

## CDx4HC4020, CDx4HCT4020 CDHigh-Speed CMOS Logic 14-Stage Binary Counter

## 1 Features

- Fully static operation
- Buffered inputs
- Common reset
- Negative edge clocking
- Fanout (over temperature range)
  - Standard outputs: 10 LSTTL loads
  - Bus driver outputs: 15 LSTTL loads
- Wide operating temperature range: -55°C to 125°C
- Balanced propagation delay and transition times
- Significant power reduction compared to LSTTL Logic ICs
- HC types
  - 2 V to 6 V operation
  - High noise immunity:  $N_{IL} = 30\%$ ,  $N_{IH} = 30\%$  of  $V_{CC}$  at  $V_{CC} = 5$  V
- HCT types
  - 4.5 V to 5.5 V operation
  - Direct LSTTL input logic compatibility,  $V_{IL} = 0.8$  V (max),  $V_{IH} = 2$  V (min)
  - CMOS input compatibility,  $I_i \leq 1 \mu\text{A}$  at  $V_{OL}, V_{OH}$

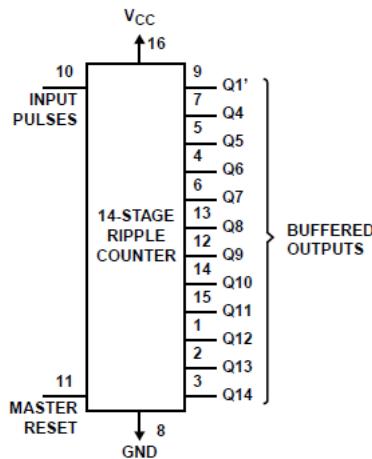
## 2 Description

The 'HC4020 and 'HCT4020 are 14-stage ripple-carry binary counters. All counter stages are controller/peripheral flip-flops. The state of the stage advances one count on the negative clock transition of each input pulse; a high voltage level on the MR line resets all counters to their zero state. All inputs and outputs are buffered.

## Device Information

PART NUMBER	PACKAGE <sup>(1)</sup>	BODY SIZE (NOM)
CD54HC4020	J (CDIP, 16)	24.38 mm × 6.92 mm
CD74HC4020CD74 HC4020	D (SOIC, 16)	9.90 mm × 3.90 mm
	N (PDIP, 16)	19.31 mm × 6.35 mm
CD54HCT4020	J (CDIP, 16)	24.38 mm × 6.92 mm
CD74HCT4020CD7 4HCT4020	D (SOIC, 16)	9.90 mm × 3.90 mm
	N (PDIP, 16)	19.31 mm × 6.35 mm

(1) For all available packages, see the orderable addendum at the end of the datasheet.



Functional Block Diagram



An IMPORTANT NOTICE at the end of this data sheet addresses availability, warranty, changes, use in safety-critical applications, intellectual property matters and other important disclaimers. PRODUCTION DATA.

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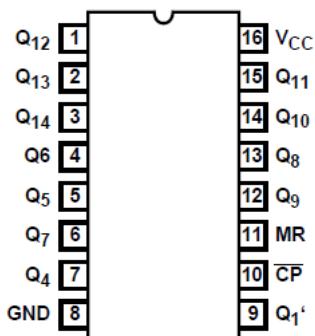
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## 3 Revision History

NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

<b>Changes from Revision C (October 2003) to Revision D (August 2022)</b>	<b>Page</b>
• Updated the numbering, formatting, tables, figures, and cross-references throughout the document to reflect modern data sheet standards.....	<b>1</b>

## 4 Pin Configuration and Functions



J, N, or D package  
16-PIN CDIP, PDIP, or SOIC  
Top View

## 5 Specifications

### 5.1 Absolute Maximum Ratings

			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage		-0.5	7	V
I <sub>IK</sub>	Input diode current	For V <sub>I</sub> < -0.5 V or V <sub>I</sub> > V <sub>CC</sub> + 0.5 V		±20	mA
I <sub>OK</sub>	Output diode current	For V <sub>O</sub> < -0.5 V or V <sub>O</sub> > V <sub>CC</sub> + 0.5 V		±20	mA
I <sub>O</sub>	Output source or sink current per output pin	For V <sub>O</sub> > -0.5 V or V <sub>O</sub> < V <sub>CC</sub> + 0.5 V		±25	mA
	Continuous current through V <sub>CC</sub> or GND			±50	mA
T <sub>J</sub>	Junction temperature			150	°C
T <sub>stg</sub>	Storage temperature range		-65	150	°C
	Lead temperature (Soldering 10s) (SOIC - lead tips only)			300	°C

