SNx4HC253 Dual 4-Line To 1-Line Data Selectors/Multiplexers With 3-State Outputs

1 Features

- 3-State version of ’HC153
- Wide operating voltage range of 2 V to 6 V
- High-current inverting outputs drive up to 15 LSTTL loads
- Low power consumption, 80-µA max I_{CC}
- Typical t_{pd} = 9 ns
- ±6-mA output drive at 5 V
- Low input current of 1 µA max
- Permit multiplexing from n lines to one line
- Perform parallel-to-serial conversion

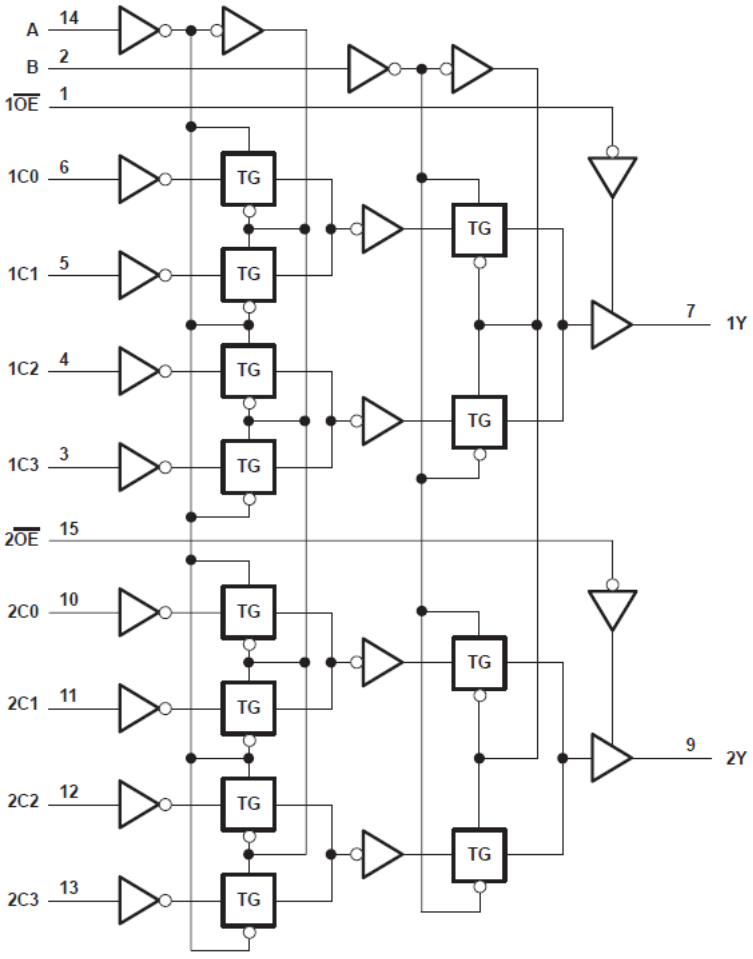
2 Description

The SNx4HC253 devices contain two independent data selectors/multiplexers with full binary decoding to select 1-of-4 data sources and features strobe-controlled ($\overline{OE}$) 3-state outputs.

Device Information

PART NUMBER	PACKAGE(1)	BODY SIZE (NOM)
SN74HC253D	SOIC (16)	9.90 mm × 3.90 mm
SN74HC253DB	SSOP (16)	6.20 mm × 5.30 mm
SN74HC253N	PDIP (16)	19.31 mm × 6.35 mm
SN74HC253NS	SO (16)	6.20 mm × 5.30 mm
SN54HC253J	CDIP (16)	24.38 mm × 6.92 mm
SNJ54HC253FK	LCCC (20)	8.89 mm × 8.45 mm

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



Pin numbers shown are for the D, DB, J, N, NS, and W packages.

Functional Block Diagram

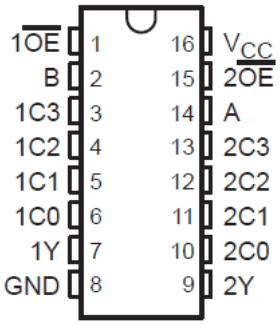
Table of Contents

3 Revision History

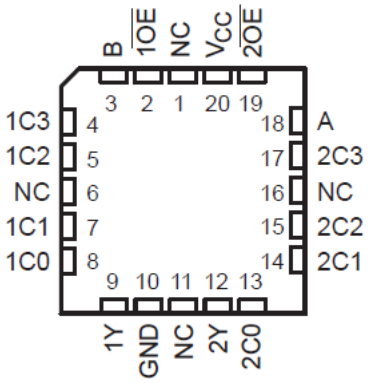
NOTE: Page numbers for previous revisions may differ from page numbers in the current version.

Changes from Revision E (September 2003) to Revision F (February 2022)	Page
• Updated numbering, formating, tables, figures, and cross-references throughout the document to reflect modern data sheet standards	1

4 Pin Configuration and Functions



J, D, DB, N, or NS Package
16-Pin CDIP, SOIC, SSOP, PDIP, SO
Top View



NC – No internal connection

FK Package
20-Pin LCCC
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 range		–0.5	7	V
I_{IK}	Input clamp current(2)	$V_I < 0$ or $V_I > V_{CC}$		±20	mA
I_{OK}	Output clamp current(2)	$V_O < 0$ or $V_O > V_{CC}$		±20	mA
I_O	Continuous output current	$V_O = 0$ to V_{CC}		±25	mA
	Continuous current through V_{CC} or GND			±50	mA
T_J	Junction temperature			150	°C
T_{stg}	Storage temperature		–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 Recommended Operating Conditions(1)

			SN54HC253			SN74HC253			UNIT
			MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage		2	5	6	2	5	6	V
V_{IH}	High-level input voltage	V_{CC} = 2 V	1.5			1.5			V
		V_{CC} = 4.5 V	3.15			3.15			
		V_{CC} = 6 V	4.2			4.2			
V_{IL}	Low-level input voltage	V_{CC} = 2 V			0.5			0.5	V
		V_{CC} = 4.5 V			1.35			1.35	
		V_{CC} = 6 V			1.8			1.8	
V_I	Input voltage		0		V_{CC}	0		V_{CC}	V
V_O	Output voltage		0		V_{CC}	0		V_{CC}	V
Δt/Δv	Input transition rise/fall time	V_{CC} = 2 V			1000			1000	ns
		V_{CC} = 4.5 V			500			500	
		V_{CC} = 6 V			400			400	
T_A	Operating free-air temperature		−55		125	−40		85	°C

(1) All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

5.3 Thermal Information

THERMAL METRIC(1)		D (SOIC) 16 PINS	DB (SSOP) 16 PINS	N (PDIP) 16 PINS	NS (SO) 16 PINS	UNIT
$R_{\theta JA}$	Junction-to-ambient thermal resistance	73	82	67	64	°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

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

PARAMETER	TEST CONDITIONS[1]		V_{CC} (V)	T_A = 25°C			SN54HC253		SN74HC253		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}	I_{OH} = −20 µA		2	1.9	1.998		1.9		1.9		V
			4.5	4.4	4.499		4.4		4.4		
			6	5.9	5.999		5.9		5.9		
	I_{OH} = −6 mA		4.5	3.98	4.3		3.7		3.84		
	I_{OH} = −7.8 mA		6	5.48	5.8		5.2		5.34		
V_{OL}	I_{OL} = 20 µA		2		0.002	0.1		0.1		0.1	V
			4.5		0.001	0.1		0.1		0.1	
			6		0.001	0.1		0.1		0.1	
	I_{OL} = 6 mA		4.5		0.17	0.26		0.4		0.33	
	I_{OL} = 7.8 mA		6		0.15	0.26		0.4		0.33	
I_I	V_I = V_{CC} or 0		6		±0.1	±100		±1000		±1000	nA
I_{OZ}	V_O = V_{CC} or 0		6		±0.01	±0.5		±10		±5	µA
I_{CC}	V_I = V_{CC} or 0	I_O = 0	6			8		160		80	µA
C_i			2 to 6		3	10		10		10	pF

