

# SNx4AHC573 Octal Transparent D-Type Latches With 3-State Outputs

## 1 Features

- Operating range 2V to 5.5V  $V_{CC}$
- 3-state outputs directly drive bus lines
- Latch-up performance exceeds 250mA per JESD 17
- 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.

## 2 Applications

- Servers
- PCs and Notebooks
- Network Switches
- Wearable Health and Fitness Devices
- Telecom Infrastructures
- Electronic Points of Sale

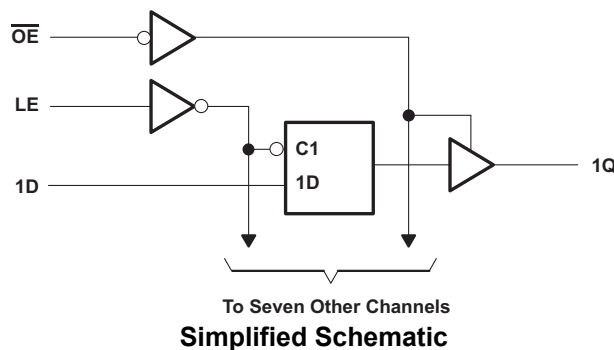
## 3 Description

The SNx4AHC573 devices are octal transparent D-type latches designed for 2V to 5.5V  $V_{CC}$  operation.

### Device Information

PART NUMBER	PACKAGE <sup>(1)</sup>	PACKAGE SIZE <sup>(2)</sup>	BODY SIZE <sup>(3)</sup>
SNx4AHC573	DB (SSOP, 20)	7.50mm × 7.8mm	7.50mm × 5.30mm
	DGV (TVSOP, 20)	5.00mm × 6.4mm	5.00mm × 4.40mm
	DW (SOIC, 20)	12.80mm × 10.3mm	12.8mm × 7.5mm
	N (PDIP, 20)	25.40mm × 9.4mm	25.40mm × 6.35mm
	NS (SOP, 20)	12.6mm × 7.8mm	12.6mm × 5.3mm
	PW (TSSOP, 20)	6.50mm × 6.4mm	6.50mm × 4.40mm

- (1) For more information, see [Section 11](#).
- (2) The package size (length × width) is a nominal value and includes pins, where applicable.
- (3) The body size (length × width) is a nominal value and does not include pins.

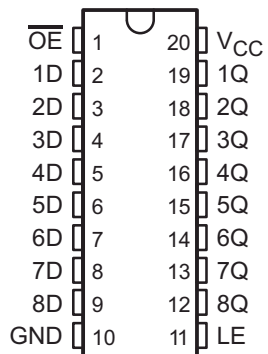


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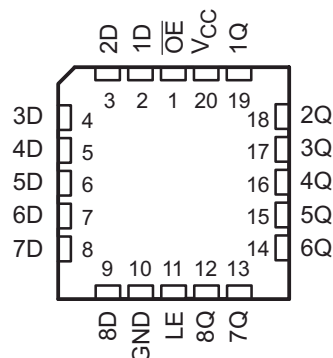
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## 4 Pin Configuration and Functions

SN54AHC573 . . . J OR W PACKAGE  
SN74AHC573 . . . DB, DGV, DW, N, NS, OR PW PACKAGE  
(TOP VIEW)



SN54AHC573 . . . FK PACKAGE  
(TOP VIEW)



PIN		I/O	DESCRIPTION
NO.	NAME		
1	OE	I	Output Enable
2	1D	I	1D Input
3	2D	I	2D Input
4	3D	I	3D Input
5	4D	I	4D Input
6	5D	I	5D Input
7	6D	I	6D Input
8	7D	I	7D Input
9	8D	I	8D Input
10	GND	—	Ground
11	LE	I	Latch Enable
12	8Q	O	8Q Output
13	7Q	O	7Q Output
14	6Q	O	6Q Output
15	5Q	O	5Q Output
16	4Q	O	4Q Output
17	3Q	O	3Q Output
18	2Q	O	2Q Output
19	1Q	O	1Q Output
20	V <sub>CC</sub>	—	Power Pin

## 5 Specifications

### 5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted) <sup>(1)</sup>

			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage range		−0.5	7	V
V <sub>I</sub>	Input voltage range <sup>(2)</sup>		−0.5	7	V
V <sub>O</sub>	Output voltage range <sup>(2)</sup>		−0.5	V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Input clamp current	V <sub>I</sub> < 0	−20		mA
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> < 0 or V <sub>O</sub> > V <sub>CC</sub>	±20		mA
I <sub>O</sub>	Continuous output current	V <sub>O</sub> = 0 to V <sub>CC</sub>	±25		mA
	Continuous current through V <sub>CC</sub> or GND		±75		mA
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 voltage ratings may be exceeded if the input and output current ratings are observed.

### 5.2 ESD Ratings

		Value	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001, all pins <sup>(1)</sup>	±2000
		Charged device model (CDM), per JEDEC specification JESD22-C101, all pins <sup>(2)</sup>	±1000

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.

(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

## 5.3 Recommended Operating Conditions

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

			SN54AHC573		SN74AHC573		UNIT
			MIN	MAX	MIN	MAX	
V <sub>CC</sub>	Supply voltage		2	5.5	2	5.5	V
V <sub>IH</sub>	High-level input voltage	V <sub>CC</sub> = 2 V	1.5		1.5		V
		V <sub>CC</sub> = 3 V	2.1		2.1		
		V <sub>CC</sub> = 5.5 V	3.85		3.85		
V <sub>IL</sub>	Low-level input voltage	V <sub>CC</sub> = 2 V		0.5		0.5	V
		V <sub>CC</sub> = 3 V		0.9		0.9	
		V <sub>CC</sub> = 5.5 V		1.65		1.65	
V <sub>I</sub>	Input voltage		0	5.5	0	5.5	V
V <sub>O</sub>	Output voltage		0	V <sub>CC</sub>	0	V <sub>CC</sub>	V
I <sub>OH</sub>	High-level output current	V <sub>CC</sub> = 2 V		–50		–50	μA
		V <sub>CC</sub> = 3.3 V ± 0.3 V		–4		–4	mA
		V <sub>CC</sub> = 5 V ± 0.5 V		–8		–8	
I <sub>OL</sub>	Low-level output current	V <sub>CC</sub> = 2 V		50		50	μA
		V <sub>CC</sub> = 3.3 V ± 0.3 V		4		4	mA
		V <sub>CC</sub> = 5 V ± 0.5 V		8		8	
Δt/Δv	Input transition rise or fall rate	V <sub>CC</sub> = 3.3 V ± 0.3 V		100		100	ns/V
		V <sub>CC</sub> = 5 V ± 0.5 V		20		20	
T <sub>A</sub>	Operating free-air temperature		–55	125	–40	125	°C

(1) 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* (SCBA004).

## 5.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>		SN74AHC573						UNIT
		DW	DB	DGV	N	NS	PW	
		20 PINS						
R <sub>θJA</sub>	Junction-to-ambient thermal resistance	81.1	97.9	117.2	53.3	77.6	116.8	°C/W
R <sub>θJC(top)</sub>	Junction-to-case (top) thermal resistance	48.9	59.6	32.7	40.0	42.7	58.5	
R <sub>θJB</sub>	Junction-to-board thermal resistance	53.8	53.1	58.7	34.2	45.7	78.7	
Ψ <sub>JT</sub>	Junction-to-top characterization parameter	19.5	21.3	1.15	26.4	10.2	12.6	
Ψ <sub>JB</sub>	Junction-to-board characterization parameter	53.1	52.7	58.0	34.1	45.2	77.9	
R <sub>θJC(bot)</sub>	Junction-to-case (bottom) thermal resistance	N/A	N/A	N/A	N/A	N/A	N/A	

(1) For more information about traditional and new thermal metrics, see the *IC Package Thermal Metrics* application report (SPRA953).

## 5.5 Electrical Characteristics

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

PARAMETER	TEST CONDITIONS	V <sub>CC</sub>	T <sub>A</sub> = 25°C			SN54AHC573		SN74AHC573		–40°C to 125°C SN74AHC573		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
V <sub>OH</sub>	I <sub>OH</sub> = –50 µA	2 V	1.9	2		1.9		1.9		1.9		V
		3 V	2.9	3		2.9		2.9		2.9		
		4.5 V	4.4	4.5		4.4		4.4		4.4		
	I <sub>OH</sub> = –4 mA	3 V	2.58			2.48		2.48		2.48		V
	I <sub>OH</sub> = –8 mA	4.5 V	3.94			3.8		3.8		3.8		
V <sub>OL</sub>	I <sub>OL</sub> = 50 µA	2 V			0.1		0.1		0.1		0.1	V
		3 V			0.1		0.1		0.1		0.1	
		4.5 V			0.1		0.1		0.1		0.1	
	I <sub>OL</sub> = 4 mA	3 V			0.36		0.5		0.44		0.44	V
	I <sub>OL</sub> = 8 mA	4.5 V			0.36		0.5		0.44		0.44	
I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	0 V to 5.5 V			±0.1		±1 <sup>(1)</sup>		±1		±1	µA
I <sub>OZ</sub>	V <sub>I</sub> = V <sub>IL</sub> or V <sub>IH</sub> , V <sub>O</sub> = V <sub>CC</sub> or GND	5.5 V			±0.25		±2.5		±2.5		±2.5	µA
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V			4		40		40		40	µA
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V		2.5	10				10		10	pF
C <sub>o</sub>	V <sub>O</sub> = V <sub>CC</sub> or GND	5 V		3.5								pF

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested at V<sub>CC</sub> = 0 V.

## 5.6 Timing Requirements, V<sub>CC</sub> = 3.3 V ± 0.3 V

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER		T <sub>A</sub> = 25°C		SN54AHC573		SN74AHC573		T <sub>A</sub> = –40°C to 125°C SN74AHC573		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>w</sub>	Pulse duration, LE high	5		5		5		5		ns
t <sub>su</sub>	Setup time, data before LE↓	3.5		3.5		3.5		3.5		ns
t <sub>h</sub>	Hold time, data after LE↓	1.5		1.5		1.5		1.5		ns

## 5.7 Timing Requirements, V<sub>CC</sub> = 5 V ± 0.5 V

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER		T <sub>A</sub> = 25°C		SN54AHC573		SN74AHC573		T <sub>A</sub> = –40°C to 125°C SN74AHC573		UNIT
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>w</sub>	Pulse duration, LE high	5		5		5		5		ns
t <sub>su</sub>	Setup time, data before LE↓	3.5		3.5		3.5		3.5		ns
t <sub>h</sub>	Hold time, data after LE↓	1.5		1.5		1.5		1.5		ns

