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Data sheet acquired from Harris Semiconductor
SCHS195C

January 1998 - Revised October 2003

CD54HC670, CD74HC670, CD74HCT670

High-Speed CMOS Logic 4x4 Register File

Features

- Simultaneous and Independent Read and Write Operations
- Expandable to 512 Words of n-Bits
- Three-State Outputs
- Organized as 4 Words x 4 Bits Wide
- Buffered Inputs
- Typical Read Time = 16ns for 'HC670 $V_{CC} = 5V$, $C_L = 15pF$, $T_A = 25^\circ C$
- Fanout (Over Temperature Range)
 - Standard Outputs 10 LSTTL Loads
 - Bus Driver Outputs 15 LSTTL Loads
- Wide Operating Temperature Range ... $-55^\circ C$ to $125^\circ C$
- Balanced Propagation Delay and Transition Times
- Significant Power Reduction Compared to LSTTL Logic ICs
- HC Types
 - 2V to 6V Operation
 - High Noise Immunity: $N_{IL} = 30\%$, $N_{IH} = 30\%$ of V_{CC} at $V_{CC} = 5V$
- HCT Types
 - 4.5V to 5.5V Operation
 - Direct LSTTL Input Logic Compatibility, $V_{IL} = 0.8V$ (Max), $V_{IH} = 2V$ (Min)
 - CMOS Input Compatibility, $I_I \leq 1\mu A$ at V_{OL}, V_{OH}

Description

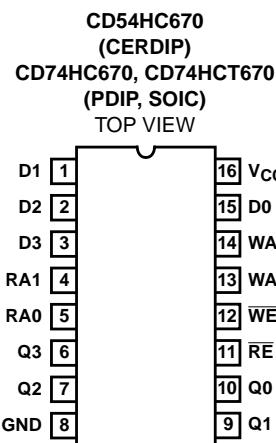
The 'HC670 and CD74HCT670 are 16-bit register files organized as 4 words x 4 bits each. Read and write address and enable inputs allow simultaneous writing into one location while reading another. Four data inputs are provided to store the 4-bit word. The write address inputs (WA0 and WA1) determine the location of the stored word in the register. When write enable (\overline{WE}) is low the word is entered into the address location and it remains transparent to the data. The outputs will reflect the true form of the input data. When (\overline{WE}) is high data and address inputs are inhibited. Data acquisition from the four registers is made possible by the read address inputs (RA1 and RA0). The addressed word appears at the output when the read enable (\overline{RE}) is low. The output is in the high impedance state when the (\overline{RE}) is high. Outputs can be tied together to increase the word capacity to 512 x 4 bits.

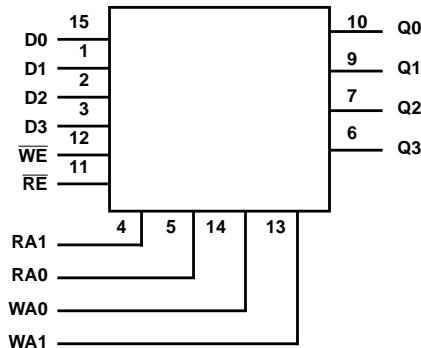
Ordering Information

PART NUMBER	TEMP. RANGE ($^\circ C$)	PACKAGE
CD54HC670F3A	-55 to 125	16 Ld CERDIP
CD74HC670E	-55 to 125	16 Ld PDIP
CD74HC670M	-55 to 125	16 Ld SOIC
CD74HC670MT	-55 to 125	16 Ld SOIC
CD74HC670M96	-55 to 125	16 Ld SOIC
CD74HCT670E	-55 to 125	16 Ld PDIP
CD74HCT670M	-55 to 125	16 Ld SOIC
CD74HCT670MT	-55 to 125	16 Ld SOIC
CD74HCT670M96	-55 to 125	16 Ld SOIC

NOTE: When ordering, use the entire part number. The suffix 96 denotes tape and reel. The suffix T denotes a small-quantity reel of 250.

Pinout



CD54HC670, CD74HC670, CD74HCT670**Functional Diagram**

WRITE MODE SELECT TABLE

OPERATING MODE	INPUTS		INTERNAL LATCHES (NOTE 1)
	WE	D _N	
Write Data	L	L	L
	L	H	H
Data Latched	H	X	No Change

NOTE:

1. The Write Address (WA0 and WA1) to the "internal latches" must be stable while WE is LOW for conventional operation.

READ MODE SELECT TABLE

OPERATING MODE	INPUTS		OUTPUT Q _N
	RE	INTERNAL LATCHES (NOTE 2)	
Read	L	L	L
	L	H	H
Disabled	H	X	(Z)

NOTE:

2. The selection of the "internal latches" by Read Address (RA0 and RA1) are not constrained by WE or RE operation.

H = High Voltage Level

L = Low Voltage Level

X = Don't Care

Z = High Impedance "Off" State

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Absolute Maximum Ratings

DC Supply Voltage, V_{CC}	-0.5V to 7V
DC Input Diode Current, I_{IK} For $V_I < -0.5V$ or $V_I > V_{CC} + 0.5V$	$\pm 20mA$
DC Output Diode Current, I_{OK} For $V_O < -0.5V$ or $V_O > V_{CC} + 0.5V$	$\pm 20mA$
DC Drain Current, per Output, I_O For $-0.5V < V_O < V_{CC} + 0.5V$	$\pm 35mA$
DC Output Source or Sink Current per Output Pin, I_O For $V_O > -0.5V$ or $V_O < V_{CC} + 0.5V$	$\pm 25mA$
DC V_{CC} or Ground Current, I_{CC}	$\pm 50mA$

