

SN54ABT2240A, SN74ABT2240A OCTAL BUFFERS AND LINE/MOS DRIVERS WITH 3-STATE OUTPUTS

SCBS232E – JANUARY 1991 – REVISED OCTOBER 1998

- Output Ports Have Equivalent $25\text{-}\Omega$ Series Resistors, So No External Resistors Are Required
- State-of-the-Art EPIC-II^B BiCMOS Design Significantly Reduces Power Dissipation
- Typical V_{OLP} (Output Ground Bounce) $< 1\text{ V}$ at $V_{CC} = 5\text{ V}$, $T_A = 25^\circ\text{C}$
- Latch-Up Performance Exceeds 500 mA Per JESD 17
- ESD Protection Exceeds 2000 V Per MIL-STD-883, Method 3015; Exceeds 200 V Using Machine Model ($C = 200\text{ pF}$, $R = 0$)
- Package Options Include Plastic Small-Outline (DW), Shrink Small-Outline (DB), and Thin Shrink Small-Outline (PW) Packages, Ceramic Chip Carriers (FK), Plastic (N) and Ceramic (J) DIPs, and Ceramic Flat (W) Package

description

These octal buffers and line drivers are designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. Together with the 'ABT2241 and 'ABT2244A, these devices provide combinations of inverting and noninverting outputs, symmetrical active-low output-enable (\overline{OE}) inputs, and complementary OE and \overline{OE} inputs. These devices feature high fan-out and improved fan-in.

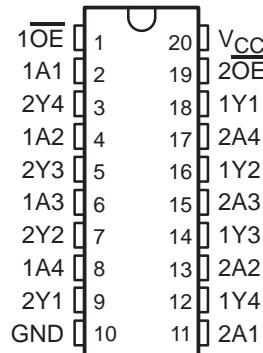
These devices are organized as two 4-bit line drivers with separate \overline{OE} inputs. When \overline{OE} is low, the devices pass inverted data from the A inputs to the Y outputs. When \overline{OE} is high, the outputs are in the high-impedance state.

The outputs, which are designed to sink up to 12 mA, include equivalent $25\text{-}\Omega$ series resistors to reduce overshoot and undershoot.

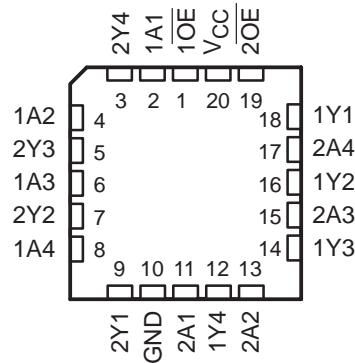
To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pullup resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

The SN54ABT2240A is characterized for operation over the full military temperature range of -55°C to 125°C . The SN74ABT2240A is characterized for operation from -40°C to 85°C .

SN54ABT2240A . . . J OR W PACKAGE
SN74ABT2240A . . . DB, DW, N, OR PW PACKAGE
(TOP VIEW)



SN54ABT2240A . . . FK PACKAGE
(TOP VIEW)



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EPIC-II^B is a trademark of Texas Instruments Incorporated.

PRODUCTION DATA information is current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.



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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

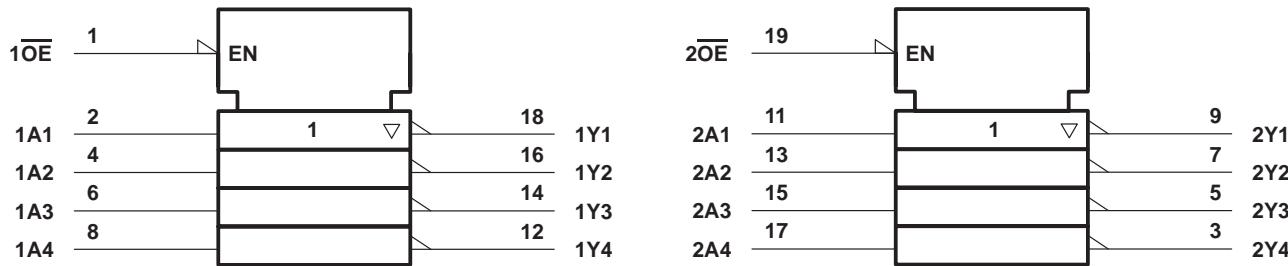
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FUNCTION TABLE
(each buffer)