## 5.8 Switching Characteristics, $V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T <sub>A</sub> = 25°C			SN54AHC573		SN74AHC573		T <sub>A</sub> = −40°C to 125°C SN74AHC573		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	D	Q	C <sub>L</sub> = 15 pF	7 <sup>(1)</sup>	11 <sup>(1)</sup>	1 <sup>(1)</sup>	13 <sup>(1)</sup>	1	13	1	14	ns	
t <sub>PHL</sub>				7 <sup>(1)</sup>	11 <sup>(1)</sup>	1 <sup>(1)</sup>	13 <sup>(1)</sup>	1	13	1	14		
t <sub>PLH</sub>	LE	Q	C <sub>L</sub> = 15 pF	7.6 <sup>(1)</sup>	11.9 <sup>(1)</sup>	1 <sup>(1)</sup>	14 <sup>(1)</sup>	1	14	1	15	ns	
t <sub>PHL</sub>				7.6 <sup>(1)</sup>	11.9 <sup>(1)</sup>	1 <sup>(1)</sup>	14 <sup>(1)</sup>	1	14	1	15		
t <sub>PZH</sub>	OE	Q	C <sub>L</sub> = 15 pF	7.3 <sup>(1)</sup>	11.5 <sup>(1)</sup>	1 <sup>(1)</sup>	13.5 <sup>(1)</sup>	1	13.5	1	14.5	ns	
t <sub>PZL</sub>				7.3 <sup>(1)</sup>	11.5 <sup>(1)</sup>	1 <sup>(1)</sup>	13.5 <sup>(1)</sup>	1	13.5	1	14.5		
t <sub>PHZ</sub>	OE	Q	C <sub>L</sub> = 15 pF	8.3 <sup>(1)</sup>	11 <sup>(1)</sup>	1 <sup>(1)</sup>	13 <sup>(1)</sup>	1	13	1	14	ns	
t <sub>PLZ</sub>				8.3 <sup>(1)</sup>	11 <sup>(1)</sup>	1 <sup>(1)</sup>	13 <sup>(1)</sup>	1	13	1	14		
t <sub>PLH</sub>	D	Q	C <sub>L</sub> = 50 pF	9.5	14.5	1	16.5	1	16.5	1	18	ns	
t <sub>PHL</sub>				9.5	14.5	1	16.5	1	16.5	1	18		
t <sub>PLH</sub>	LE	Q	C <sub>L</sub> = 50 pF	10.1	15.4	1	17.5	1	17.5	1	19	ns	
t <sub>PHL</sub>				10.1	15.4	1	17.5	1	17.5	1	19		
t <sub>PZH</sub>	OE	Q	C <sub>L</sub> = 50 pF	9.8	15	1	17	1	17	1	18	ns	
t <sub>PZL</sub>				9.8	15	1	17	1	17	1	18		
t <sub>PHZ</sub>	OE	Q	C <sub>L</sub> = 50 pF	10.7	14.5	1	16.5	1	16.5	1	17.5	ns	
t <sub>PLZ</sub>				10.7	14.5	1	16.5	1	16.5	1	17.5		
t <sub>sk(o)</sub>			C <sub>L</sub> = 50 pF		1.5 <sup>(2)</sup>				1.5			ns	

- (1) On products compliant to MIL-PRF-38535, this parameter is not production tested.  
(2) On products compliant to MIL-PRF-38535, this parameter does not apply.

## 5.9 Switching Characteristics, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$

over recommended operating free-air temperature range (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T <sub>A</sub> = 25°C			SN54AHC573		SN74AHC573		T <sub>A</sub> = −40°C to 125°C SN74AHC573		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>PLH</sub>	D	Q	C <sub>L</sub> = 15 pF	4.5 <sup>(1)</sup>	6.8 <sup>(1)</sup>	1 <sup>(1)</sup>	8 <sup>(1)</sup>	1	8	1	8.5	ns	
t <sub>PHL</sub>				4.5 <sup>(1)</sup>	6.8 <sup>(1)</sup>	1 <sup>(1)</sup>	8 <sup>(1)</sup>	1	8	1	8.5		
t <sub>PLH</sub>	LE	Q	C <sub>L</sub> = 15 pF	5 <sup>(1)</sup>	7.7 <sup>(1)</sup>	1 <sup>(1)</sup>	9 <sup>(1)</sup>	1	9	1	10	ns	
t <sub>PHL</sub>				5 <sup>(1)</sup>	7.7 <sup>(1)</sup>	1 <sup>(1)</sup>	9 <sup>(1)</sup>	1	9	1	10		
t <sub>PZH</sub>	OE	Q	C <sub>L</sub> = 15 pF	5.2 <sup>(1)</sup>	7.7 <sup>(1)</sup>	1 <sup>(1)</sup>	9 <sup>(1)</sup>	1	9	1	10	ns	
t <sub>PZL</sub>				5.2 <sup>(1)</sup>	7.7 <sup>(1)</sup>	1 <sup>(1)</sup>	9 <sup>(1)</sup>	1	9	1	10		
t <sub>PHZ</sub>	OE	Q	C <sub>L</sub> = 15 pF	5.2 <sup>(1)</sup>	7.7 <sup>(1)</sup>	1 <sup>(1)</sup>	9 <sup>(1)</sup>	1	9	1	10	ns	
t <sub>PLZ</sub>				5.2 <sup>(1)</sup>	7.7 <sup>(1)</sup>	1 <sup>(1)</sup>	9 <sup>(1)</sup>	1	9	1	10		
t <sub>PLH</sub>	D	Q	C <sub>L</sub> = 50 pF	6	8.8	1	10	1	10	1	11	ns	
t <sub>PHL</sub>				6	8.8	1	10	1	10	1	11		
t <sub>PLH</sub>	LE	Q	C <sub>L</sub> = 50 pF	6.5	9.7	1	11	1	11	1	12	ns	
t <sub>PHL</sub>				6.5	9.7	1	11	1	11	1	12		
t <sub>PZH</sub>	OE	Q	C <sub>L</sub> = 50 pF	6.7	9.7	1	11	1	11	1	12	ns	
t <sub>PZL</sub>				6.7	9.7	1	11	1	11	1	12		
t <sub>PHZ</sub>	OE	Q	C <sub>L</sub> = 50 pF	6.7	9.7	1	11	1	11	1	12	ns	
t <sub>PLZ</sub>				6.7	9.7	1	11	1	11	1	12		
t <sub>sk(o)</sub>			C <sub>L</sub> = 50 pF		1 <sup>(2)</sup>				1			ns	

- (1) On products compliant to MIL-PRF-38535, this parameter is not production tested.  
(2) On products compliant to MIL-PRF-38535, this parameter does not apply.

## 5.10 Noise Characteristics

$V_{CC} = 5\text{ V}$ ,  $C_L = 50\text{ pF}$ ,  $T_A = 25^\circ\text{C}$  <sup>(1)</sup>

PARAMETER		SN74AHC573		UNIT
		MIN	MAX	
$V_{OL(P)}$	Quiet output, maximum dynamic $V_{OL}$		1	V
$V_{OL(V)}$	Quiet output, minimum dynamic $V_{OL}$		-0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic $V_{OH}$	4		V
$V_{IH(D)}$	High-level dynamic input voltage	3.5		V
$V_{IL(D)}$	Low-level dynamic input voltage		1.5	V

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

## 5.11 Operating Characteristics

$V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$

PARAMETER		TEST CONDITIONS		TYP	UNIT
$C_{pd}$	Power dissipation capacitance	No load,	$f = 1\text{ MHz}$	16	pF

## 5.12 Typical Characteristics

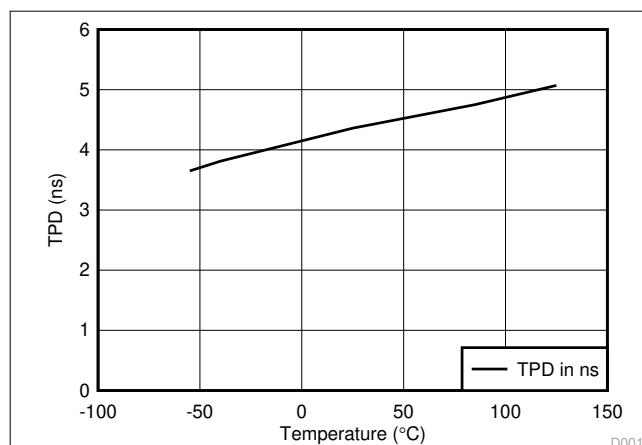


Figure 5-1. TPD vs Temperature at 5 V

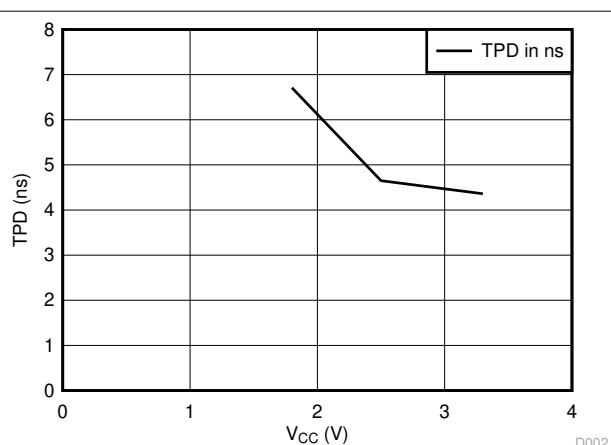
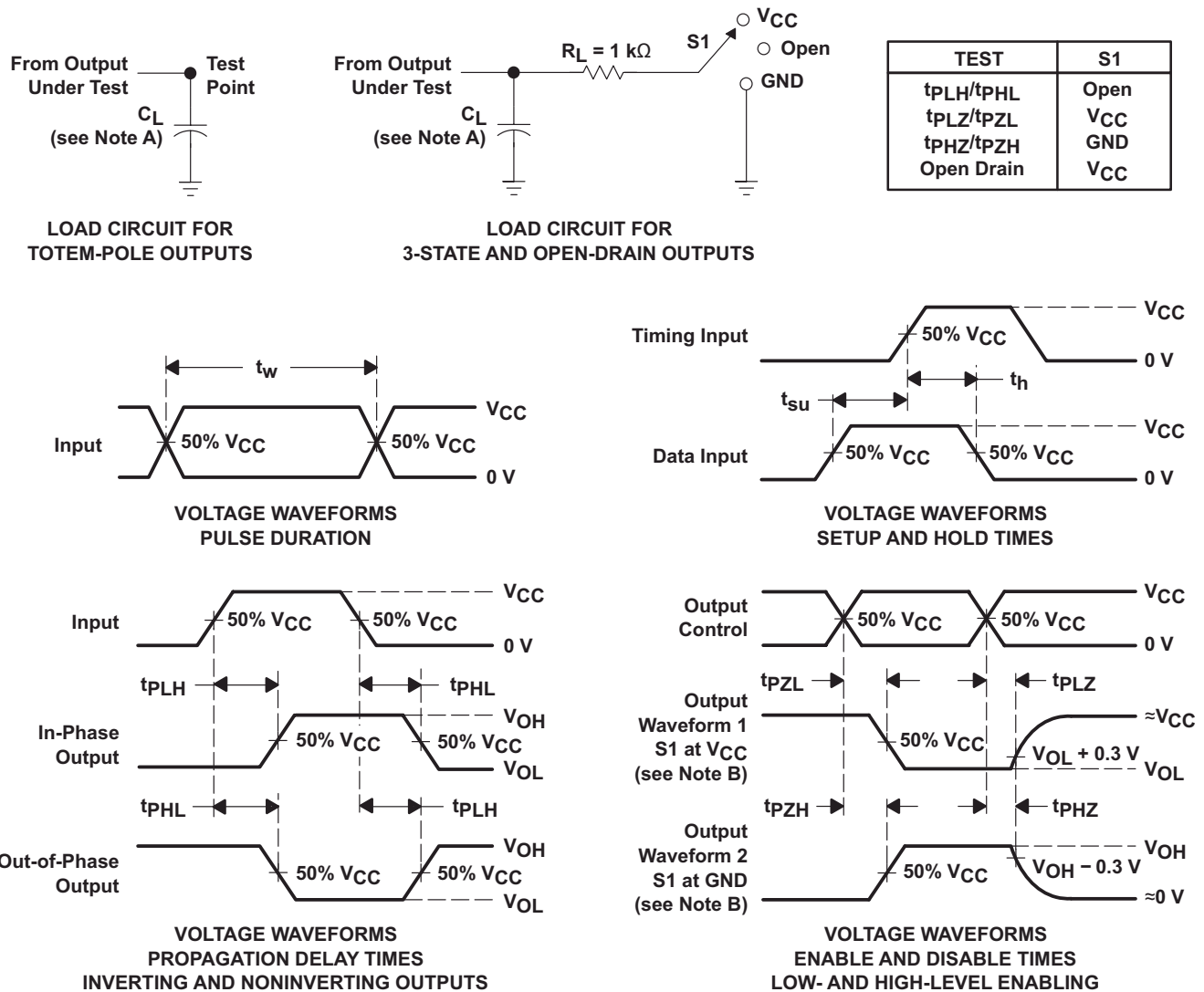


Figure 5-2. TPD vs  $V_{CC}$

## 6 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:  $PRR \leq 1\text{ MHz}$ ,  $Z_O = 50\ \Omega$ ,  $t_r \leq 3\text{ ns}$ ,  $t_f \leq 3\text{ ns}$ .  
D. The outputs are measured one at a time with one input transition per measurement.  
E. All parameters and waveforms are not applicable to all devices.