### 5.2 Recommended Operating Conditions

			MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage range	HC types	2	6	V
		HCT types	4.5	5.5	
V <sub>I</sub> , V <sub>O</sub>	DC input or output voltage		0	V <sub>CC</sub>	V
	Input rise and fall time	2 V		1000	ns
		4.5 V		500	
		6 V		400	
T <sub>A</sub>	Temperature range		-55	125	°C

### 5.3 Thermal Information

THERMAL METRIC	R <sub>θJA</sub>	D (SOIC)	N (PDIP)	UNIT
		16 PINS	16 PINS	
	Junction-to-ambient thermal resistance <sup>(1)</sup>	73	67	°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 <sup>(2)</sup>	V <sub>CC</sub> (V)	25°C			-40°C to 85°C		-55°C to 125°C		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
<b>HC TYPES</b>										
V <sub>IH</sub>	High level input voltage		2	1.5		1.5		1.5		V
			4.5	3.15		3.15		3.15		
			6	4.2		4.2		4.2		
V <sub>IL</sub>	Low level input voltage		2		0.5		0.5		0.5	V
			4.5		1.35		1.35		1.35	
			6		1.8		1.8		1.8	
V <sub>OH</sub>	High level output voltage CMOS loads	I <sub>OH</sub> = -20 µA	2	1.9		1.9		1.9		V
		I <sub>OH</sub> = -20 µA	4.5	4.4		4.4		4.4		
		I <sub>OH</sub> = -20 µA	6	5.9		5.9		5.9		
	High level output voltage TTL loads	I <sub>OH</sub> = -4 mA	4.5	3.98		3.84		3.7		V
		I <sub>OH</sub> = -5.2 mA	6	5.48		5.34		5.2		
V <sub>OL</sub>	Low level output voltage CMOS loads	I <sub>OL</sub> = 20 µA	2		0.1		0.1		0.1	V
		I <sub>OL</sub> = 20 µA	4.5		0.1		0.1		0.1	
		I <sub>OL</sub> = 20 µA	6		0.1		0.1		0.1	
	Low level output voltage TTL loads	I <sub>OL</sub> = 4 mA	4.5		0.26		0.33		0.4	V
		I <sub>OL</sub> = 5.2 mA	6		0.26		0.33		0.4	
I <sub>I</sub>	Input leakage current	V <sub>CC</sub> or GND	6		±0.1		±1		±1	µA
I <sub>CC</sub>	Supply current	V <sub>CC</sub> or GND	6		8		80		160	µA
<b>HCT TYPES</b>										
V <sub>IH</sub>	High level input voltage		4.5 to 5.5	2		2		2		V
V <sub>IL</sub>	Low level input voltage		4.5 to 5.5		0.8		0.8		0.8	V
V <sub>OH</sub>	High level output voltage CMOS loads	I <sub>OH</sub> = -20 µA	4.5	4.4		4.4		4.4		V
	High level output voltage TTL loads	I <sub>OH</sub> = -4 mA	4.5	3.98		3.84		3.7		V
V <sub>OL</sub>	Low level output voltage CMOS loads	I <sub>OL</sub> = 20 µA	4.5		0.1		0.1		0.1	V
	Low level output voltage TTL loads	I <sub>OL</sub> = 4 mA	4.5		0.26		0.33		0.4	V
I <sub>I</sub>	Input leakage current	V <sub>CC</sub> and GND	5.5		±0.1		±1		±1	µA
I <sub>CC</sub>	Supply current	V <sub>CC</sub> or GND	5.5		8		80		160	µA
ΔI <sub>CC</sub> <sup>(1)</sup>	Additional supply current per input pin	MR input held at V <sub>CC</sub> -2.1	4.5 to 5.5	100	234		292.5		318.5	µA
		CP input held at V <sub>CC</sub> -2.1	4.5 to 5.5	100	180		225		245	µA

(1) For dual-supply systems theoretical worst case (V<sub>I</sub> = 2.4 V, V<sub>CC</sub> = 5.5 V) specification is 1.8 mA.

(2) V<sub>I</sub> = V<sub>IH</sub> or V<sub>IL</sub>, unless otherwise noted.

