



CD54HC173, CD74HC173, CD54HCT173, CD74HCT173

JAJSO86F – NOVEMBER 1998 – REVISED MARCH 2022

CDx4HC173、CDx4HCT173 ハイスピード CMOS ロジック、クワッド D タイプ・フリップ・フロップ、3 ステート

1 特長

- 3 ステート・バッファ付き出力
- ゲート付き入力および出力イネーブル
- ファンアウト (全温度範囲にわたって)
 - 標準出力: 10 個の LSTTL 負荷
 - バス・ドライバ出力: 15 個の LSTTL 負荷
- 広い動作温度範囲: -55°C ~ 125°C
- 平衡な伝搬遅延と遷移時間
- LSTTL ロジック IC に比べて消費電力を大幅削減
- HC タイプ
 - 2V ~ 6V で動作
 - 優れたノイズ耐性: V_{CC} の $N_{\text{IL}} = 30\%$ 、 $N_{\text{IH}} = 30\%$ ($V_{\text{CC}} = 5\text{V}$ 時)
- HCT タイプ
 - 4.5V ~ 5.5V で動作
 - LSTTL 入力ロジックと直接互換、 $V_{\text{IL}} = 0.8\text{V}$ (最大値)、 $V_{\text{IH}} = 2\text{V}$ (最小値)
 - CMOS 入力互換、 V_{OL} 、 V_{OH} で $I_{\text{L}} \leq 1\mu\text{A}$

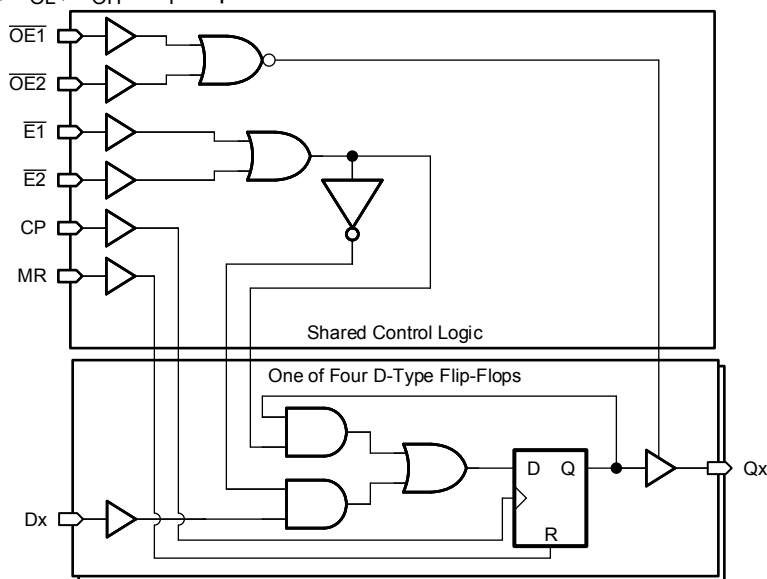
2 概要

CDx4HC173 と CDx4HCT173 は 4 つの独立した D タイプ・フリップ・フロップを内蔵し、共有クロック (CP)、リセット (MR)、データ・イネーブル ($\overline{\text{E1}}$ 、 $\overline{\text{E2}}$) ピンを備えています。

デバイス情報

部品番号	パッケージ ⁽¹⁾	本体サイズ (公称)
CD54HC173F	CDIP (16)	21.34mm × 6.92mm
CD54HCT173F3A	CDIP (16)	21.34mm × 6.92mm
CD74HC173E	PDIP (16)	19.31mm × 6.35mm
CD74HCT173E	PDIP (16)	19.31mm × 6.35mm
CD74HC173M	SOIC (16)	9.90mm × 3.90mm
CD74HCT173M	SOIC (16)	9.90mm × 3.90mm
CD74HC173PW	TSSOP (16)	5.00mm × 4.40mm

- (1) すべてのパッケージについては、このデータシートの末尾にある注文情報を参照してください。



機能ブロック図



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3 Revision History

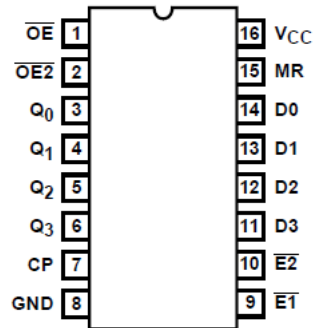
資料番号末尾の英字は改訂を表しています。その改訂履歴は英語版に準じています。

Changes from Revision E (October 2003) to Revision F (March 2022)

Page

- 最新のデータシート規格を反映するように、文書全体にわたって表、図、相互参照の採番方法を更新..... **1**

4 Pin Configuration and Functions



J, N, D, or PW Package
16-Pin CDIP, PDIP, SOIC, or TSSOP
Top View

5 Specifications

5.1 Absolute Maximum Ratings

Over operating free-air temperature range (unless otherwise noted)⁽¹⁾

		MIN	MAX	UNIT
V_{CC}	Supply voltage	-0.5	7	V
I_{IK}	Input diode current ⁽²⁾	$V_I < -0.5\text{ V}$ or $V_I > V_{CC} + 0.5\text{ V}$		±20 mA
I_{OK}	Output diode current ⁽²⁾	$V_O < -0.5\text{ V}$ or $V_O > V_{CC} + 0.5\text{ V}$		±20 mA
I_O	Output source or sink current per output pin	$V_O > -0.5\text{ V}$ or $V_O < V_{CC} + 0.5\text{ V}$		±25 mA
	Continuous current through V_{CC} or GND			±70 mA
T_J	Junction temperature			150 °C
	Lead temperature (soldering 10s) (SOIC - lead tips only)			300 °C
T_{stg}	Storage temperature	-65	150	°C

- (1) Stresses beyond those listed under *Absolute Maximum Rating* may cause permanent damage to the device. These are stress ratings only, which do not imply functional operation of the device at these or any other conditions beyond those indicated under *Recommended Operating Condition*. 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 Recommended Operating Conditions