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

5.5 Switching Characteristics

over recommended operating free-air temperature range, C_L = 50 pF (unless otherwise noted) (see Figure 6)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} (V)	T_A = 25°C			SN54HC253		SN74HC253		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A or B	Any Y	2		62	150		225		190	ns
			4.5		19	30		45		38	
			6		16	26		38		32	
	Data (Any C)	Y	2		54	126		210		175	
			4.5		16	28		42		35	
			6		13	23		36		30	
t_{en}	$\overline{OE}$	Y	2		28	100		150		125	ns
			4.5		11	20		30		25	
			6		9	17		26		21	
t_{dis}	$\overline{OE}$	Y	2		21	135		203		170	ns
			4.5		14	30		45		38	
			6		12	35		38		31	
t_t		Y	2		28	60		90		75	ns
			4.5		8	12		18		15	
			6		6	10		15		13	

5.6 Switching Characteristics

over recommended operating free-air temperature range, C_L = 150 pF (unless otherwise noted) (see Figure 6)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} (V)	T_A = 25°C			SN54HC253		SN74HC253		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A or B	Any Y	2		76	235		355		295	ns
			4.5		23	47		71		59	
			6		20	41		60		51	
	Data (Any C)	Y	2		68	220		335		275	
			4.5		20	44		67		55	
			6		17	38		57		51	
t_{en}	$\overline{OE}$	Y	2		44	185		280		230	ns
			4.5		16	37		56		46	
			6		14	32		48		40	
t_t		Y	2		45	210		315		265	ns
			4.5		17	42		63		53	
			6		13	36		53		45	

5.7 Operating Characteristics

T_A = 25°C

PARAMETER		TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance per multiplexer	No load	45	pF

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}

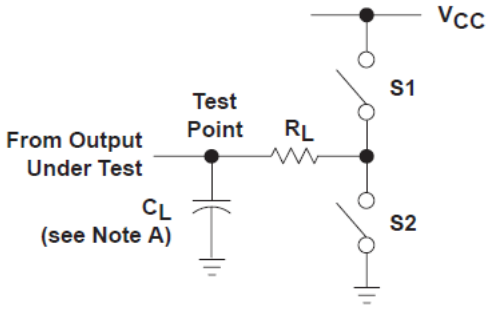


Figure 6-1. Load Circuit

PARAMETER		R_L	C_L	S1	S2
t_{en}	t_{PZH}	1 kΩ	50 pF or 150 pF	Open	Closed
	t_{PZL}			Closed	Open
t_{dis}	t_{PHZ}	1 kΩ	50 pF	Open	Closed
	t_{PLZ}			Closed	Open
t_{pd} or t_t		--	50 pF or 150 pF	Open	Open

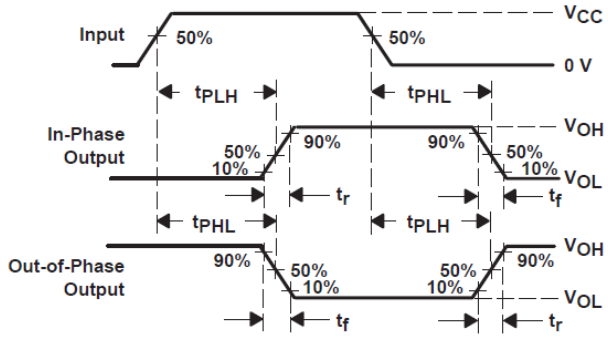


Figure 6-2. Voltage Waveforms
Propagation Delay and Output Transition Times

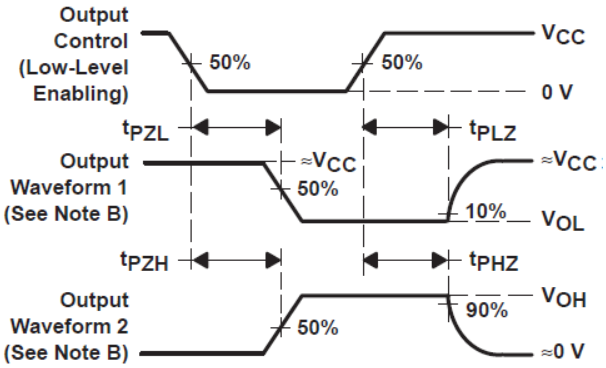


Figure 6-3. Voltage Waveforms
Enable and Disable Times for 3-State Outputs

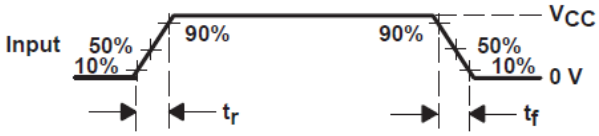


Figure 6-4. Voltage Waveform
Input Rise and Fall Times

A. C_L includes probe and test-fixture capacitance.

B. Waveform 1 is for an output with internal conditions such that the output is low except when diabled by the output control.
Waveform 2 is for an output with internal conditions such that the output is high except when diabled by the output control.

C. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following charactersitics: PRR ≤ 1 MHz, Z_O = 50 Ω, t_r = 6 ns, t_f = 6 ns.

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

E. t_{PLZ} and t_{PHZ} are the same as t_{dis}.

F. t_{PZL} and t_{PZH} are the same as t_{en}.

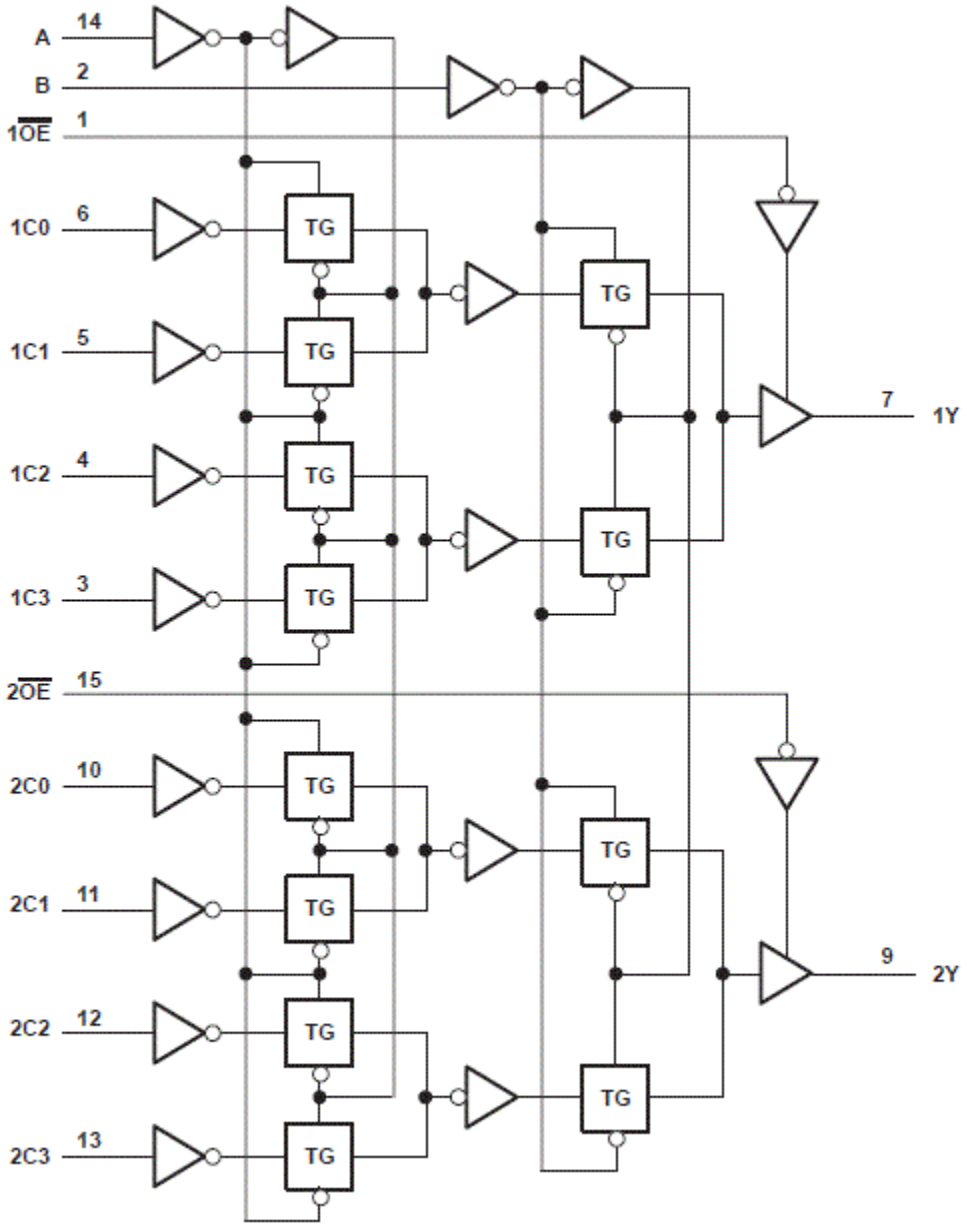
7 Detailed Description

7.1 Overview

Each of these data selectors/multiplexers contains inverters and drivers to supply full binary decoding data selection to the AND-OR gates. Separate output-control inputs are provided for each of the two 4-line sections.