## 5.5 Prerequisite for Switching Characteristics

PARAMETER	V <sub>CC</sub> (V)	25°C			-40°C to 85°C		-55°C to 125°C		UNIT
		MIN	TYP	MAX	MIN	MAX	MIN	MAX	
<b>HC TYPES</b>									
f <sub>MAX</sub>	Maximum input pulse frequency	2	6		5		4		MHz
		4.5	30		25		20		
		6	35		29		24		
t <sub>W</sub>	Input pulse width	2	80		100		120		ns
		4.5	16		20		24		
		6	14		17		20		
t <sub>REM</sub>	Reset removal time	2	50		65		75		ns
		4.5	10		13		15		
		6	9		11		13		
t <sub>W</sub>	Reset pulse width	2	80		100		120		ns
		4.5	16		20		24		
		6	14		17		20		
<b>HCT TYPES</b>									
f <sub>MAX</sub>	Maximum input pulse frequency	4.5	25		20		16		MHz
t <sub>W</sub>	Input pulse width	4.5	20		25		30		ns
t <sub>REC</sub>	Reset recovery time	4.5	10		13		15		ns
t <sub>W</sub>	Reset pulse width	4.5	20		25		30		ns

## 5.6 Switching Characteristics

Input t<sub>r</sub>, t<sub>f</sub> = 6 ns. See [Parameter Measurement Information](#)

PARAMETER	TEST CONDITIONS	V <sub>CC</sub> (V)	25°C			-40°C to 85°C		-55°C to 125°C		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
<b>HC TYPES</b>										
t <sub>PLH</sub> , t <sub>PHL</sub>	Propagation delay time CP to Q1' Output	C <sub>L</sub> = 50 pF	2		140		175		210	ns
			4.5		28		35		42	
		C <sub>L</sub> = 15 pF	5		11					
		C <sub>L</sub> = 50 pF	6		24		30		36	
t <sub>PLH</sub> , t <sub>PHL</sub>	Q <sub>n</sub> to Q <sub>n</sub> + 1	C <sub>L</sub> = 50 pF	2		75		95		110	ns
			4.5		15		19		22	
		C <sub>L</sub> = 15 pF	5		6					
		C <sub>L</sub> = 50 pF	6		13		16		19	
t <sub>PLH</sub> , t <sub>PHL</sub>	MR to Q <sub>n</sub>	C <sub>L</sub> = 50 pF	2		170		215		255	ns
			4.5		34		43		51	
			5		14					
			6		29		37		43	
t <sub>TLH</sub> , t <sub>THL</sub>	Output transition time	C <sub>L</sub> = 50 pF	2		75		95		110	ns
			4.5		15		19		22	
			6		13		16		19	
C <sub>IN</sub>	Input capacitance	C <sub>L</sub> = 50 pF			10		10		10	pF
C <sub>PD</sub>	Power dissipation capacitance <sup>(1) (2)</sup>	C <sub>L</sub> = 15 pF	5	30						pF
<b>HCT TYPES</b>										

## 5.6 Switching Characteristics (continued)

Input  $t_r, t_f = 6$  ns. See [Parameter Measurement Information](#)

PARAMETER	TEST CONDITIONS	$V_{CC}$ (V)	25°C			-40°C to 85°C		-55°C to 125°C		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{PLH}, t_{PHL}$	Propagation delay time CP to Q1' Output	$C_L = 50$ pF	4.5		40		50		60	ns
		$C_L = 15$ pF	5		17					
$t_{PLH}, t_{PHL}$	Qn to $Q_n + 1$	$C_L = 50$ pF	4.5		15		19		22	ns
		$C_L = 15$ pF	5		6					
$t_{TLH}, t_{THL}$	MR to $Q_n$	$C_L = 50$ pF	4.5		40		50		60	ns
		$C_L = 15$ pF	5		17					
$t_{TLH}, t_{THL}$	Output transition	$C_L = 50$ pF	4.5		15		19		22	ns
$C_{IN}$	Input capacitance	$C_L = 50$ pF			10		10		10	pF
$C_{PD}$	Power dissipation capacitance <sup>(1) (2)</sup>	$C_L = 15$ pF	5		30					pF

(1)  $C_{PD}$  is used to determine the dynamic power consumption, per package.

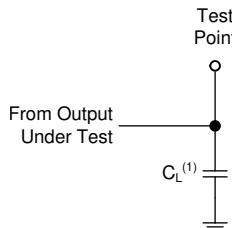
(2)  $P_D = V_{CC}^2 f_i (C_{PD} + C_L)$  where  $f_i$  = Input frequency,  $C_L$  = Output load capacitance,  $V_{CC}$  = Supply Voltage.