**Figure 6-1. Load Circuit and Voltage Waveforms**

## 7 Detailed Description

### 7.1 Overview

The SNx4AHC573 devices are octal transparent D-type latches designed for 2-V to 5.5-V  $V_{CC}$  operation.

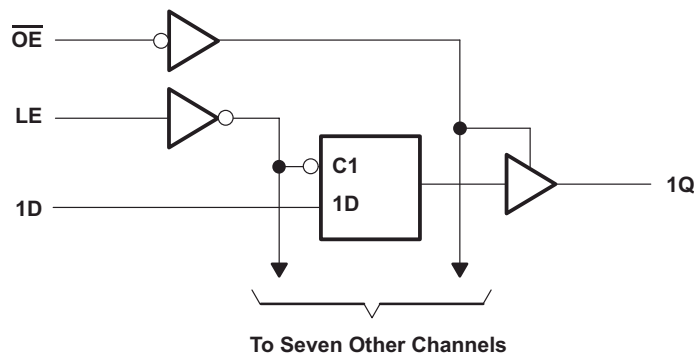
When the latch-enable (LE) input is high, the Q outputs follow the data (D) inputs. When LE is low, the Q outputs are latched at the logic levels of the D inputs.

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 pull-up components.

$\overline{OE}$  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 pull-up resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

### 7.2 Functional Block Diagram



### 7.3 Feature Description

- Wide operating voltage range
  - Operates from 2 V to 5.5 V
- Allows down voltage translation
  - Inputs accept voltages to 5.5 V
- Slow edges reduce output ringing

### 7.4 Device Functional Modes

**Table 7-1. Function Table  
(Each Latch)**

INPUTS			OUTPUT
$\overline{OE}$	LE	D	Q
L	H	H	H
L	H	L	L
L	L	X	$Q_0$
H	X	X	Z

## 8 Application and Implementation

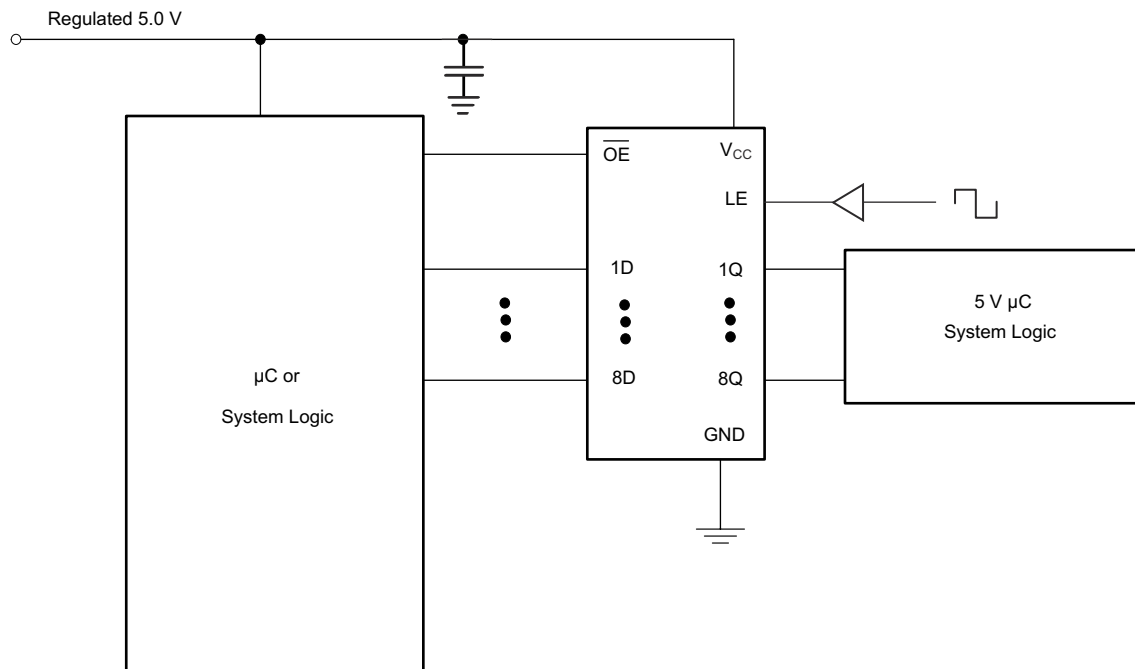
### Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

### 8.1 Application Information

The SN74AHC573 is a low-drive CMOS device that can be used for a multitude of bus-interface type applications where output ringing is a concern. The low drive and slow edge rates will minimize overshoot and undershoot on the outputs. The inputs accept voltages up to 5.5 V allowing down translation to the  $V_{CC}$  level. Figure 8-2 shows how the slower edges can reduce ringing on the output compared to higher drive parts like AC.

### 8.2 Typical Application



**Figure 8-1. Typical Application Schematic**

#### 8.2.1 Design Requirements

This device uses CMOS technology and has balanced output drive. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. The high drive will also create fast edges into light loads; therefore, routing and load conditions should be considered to prevent ringing.

#### 8.2.2 Detailed Design Procedure

- Recommended input conditions
  - Rise time and fall time specs: See  $(\Delta t/\Delta V)$  in the [Section 5.3](#) table.
  - Specified High and low levels: See  $(V_{IH}$  and  $V_{IL})$  in the [Section 5.3](#) table.
  - Inputs are overvoltage tolerant allowing them to go as high as 5.5 V at any valid  $V_{CC}$ .
- Recommend output conditions
  - Load currents should not exceed 25 mA per output and 75 mA total for the part.
  - Outputs should not be pulled above  $V_{CC}$ .

### 8.2.3 Application Curves

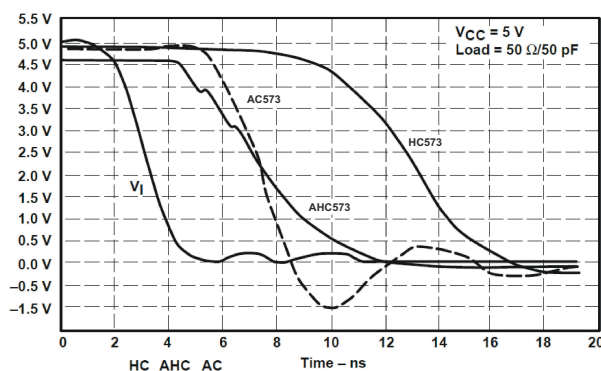


Figure 8-2. Switching Characteristics Comparison

## 8.3 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the [Section 5.3](#) table.

Each  $V_{CC}$  pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, 0.1  $\mu\text{F}$  bypass capacitor is recommended. If there are multiple  $V_{CC}$  pins, 0.01  $\mu\text{F}$  or 0.022  $\mu\text{F}$  is recommended for each power pin. It is acceptable to parallel multiple bypass capacitors to reject different frequencies of noise. A 0.1  $\mu\text{F}$  and 1  $\mu\text{F}$  are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

## 8.4 Layout

### 8.4.1 Layout Guidelines

When using multiple bit logic devices inputs should not ever float.

In many cases, functions or parts of functions of digital logic devices are unused, for example, when only two inputs of a triple-input AND gate are used or only 3 of the 4 buffer gates are used. Such input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. Specified in [Figure 8-3](#) are the rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or  $V_{CC}$ ; whichever makes more sense or is more convenient. It is generally acceptable to float outputs unless the part is a transceiver. If the transceiver has an output enable pin, it will disable the outputs section of the part when asserted. This will not disable the input section of the IO's so they cannot float when disabled.

### 8.4.2 Layout Example

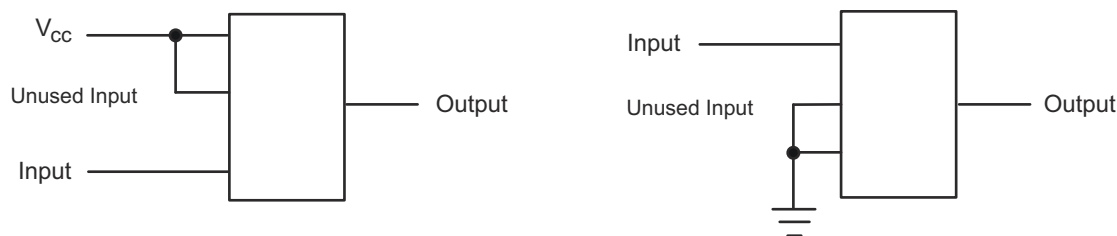


Figure 8-3. Layout Diagram

## 9 Device and Documentation Support

### 9.1 Related Links

The table below lists quick access links. Categories include technical documents, support and community resources, tools and software, and quick access to sample or buy.

**Table 9-1. Related Links**

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN54AHC573	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
SN74AHC573	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>

### 9.2 Trademarks

All trademarks are the property of their respective owners.

### 9.3 Electrostatic Discharge Caution



This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

### 9.4 Glossary

[TI Glossary](#)

This glossary lists and explains terms, acronyms, and definitions.

## 10 Revision History

<b>Changes from Revision L (September 2014) to Revision M (August 2024)</b>	<b>Page</b>
• Added package size to <i>Device information</i> table.....	1
• Updated <i>Handling Ratings</i> to <i>ESD Ratings</i> table.....	4
• Updated R $\theta$ JA values: PW = 103.3 to 116.8, DW = 79.4 to 81.1, NS = 79.2 to 77.6; Updated PW, DW, and NS packages for R $\theta$ JC(top), R $\theta$ JB, $\Psi$ JT, $\Psi$ JB, and R $\theta$ JC(bot), all values in °C/W .....	5

<b>Changes from Revision K (January 2004) to Revision L (September 2014)</b>	<b>Page</b>
• Updated document to new TI data sheet format.....	1
• Deleted Ordering Information table.....	1
• Added Military Disclaimer to Features list.....	1
• Added Applications.....	1
• Added Handling Ratings table.....	4
• Changed MAX operating temperature to 125°C in Recommended Operating Conditions table. ....	5
• Added Thermal Information table.....	5
• Added –40°C to 125°C temperature range for SN74AHC573 in Electrical Characteristics table.....	6
• Added T <sub>A</sub> = –40°C to 125°C temperature range for SN74AHC573 in Timing Requirements table. ....	6
• Added T <sub>A</sub> = –40°C to 125°C temperature range for SN74AHC573 in Timing Requirements table. ....	6
• Added T <sub>A</sub> = –40°C to 125°C temperature range for SN74AHC573 in Switching Characteristics table. ....	7
• Added T <sub>A</sub> = –40°C to 125°C temperature range for SN74AHC573 in Switching Characteristics table. ....	7
• Added Typical Characteristics.....	8
• Added Application and Implementation section.....	11
• Added Power Supply Recommendations and Layout sections.....	12

## 11 Mechanical, Packaging, and Orderable Information

The following pages include mechanical, packaging, and orderable information. This information is the most current data available for the designated devices. This data is subject to change without notice and revision of this document. For browser-based versions of this data sheet, refer to the left-hand navigation.