Thermal Information

Thermal Resistance (Typical, Note 3)	θ_{JA} ($^{\circ}C/W$)
E (PDIP) Package	67
M (SOIC) Package	73
Maximum Junction Temperature	150 $^{\circ}C$
Maximum Storage Temperature Range	-65 $^{\circ}C$ to 150 $^{\circ}C$
Maximum Lead Temperature (Soldering 10s)	300 $^{\circ}C$
(SOIC - Lead Tips Only)	

Operating Conditions

Temperature Range, T_A	-55 $^{\circ}C$ to 125 $^{\circ}C$
Supply Voltage Range, V_{CC}	
HC Types	.2V to 6V
HCT Types	4.5V to 5.5V
DC Input or Output Voltage, V_I , V_O	0V to V_{CC}
Input Rise and Fall Time	
2V	1000ns (Max)
4.5V	500ns (Max)
6V	400ns (Max)

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE:

3. The package thermal impedance is calculated in accordance with JESD 51-7.

DC Electrical Specifications

PARAMETER	SYMBOL	TEST CONDITIONS		V_{CC} (V)	25 $^{\circ}C$			-40 $^{\circ}C$ TO 85 $^{\circ}C$		-55 $^{\circ}C$ TO 125 $^{\circ}C$		UNITS
		V_I (V)	I_O (mA)		MIN	TYP	MAX	MIN	MAX	MIN	MAX	
HC TYPES												
High Level Input Voltage	V_{IH}	-	-	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
Low Level Input Voltage	V_{IL}	-	-	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
High Level Output Voltage CMOS Loads	V_{OH}	V_{IH} or V_{IL}	-0.02	2	1.9	-	-	1.9	-	1.9	-	V
			-0.02	4.5	4.4	-	-	4.4	-	4.4	-	V
			-0.02	6	5.9	-	-	5.9	-	5.9	-	V
High Level Output Voltage TTL Loads			-	-	-	-	-	-	-	-	-	V
			-6	4.5	3.98	-	-	3.84	-	3.7	-	V
			-7.8	6	5.48	-	-	5.34	-	5.2	-	V
Low Level Output Voltage CMOS Loads	V_{OL}	V_{IH} or V_{IL}	0.02	2	-	-	0.1	-	0.1	-	0.1	V
			0.02	4.5	-	-	0.1	-	0.1	-	0.1	V
			0.02	6	-	-	0.1	-	0.1	-	0.1	V
Low Level Output Voltage TTL Loads			-	-	-	-	-	-	-	-	-	V
			6	4.5	-	-	0.26	-	0.33	-	0.4	V
			7.8	6	-	-	0.26	-	0.33	-	0.4	V
Input Leakage Current	I_I	V_{CC} or GND	-	6	-	-	± 0.1	-	± 1	-	± 1	μA

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DC Electrical Specifications (Continued)

PARAMETER	SYMBOL	TEST CONDITIONS		V _{CC} (V)	25°C			-40°C TO 85°C		-55°C TO 125°C		UNITS
		V _I (V)	I _O (mA)		MIN	TYP	MAX	MIN	MAX	MIN	MAX	
Quiescent Device Current	I _{CC}	V _{CC} or GND	0	6	-	-	8	-	80	-	160	µA
Three- State Leakage Current		V _{IL} or V _{IH}	V _O = V _{CC} or GND	6	-	-	±0.5	-	±5.0	-	±10	µA
HCT TYPES												
High Level Input Voltage	V _{IH}	-	-	4.5 to 5.5	2	-	-	2	-	2	-	V
Low Level Input Voltage	V _{IL}	-	-	4.5 to 5.5	-	-	0.8	-	0.8	-	0.8	V
High Level Output Voltage CMOS Loads	V _{OH}	V _{IH} or V _{IL}	-0.02	4.5	4.4	-	-	4.4	-	4.4	-	V
High Level Output Voltage TTL Loads			-6	4.5	3.98	-	-	3.84	-	3.7	-	V
Low Level Output Voltage CMOS Loads	V _{OL}	V _{IH} or V _{IL}	0.02	4.5	-	-	0.1	-	0.1	-	0.1	V
Low Level Output Voltage TTL Loads			6	4.5	-	-	0.26	-	0.33	-	0.4	V
Input Leakage Current	I _I	V _{CC} and GND	0	5.5	-	-	±0.1	-	±1	-	±1	µA
Quiescent Device Current	I _{CC}	V _{CC} or GND	0	5.5	-	-	8	-	80	-	160	µA
Three- State Leakage Current		V _{IL} or V _{IH}	V _O = V _{CC} or GND	5.5	-	-	±0.5	-	±5.0	-	±10	µA
Additional Quiescent Device Current Per Input Pin: 1 Unit Load	ΔI _{CC} (Note 4)	V _{CC} -2.1	-	4.5 to 5.5	-	100	360	-	450	-	490	µA

NOTE:

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

HCT Input Loading Table

INPUT	UNIT LOADS
WE	0.3
WA0	0.2
WA1	0.4
RE	1.5
DATA	0.15
RA0	0.4
RA1	0.7

NOTE: Unit Load is ΔI_{CC} limit specific in DC Electrical Specifications Table, e.g., 360µA max. at 25°C.