## 6 Parameter Measurement Information

Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: PRR  $\leq$  1 MHz,  $Z_O = 50 \Omega$ ,  $t_t < 6$  ns.

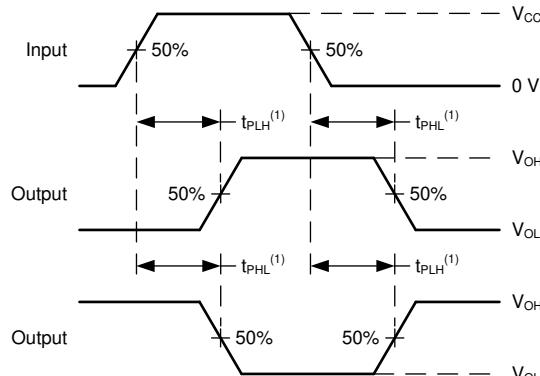
For clock inputs,  $f_{max}$  is measured when the input duty cycle is 50%.

The outputs are measured one at a time with one input transition per measurement.



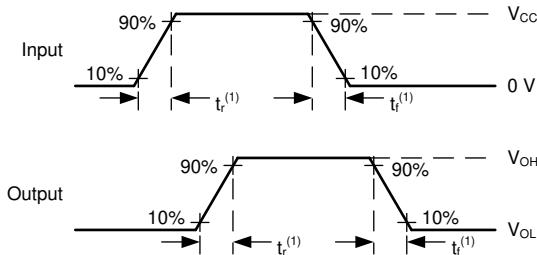
(1)  $C_L$  includes probe and test-fixture capacitance.

**Figure 6-1. Load Circuit for Push-Pull Outputs**



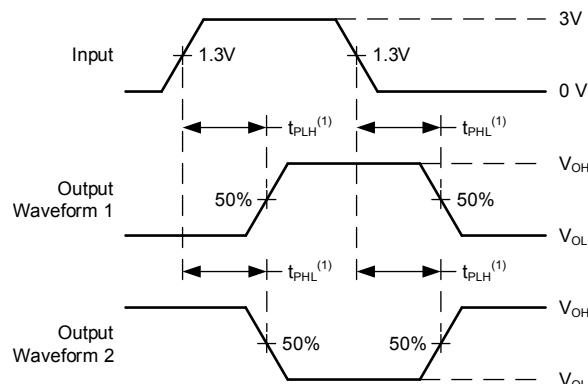
(1) The greater between  $t_{PLH}$  and  $t_{PHL}$  is the same as  $t_{pd}$ .

**Figure 6-2. Voltage Waveforms, Propagation Delays for Standard CMOS Inputs**



(1) The greater between  $t_r$  and  $t_f$  is the same as  $t_t$ .

**Figure 6-3. Voltage Waveforms, Input and Output Transition Times for Standard CMOS Inputs**



(1) The greater between  $t_{PLH}$  and  $t_{PHL}$  is the same as  $t_{pd}$ .

**Figure 6-4. Voltage Waveforms, Propagation Delays for TTL-Compatible Inputs**

## 7 Detailed Description

### 7.1 Overview

The 'HC4020 and 'HCT4020 are 14-stage ripple-carry binary counters. All counter stages are controller flipflops. The state of the stage advances one count on the negative clock transition of each input pulse; a high voltage level on the CLR line resets all counters to their zero state. All inputs and outputs are buffered.

### 7.2 Functional Block Diagram

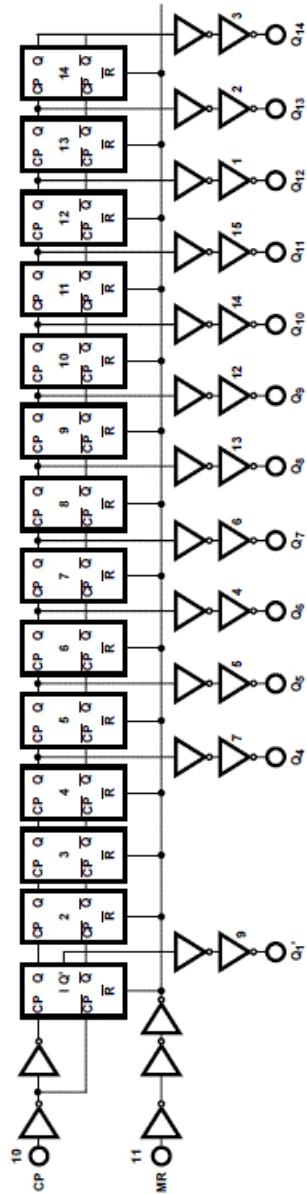


Figure 7-1. Functional Diagram

## 7.3 Device Functional Modes

Table 7-1. Truth Table

CP COUNT <sup>(1)</sup>	MR	OUTPUT STATE
↑	L	No change
↓	L	Advance to next state
X	H	All outputs are low

(1) H = High Voltage Level, L = Low Voltage Level, X = Don't Care  
↑ = Transition from Low to High Level, ↓ = Transition from High to Low.