## PACKAGING INFORMATION

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
<a href="#">5962-9685601Q2A</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9685601Q2A SNJ54AHC 573FK
<a href="#">5962-9685601QRA</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9685601QR A SNJ54AHC573J
<a href="#">5962-9685601QSA</a>	Active	Production	CFP (W)   20	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9685601QS A SNJ54AHC573W
<a href="#">SN74AHC573DBR</a>	Active	Production	SSOP (DB)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
SN74AHC573DBR.A	Active	Production	SSOP (DB)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
<a href="#">SN74AHC573DGVR</a>	Active	Production	TVSOP (DGV)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
SN74AHC573DGVR.A	Active	Production	TVSOP (DGV)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
<a href="#">SN74AHC573DW</a>	Obsolete	Production	SOIC (DW)   20	-	-	Call TI	Call TI	-40 to 125	AHC573
<a href="#">SN74AHC573DWR</a>	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC573
SN74AHC573DWR.A	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC573
SN74AHC573DWRE4	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC573
SN74AHC573DWRG4	Active	Production	SOIC (DW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC573
<a href="#">SN74AHC573N</a>	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74AHC573N
SN74AHC573N.A	Active	Production	PDIP (N)   20	20   TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 125	SN74AHC573N
<a href="#">SN74AHC573NSR</a>	Active	Production	SOP (NS)   20	2000   LARGE T&R	Yes	NIPDAU   NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC573
SN74AHC573NSR.A	Active	Production	SOP (NS)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC573
<a href="#">SN74AHC573PW</a>	Obsolete	Production	TSSOP (PW)   20	-	-	Call TI	Call TI	-40 to 125	HA573
<a href="#">SN74AHC573PWR</a>	Active	Production	TSSOP (PW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
SN74AHC573PWR.A	Active	Production	TSSOP (PW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
<a href="#">SN74AHC573PWRG4</a>	Active	Production	TSSOP (PW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
SN74AHC573PWRG4.A	Active	Production	TSSOP (PW)   20	2000   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA573
<a href="#">SNJ54AHC573FK</a>	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962- 9685601Q2A SNJ54AHC 573FK

Orderable part number	Status (1)	Material type (2)	Package   Pins	Package qty   Carrier	RoHS (3)	Lead finish/ Ball material (4)	MSL rating/ Peak reflow (5)	Op temp (°C)	Part marking (6)
SNJ54AHC573FK.A	Active	Production	LCCC (FK)   20	55   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9685601Q2A SNJ54AHC 573FK
<a href="#">SNJ54AHC573J</a>	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9685601QR A SNJ54AHC573J
SNJ54AHC573J.A	Active	Production	CDIP (J)   20	20   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9685601QR A SNJ54AHC573J
<a href="#">SNJ54AHC573W</a>	Active	Production	CFP (W)   20	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9685601QS A SNJ54AHC573W
SNJ54AHC573W.A	Active	Production	CFP (W)   20	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9685601QS A SNJ54AHC573W

(1) **Status:** For more details on status, see our [product life cycle](#).

(2) **Material type:** When designated, preproduction parts are prototypes/experimental devices, and are not yet approved or released for full production. Testing and final process, including without limitation quality assurance, reliability performance testing, and/or process qualification, may not yet be complete, and this item is subject to further changes or possible discontinuation. If available for ordering, purchases will be subject to an additional waiver at checkout, and are intended for early internal evaluation purposes only. These items are sold without warranties of any kind.

(3) **RoHS values:** Yes, No, RoHS Exempt. See the [TI RoHS Statement](#) for additional information and value definition.

(4) **Lead finish/Ball material:** Parts may have multiple material finish options. Finish options are separated by a vertical ruled line. Lead finish/Ball material values may wrap to two lines if the finish value exceeds the maximum column width.

(5) **MSL rating/Peak reflow:** The moisture sensitivity level ratings and peak solder (reflow) temperatures. In the event that a part has multiple moisture sensitivity ratings, only the lowest level per JEDEC standards is shown. Refer to the shipping label for the actual reflow temperature that will be used to mount the part to the printed circuit board.

(6) **Part marking:** There may be an additional marking, which relates to the logo, the lot trace code information, or the environmental category of the part.

Multiple part markings will be inside parentheses. Only one part marking contained in parentheses and separated by a "~" will appear on a part. If a line is indented then it is a continuation of the previous line and the two combined represent the entire part marking for that device.

**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.

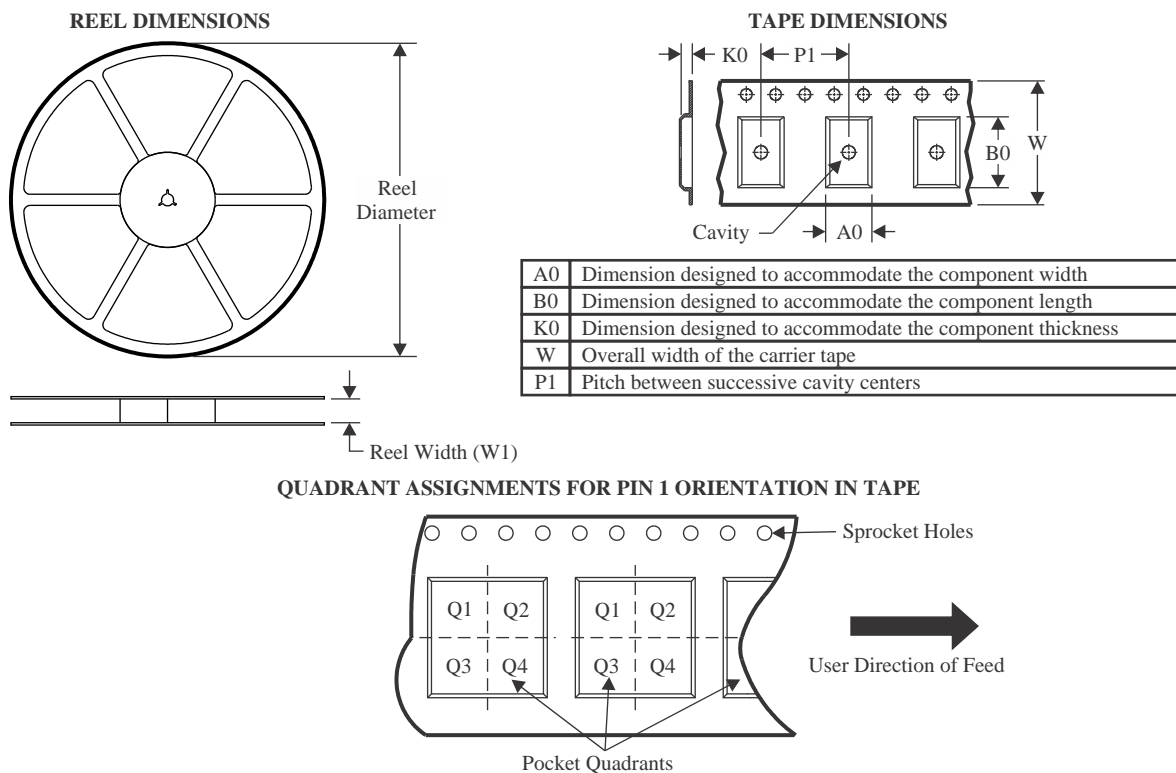
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF SN54AHC573, SN74AHC573 :**

- Catalog : [SN74AHC573](#)
- Automotive : [SN74AHC573-Q1](#), [SN74AHC573-Q1](#)
- Military : [SN54AHC573](#)

**NOTE:** Qualified Version Definitions:

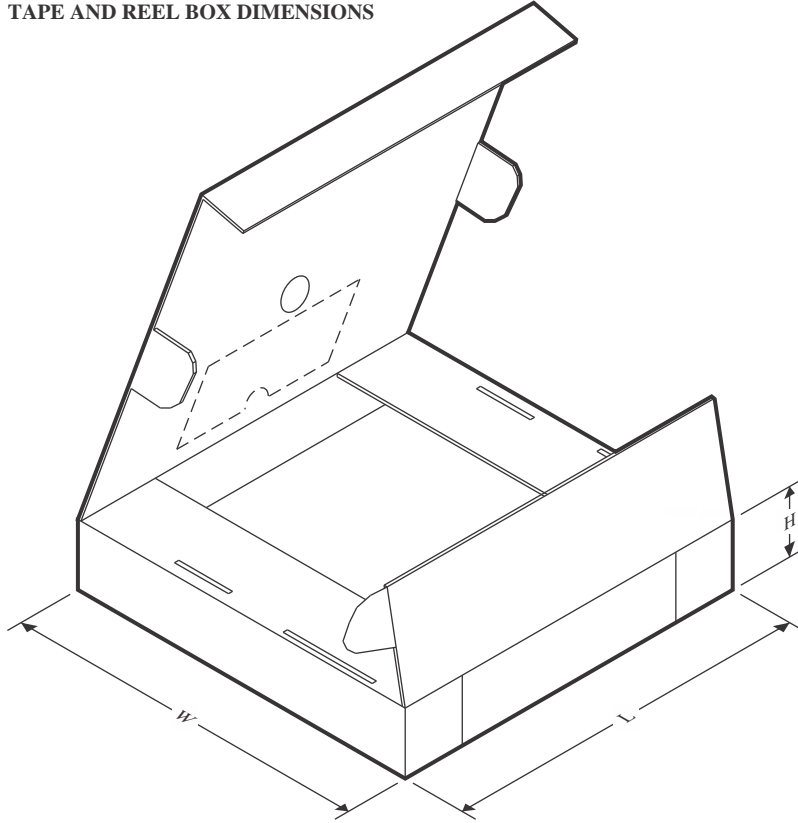
- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Military - QML certified for Military and Defense Applications

**TAPE AND REEL INFORMATION**


\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74AHC573DBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74AHC573DGV	TVSOP	DGV	20	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHC573DWR	SOIC	DW	20	2000	330.0	24.4	10.9	13.3	2.7	12.0	24.0	Q1
SN74AHC573DWR	SOIC	DW	20	2000	330.0	24.4	10.9	13.3	2.7	12.0	24.0	Q1
SN74AHC573NSR	SOP	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1
SN74AHC573NSR	SOP	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1
SN74AHC573PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.0	1.4	8.0	16.0	Q1
SN74AHC573PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.0	1.4	8.0	16.0	Q1
SN74AHC573PWRG4	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

## TAPE AND REEL BOX DIMENSIONS



\*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AHC573DBR	SSOP	DB	20	2000	356.0	356.0	35.0
SN74AHC573DGVR	TVSOP	DGV	20	2000	356.0	356.0	35.0
SN74AHC573DWR	SOIC	DW	20	2000	367.0	367.0	45.0
SN74AHC573DWR	SOIC	DW	20	2000	356.0	356.0	45.0
SN74AHC573NSR	SOP	NS	20	2000	367.0	367.0	45.0
SN74AHC573NSR	SOP	NS	20	2000	356.0	356.0	45.0
SN74AHC573PWR	TSSOP	PW	20	2000	356.0	356.0	35.0
SN74AHC573PWR	TSSOP	PW	20	2000	353.0	353.0	32.0
SN74AHC573PWRG4	TSSOP	PW	20	2000	356.0	356.0	35.0

## TUBE



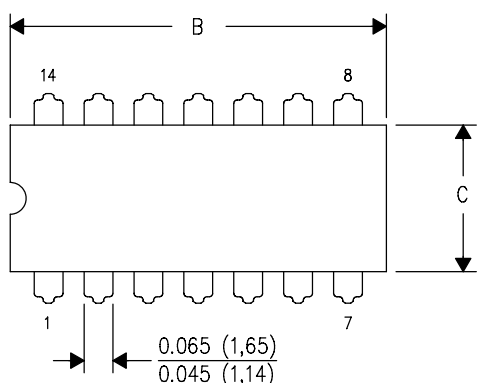
\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
5962-9685601Q2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-9685601QSA	W	CFP	20	25	506.98	26.16	6220	NA
SN74AHC573N	N	PDIP	20	20	506	13.97	11230	4.32
SN74AHC573N.A	N	PDIP	20	20	506	13.97	11230	4.32
SNJ54AHC573FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHC573FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHC573W	W	CFP	20	25	506.98	26.16	6220	NA
SNJ54AHC573W.A	W	CFP	20	25	506.98	26.16	6220	NA