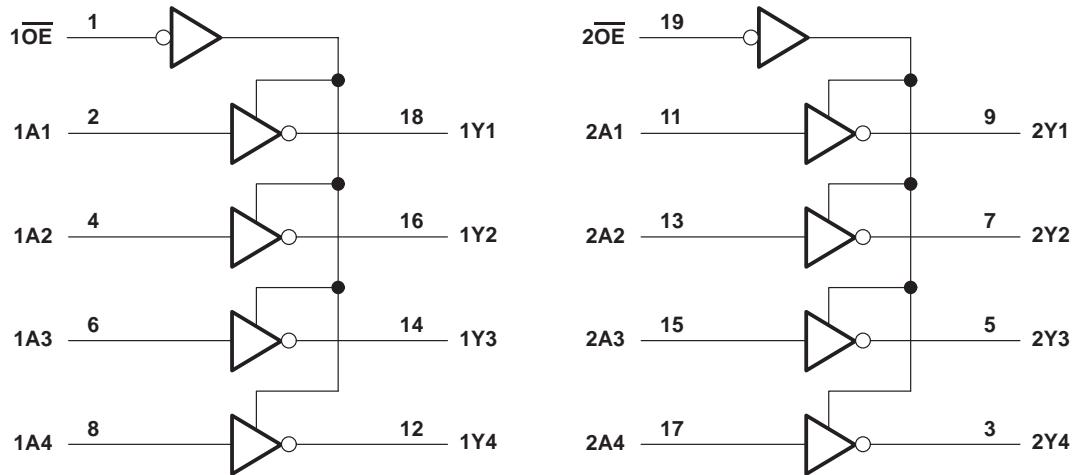
INPUTS		OUTPUT
\overline{OE}	A	Y
L	H	L
L	L	H
H	X	Z

logic symbol†

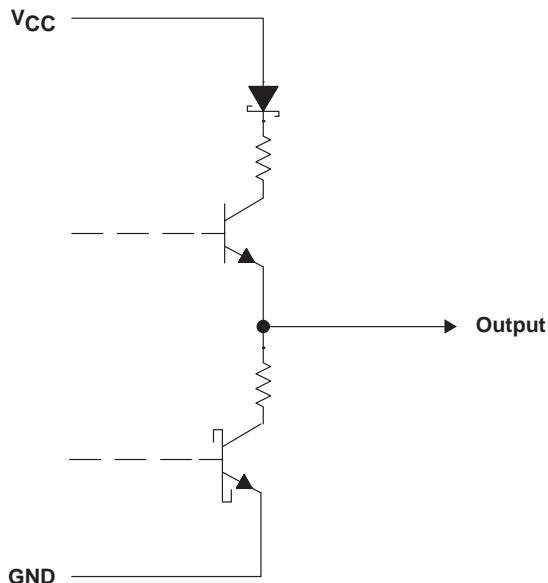


† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



schematic of Y outputs



absolute maximum ratings over operating free-air temperature range (unless otherwise noted)[†]

Supply voltage range, V_{CC}	.....	-0.5 V to 7 V
Input voltage range, V_I (see Note 1)	.....	-0.5 V to 7 V
Voltage range applied to any output in the high or power-off state, V_O	.....	-0.5 V to 5.5 V
Current into any output in the low state, I_O	.....	30 mA
Input clamp current, I_{IK} ($V_I < 0$)	.....	-18 mA
Output clamp current, I_{OK} ($V_O < 0$)	.....	-50 mA
Package thermal impedance, θ_{JA} (see Note 2):	DB package	115°C/W
	DW package	97°C/W
	N package	67°C/W
	PW package	128°C/W
Storage temperature range, T_{stg}	.....	-65°C to 150°C

[†] 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.

NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
 2. The package thermal impedance is calculated in accordance with JESD 51, except for through-hole packages, which use a trace length of zero.

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SCBS232E – JANUARY 1991 – REVISED OCTOBER 1998

recommended operating conditions (see Note 3)

		SN54ABT2240A		SN74ABT2240A		UNIT
		MIN	MAX	MIN	MAX	
V _{CC}	Supply voltage	4.5	5.5	4.5	5.5	V
V _{IH}	High-level input voltage	2		2		V
V _{IL}	Low-level input voltage		0.8		0.8	V
V _I	Input voltage	0	V _{CC}	0	V _{CC}	V
I _{OH}	High-level output current		-24		-32	mA
I _{OL}	Low-level output current		12		12	mA
Δt/Δv	Input transition rise or fall rate	Outputs enabled		5	5	ns/V
T _A	Operating free-air temperature	-55	125	-40	85	°C

NOTE 3: 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.

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

PARAMETER	TEST CONDITIONS	T _A = 25°C			SN54ABT2240A		SN74ABT2240A		UNIT		
		MIN	TYP†	MAX	MIN	MAX	MIN	MAX			
V _{IK}	V _{CC} = 4.5 V, I _I = -18 mA		-1.2		-1.2		-1.2		V		
V _{OH}	V _{CC} = 4.5 V, I _{OH} = -3 mA	2.5		2.5		2.5			V		
	V _{CC} = 5 V, I _{OH} = -3 mA	3		3		3					
	V _{CC} = 4.5 V	I _{OH} = -24 mA	2		2						
		I _{OH} = -32 mA	2*				2				
V _{OL}	V _{CC} = 4.5 V, I _{OL} = 12 mA		0.8		0.8		0.8		V		
V _{hys}		100							mV		
I _I	V _{CC} = 5.5 V, V _I = V _{CC} or GND		±1		±1		±1		µA		
I _{OZH}	V _{CC} = 5.5 V, V _O = 2.7 V		10*		10		10		µA		
I _{OZL}	V _{CC} = 5.5 V, V _O = 0.5 V		-10*		-10		-10		µA		
I _{off}	V _{CC} = 0, V _I or V _O ≤ 4.5 V		±100				±100		µA		
I _{CEX}	V _{CC} = 5.5 V, V _O = 5.5 V	Outputs high		50		50		50	µA		
I _O ‡	V _{CC} = 5.5 V, V _O = 2.5 V	-50	-100	-180	-50	-180	-50	-180	mA		
I _{CC}	V _{CC} = 5.5 V, I _O = 0, V _I = V _{CC} or GND	Outputs high		1	250		250	250	µA		
		Outputs low		24	30		30	30	mA		
		Outputs disabled		0.5	250		250	250	µA		
ΔI _{CC} §	Data inputs	V _{CC} = 5.5 V, One input at 3.4 V, Other inputs at V _{CC} or GND		Outputs enabled	1.5		1.5	1.5	mA		
		Outputs disabled			0.05		0.05	0.05			
C _i	V _I = 2.5 V or 0.5 V			4					pF		
	V _O = 2.5 V or 0.5 V			7					pF		

* On products compliant to MIL-PRF-38535, this parameter does not apply.

† All typical values are at V_{CC} = 5 V.

‡ Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

§ This is the increase in supply current for each input that is at the specified TTL voltage level rather than V_{CC} or GND.

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 WITH 3-STATE OUTPUTS

SCBS232E – JANUARY 1991 – REVISED OCTOBER 1998

switching characteristics over recommended ranges of supply voltage and operating free-air temperature, $C_L = 50 \text{ pF}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN54ABT2240A			UNIT	
			$V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$				
			MIN	TYP	MAX		
t_{PLH}	A	Y	1	3	4	1	5
t_{PHL}			2.1	4.8	5.8	2.1	6.3
t_{PZH}	\overline{OE}	Y	1.5	3.7	4.7	1.5	6.1
t_{PZL}			1.7	6.5	7.6	1.7	8.8
t_{PHZ}	\overline{OE}	Y	1.8	3.8	6.4	1.5	6.8
t_{PLZ}			1	4.7	5.8	1	6.9