The 3-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (in the high-impedance state), the low impedance of the single enabled output drives the bus line to a high or low logic level. Each output has its own output-enable ($\overline{OE}$) input. The outputs are disabled when their respective $\overline{OE}$ is high.

7.2 Functional Block Diagram



7.3 Device Functional Modes

Table 7-1. Function Table

INPUTS							OUTPUT Y
SELECT[1]		DATA				$\overline{OE}$	
B	A	C0	C1	C2	C3		
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

(1) Select inputs A and B are common to both sections.

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-µF capacitor is recommended for this device. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. The 0.1-µF and 1-µF 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. 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 Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead finish/ Ball material (6)	MSL Peak Temp (3)	Op Temp (°C)	Device Marking (4/5)	Samples
5962-88682012A	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-88682012A SNJ54HC 253FK	Samples
5962-8868201EA	ACTIVE	CDIP	J	16	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8868201EA SNJ54HC253J	Samples
SN54HC253J	ACTIVE	CDIP	J	16	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	SN54HC253J	Samples
SN74HC253DBR	ACTIVE	SSOP	DB	16	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC253	Samples
SN74HC253DR	ACTIVE	SOIC	D	16	2500	RoHS & Green	NIPDAU | SN	Level-1-260C-UNLIM	-40 to 85	HC253	Samples
SN74HC253N	ACTIVE	PDIP	N	16	25	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 85	SN74HC253N	Samples
SN74HC253NE4	ACTIVE	PDIP	N	16	25	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 85	SN74HC253N	Samples
SN74HC253NSR	ACTIVE	SO	NS	16	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 85	HC253	Samples
SNJ54HC253FK	ACTIVE	LCCC	FK	20	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-88682012A SNJ54HC 253FK	Samples
SNJ54HC253J	ACTIVE	CDIP	J	16	1	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-8868201EA SNJ54HC253J	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) **RoHS:** TI defines "RoHS" to mean semiconductor products that are compliant with the current EU RoHS requirements for all 10 RoHS substances, including the requirement that RoHS substance do not exceed 0.1% by weight in homogeneous materials. Where designed to be soldered at high temperatures, "RoHS" products are suitable for use in specified lead-free processes. TI may reference these types of products as "Pb-Free".
RoHS Exempt: TI defines "RoHS Exempt" to mean products that contain lead but are compliant with EU RoHS pursuant to a specific EU RoHS exemption.

Green: TI defines "Green" to mean the content of Chlorine (Cl) and Bromine (Br) based flame retardants meet JS709B low halogen requirements of <=1000ppm threshold. Antimony trioxide based flame retardants must also meet the <=1000ppm threshold requirement.

(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 finish/Ball material - Orderable Devices 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.

OTHER QUALIFIED VERSIONS OF SN54HC253, SN74HC253 :

- Catalog : SN74HC253
- Automotive : SN74HC253-Q1, SN74HC253-Q1
- Enhanced Product : SN74HC253-EP, SN74HC253-EP
- Military : SN54HC253

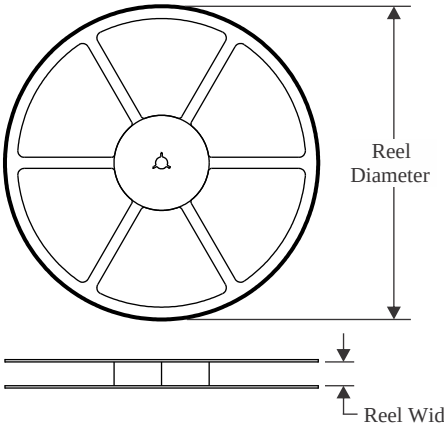
NOTE: Qualified Version Definitions:

- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications

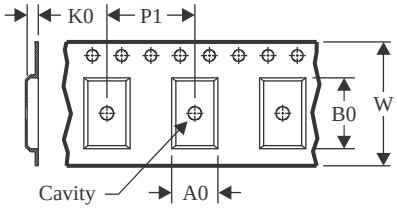
- Military - QML certified for Military and Defense Applications

TAPE AND REEL INFORMATION

REEL DIMENSIONS

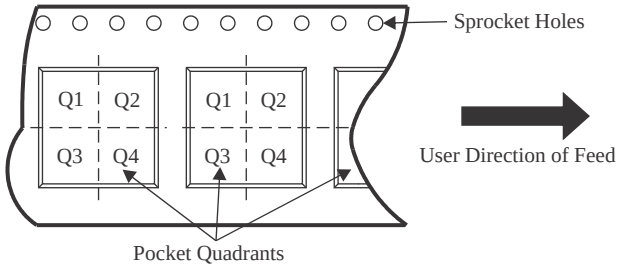


TAPE DIMENSIONS



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

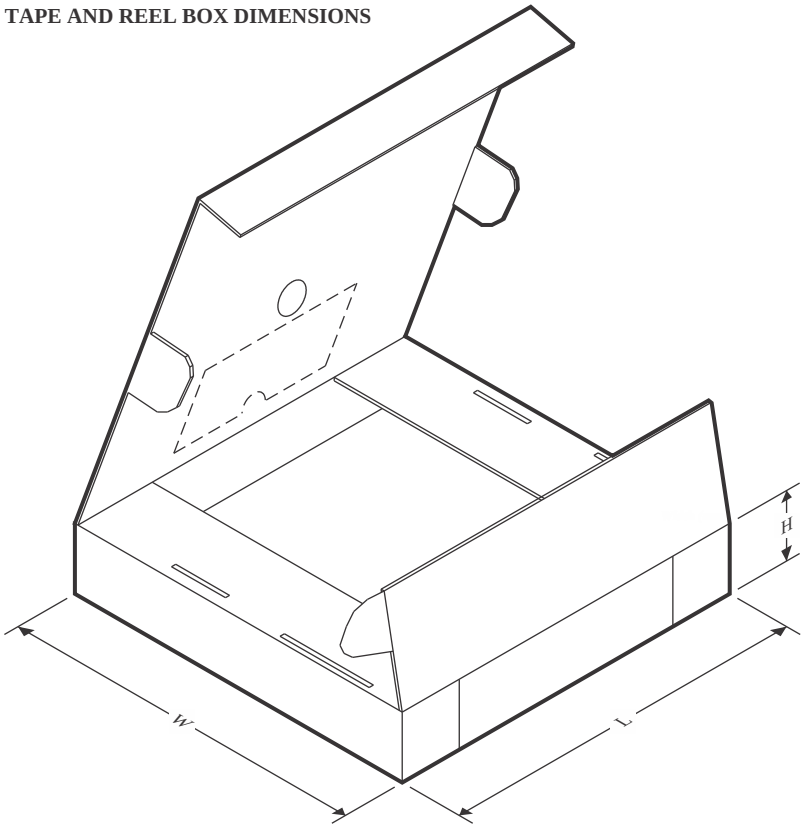
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
SN74HC253DBR	SSOP	DB	16	2000	330.0	16.4	8.35	6.6	2.4	12.0	16.0	Q1
SN74HC253DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74HC253DR	SOIC	D	16	2500	330.0	16.4	6.5	10.3	2.1	8.0	16.0	Q1
SN74HC253DR	SOIC	D	16	2500	330.0	16.4	6.6	9.3	2.1	8.0	16.0	Q1
SN74HC253NSR	SO	NS	16	2000	330.0	16.4	8.45	10.55	2.5	12.0	16.2	Q1
SN74HC253NSR	SO	NS	16	2000	330.0	16.4	8.2	10.5	2.5	12.0	16.0	Q1