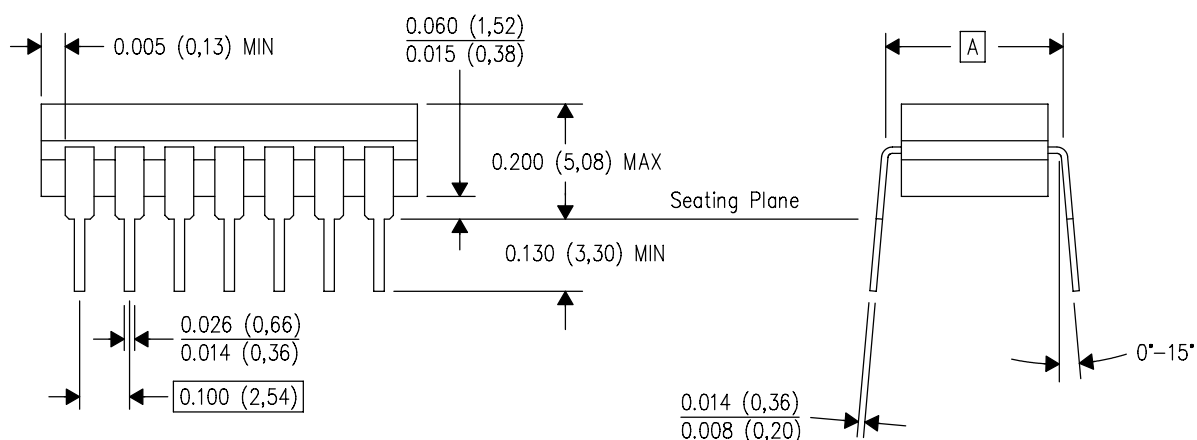
J (R-GDIP-T\*\*)

14 LEADS SHOWN

# CERAMIC DUAL IN-LINE PACKAGE



PINS ** DIM	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



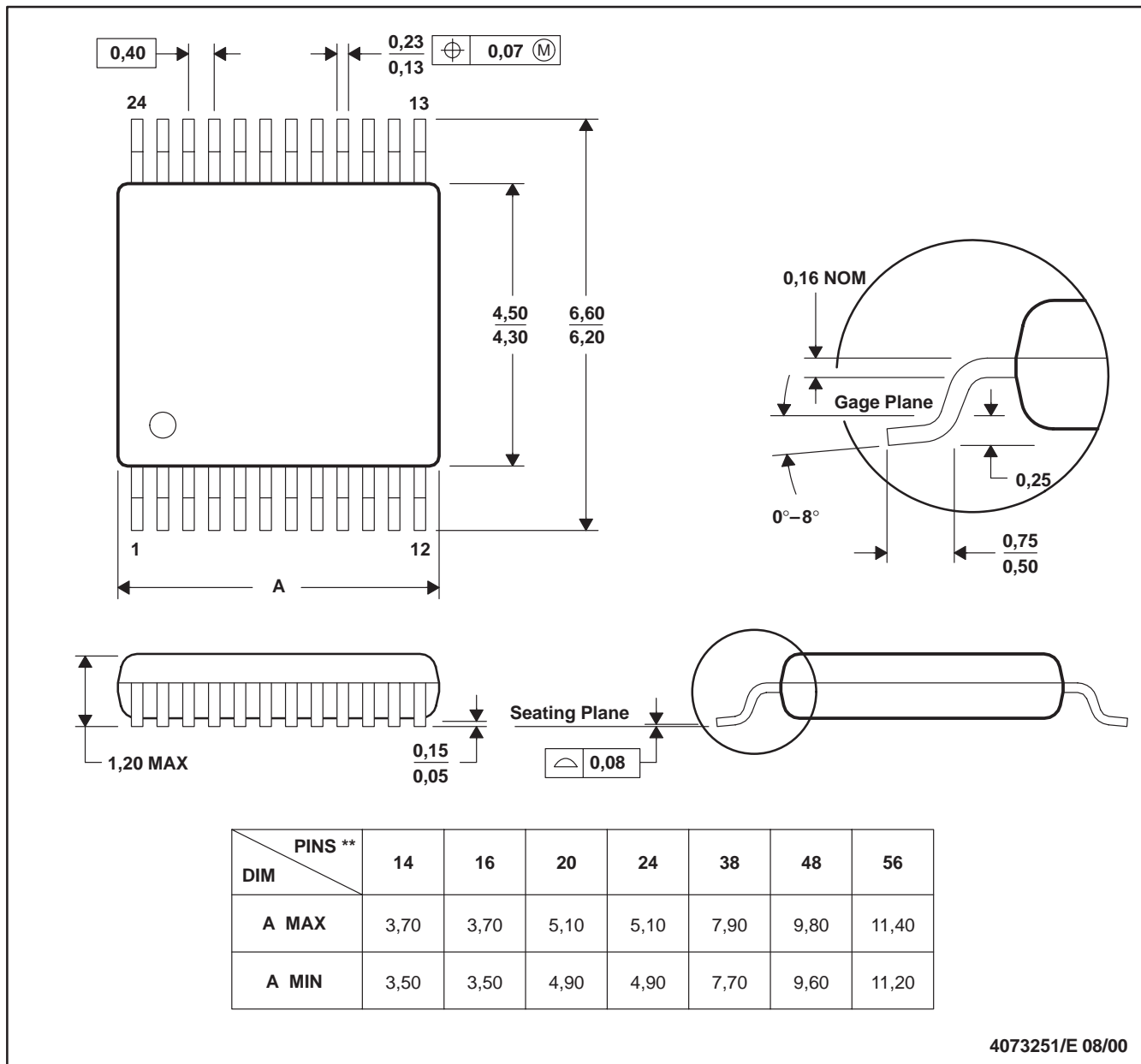
4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package is hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

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

## PLASTIC SMALL-OUTLINE

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

## GENERIC PACKAGE VIEW

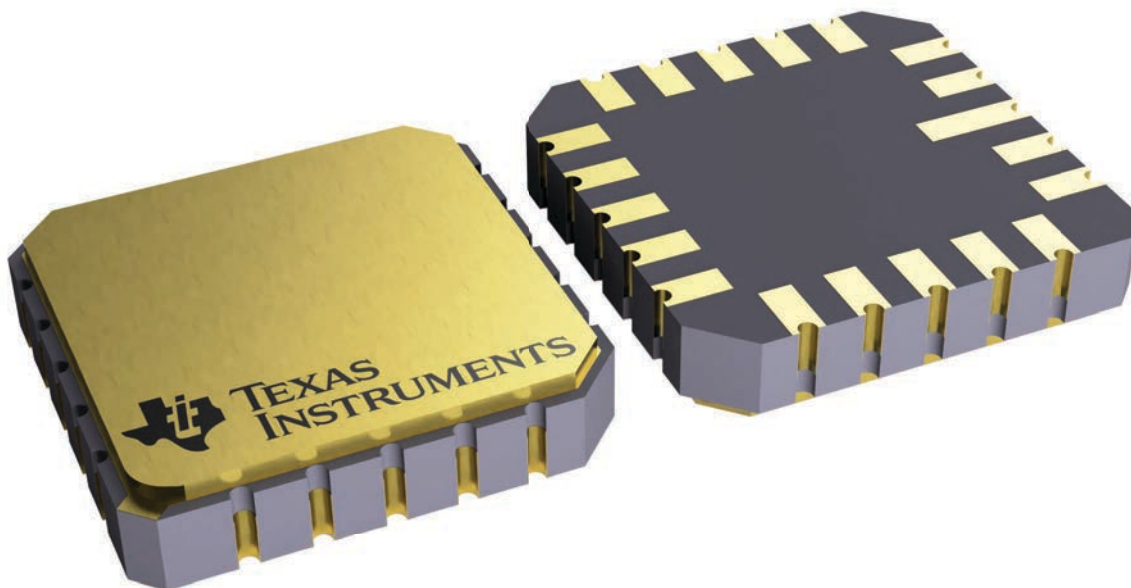
**FK 20**

**LCCC - 2.03 mm max height**

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

This image is a representation of the package family, actual package may vary.  
Refer to the product data sheet for package details.

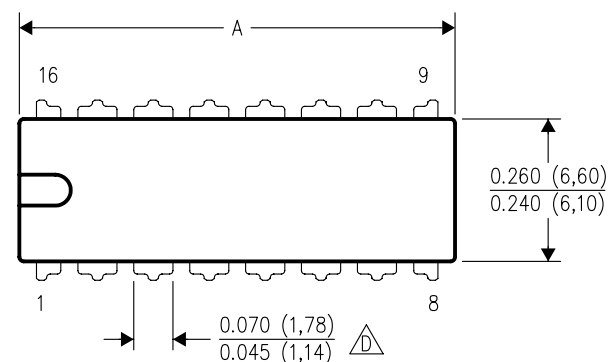


4229370VA\

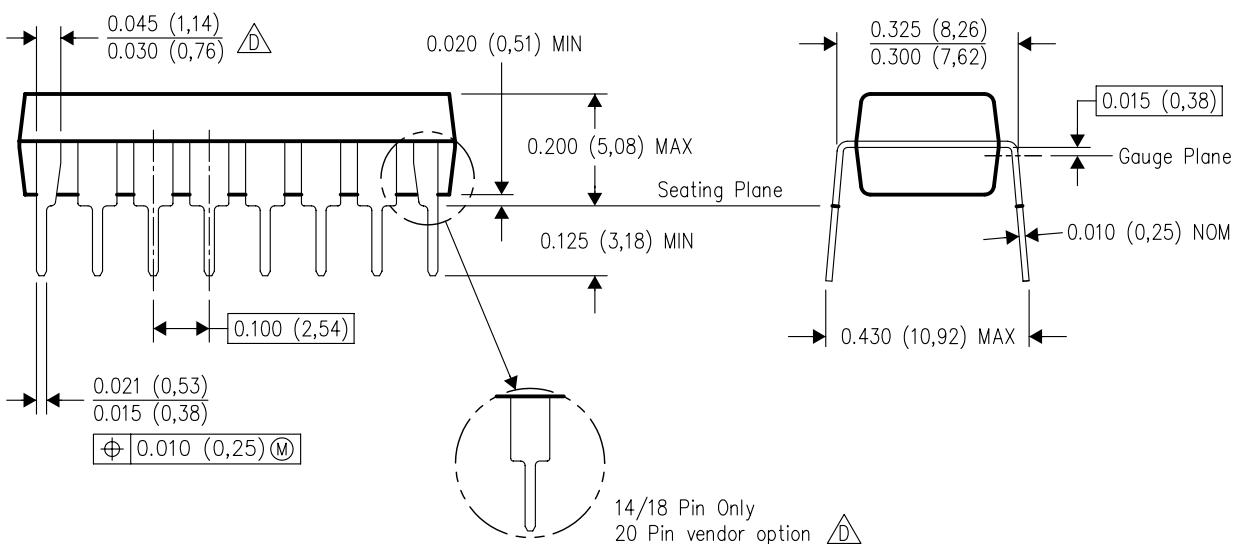
N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE





PINS ** DIM	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD



4040049/E 12/2002

NOTES:

