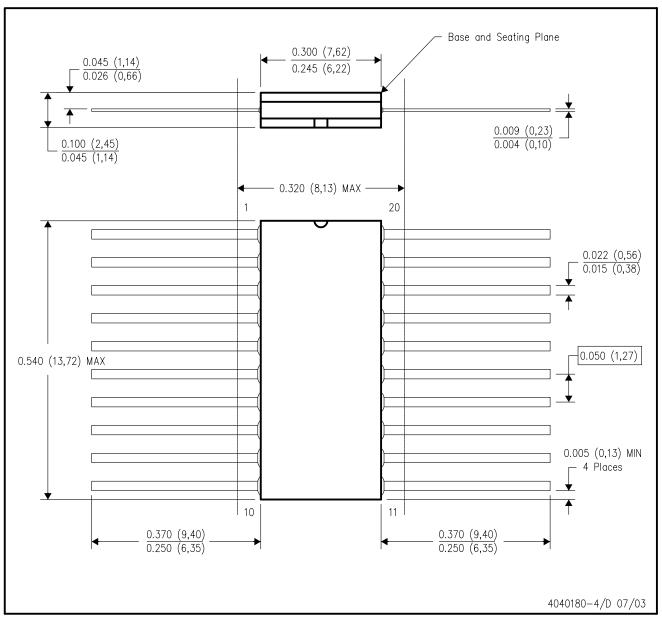
### 14 LEADS SHOWN



- 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



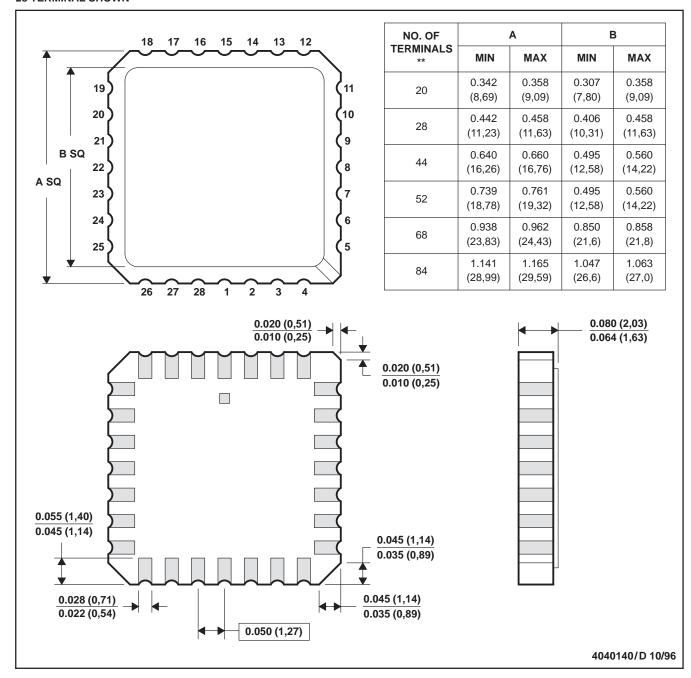
- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within Mil-Std 1835 GDFP2-F20



### 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

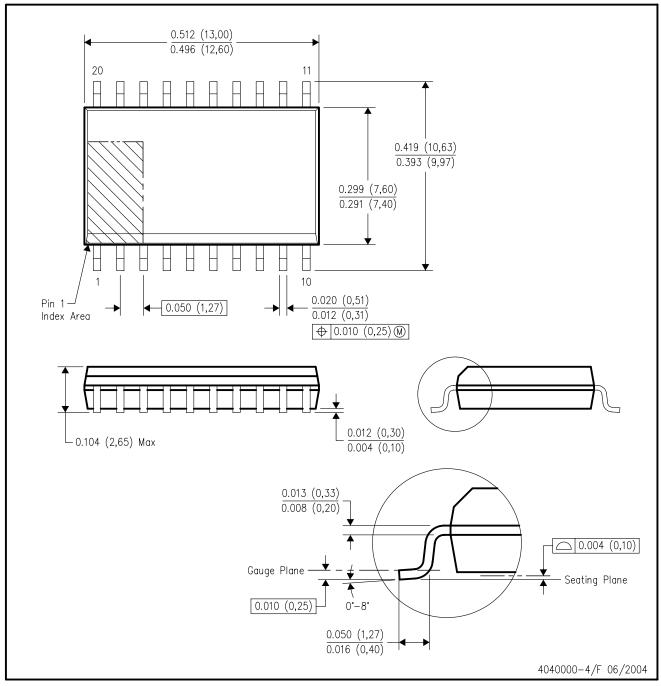


- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).
- The 20 pin end lead shoulder width is a vendor option, either half or full width.



### DW (R-PDSO-G20)

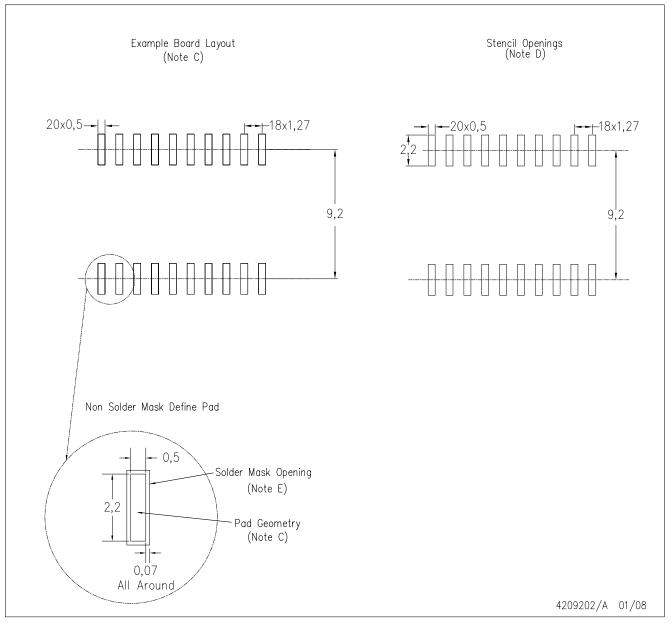
### PLASTIC SMALL-OUTLINE PACKAGE



- 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.



### DW (R-PDSO-G20)



- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Customers should place a note on the circuit board fabrication drawing not to alter the center solder mask defined pad.
- 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.



### 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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