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Prerequisite for Switching Specifications

PARAMETER	SYMBOL	V _{CC} (V)	25°C			-40°C TO 85°C			-55°C TO 125°C			UNITS
			MIN	TYP	MAX	MIN	TYP	MAX	MIN	TYP	MAX	
HC TYPES												
Setup Time Data to WE Write to WE	t _{SU} , t _h	2	60	-	-	75	-	-	90	-	-	ns
		4.5	12	-	-	15	-	-	18	-	-	ns
		6	10	-	-	13	-	-	15	-	-	ns
Hold Time Data to WE Write to WE	t _H , t _W	2	5	-	-	5	-	-	5	-	-	ns
		4.5	5	-	-	5	-	-	5	-	-	ns
		6	5	-	-	5	-	-	5	-	-	ns
Pulse Width WE	t _W	2	80	-	-	100	-	-	120	-	-	ns
		4.5	16	-	-	20	-	-	24	-	-	ns
		6	14	-	-	17	-	-	20	-	-	ns
Latch Time WE to RA0, RA1	t _{LATCH}	2	100	-	-	125	-	-	150	-	-	ns
		4.5	20	-	-	25	-	-	30	-	-	ns
		6	17	-	-	21	-	-	26	-	-	ns
HCT TYPES												
Setup Time Data to WE	t _{SU} , t _h	4.5	12	-	-	15	-	-	18	-	-	ns
Hold Time Data to WE Write to WE	t _H , t _W	4.5	5	-	-	5	-	-	5	-	-	ns
Setup Time Write to WE	t _{SU}	4.5	18	-	-	23	-	-	27	-	-	ns
Pulse Width WE	t _W	4.5	20	-	-	25	-	-	30	-	-	ns
Latch Time WE to RA0, RA1	t _{LATCH}	4.5	25	-	-	31	-	-	38	-	-	ns

Switching Specifications C_L = 50pF, Input t_r, t_f = 6ns

PARAMETER	SYMBOL	TEST CONDITIONS	V _{CC} (V)	25°C			-40°C TO 85°C		-55°C TO 125°C		UNITS
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
HC TYPES											
Propagation Delay Reading Any Word	t _{PLH} , t _{PHL}	C _L = 50pF	2	-	-	195	-	245	-	295	ns
			4.5	-	-	39	-	49	-	59	ns
		C _L = 15pF	5	-	16	-	-	-	-	-	ns
		C _L = 50pF	6	-	-	33	-	42	-	50	ns
Write Enable to Output	t _{PLH} , t _{PHL}	C _L = 50pF	2	-	-	250	-	315	-	375	ns
			4.5	-	-	50	-	63	-	75	ns
		C _L = 15pF	5	-	21	-	-	-	-	-	ns
		C _L = 50pF	6	-	-	43	-	54	-	64	ns

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Switching Specifications $C_L = 50\text{pF}$, Input $t_r, t_f = 6\text{ns}$ (Continued)

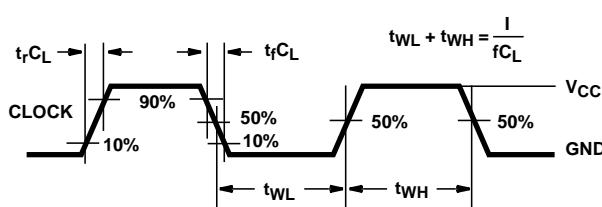
PARAMETER	SYMBOL	TEST CONDITIONS	V_{CC} (V)	25°C			-40°C TO 85°C		-55°C TO 125°C		UNITS
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
Data to Output	t_{PLH}, t_{PHL}	$C_L = 50\text{pF}$	2	-	-	256	-	315	-	375	ns
			4.5	-	-	50	-	63	-	75	ns
		$C_L = 15\text{pF}$	5	-	21	-	-	-	-	-	ns
		$C_L = 50\text{pF}$	6	-	-	43	-	54	-	64	ns
Output Disable Time	t_{PLZ}, t_{PHZ}	$C_L = 50\text{pF}$	2	-	-	150	-	190	-	225	ns
			4.5	-	-	30	-	38	-	45	ns
		$C_L = 15\text{pF}$	5	-	12	-	-	-	-	-	ns
		$C_L = 50\text{pF}$	6	-	-	26	-	33	-	38	ns
Output Enable Time	t_{PZL}, t_{PZH}	$C_L = 50\text{pF}$	2	-	-	150	-	190	-	225	ns
			4.5	-	-	30	-	38	-	45	ns
		$C_L = 15\text{pF}$	5	-	12	-	-	-	-	-	ns
		$C_L = 50\text{pF}$	6	-	-	26	-	33	-	38	ns
Output Transition Time	t_{THL}, t_{TLH}	$C_L = 50\text{pF}$	2	-	-	75	-	95	-	110	ns
			4.5	-	-	15	-	19	-	22	ns
			6	-	-	13	-	10	-	19	ns
Input Capacitance	C_I	$C_L = 50\text{pF}$	-	10	-	10	-	10	-	10	pF
Three-State Output Capacitance	C_O	-	-	20	-	20	-	20	-	20	pF
Power Dissipation Capacitance (Notes 5, 6)	C_{PD}	$C_L = 15\text{pF}$	5	-	59	-	-	-	-	-	pF
HCT TYPES											
Propagation Delay Reading Any Word	t_{PHL}, t_{PLH}	$C_L = 50\text{pF}$	4.5	-	-	40	-	50	-	53	ns
			$C_L = 15\text{pF}$	5	-	17	-	-	-	-	ns
Write Enable to Output	t_{PHL}, t_{PLH}	$C_L = 50\text{pF}$	4.5	-	-	50	-	63	-	75	ns
			$C_L = 15\text{pF}$	5	-	21	-	-	-	-	ns
Data to Output	t_{PHL}, t_{PLH}	$C_L = 50\text{pF}$	4.5	-	-	50	-	63	-	75	ns
			$C_L = 15\text{pF}$	5	-	21	-	-	-	-	ns
Output Disable Time	t_{PLZ}, t_{PHZ}	$C_L = 50\text{pF}$	4.5	-	-	35	-	44	-	53	ns
			$C_L = 15\text{pF}$	5	-	14	-	-	-	-	ns
Output Enable Time	t_{PZL}, t_{PZH}	$C_L = 50\text{pF}$	4.5	-	-	38	-	48	-	57	ns
			$C_L = 15\text{pF}$	5	-	16	-	-	-	-	ns
Output Transition Time	t_{TLH}, t_{THL}	$C_L = 50\text{pF}$	4.5	-	-	15	-	19	-	22	ns
Input Capacitance	C_I	$C_L = 50\text{pF}$	-	10	-	10	-	10	-	10	pF
Three-State Output Capacitance	C_O	-	-	20	-	20	-	20	-	20	pF
Power Dissipation Capacitance (Notes 5, 6)	C_{PD}	$C_L = 15\text{pF}$	5	-	66	-	-	-	-	-	pF