			MIN	MAX	UNIT
V_{CC}	Supply voltage range	HC types	2	6	V
		HCT types	4.5	5.5	
V_I	Input voltage		0	V_{CC}	V
V_O	Output voltage		0	V_{CC}	V
t_t	Input rise and fall time	$V_{CC} = 2\text{ V}$		1000	ns
		$V_{CC} = 4.5\text{ V}$		500	
		$V_{CC} = 6\text{ V}$		400	
T_A	Temperature range		-55	125	°C

5.3 Thermal Information

THERMAL METRIC		N (PDIP)	D (SOIC)	NS (SOP)	PW (TSSOP)	UNIT
		16 PINS	16 PINS	16 PINS	16 PINS	
$R_{\theta JA}$	Junction-to-ambient thermal resistance ⁽¹⁾	67	73	64	108	°C/W

- (1) For more information about traditional and new thermal metrics, see the [Semiconductor and IC Package Thermal Metrics](#) application report

5.4 Electrical Characteristics

PARAMETER		TEST CONDITIONS ⁽¹⁾	V _{CC}	25°C			–40°C to 85°C		–55°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
HC TYPES											
V _{IH}	High-level input voltage		2	1.5		1.5		1.5		V	
			4.5	3.15		3.15		3.15		V	
			6	4.2		4.2		4.2		V	
V _{IL}	Low-level input voltage		2	0.5		0.5		0.5		V	
			4.5	1.35		1.35		1.35		V	
			6	1.8		1.8		1.8		V	
V _{OH}	High-level output voltage CMOS loads	I _{OH} = – 20μA	2	1.9		1.9		1.9		V	
		I _{OH} = – 20μA	4.5	4.4		4.4		4.4		V	
		I _{OH} = – 20μA	6	5.9		5.9		5.9		V	
	High-level output voltage TTL loads	I _{OH} = – 6mA	4.5	3.98		3.84		3.7		V	
		I _{OH} = – 7.8mA	6	5.48		5.34		5.2		V	
V _{OL}	Low-level output voltage CMOS loads	I _{OL} = 20μA	2	0.1		0.1		0.1		V	
		I _{OL} = 20μA	4.5	0.1		0.1		0.1		V	
		I _{OL} = 20μA	6	0.1		0.1		0.1		V	
	Low-level output voltage TTL loads	I _{OL} = 6mA	4.5	0.26		0.33		0.4		V	
		I _{OL} = 7.8mA	6	0.26		0.33		0.4		V	
I _I	Input leakage current	V _{CC} or GND	6	±0.1		±1		±1		μA	
I _{CC}	Supply current	V _{CC} or GND	6	8		80		160		μA	
I _{OZ}	Three-state leakage current		6	±0.5		±0.5		±10		μA	
HCT TYPES											
V _{IH}	High-level input voltage		4.5 to 5.5	2		2		2		V	
V _{IL}	Low-level input voltage		4.5 to 5.5	0.8		0.8		0.8		V	
V _{OH}	High-level output voltage CMOS loads	I _{OH} = – 20μA	4.5	4.4		4.4		4.4		V	
	High-level output voltage TTL loads	I _{OH} = – 6mA	4.5	3.98		3.84		3.7		V	
V _{OL}	Low-level output voltage CMOS loads	I _{OL} = 20μA	4.5	0.1		0.1		0.1		V	
	Low-level output voltage TTL loads	I _{OL} = 6mA	4.5	0.26		0.33		0.4		V	
I _I	Input leakage current	V _{CC} and GND	5.5	±0.1		±1		±1		μA	
I _{CC}	Supply Current	V _{CC} and GND	5.5	8		80		160		μA	
ΔI _{CC} ^{(2) (3)}	Additional supply current per input pin	One of D0-D3	4.5 to 5.5	15	54	67.5		73.5		μA	
		One of E ₁ and E ₂	4.5 to 5.5	15	54	67.5		73.5		μA	
		CP	4.5 to 5.5	25	90	112.5		122.5		μA	
		MR	4.5 to 5.5	20	72	90		98		μA	
		One of $\overline{\text{OE}}1$ and $\overline{\text{OE}}2$	4.5 to 5.5	50	180	225		245		μA	

PARAMETER		TEST CONDITIONS ⁽¹⁾	V _{CC}	25°C			–40°C to 85°C		–55°C to 125°C		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
I _{OZ}	Three-state leakage current		5.5			±0.5		±5.0		±10	μA

(1) V_I = V_{IH} or V_{IL}, unless otherwise noted.

(2) For dual-supply systems theoretical worst case (V_I = 2.4 V, V_{CC} = 5.5 V) specification is 1.8 mA.

(3) Inputs held at V_{CC} – 2.1.

5.5 Switching Characteristics

Input t_I = 6ns. Unless otherwise specified, C_L = 50pF

PARAMETER		V _{CC} (V)	25°C		-40°C to 85°C	-55°C to 125°C	UNIT
			TYP	MAX	MAX	MAX	
HC TYPES							
t _{pd}	Propagation delay, clock to output	2		200	250	300	ns
		4.5	17 ⁽¹⁾	40	50	60	
		6		34	43	51	
t _{pd}	Propagation delay, MR to output	2		175	220	265	ns
		4.5	12 ⁽¹⁾	35	44	53	
		6		30	37	45	
t _{pd}	Propagation delay output enable to Q (Figure 6)	2		150	190	225	ns
		4.5	12 ⁽¹⁾	30	38	45	
		6		26	33	38	
t _t	Output transition times	2		60	75	90	ns
		4.5		12	15	18	
		6		10	13	15	
f _{MAX}	Maximum clock frequency	5	60 ⁽¹⁾				MHz
C _i	Input capacitance			10	10	10	pF
C _O	Three-state output capacitance			10	10	10	pF
C _{pd} ^{(2) (3)}	Power dissipation capacitance	5	29				pF
HCT TYPES							
t _{pd}	Propagation delay, clock to output	4.5	17 ⁽¹⁾	40	50	60	ns
t _{pd}	Propagation delay, MR to output	4.5	18 ⁽¹⁾	44	55	66	ns
t _{pd}	Propagation delay output enable to Q (Figure 6)	2		150	190	225	ns
		4.5	14 ⁽¹⁾	30	38	45	
		6		26	33	38	
t _t	Output transition times	4.5		15	19	22	ns
f _{MAX}	Maximum clock frequency	5	60 ⁽¹⁾				MHz
C _i	Input capacitance			10	10	10	pF
C _{pd} ^{(2) (3)}	Power dissipation capacitance	5	34				pF

(1) Typical value tested at 5V, C_L = 15pF.