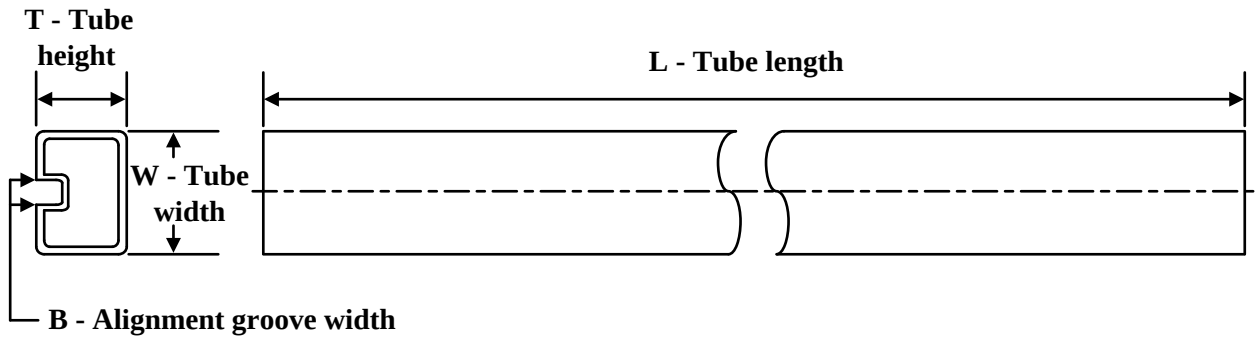
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74HC253DBR	SSOP	DB	16	2000	356.0	356.0	35.0
SN74HC253DR	SOIC	D	16	2500	356.0	356.0	35.0
SN74HC253DR	SOIC	D	16	2500	340.5	336.1	32.0
SN74HC253DR	SOIC	D	16	2500	366.0	364.0	50.0
SN74HC253NSR	SO	NS	16	2000	356.0	356.0	35.0
SN74HC253NSR	SO	NS	16	2000	356.0	356.0	35.0