## 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- $\mu$ F capacitor is recommended for this device. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. The 0.1- $\mu$ F and 1- $\mu$ 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 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on [ti.com](http://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.

### 10.2 Support Resources

[TI E2E™ support forums](#) are an engineer's go-to source for fast, verified answers and design help — straight from the experts. Search existing answers or ask your own question to get the quick design help you need.

Linked content is provided "AS IS" by the respective contributors. They do not constitute TI specifications and do not necessarily reflect TI's views; see TI's [Terms of Use](#).

### 10.3 Trademarks

TI E2E™ is a trademark of Texas Instruments.

All trademarks are the property of their respective owners.

### 10.4 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.

### 10.5 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)
5962-8945801EA	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8945801EA CD54HCT4020F3A
CD54HC4020F	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54HC4020F
CD54HC4020F.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	CD54HC4020F
CD54HC4020F3A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8500301EA CD54HC4020F3A
CD54HC4020F3A.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	8500301EA CD54HC4020F3A
CD54HCT4020F3A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8945801EA CD54HCT4020F3A
CD54HCT4020F3A.A	Active	Production	CDIP (J)   16	25   TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8945801EA CD54HCT4020F3A
CD74HC4020E	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HC4020E
CD74HC4020E.A	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HC4020E
CD74HC4020EE4	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HC4020E
CD74HC4020M	Obsolete	Production	SOIC (D)   16	-	-	Call TI	Call TI	-55 to 125	HC4020M
CD74HC4020M96	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU   SN	Level-1-260C-UNLIM	-55 to 125	HC4020M
CD74HC4020M96.A	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HC4020M
CD74HC4020M961G4	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HC4020M
CD74HC4020M961G4.A	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HC4020M
CD74HCT4020E	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HCT4020E
CD74HCT4020E.A	Active	Production	PDIP (N)   16	25   TUBE	Yes	NIPDAU	N/A for Pkg Type	-55 to 125	CD74HCT4020E
CD74HCT4020M	Obsolete	Production	SOIC (D)   16	-	-	Call TI	Call TI	-55 to 125	HCT4020M
CD74HCT4020M96	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HCT4020M
CD74HCT4020M96.A	Active	Production	SOIC (D)   16	2500   LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-55 to 125	HCT4020M
CD74HCT4020MT	Obsolete	Production	SOIC (D)   16	-	-	Call TI	Call TI	-55 to 125	HCT4020M

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

<sup>(2)</sup> **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.

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

<sup>(4)</sup> **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.

<sup>(5)</sup> **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.

<sup>(6)</sup> **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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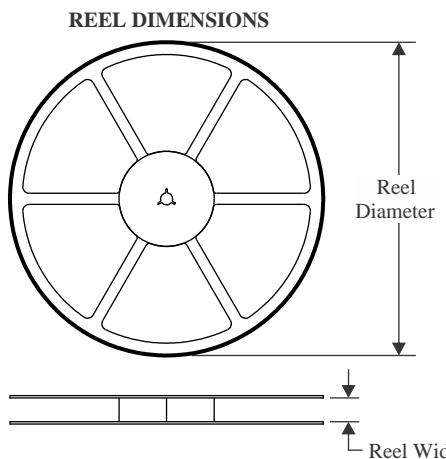
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

**OTHER QUALIFIED VERSIONS OF CD54HC4020, CD54HCT4020, CD74HC4020, CD74HCT4020 :**

- Catalog : [CD74HC4020](#), [CD74HCT4020](#)
- Military : [CD54HC4020](#), [CD54HCT4020](#)

**NOTE: Qualified Version Definitions:**

- Catalog - TI's standard catalog product
- Military - QML certified for Military and Defense Applications