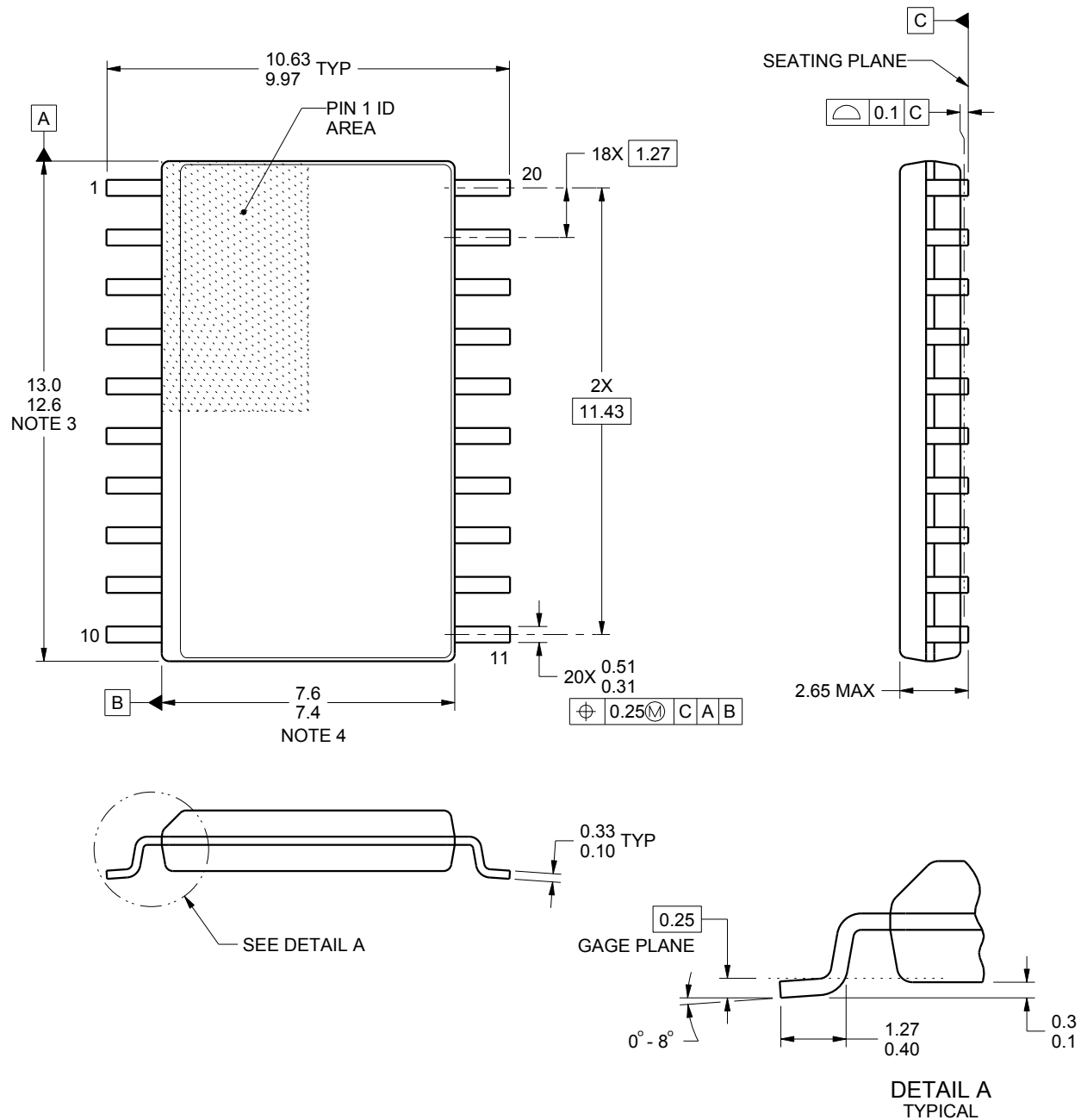
- A. All linear dimensions are in inches (millimeters).  
B. This drawing is subject to change without notice.
-  Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).  
 The 20 pin end lead shoulder width is a vendor option, either half or full width.

**DW0020A**

## PACKAGE OUTLINE

**SOIC - 2.65 mm max height**

SOIC



4220724/A 05/2016

NOTES:

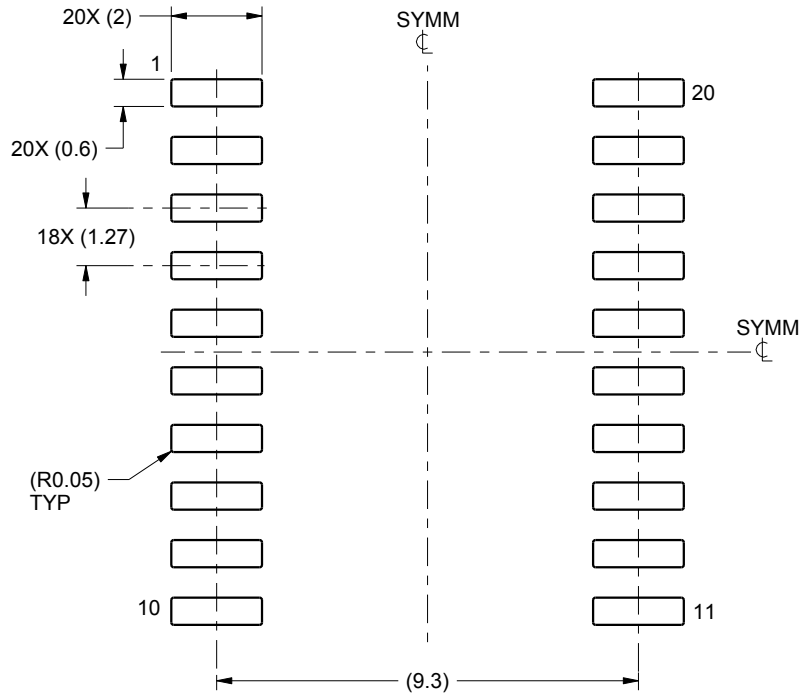
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.43 mm per side.
5. Reference JEDEC registration MS-013.

# EXAMPLE BOARD LAYOUT

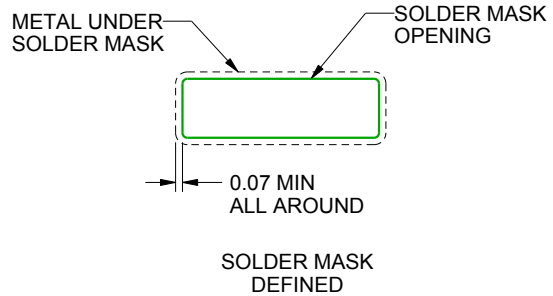
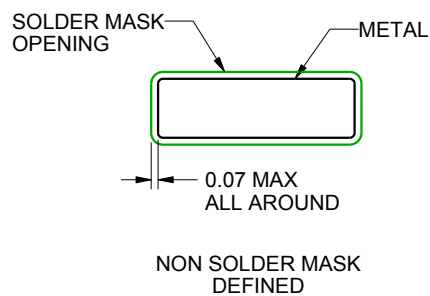
DW0020A

SOIC - 2.65 mm max height

SOIC



LAND PATTERN EXAMPLE  
SCALE:6X



SOLDER MASK DETAILS

4220724/A 05/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

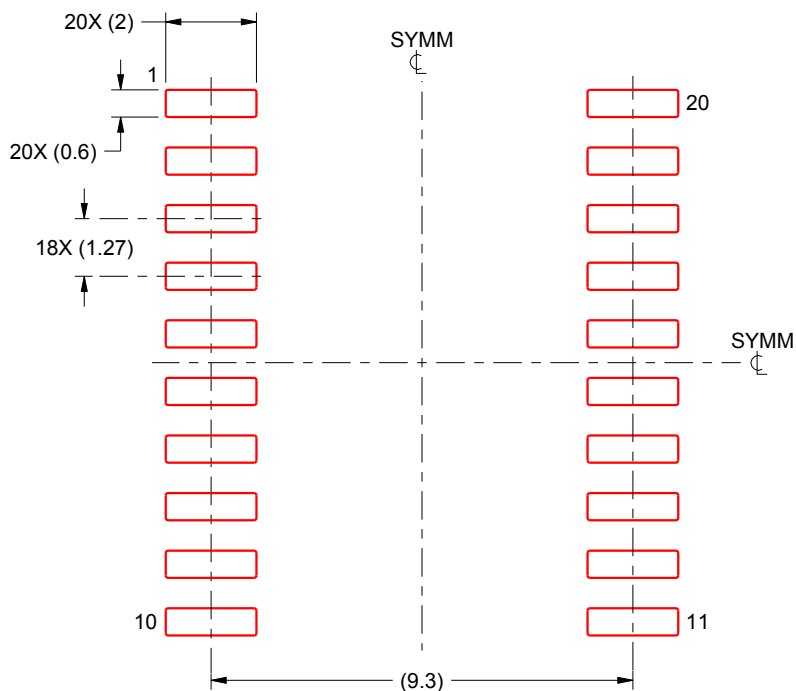
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

## EXAMPLE STENCIL DESIGN

DW0020A

SOIC - 2.65 mm max height

SOIC



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE:6X

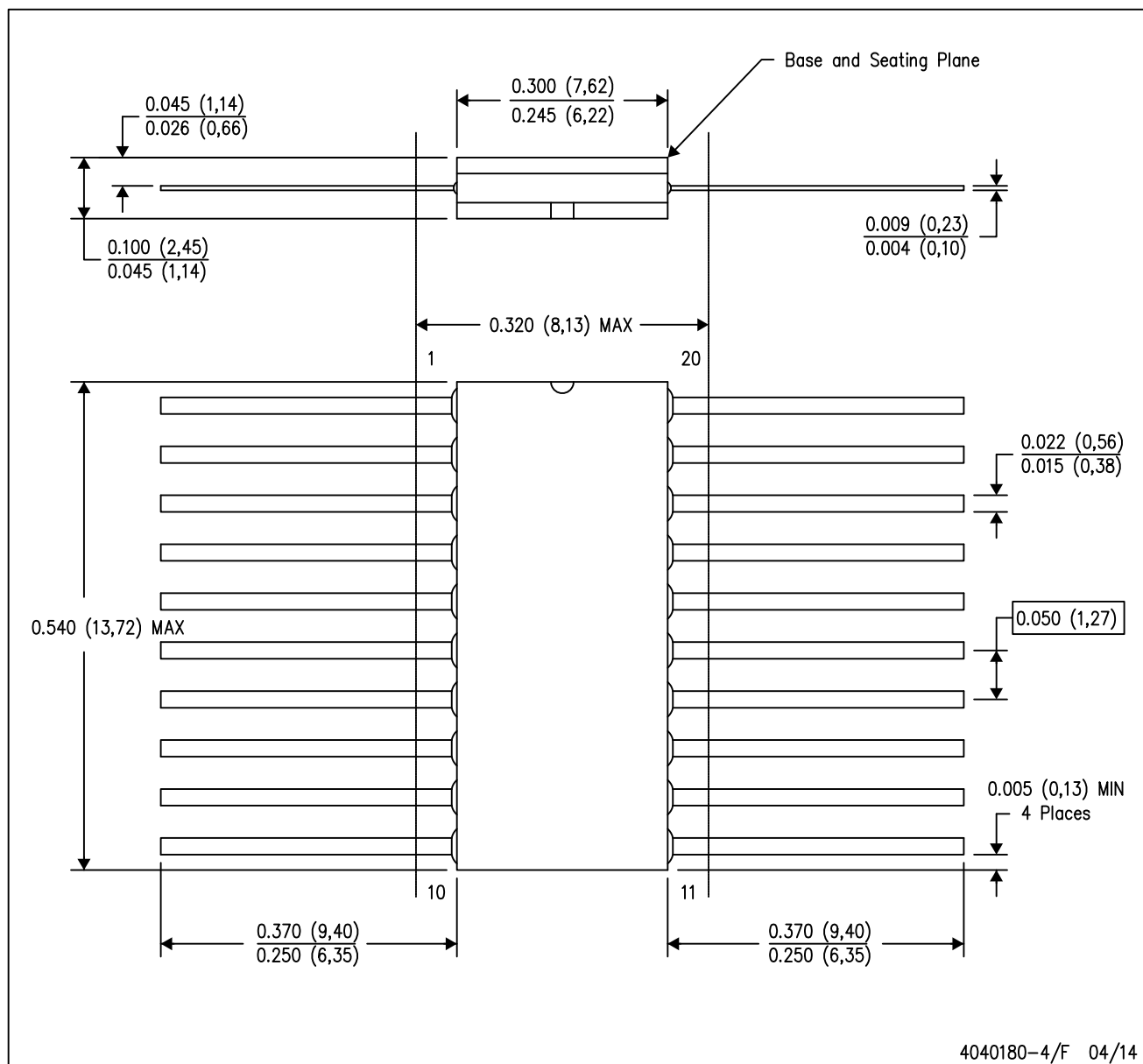
4220724/A 05/2016

NOTES: (continued)