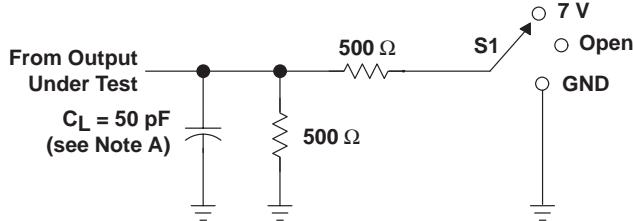
switching characteristics over recommended ranges of supply voltage and operating free-air temperature, $C_L = 50 \text{ pF}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	SN74ABT2240A			UNIT	
			$V_{CC} = 5 \text{ V}$, $T_A = 25^\circ\text{C}$				
			MIN	TYP	MAX		
t_{PLH}	A	Y	1	3	4.1	1	4.8
t_{PHL}			2.1	4.1	5.1	2.1	5.4
t_{PZH}	\overline{OE}	Y	1.1	3.1	4.7	1.1	5.2
t_{PZL}			1.7	4.5	6.4	1.7	6.8
t_{PHZ}	\overline{OE}	Y	1.8	3.4	5.7	1.8	6.4
t_{PLZ}			1.9	3.6	6	1.9	6.2

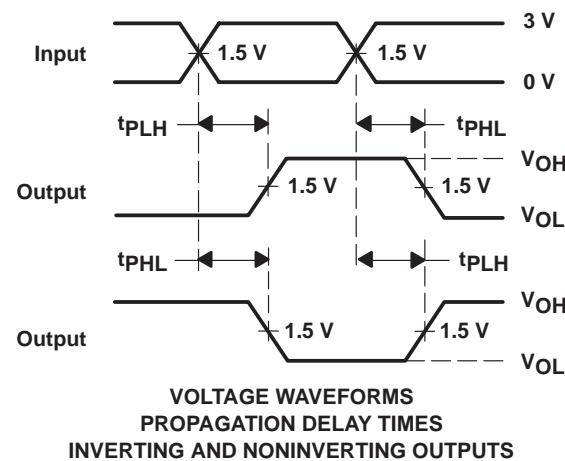
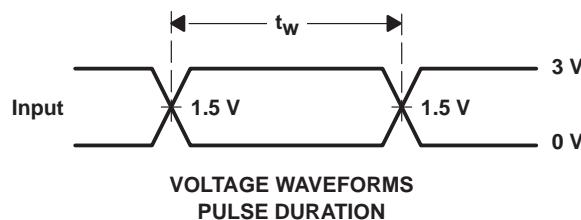
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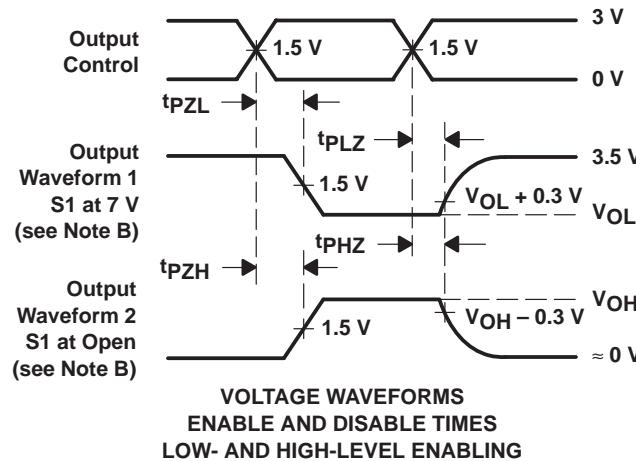
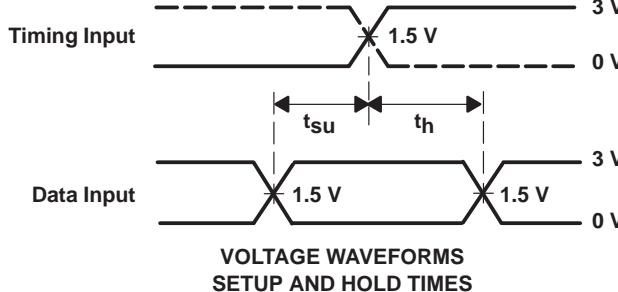
PARAMETER MEASUREMENT INFORMATION