NOTES:

5. C_{PD} is used to determine the dynamic power consumption, per output.
6. $P_D = C_{PD} V_{CC}^2 f_i + \sum C_L V_{CC}^2 f_O$ where f_i = Input Frequency, f_O = Output Frequency, C_L = Output Load Capacitance, V_{CC} = Supply Voltage.

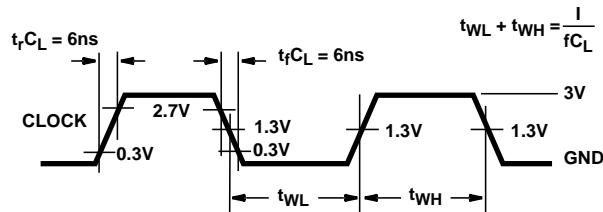
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Test Circuits and Waveforms



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%.

FIGURE 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%.

FIGURE 2. HCT CLOCK PULSE RISE AND FALL TIMES AND PULSE WIDTH

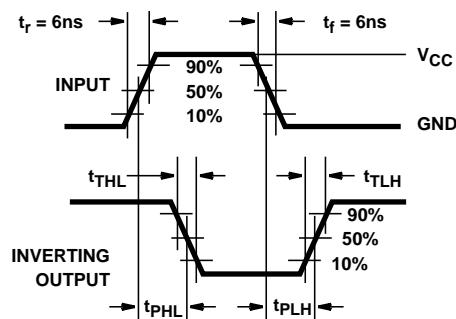


FIGURE 3. HC TRANSITION TIMES AND PROPAGATION DELAY TIMES, COMBINATION LOGIC

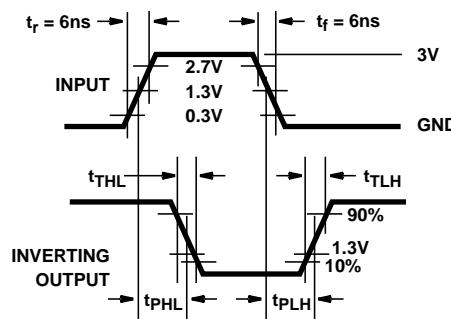


FIGURE 4. HCT TRANSITION TIMES AND PROPAGATION DELAY TIMES, COMBINATION LOGIC

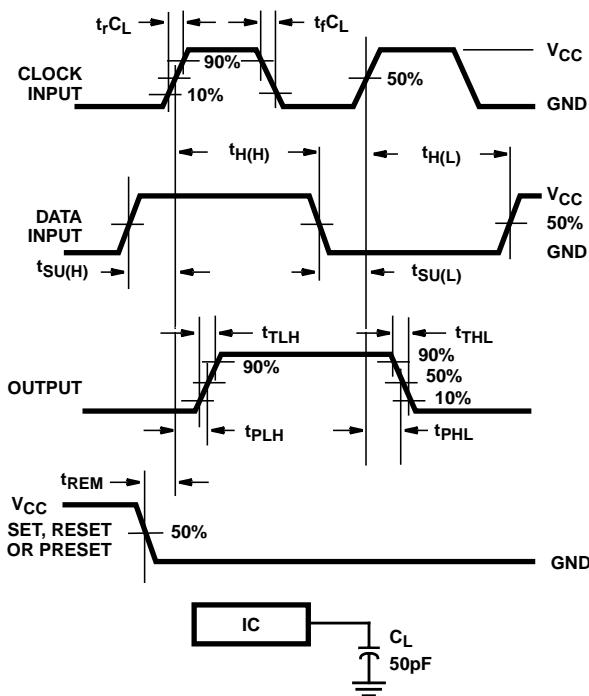


FIGURE 5. HC SETUP TIMES, HOLD TIMES, REMOVAL TIME, AND PROPAGATION DELAY TIMES FOR EDGE TRIGGERED SEQUENTIAL LOGIC CIRCUITS

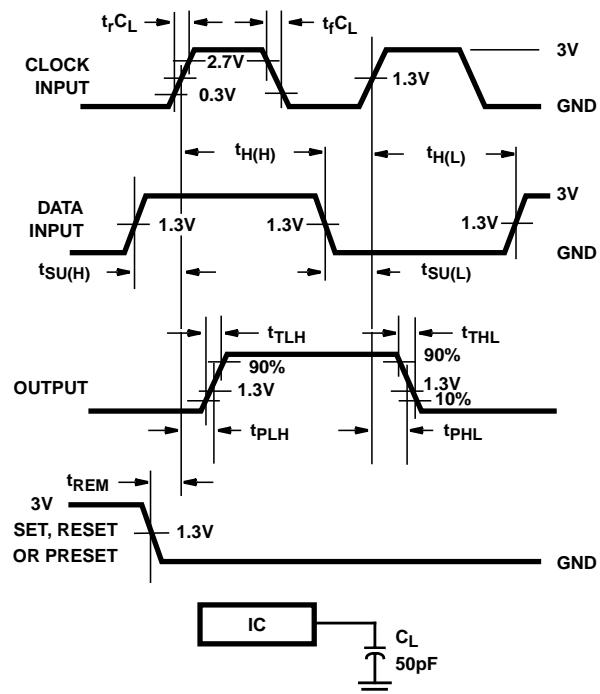


FIGURE 6. HCT SETUP TIMES, HOLD TIMES, REMOVAL TIME, AND PROPAGATION DELAY TIMES FOR EDGE TRIGGERED SEQUENTIAL LOGIC CIRCUITS