(2) C_{PD} is used to determine the edynamic power consumption, per package.

(3) P_D = V_{CC}²f_i + Σ (C_L V_{CC}² + f_O) where f_i = Input Frequency, C_L = Output Load Capacitance, V_{CC} = Supply Voltage.

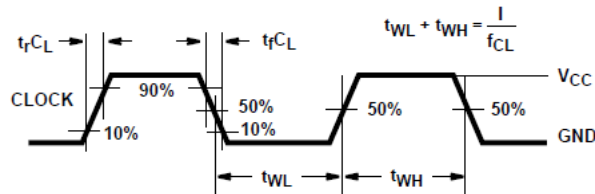
5.6 Prerequisite For Switching Characteristics

PARAMETER		V _{CC} (V)	25°C		-40°C to 85°C		-55°C to 125°C		UNITS
			MIN	MAX	MIN	MAX	MIN	MAX	
HC TYPES									
f _{MAX}	Maximum clock frequency	2	6	5	4	MHz			
		4.5	30	24	20				
		6	35	28	24				
t _W	MR pulse width	2	80	100	120	ns			
		4.5	16	20	24				
		6	14	17	20				
t _W	Clock pulse width	2	80	100	120	ns			
		4.5	16	20	24				
		6	14	17	20				
t _{SU}	Set-up time, data to clock and $\overline{E}$ to clock	2	60	75	90	ns			
		4.5	12	15	18				
		6	10	13	15				
t _H	Hold time, data to clock	2	3	3	3	ns			
		4.5	3	3	3				
		6	3	3	3				
t _H	Hold time, $\overline{E}$ to clock	2	0	0	0	ns			
		4.5	0	0	0				
		6	0	0	0				
t _{REM}	Removal time, MR to clock	2	60	75	90	ns			
		4.5	12	15	18				
		6	10	13	15				
HCT TYPES									
f _{MAX}	Maximum clock frequency	4.5	20	16	13	MHz			
t _W t _W	MR pulse width	4.5	15	19	22	ns			
t _W	Clock pulse width	4.5	25	31	38	ns			
t _{SU}	Set-up Time, $\overline{E}$ to clock	4.5	12	15	18	ns			
t _{SU}	Set-up time, data to clock	4.5	18	23	27	ns			
t _H	Hold time, data to clock	4.5	0	0	0	ns			
t _H	Hold time, $\overline{E}$ to clock	4.5	0	0	0	ns			
t _{REM}	Removal time, MR to clock	4.5	12	15	18	ns			

6 Parameter Measurement Information

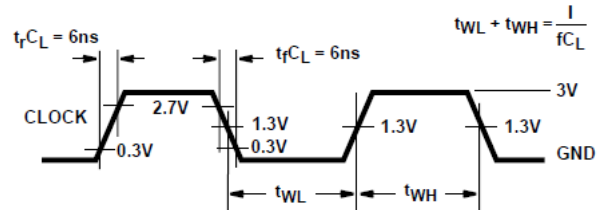
t_{PD} is the maximum between t_{PLH} and t_{PHL}

t_t is the maximum between t_{TLH} and t_{THL}



NOTE: Outputs should be switching from 10% V_{CC} to 90% V_{CC} in accordance with device truth table. For f_{MAX} , input duty cycle = 50%

FIG 6-1. HC clock pulse rise and fall times and pulse width



NOTE: Outputs should be switching from 10% V_{CC} to 90% V_{CC} in accordance with device truth table. For f_{MAX} , input duty cycle = 50%

FIG 6-2. HCT clock pulse rise and fall times and pulse width

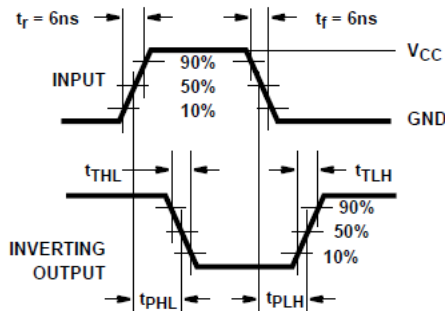


FIG 6-3. HC and HCU transition times and propagation delay times, combination logic

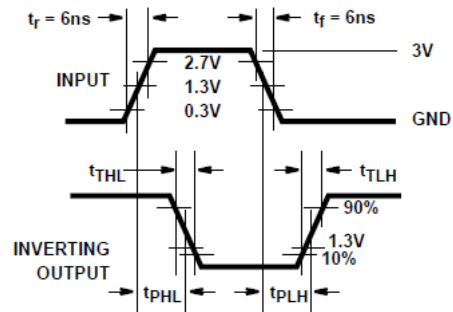


FIG 6-4. HCT transition times and propagation delay times, combination logic

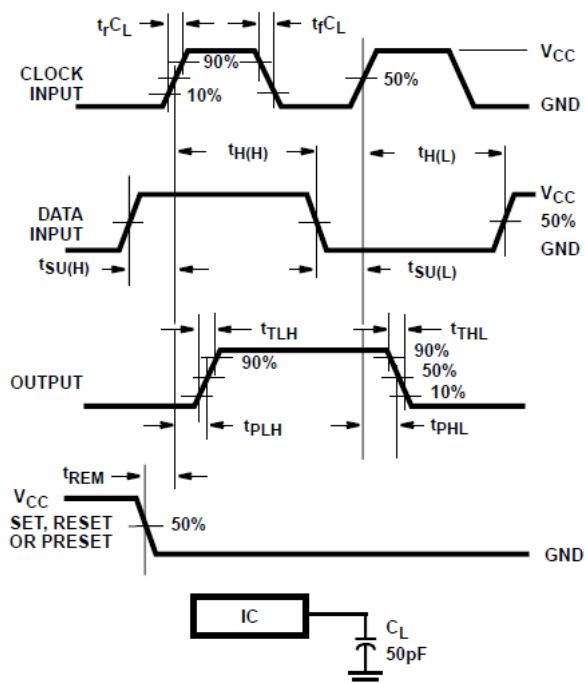


FIG 6-5. HC setup times, hold times, removal time, and propagation delay times for edge triggered sequential logic circuits