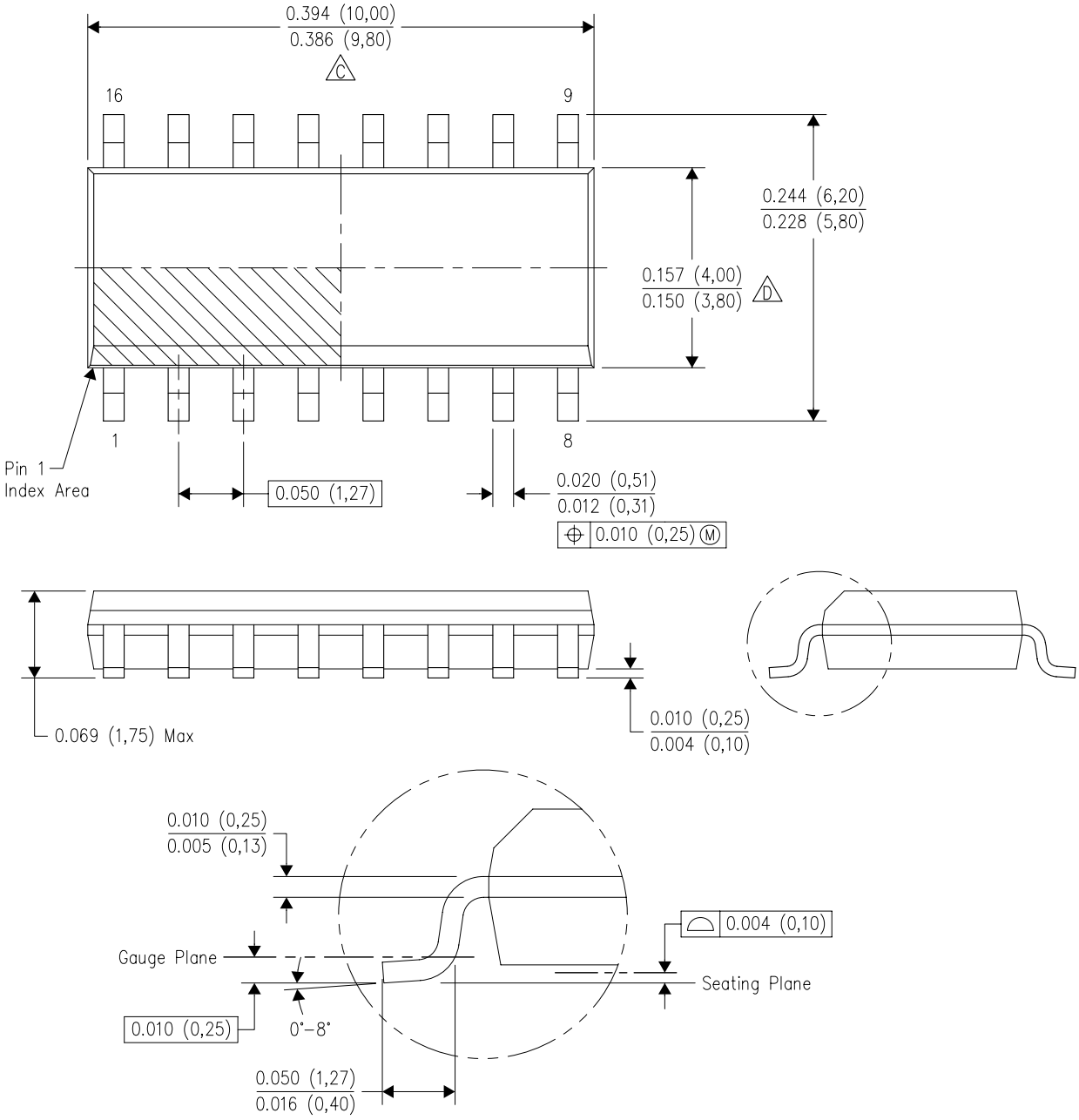
TUBE



*All dimensions are nominal

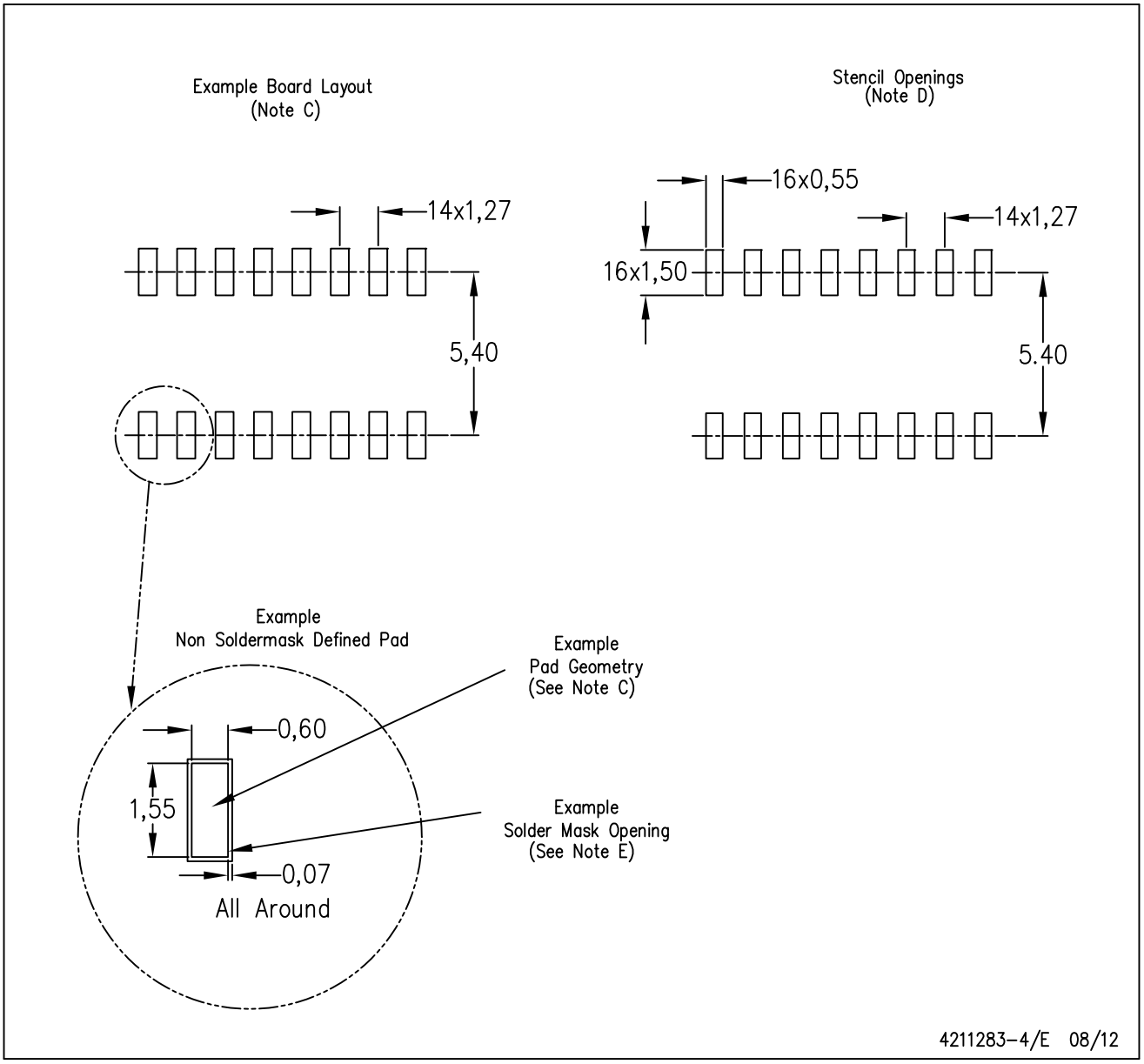
Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
5962-88682012A	FK	LCCC	20	1	506.98	12.06	2030	NA
SN74HC253N	N	PDIP	16	25	506	13.97	11230	4.32
SN74HC253N	N	PDIP	16	25	506	13.97	11230	4.32
SN74HC253NE4	N	PDIP	16	25	506	13.97	11230	4.32
SN74HC253NE4	N	PDIP	16	25	506	13.97	11230	4.32
SNJ54HC253FK	FK	LCCC	20	1	506.98	12.06	2030	NA

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.

D (R–PDSO–G16) PLASTIC SMALL OUTLINE



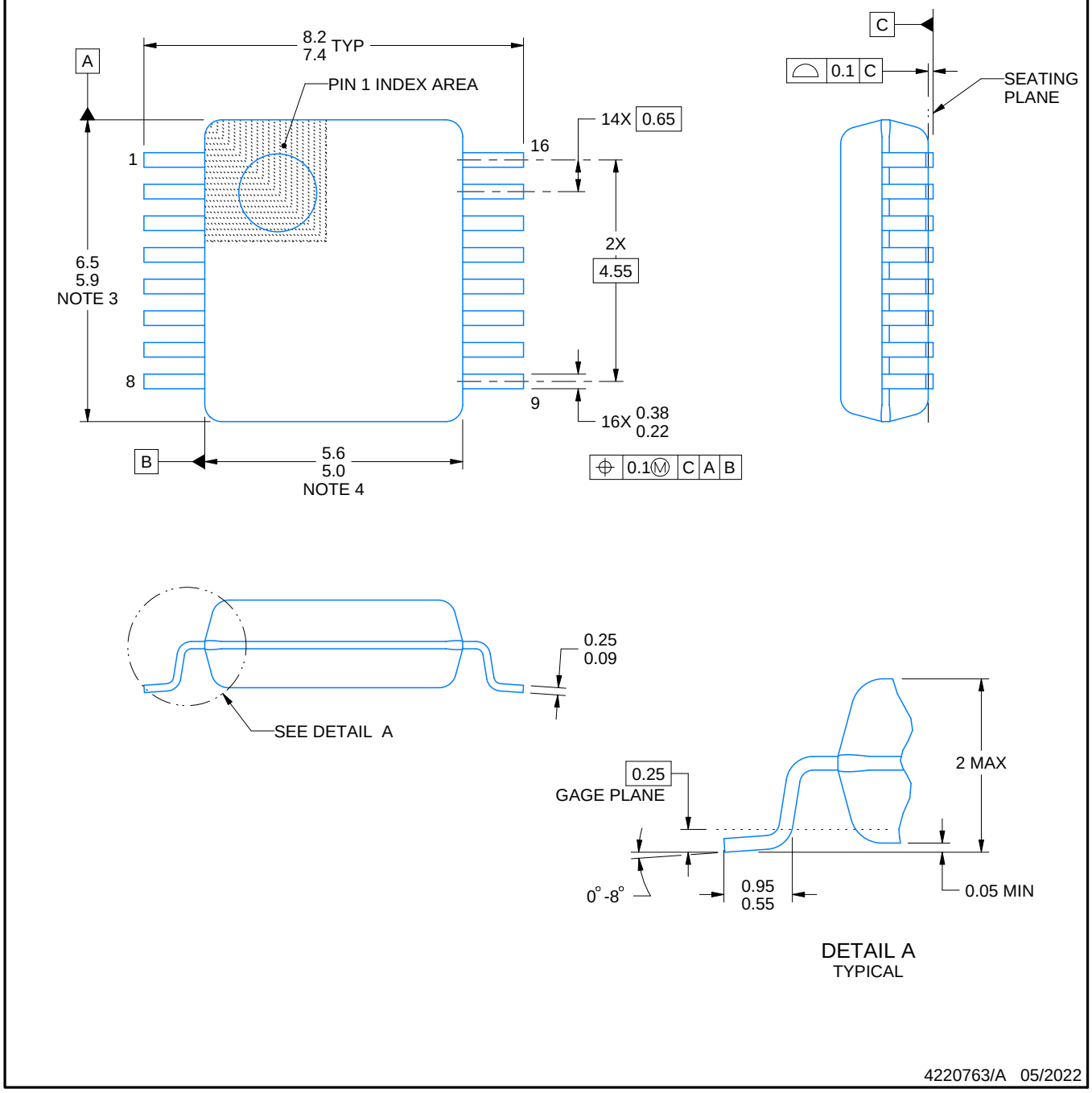
NOTES:
A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Publication IPC–7351 is recommended for alternate designs.
D. Laser cutting apertures with trapezoidal walls and also rounding corners will offer better paste release. Customers should contact 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.