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Test Circuits and Waveforms (Continued)

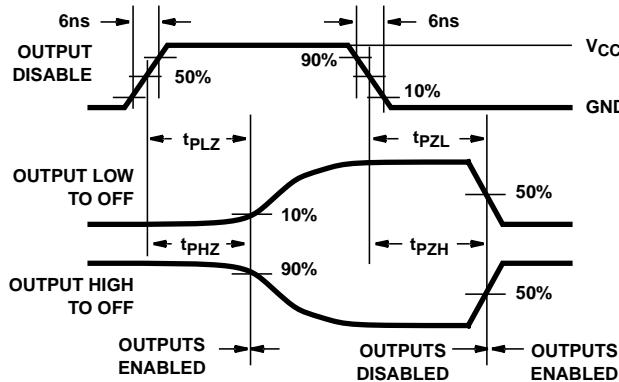


FIGURE 7. HC THREE-STATE PROPAGATION DELAY WAVEFORM

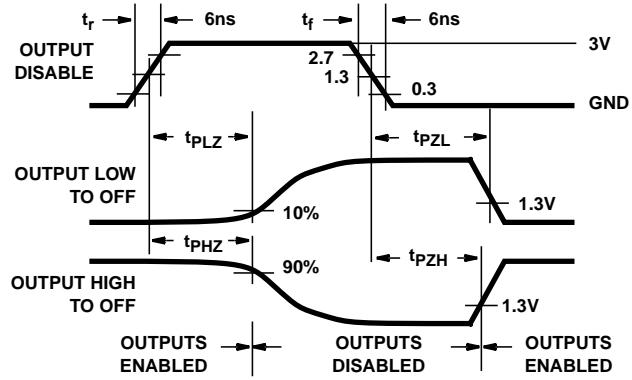
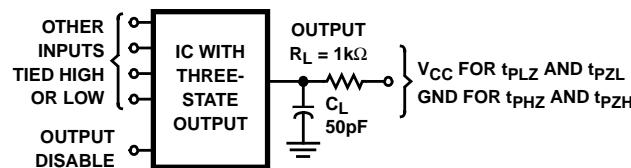


FIGURE 8. HCT THREE-STATE PROPAGATION DELAY WAVEFORM



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 $R_L = 1k\Omega$ to V_{CC} , $C_L = 50pF$.

FIGURE 9. HC AND HCT THREE-STATE PROPAGATION DELAY TEST CIRCUIT

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
CD74HC670E	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74HC670E	Samples
CD74HC670EE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74HC670E	Samples
CD74HC670M	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	HC670M	Samples
CD74HC670M96	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	HC670M	Samples
CD74HCT670E	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74HCT670E	Samples
CD74HCT670EE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type	-55 to 125	CD74HCT670E	Samples
CD74HCT670M	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	-55 to 125	HCT670M	Samples

(1) The marketing status values are defined as follows:

ACTIVE: Product device recommended for new designs.

LIFEBUY: TI has announced that the device will be discontinued, and a lifetime-buy period is in effect.

NRND: Not recommended for new designs. Device is in production to support existing customers, but TI does not recommend using this part in a new design.

PREVIEW: Device has been announced but is not in production. Samples may or may not be available.

OBsolete: TI has discontinued the production of the device.

(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check <http://www.ti.com/productcontent> for the latest availability information and additional product content details.

TBD: The Pb-Free/Green conversion plan has not been defined.

Pb-Free (RoHS): TI's terms "Lead-Free" or "Pb-Free" mean semiconductor products that are compatible with the current RoHS requirements for all 6 substances, including the requirement that lead not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, TI Pb-Free products are suitable for use in specified lead-free processes.

Pb-Free (RoHS Exempt): This component has a RoHS exemption for either 1) lead-based flip-chip solder bumps used between the die and package, or 2) lead-based die adhesive used between the die and leadframe. The component is otherwise considered Pb-Free (RoHS compatible) as defined above.

Green (RoHS & no Sb/Br): TI defines "Green" to mean Pb-Free (RoHS compatible), and free of Bromine (Br) and Antimony (Sb) based flame retardants (Br or Sb do not exceed 0.1% by weight in homogeneous material)

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

(4) There may be additional marking, which relates to the logo, the lot trace code information, or the environmental category on the device.