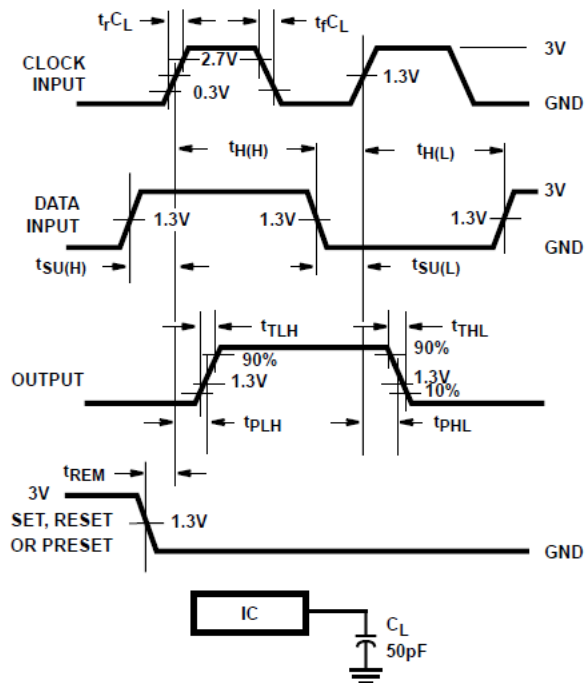


FIG 6-6. HCT setup times, hold times, removal time, and propagation delay times for edge triggered sequential logic circuits

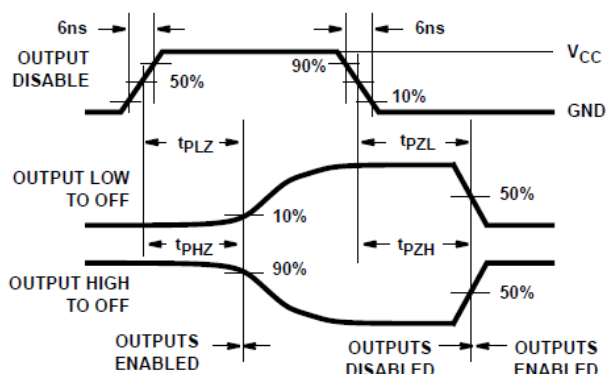


FIG 6-7. HC three-state propagation delay waveform

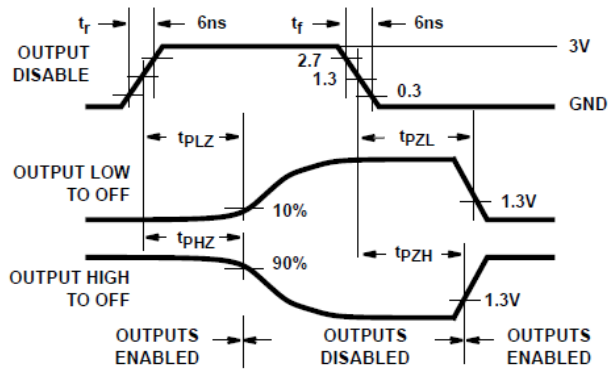
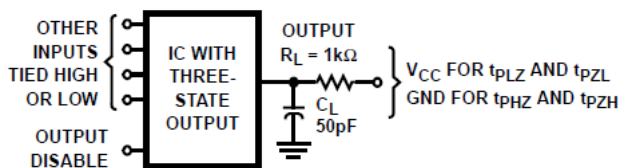


FIG 6-8. HCT three-state propagation delay waveform



NOTE: Open drain waveforms t_{PLZ} and t_{PZL} are the same as those for three-state shown on the left. The test circuit is Output $R_L = 1\text{k}\Omega$ to V_{CC} , $C_L = 50\text{pF}$

FIG 6-9. HC and HCT three-state propagation delay test circuit

7 Detailed Description

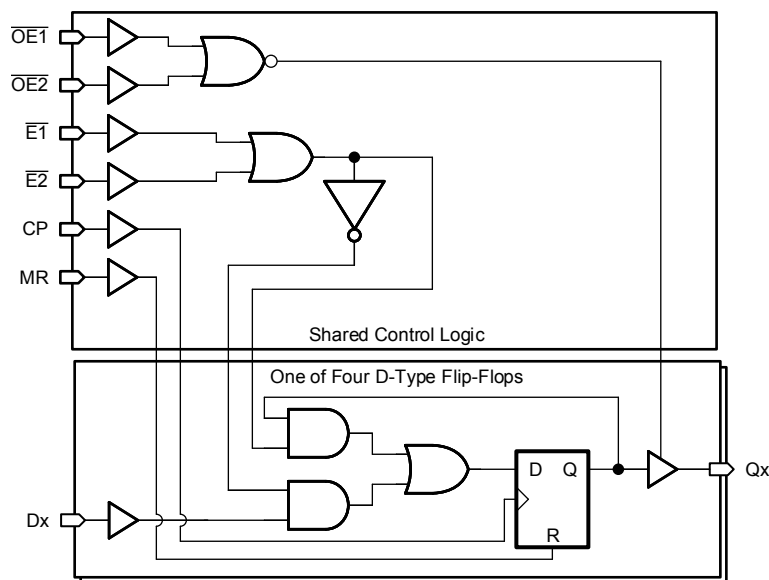
7.1 Overview

The CDx4HC173 or CDx4HCT173 high speed three-state quad D-type flip-flops are fabricated with silicon gate CMOS technology. They possess the low power consumption of standard CMOS Integrated circuits, and can operate at speeds comparable to the equivalent low power Schottky devices. The buffered outputs can drive 15 LSTTL loads. The large output drive capability and three-state feature make these parts ideally suited for interfacing with bus lines in bus oriented systems

The four D-type flip-flops operate synchronously from a common clock. The outputs are in the three-state mode when either of the two output disable pins are at the logic "1" level. The input ENABLES allow the flip-flops to remain in their present states without having to disrupt the clock. If either of the 2 input ENABLES are taken to a logic "1" level, the Q outputs are fed back to the inputs, forcing the flip-flops to remain in the same state. Reset is enabled by taking the RESET (MR) input to a logic "1" level. The data outputs change state on the positive going edge of the clock.