PACKAGE OUTLINE

DB0016A

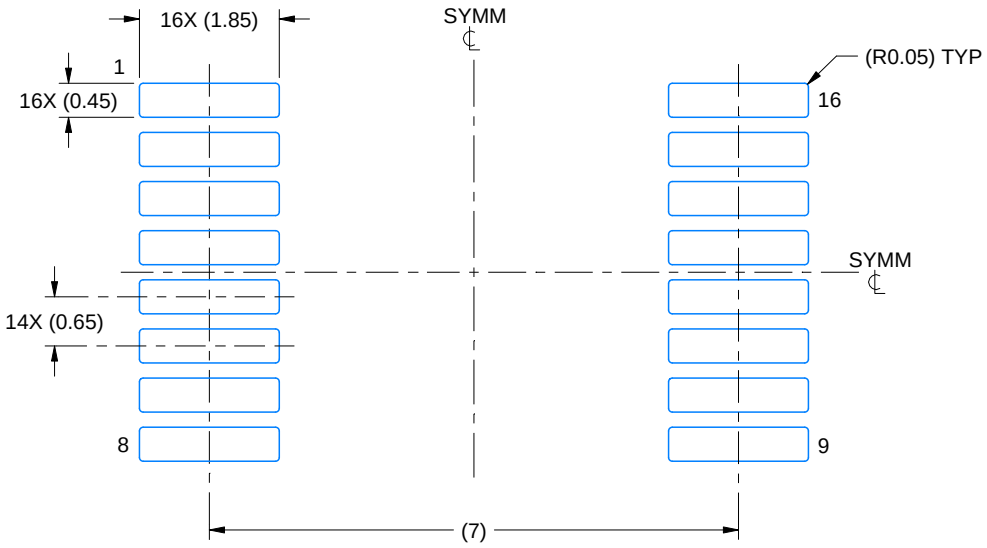
SSOP - 2 mm max height

SMALL OUTLINE PACKAGE

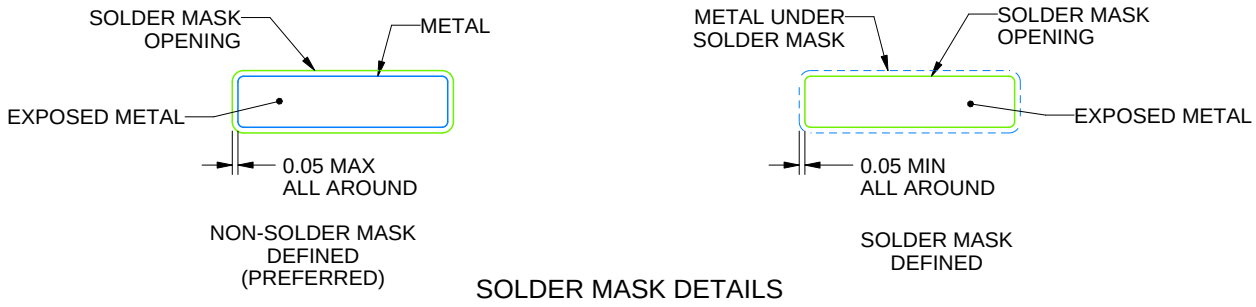


NOTES:

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. Reference JEDEC registration MO-150.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X

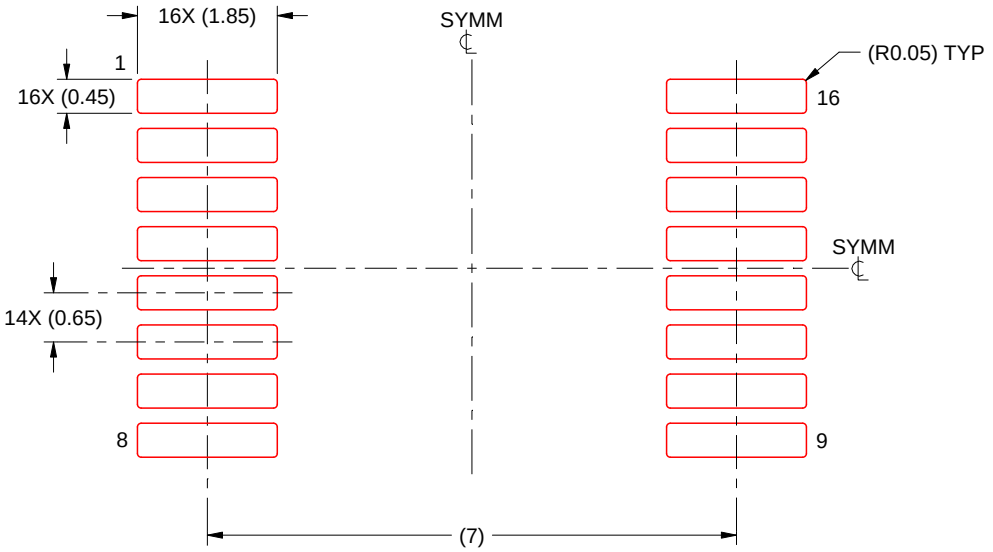


SOLDER MASK DETAILS

4220763/A 05/2022

NOTES: (continued)

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



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

4220763/A 05/2022

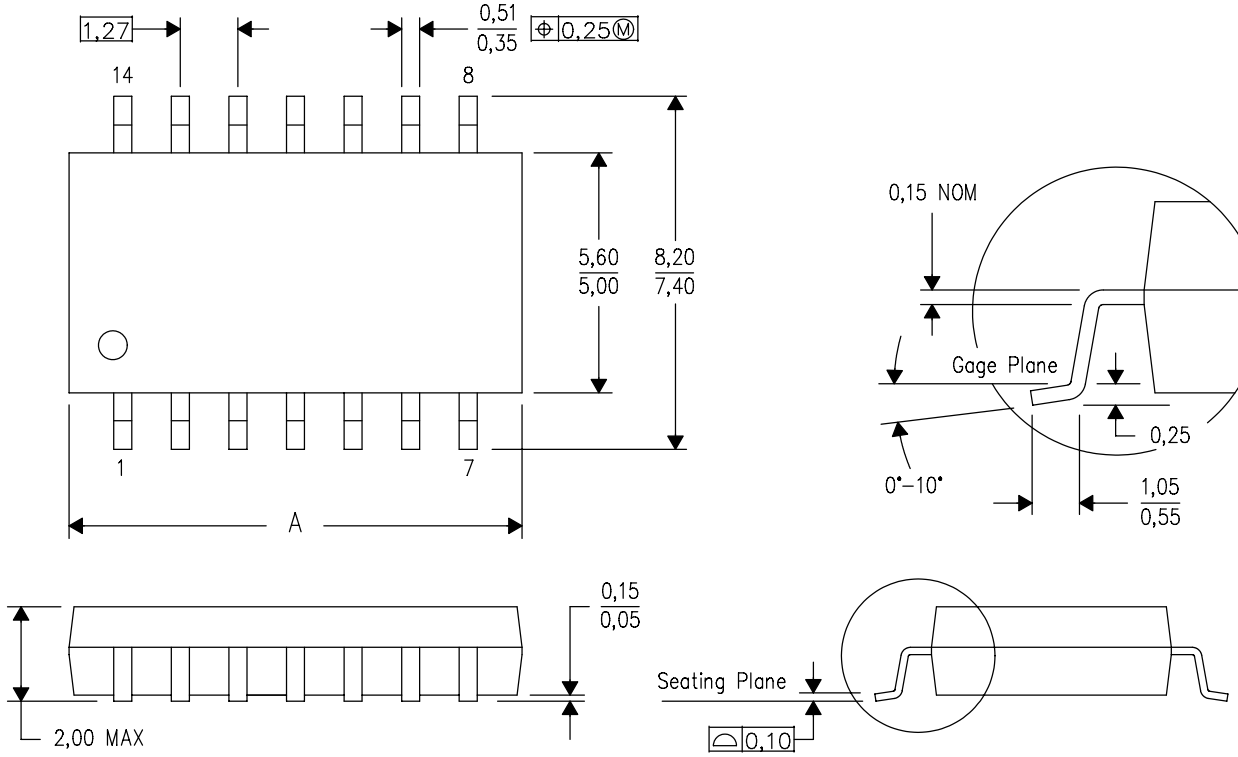
NOTES: (continued)

7. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
8. 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.