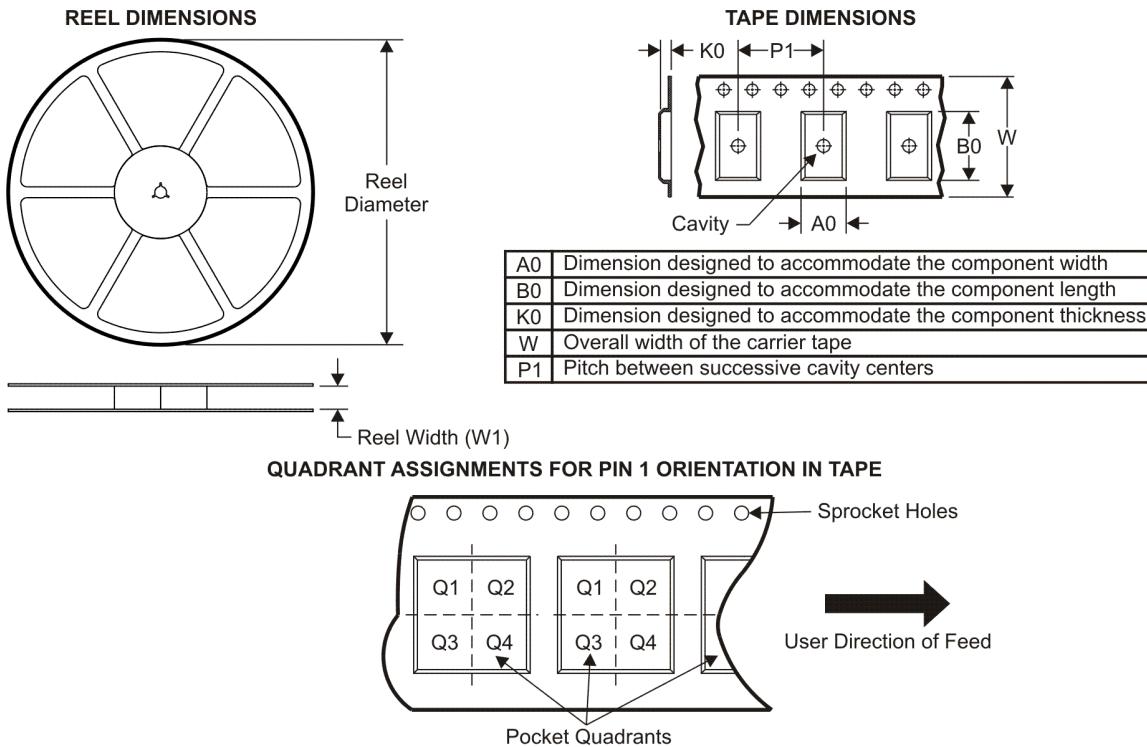
(5) Multiple Device Markings will be inside parentheses. Only one Device Marking contained in parentheses and separated by a "~" will appear on a device. If a line is indented then it is a continuation of the previous line and the two combined represent the entire Device Marking for that device.

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

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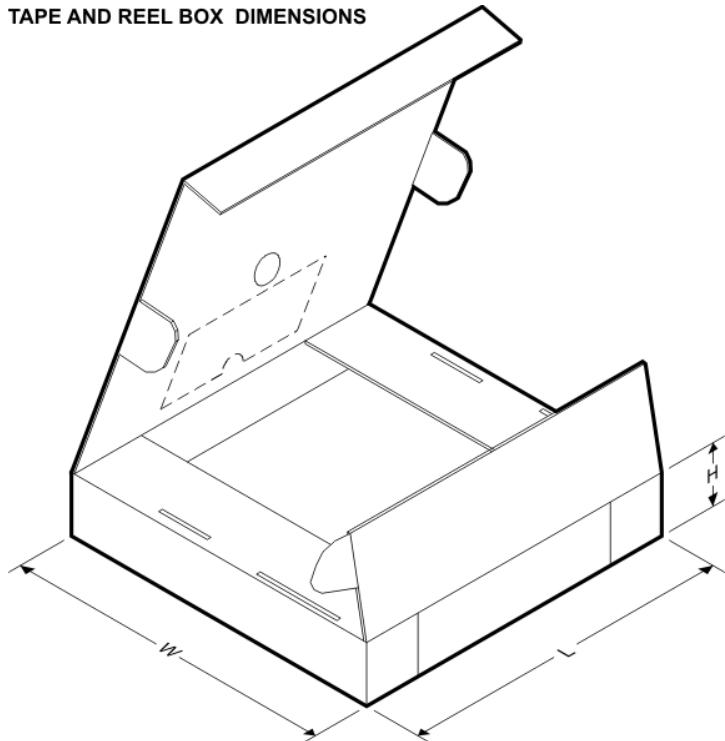
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TAPE AND REEL INFORMATION



*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
CD74HC670M96	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