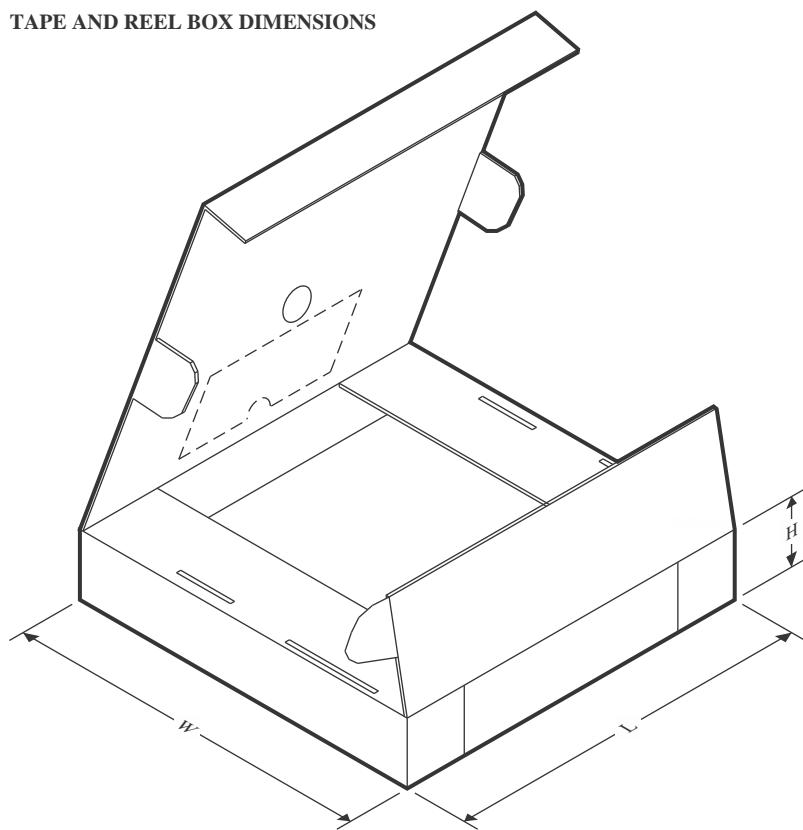
**TAPE AND REEL INFORMATION**


A0	Dimension designed to accommodate the component width
B0	Dimension designed to accommodate the component length
K0	Dimension designed to accommodate the component thickness
W	Overall width of the carrier tape
P1	Pitch between successive cavity centers

**QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE**


\*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
CD74HC4020M96	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
CD74HC4020M961G4	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
CD74HCT4020M96	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)
CD74HC4020M96	SOIC	D	16	2500	353.0	353.0	32.0
CD74HC4020M961G4	SOIC	D	16	2500	353.0	353.0	32.0
CD74HCT4020M96	SOIC	D	16	2500	340.5	336.1	32.0