GENERIC PACKAGE VIEW

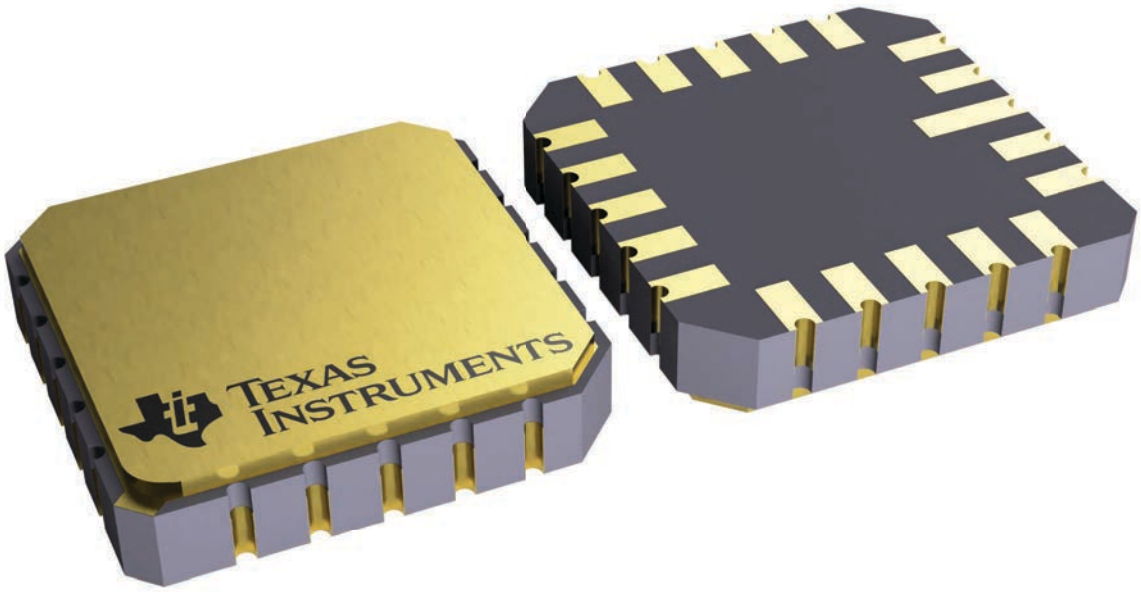
FK 20

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.

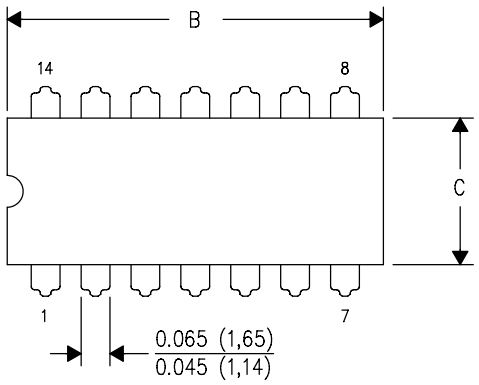


4229370VA\

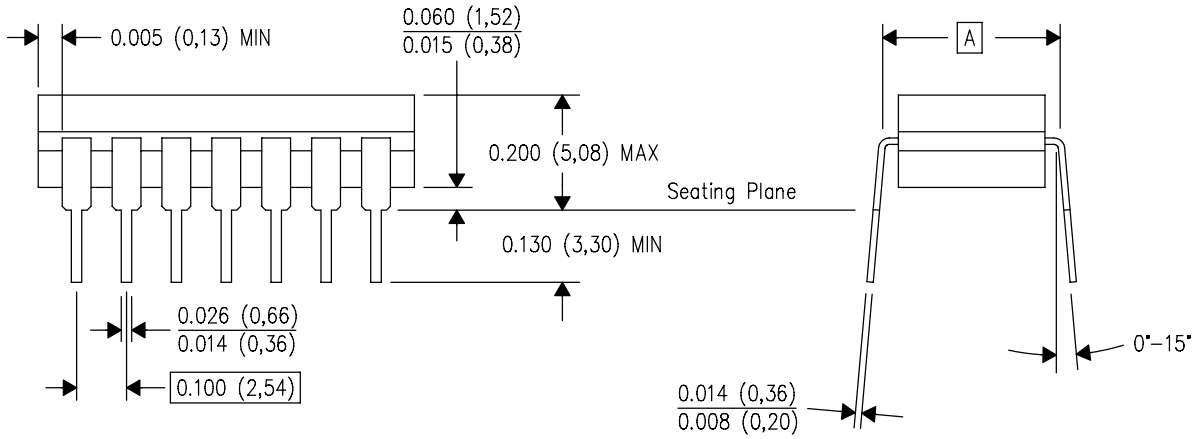
J (R–GDIP–T**)

14 LEADS SHOWN

CERAMIC DUAL IN–LINE PACKAGE



DIM \ PINS **	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)



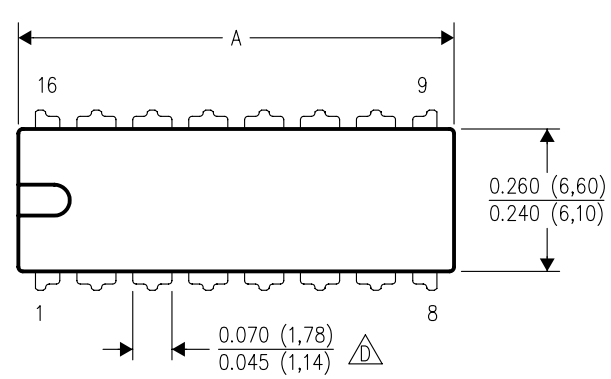
4040083/F 03/03

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.

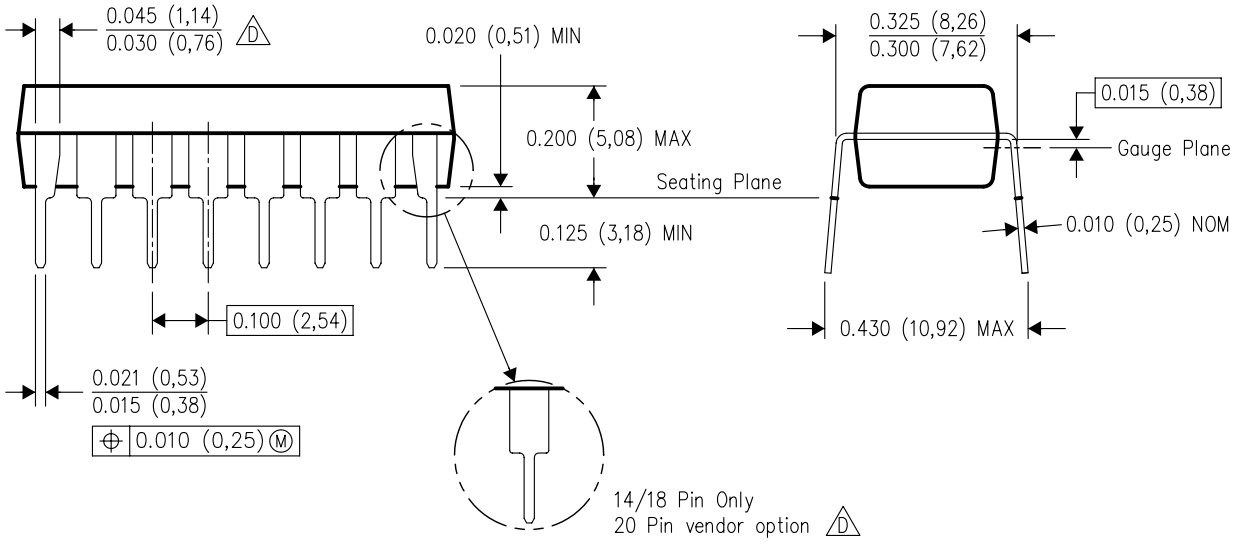
N (R–PDIP–T**)

PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN

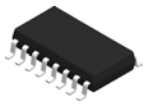


DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS–001 VARIATION (C)	AA	BB	AC	AD