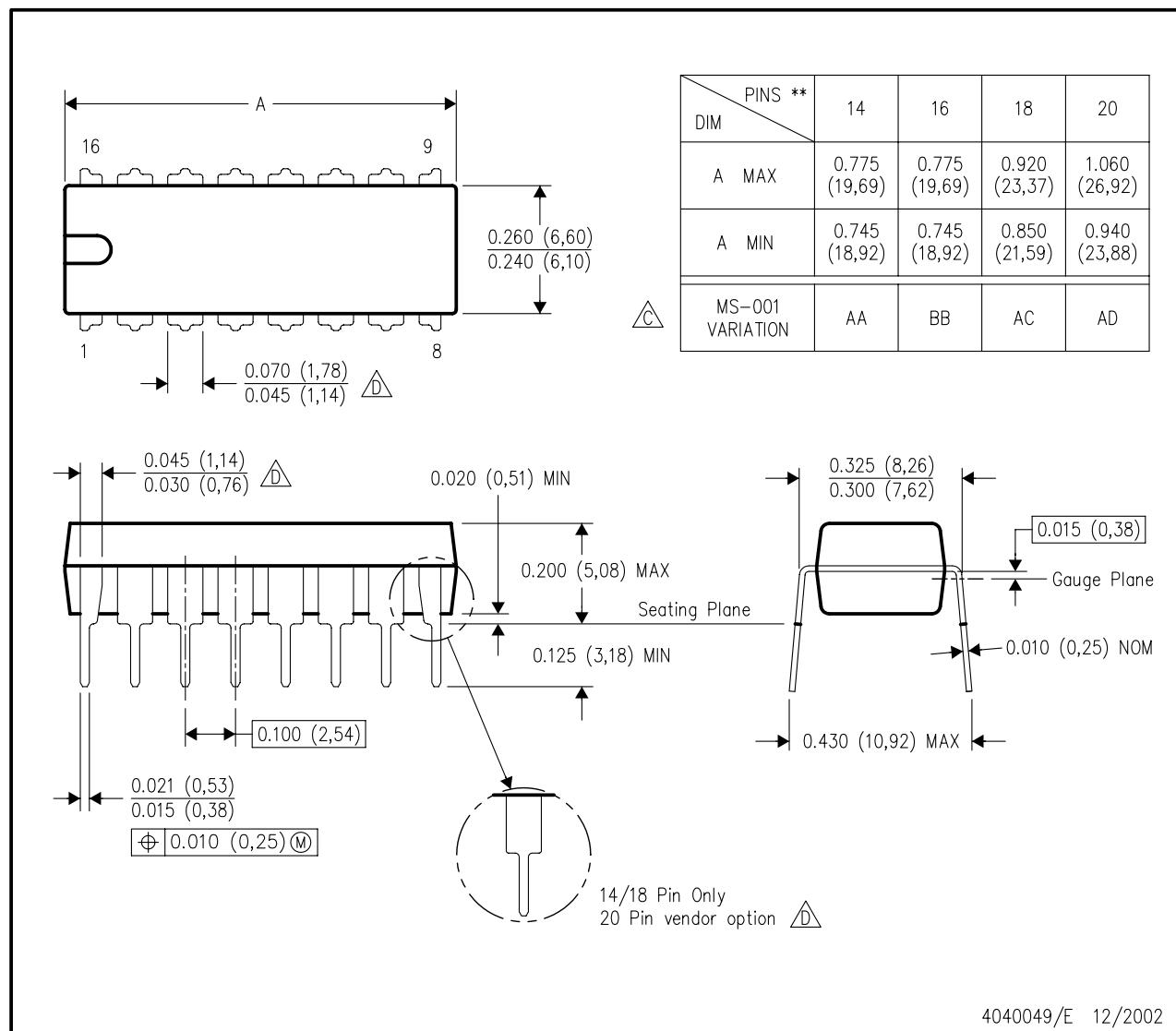
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
CD74HC670M96	SOIC	D	16	2500	333.2	345.9	28.6

MECHANICAL DATA

N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



4040049/E 12/2002

NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.

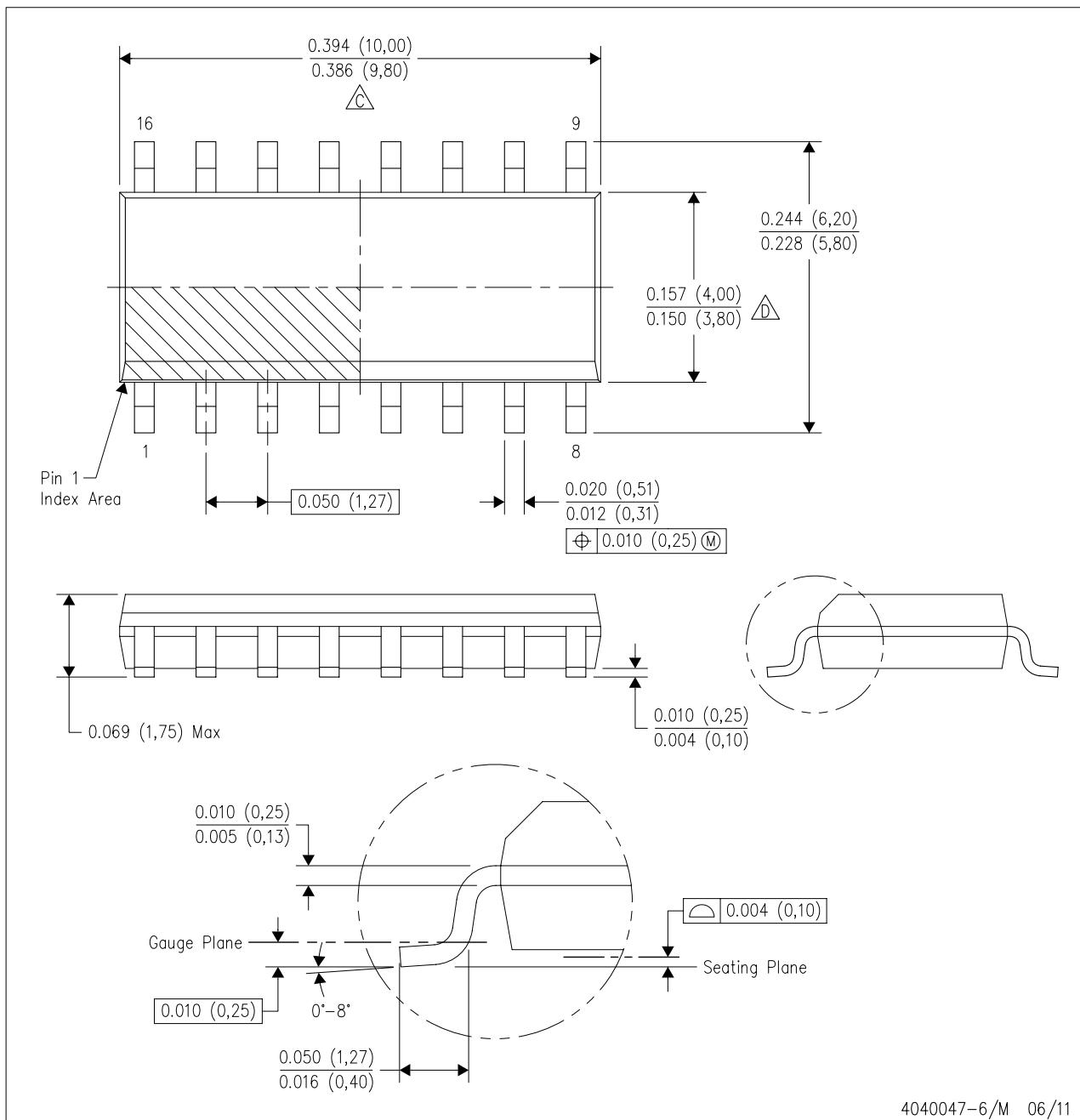
\triangle Falls within JEDEC MS-001, except 18 and 20 pin minimum body length (Dim A).