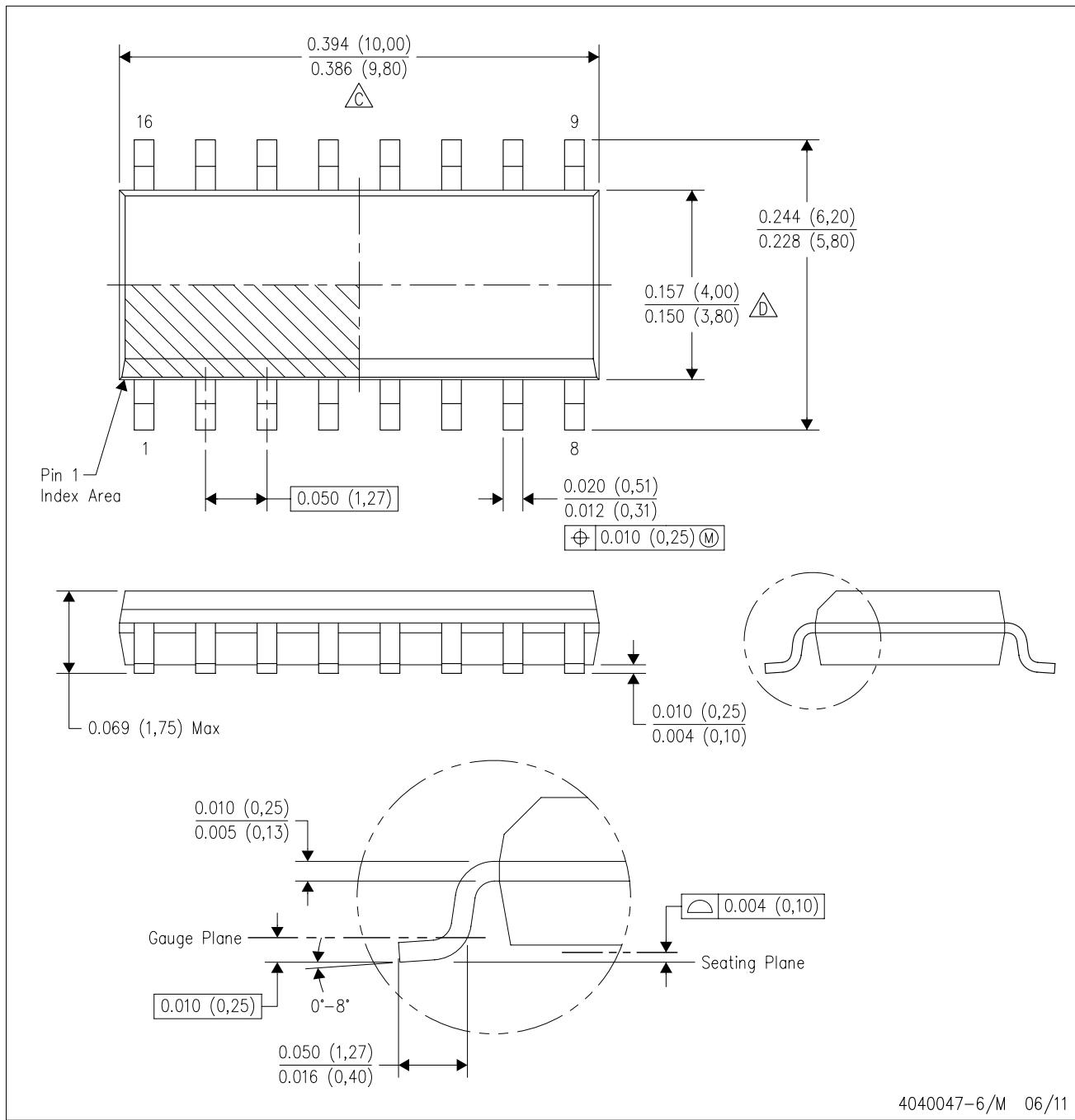
**TUBE**


\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
CD74HC4020E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC4020E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC4020E.A	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC4020E.A	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC4020EE4	N	PDIP	16	25	506	13.97	11230	4.32
CD74HC4020EE4	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT4020E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT4020E	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT4020E.A	N	PDIP	16	25	506	13.97	11230	4.32
CD74HCT4020E.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.

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.

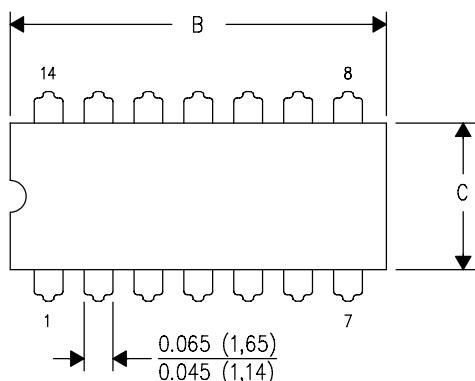
D. Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.

E. Reference JEDEC MS-012 variation AC.

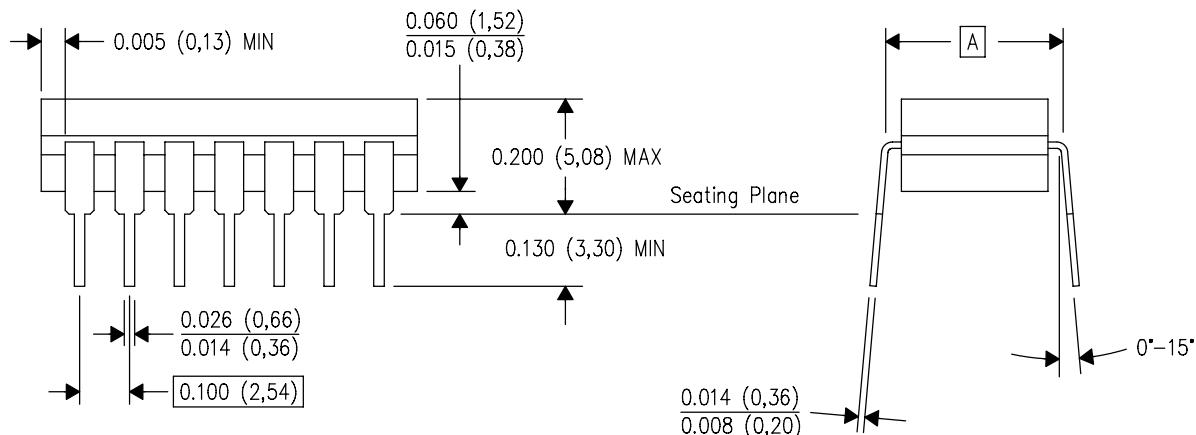
J (R-GDIP-T\*\*)