The 'HCT173 logic family is functionally, as well as pin compatible with the standard LS logic family.

7.2 Functional Block Diagram



7.3 Device Functional Modes

表 7-1. Truth Table⁽¹⁾⁽²⁾

INPUTS				DATA	OUTPUT
MR	CP	DATA ENABLE			
		E1	E2	D	Q _n
H	X	X	X	X	L
L	L	X	X	X	Q ₀
L	↑	H	X	X	Q ₀
L	↑	X	H	X	Q ₀
L	↑	L	L	L	L
L	↑	L	L	H	H

- (1) H = High voltage level. L = Low voltage level. X = Irrelevant. ↑ = Transition from low to high level. Q₀ = Level before the indicated steady-state input conditions were established.
- (2) When either OE1 or OE2 (or both) is (are) high, the output is disabled to the high-impedance state, however, sequential operation of the flip-flops is not affected.

8 Power Supply Recommendations

The power supply can be any voltage between the minimum and maximum supply voltage rating located in the *Recommended Operating Conditions*. Each V_{CC} terminal should have a good bypass capacitor to prevent power disturbance. A 0.1- μ F capacitor is recommended for this device. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. The 0.1- μ F and 1- μ F capacitors are commonly used in parallel. The bypass capacitor should be installed as close to the power terminal as possible for best results.

9 Layout

9.1 Layout Guidelines

When using multiple-input and multiple-channel logic devices inputs must not ever be left floating. 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 unused input pins must not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. All unused inputs of digital logic devices must be connected to a logic high or logic low voltage, as defined by the input voltage specifications, to prevent them from floating. The logic level that must be applied to any particular unused input depends on the function of the device. Generally, the inputs are tied to GND or V_{CC} , whichever makes more sense for the logic function or is more convenient.

10 Device and Documentation Support

TI offers an extensive line of development tools. Tools and software to evaluate the performance of the device, generate code, and develop solutions are listed below.

10.1 Documentation Support

10.1.1 Related Documentation

10.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](https://www.ti.com). Click on *Subscribe to updates* to register and receive a weekly digest of any product information that has changed. For change details, review the revision history included in any revised document.

10.3 サポート・リソース

[TI E2E™ サポート・フォーラム](#)は、エンジニアが検証済みの回答と設計に関するヒントをエキスパートから迅速かつ直接得ることができる場所です。既存の回答を検索したり、独自の質問をしたりすることで、設計に必要な支援を迅速に得ることができます。

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10.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.

すべての商標は、それぞれの所有者に帰属します。

10.5 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.

10.6 Glossary

[TI Glossary](#) This glossary lists and explains terms, acronyms, and definitions.

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)
5962-8682501EA	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8682501EA CD54HC173F3A
5962-8875901EA	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8875901EA CD54HCT173F3A
CD54HC173F	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54HC173F
CD54HC173F.A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54HC173F
CD54HC173F3A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8682501EA CD54HC173F3A
CD54HC173F3A.A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8682501EA CD54HC173F3A
CD54HCT173F3A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8875901EA CD54HCT173F3A
CD54HCT173F3A.A	Active	Production	CDIP (J) 16	25 TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8875901EA CD54HCT173F3A
CD74HC173E	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HC173E
CD74HC173E.A	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HC173E
CD74HC173M	Obsolete	Production	SOIC (D) 16	-	-	Call TI	Call TI	-55 to 125	HC173M
CD74HC173M96	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HC173M
CD74HC173M96.A	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HC173M
CD74HC173PW	Obsolete	Production	TSSOP (PW) 16	-	-	Call TI	Call TI	-55 to 125	HJ173
CD74HC173PWR	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU SN	Level-1-260C-UNLIM	-55 to 125	HJ173
CD74HC173PWR.A	Active	Production	TSSOP (PW) 16	2000 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HJ173
CD74HCT173E	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HCT173E
CD74HCT173E.A	Active	Production	PDIP (N) 16	25 TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HCT173E
CD74HCT173M	Obsolete	Production	SOIC (D) 16	-	-	Call TI	Call TI	-55 to 125	HCT173M
CD74HCT173M96	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HCT173M
CD74HCT173M96.A	Active	Production	SOIC (D) 16	2500 LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HCT173M

⁽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.

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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.

OTHER QUALIFIED VERSIONS OF CD54HC173, CD54HCT173, CD74HC173, CD74HCT173 :

- Catalog : [CD74HC173](#), [CD74HCT173](#)
- Military : [CD54HC173](#), [CD54HCT173](#)

NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- 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
CD74HC173M96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
CD74HC173PWR	TSSOP	PW	16	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
CD74HCT173M96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	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)
CD74HC173M96	SOIC	D	16	2500	353.0	353.0	32.0
CD74HC173PWR	TSSOP	PW	16	2000	356.0	356.0	35.0
CD74HCT173M96	SOIC	D	16	2500	340.5	336.1	32.0