\triangle The 20 pin end lead shoulder width is a vendor option, either half or full width.

MECHANICAL DATA

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



4040047-6/M 06/11

NOTES: A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.

 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.

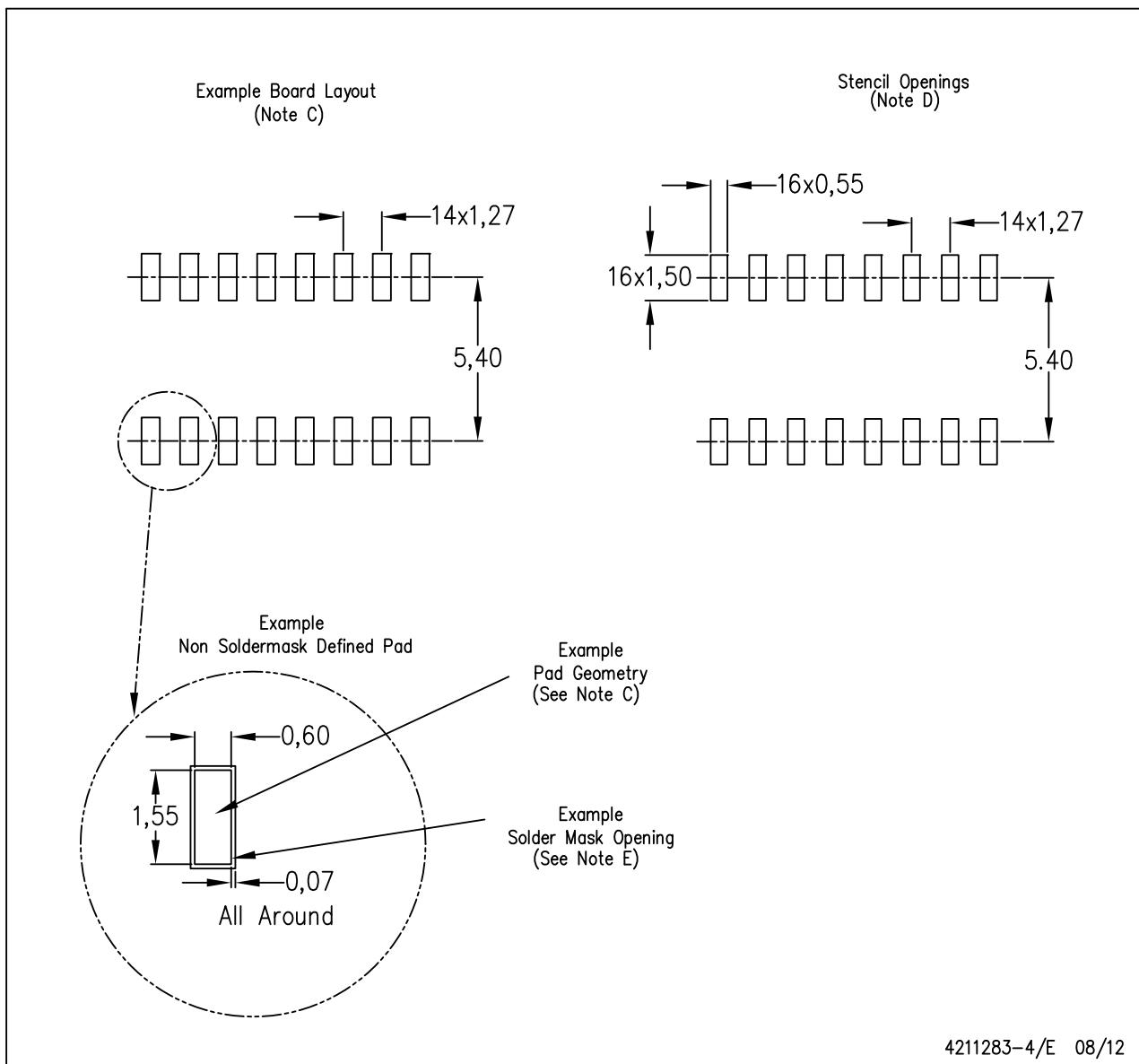
 not exceed 0.006 (0,15) each side.
 Body width does not include interlead flash. Interlead flash shall not exceed 0.017 (0,43) each side.
 Reference JEDEC MS-012 variation AC

E. Reference JEDEC MS-012 variation AC.

LAND PATTERN DATA

D (R-PDSO-G16)

PLASTIC SMALL OUTLINE



NOTES:

- A. All linear dimensions are in millimeters.
- B. This drawing is subject to change without notice.
- C. Publication IPC-7351 is recommended for alternate designs.
- D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact their board assembly site for stencil design recommendations. Refer to IPC-7525 for other stencil recommendations.
- E. Customers should contact their board fabrication site for solder mask tolerances between and around signal pads.

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