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)



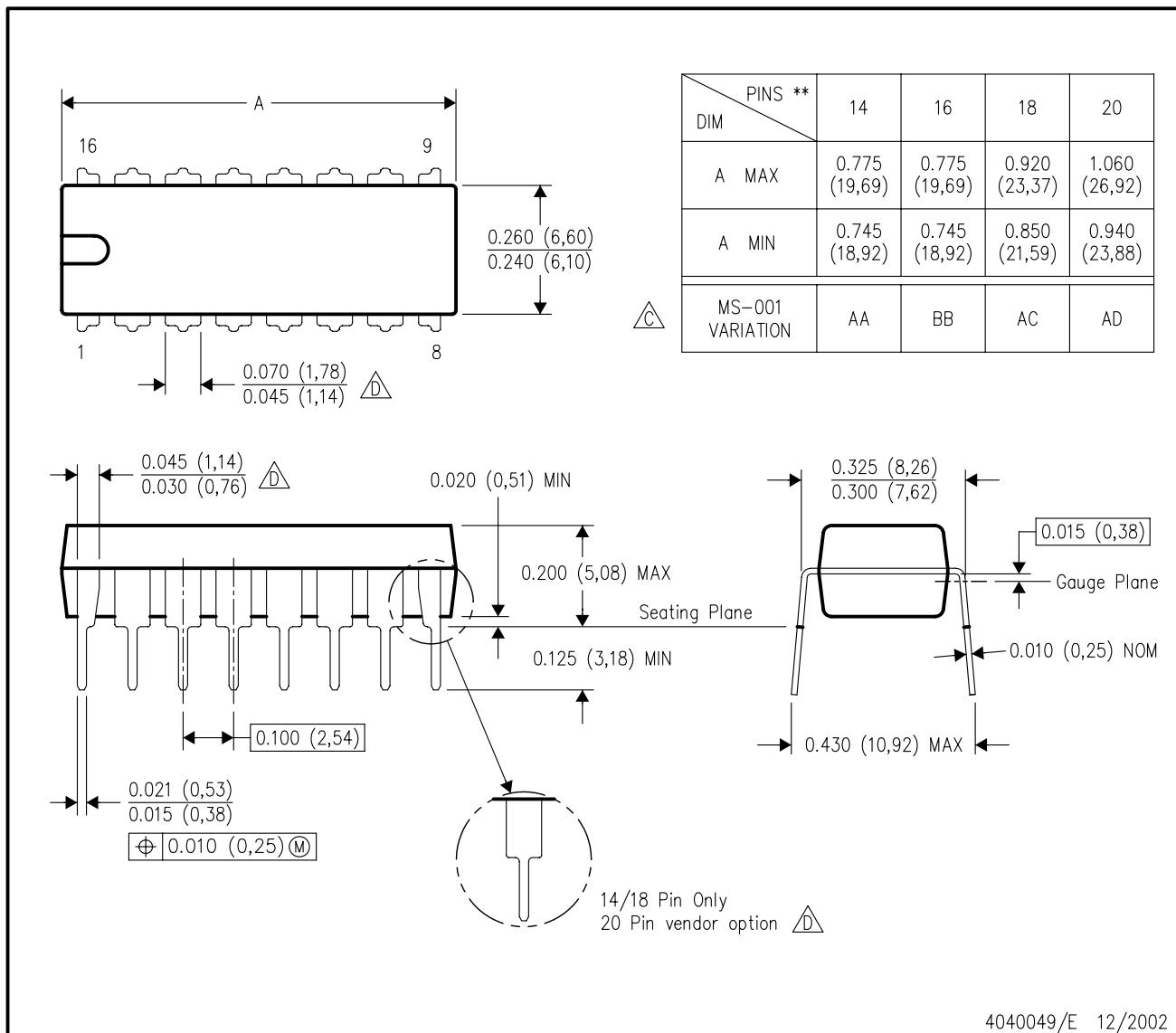
4040083/F 03/03

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.

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

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



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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