TUBE

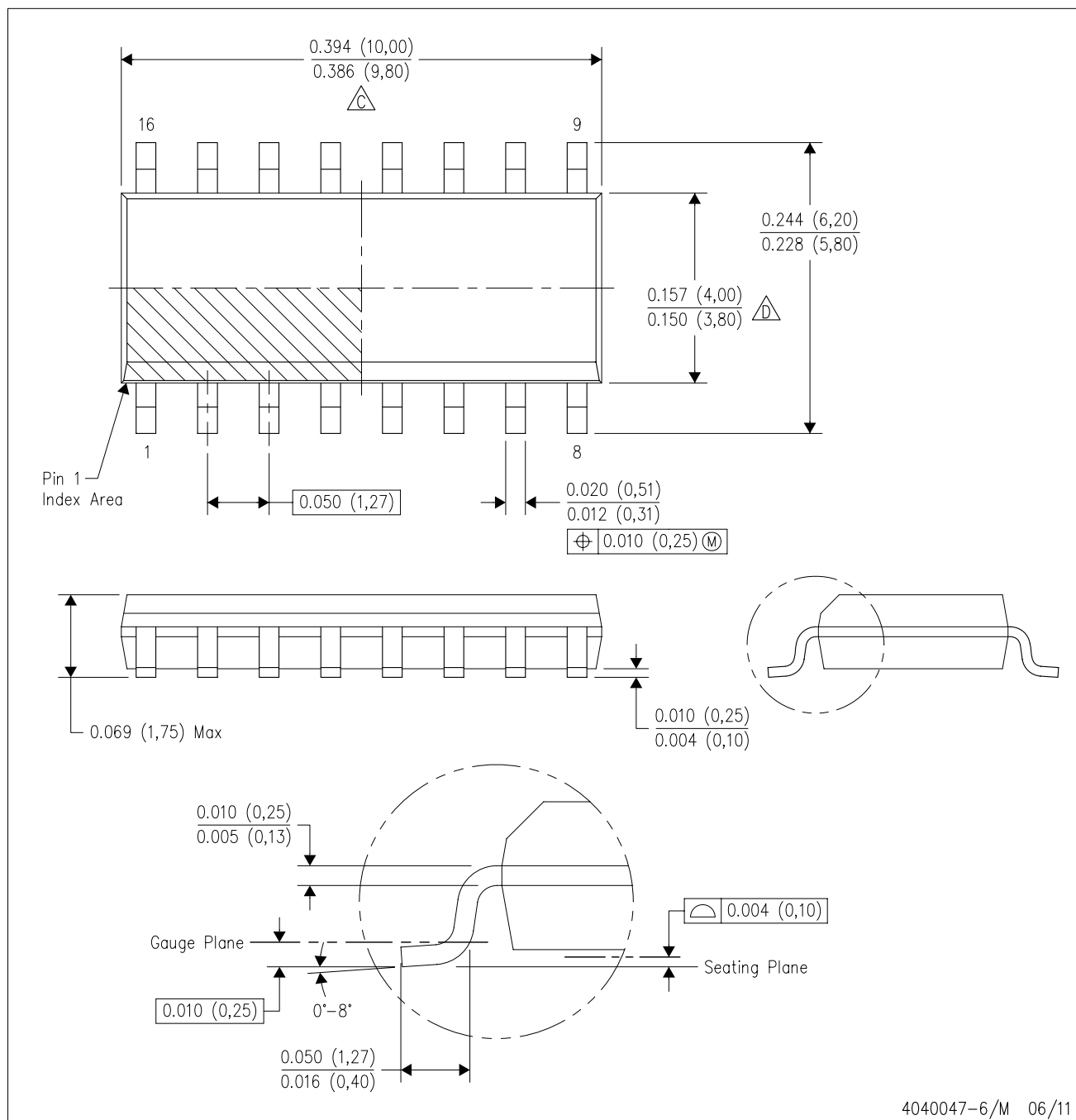


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
CD74HC173E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC173E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC173E.A	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC173E.A	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT173E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT173E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT173E.A	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT173E.A	N	PDIP	16	25	506	13.97	11230	4.32

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE

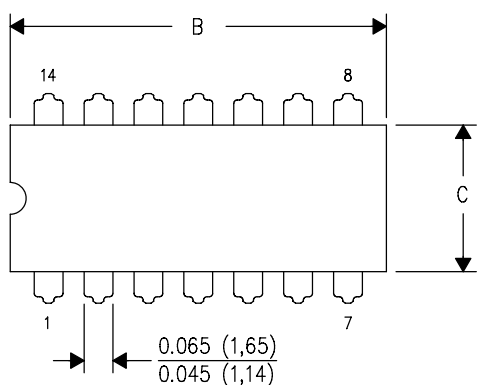


- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - $\triangle C$ Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0.006 (0,15) each side.
 - $\triangle D$ Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 - E. Reference JEDEC MS-012 variation AC.

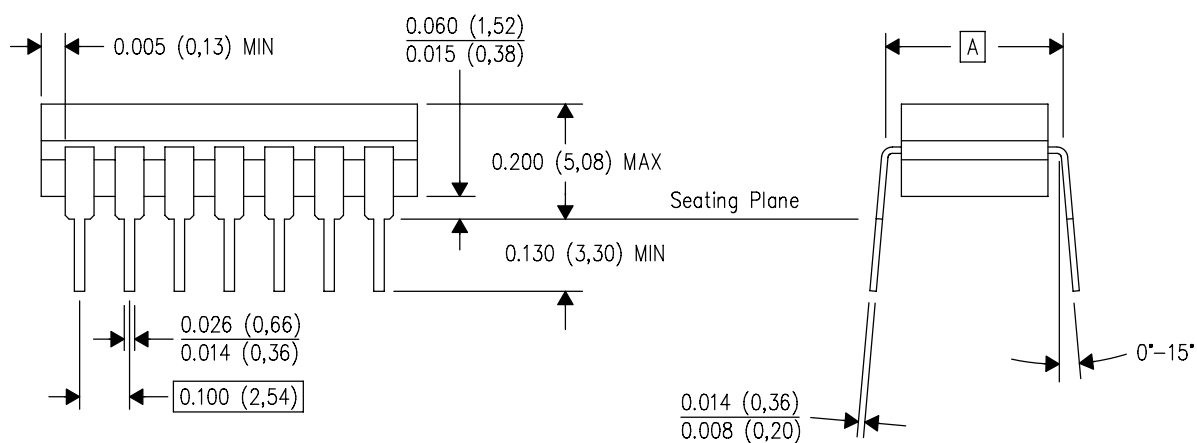
J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE

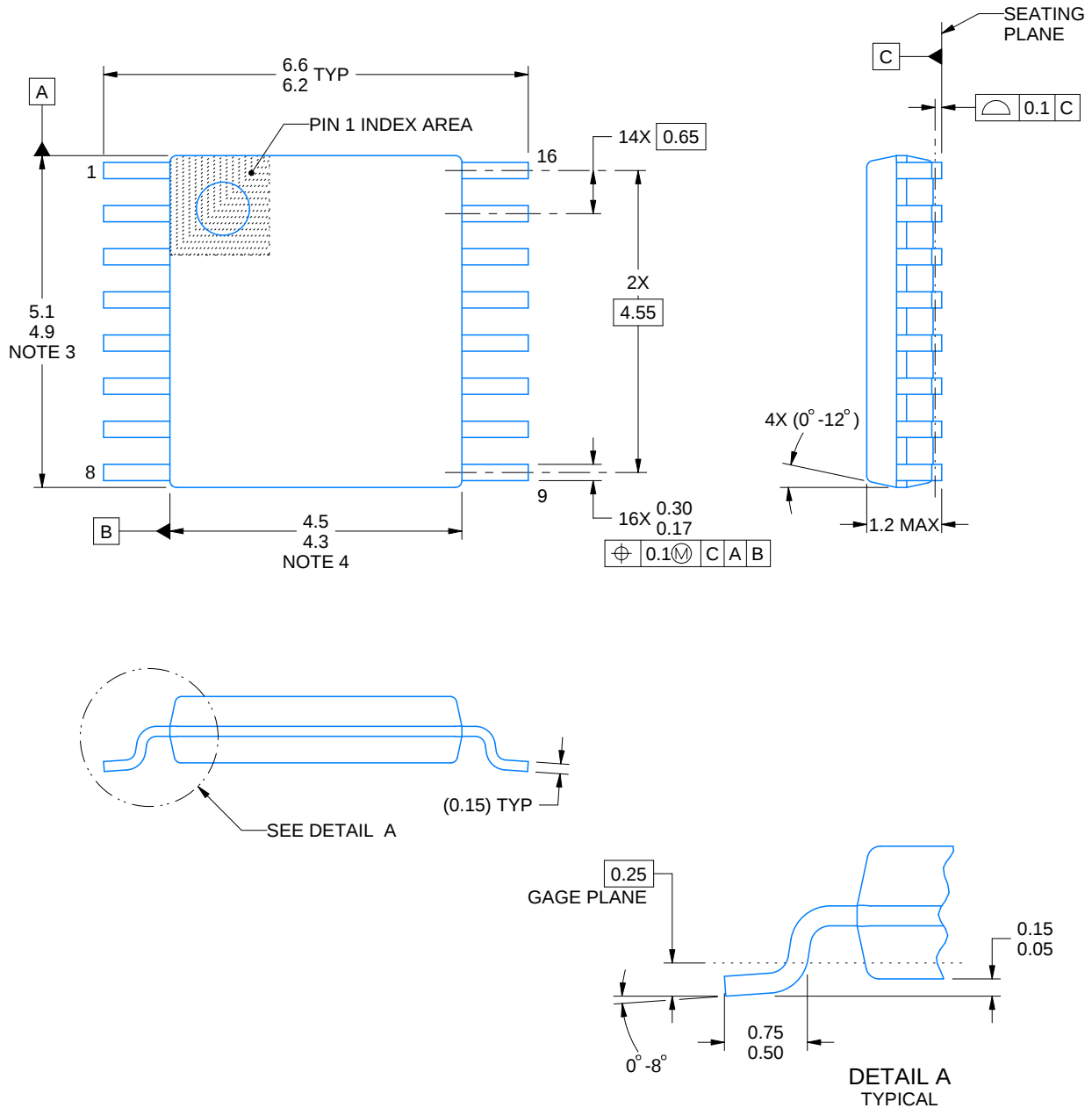
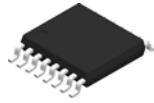


PINS ** DIM	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- 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.



4220204/B 12/2023

NOTES:

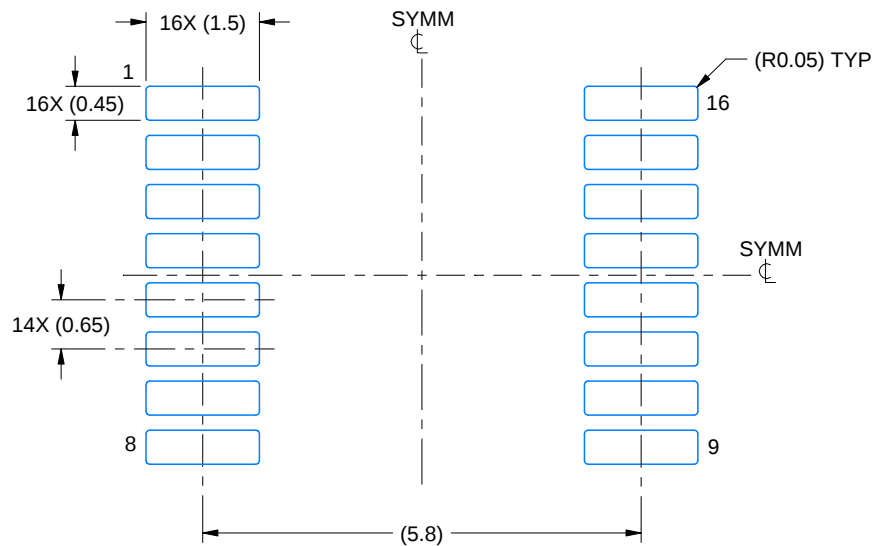
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or 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