4040049/E 12/2002

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

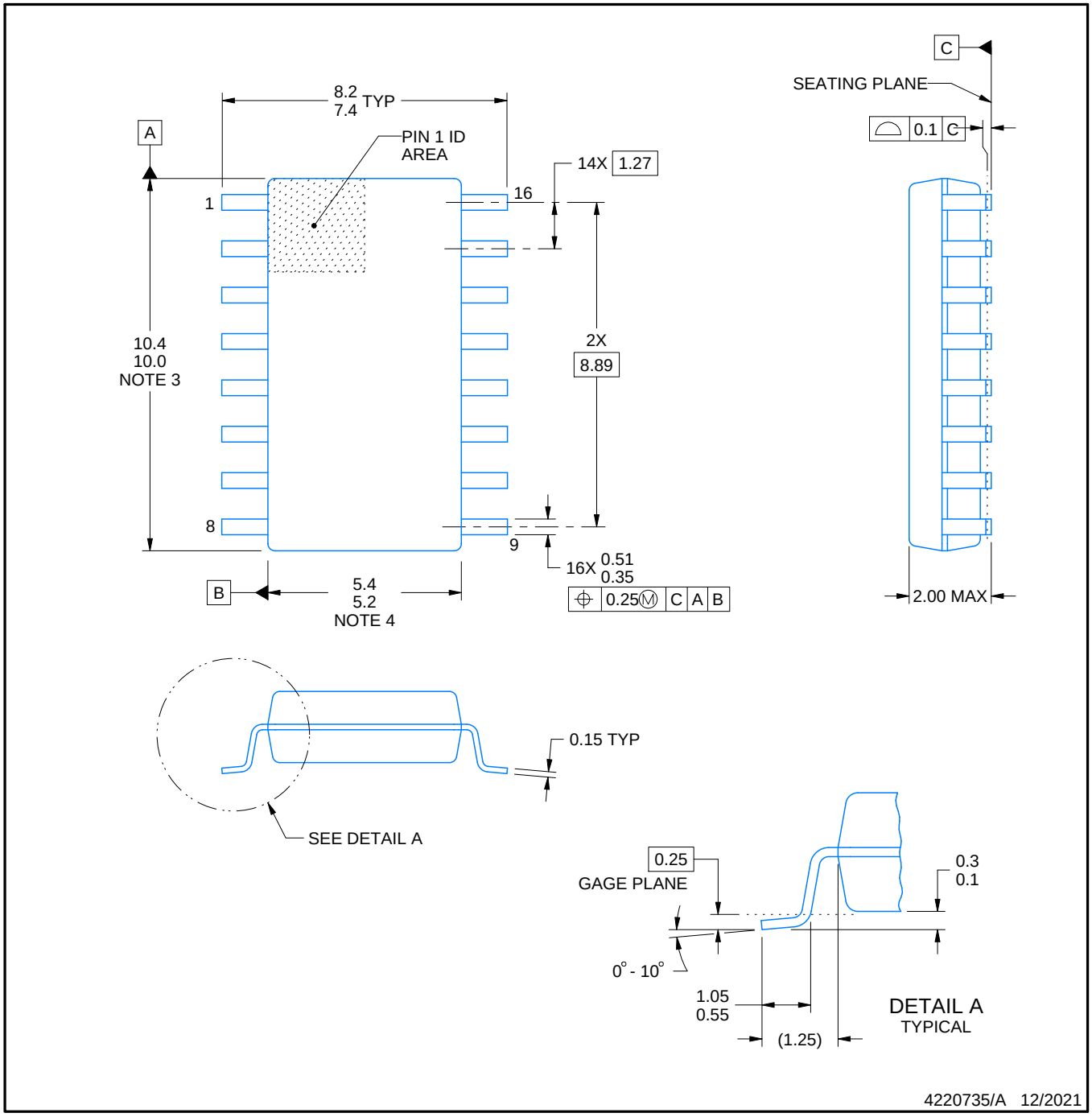


PACKAGE OUTLINE

NS0016A

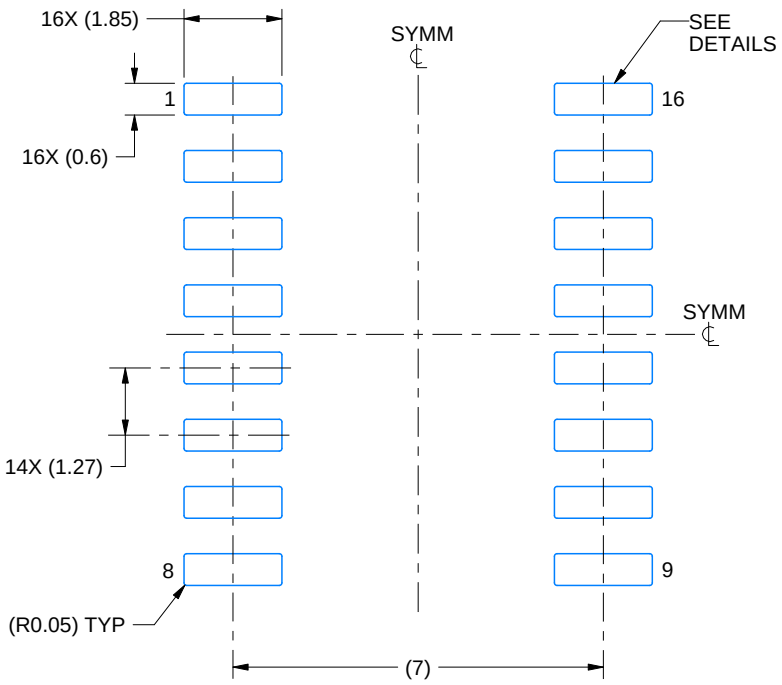
SOP - 2.00 mm max height

SOP

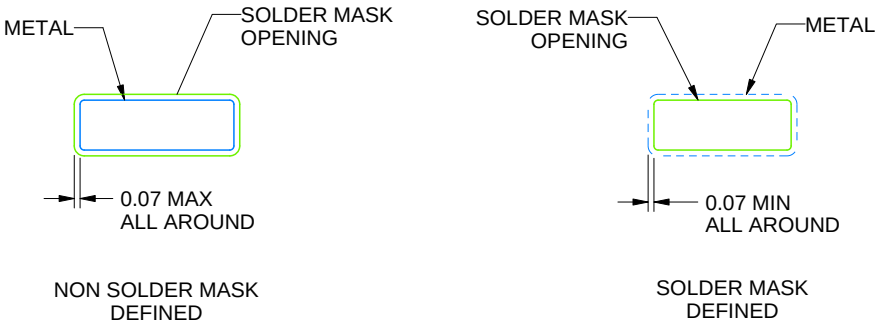


NOTES:

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 0.25 mm, per side.



LAND PATTERN EXAMPLE
SCALE:7X



NON SOLDER MASK
DEFINED

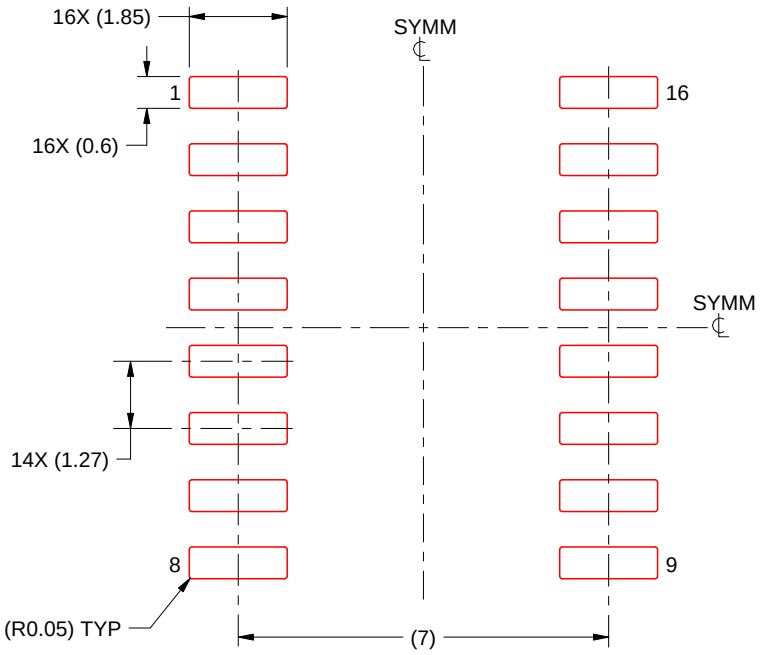
SOLDER MASK
DEFINED

SOLDER MASK DETAILS

4220735/A 12/2021

NOTES: (continued)

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



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:7X

4220735/A 12/2021

NOTES: (continued)

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

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