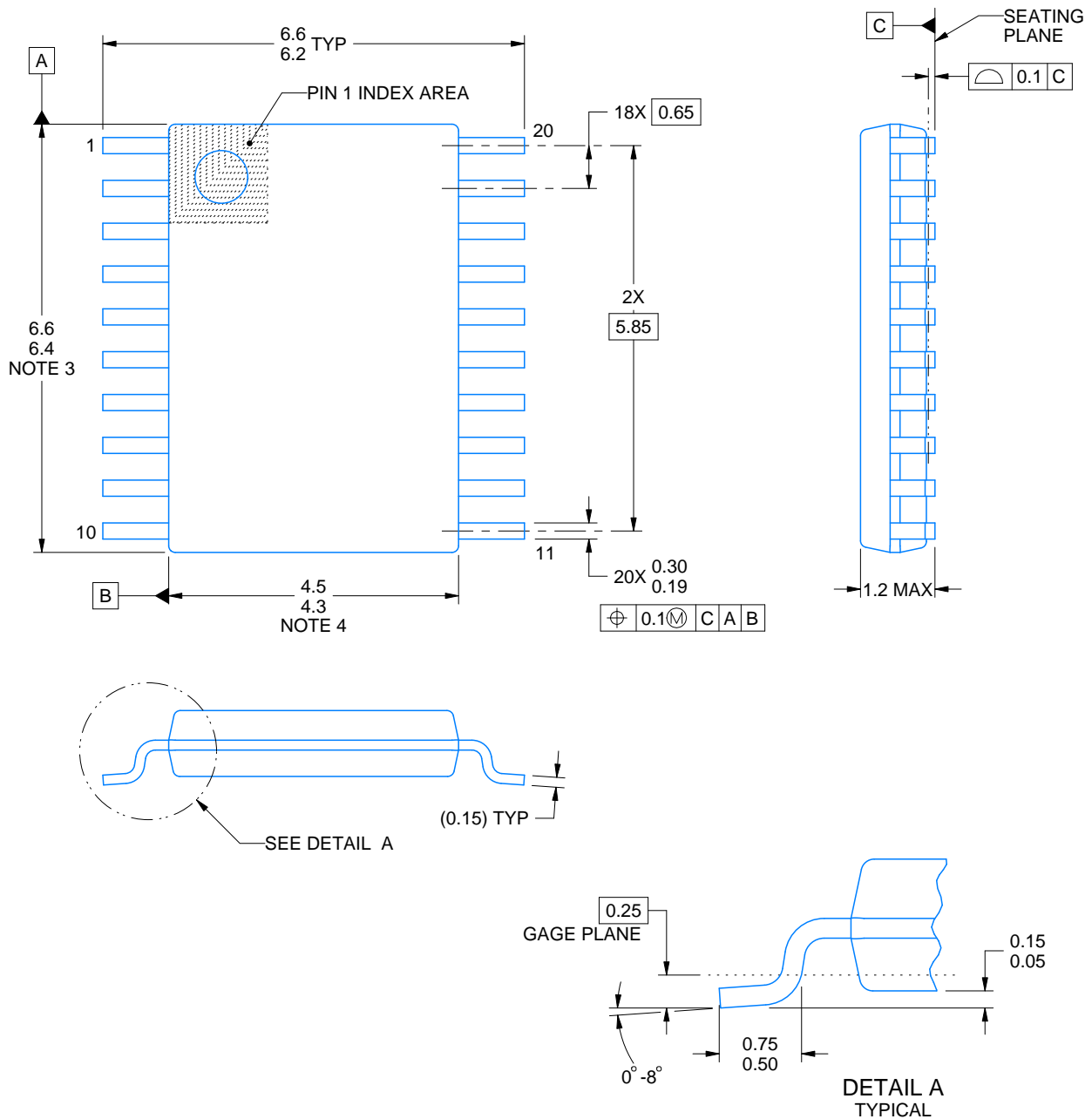
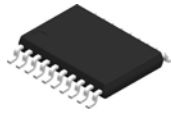
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

W (R-GDFP-F20)

CERAMIC DUAL FLATPACK



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



4220206/A 02/2017

## NOTES:

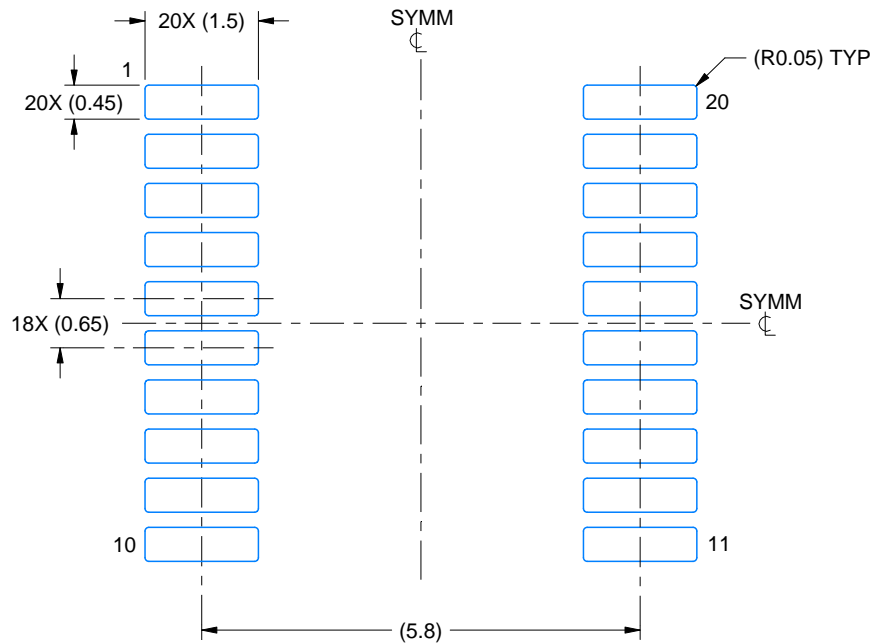
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-153.

# EXAMPLE BOARD LAYOUT

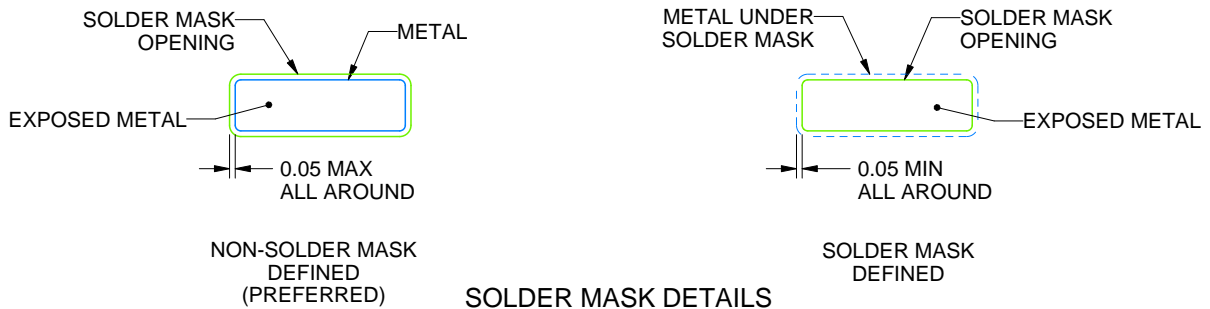
PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4220206/A 02/2017

NOTES: (continued)

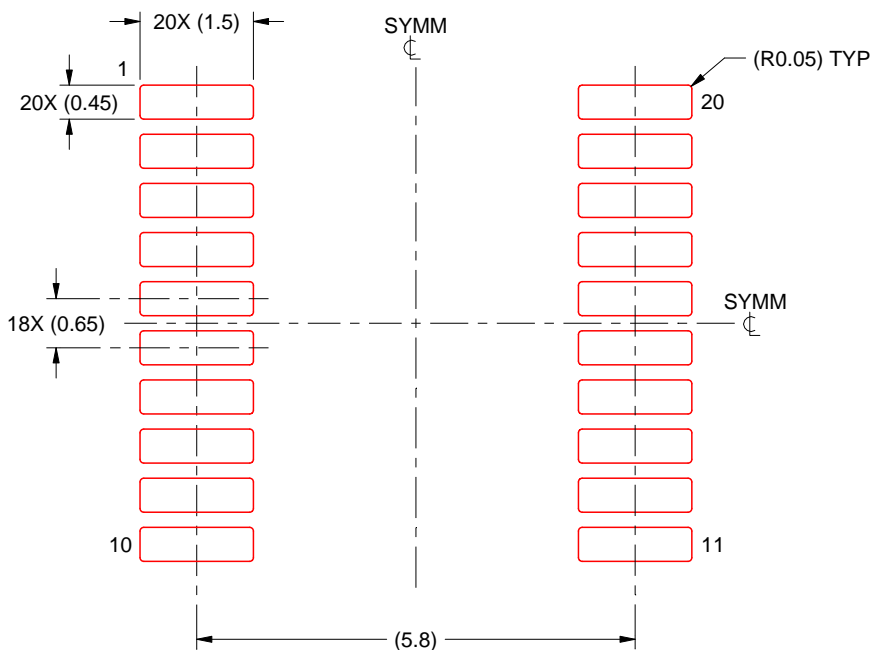
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE

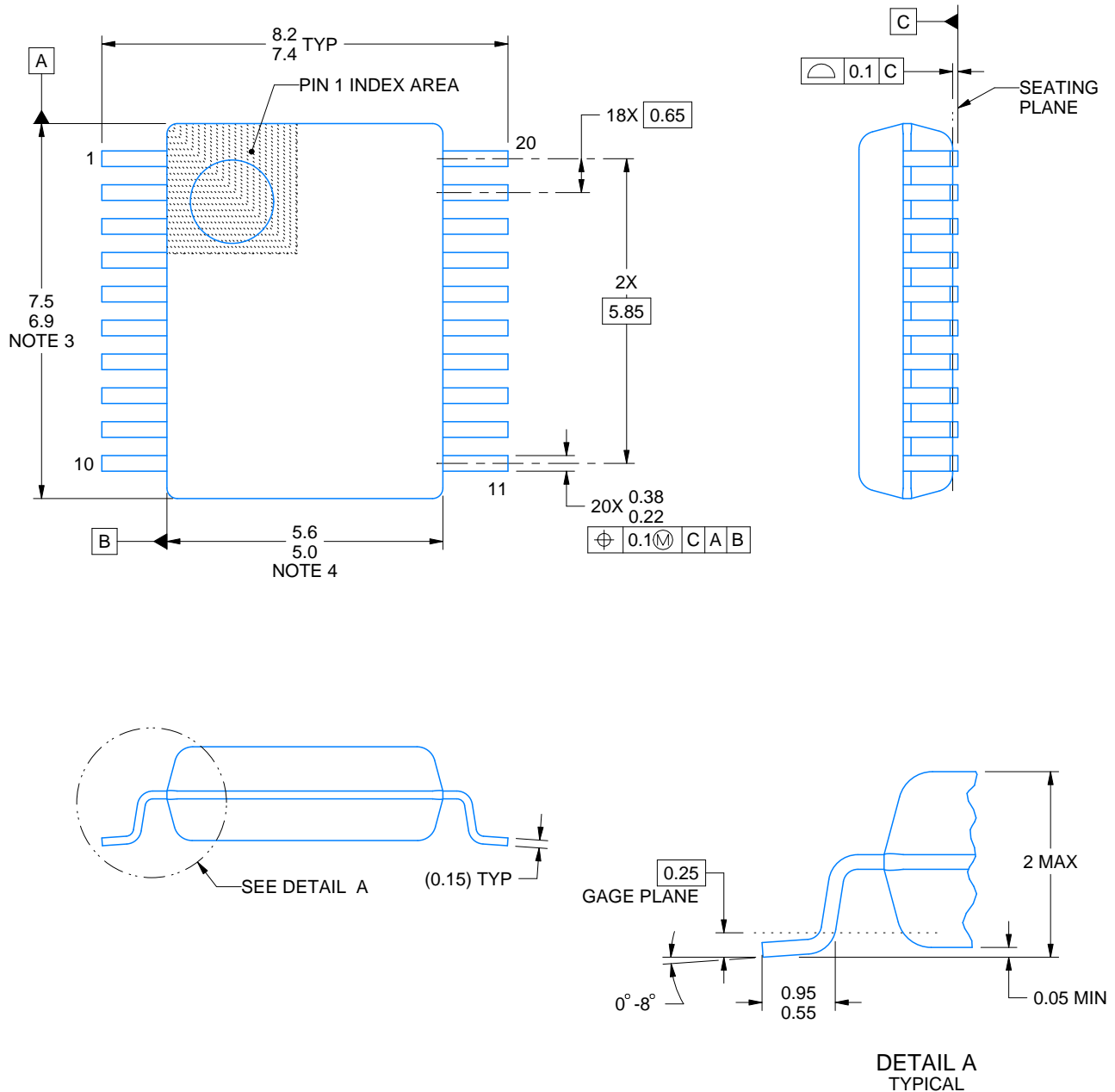


SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4220206/A 02/2017

NOTES: (continued)

8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.



4214851/B 08/2019

## NOTES:

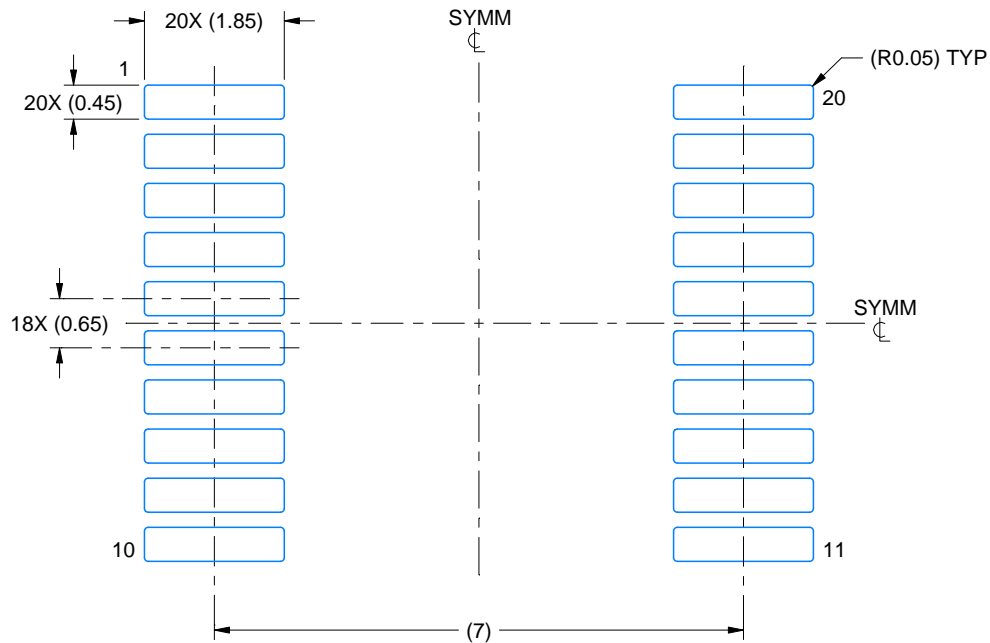
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.15 mm per side.
4. This dimension does not include interlead flash. Interlead flash shall not exceed 0.25 mm per side.
5. Reference JEDEC registration MO-150.

# EXAMPLE BOARD LAYOUT

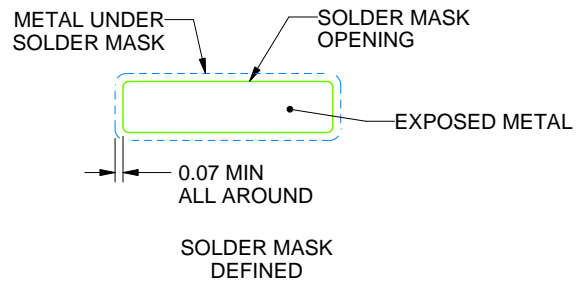
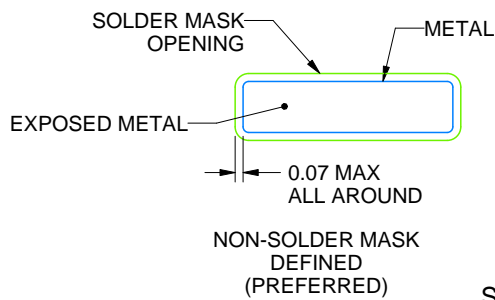
DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



SOLDER MASK DETAILS

4214851/B 08/2019

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

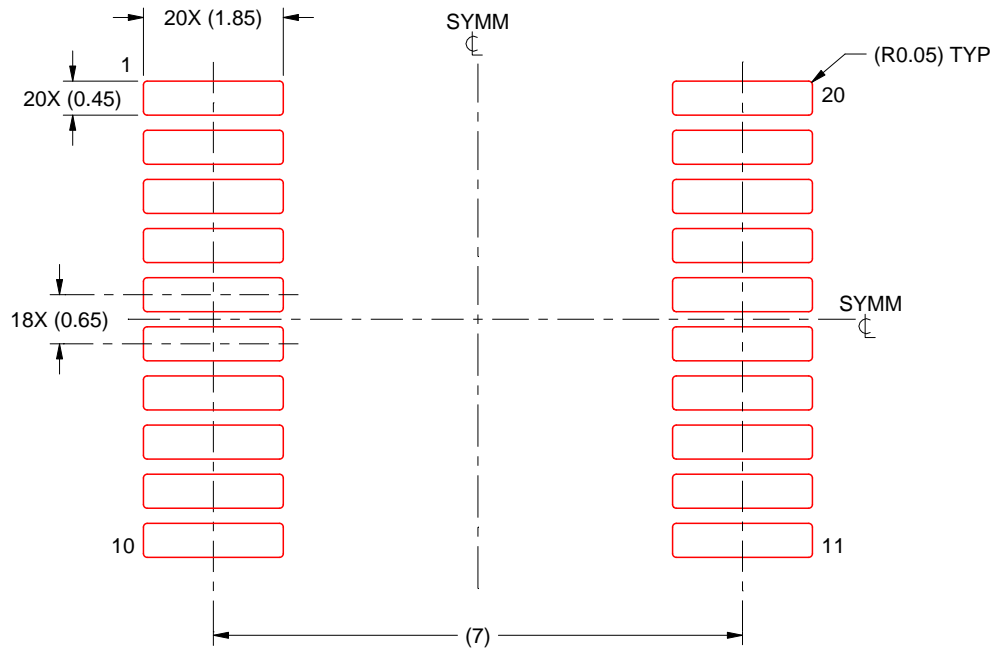
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# EXAMPLE STENCIL DESIGN

DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



SOLDER PASTE EXAMPLE  
BASED ON 0.125 mm THICK STENCIL  
SCALE: 10X

4214851/B 08/2019

NOTES: (continued)

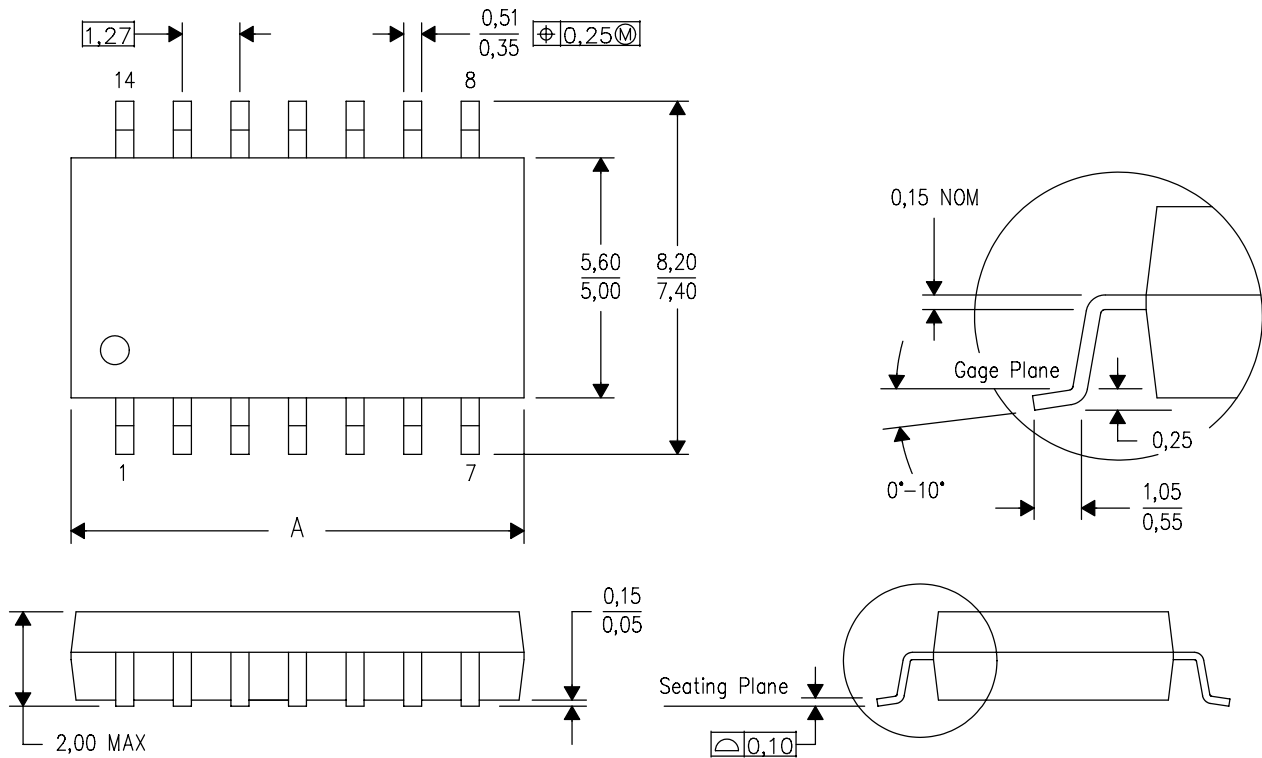
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

# MECHANICAL DATA

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

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



DIM \ PINS **	14	16	20	24
A MAX	10,50	10,50	12,90	15,30
A MIN	9,90	9,90	12,30	14,70

4040062/C 03/03

- 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.

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