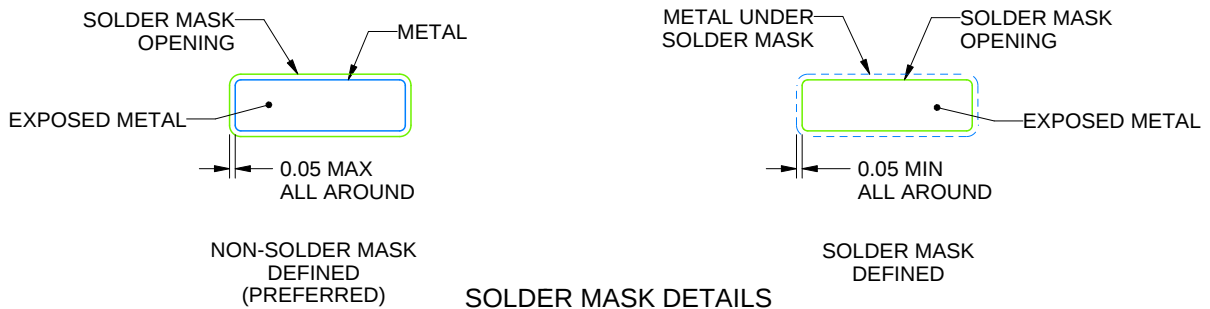
PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4220204/B 12/2023

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

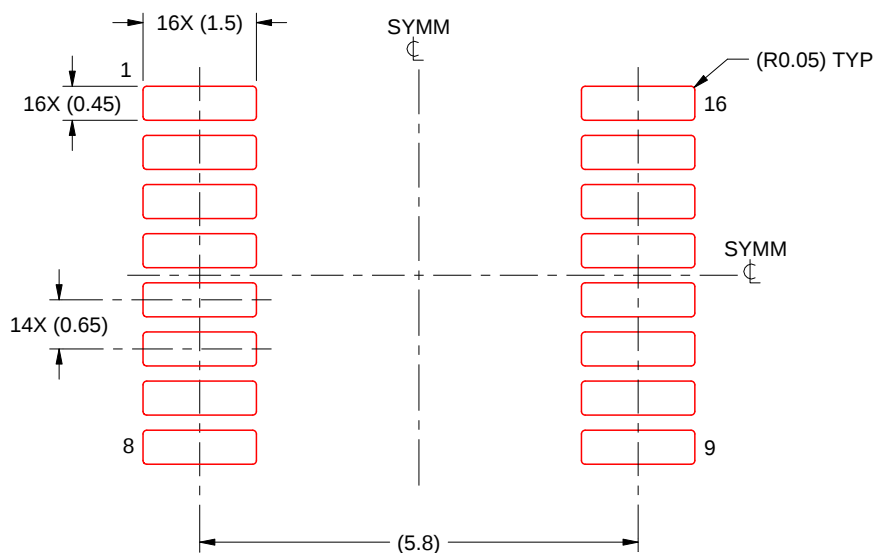
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

PW0016A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



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

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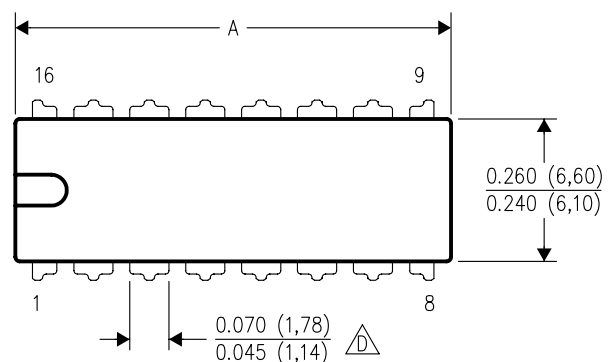
NOTES: (continued)

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.

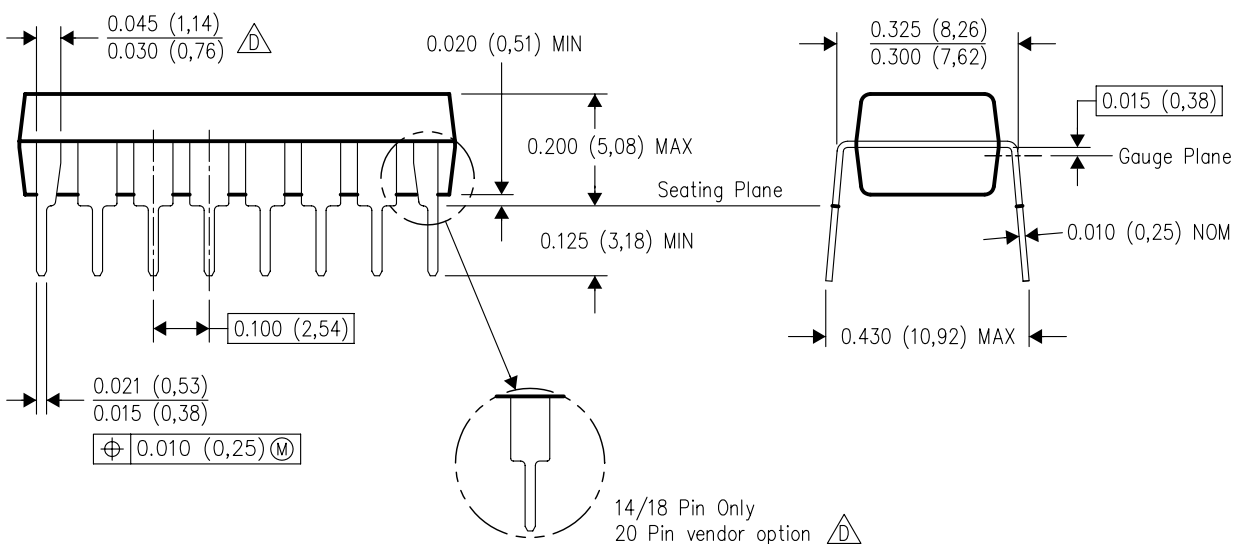
N (R-PDIP-T**)

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.

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最終更新日：2025 年 10 月