LOAD CIRCUIT



TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	7 V
t_{PHZ}/t_{PZH}	Open



NOTES: A. C_L includes probe and jig capacitance.
 B. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.
 C. All input pulses are supplied by generators having the following characteristics: PRR \leq 10 MHz, $Z_O = 50 \Omega$, $t_r \leq 2.5$ ns, $t_f \leq 2.5$ ns.
 D. The outputs are measured one at a time with one transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

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)
5962-9469701Q2A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9469701Q2A SNJ54ABT2240AFK
5962-9469701QRA	Active	Production	CDIP (J) | 20	20 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9469701QR A SNJ54ABT2240AJ
SN74ABT2240ABR	Active	Production	SSOP (DB) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AA240A
SN74ABT2240ABR.B	Active	Production	SSOP (DB) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AA240A
SN74ABT2240ADW	Active	Production	SOIC (DW) | 20	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ABT2240A
SN74ABT2240ADW.B	Active	Production	SOIC (DW) | 20	25 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ABT2240A
SN74ABT2240ADWR	Active	Production	SOIC (DW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ABT2240A
SN74ABT2240ADWR.B	Active	Production	SOIC (DW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ABT2240A
SN74ABT2240AN	Active	Production	PDIP (N) | 20	20 | TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74ABT2240AN
SN74ABT2240AN.B	Active	Production	PDIP (N) | 20	20 | TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74ABT2240AN
SN74ABT2240ANSR	Active	Production	SOP (NS) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ABT2240A
SN74ABT2240ANSR.B	Active	Production	SOP (NS) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	ABT2240A
SN74ABT2240APW	Active	Production	TSSOP (PW) | 20	70 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AA240A
SN74ABT2240APW.B	Active	Production	TSSOP (PW) | 20	70 | TUBE	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AA240A
SN74ABT2240APWR	Active	Production	TSSOP (PW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AA240A
SN74ABT2240APWR.B	Active	Production	TSSOP (PW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AA240A
SNJ54ABT2240AFK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9469701Q2A SNJ54ABT2240AFK
SNJ54ABT2240AJ	Active	Production	CDIP (J) | 20	20 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-9469701QR A SNJ54ABT2240AJ

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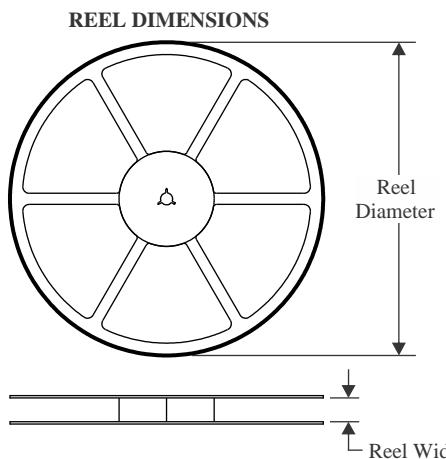
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

OTHER QUALIFIED VERSIONS OF SN54ABT2240A, SN74ABT2240A :

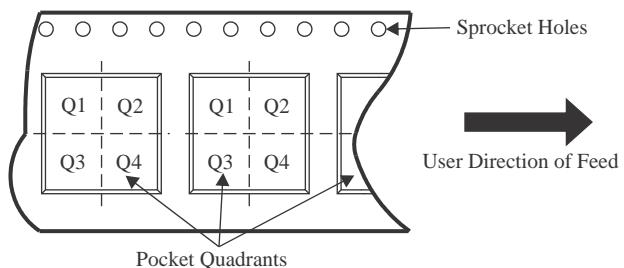
- Catalog : [SN74ABT2240A](#)
- Military : [SN54ABT2240A](#)

NOTE: Qualified Version Definitions:

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

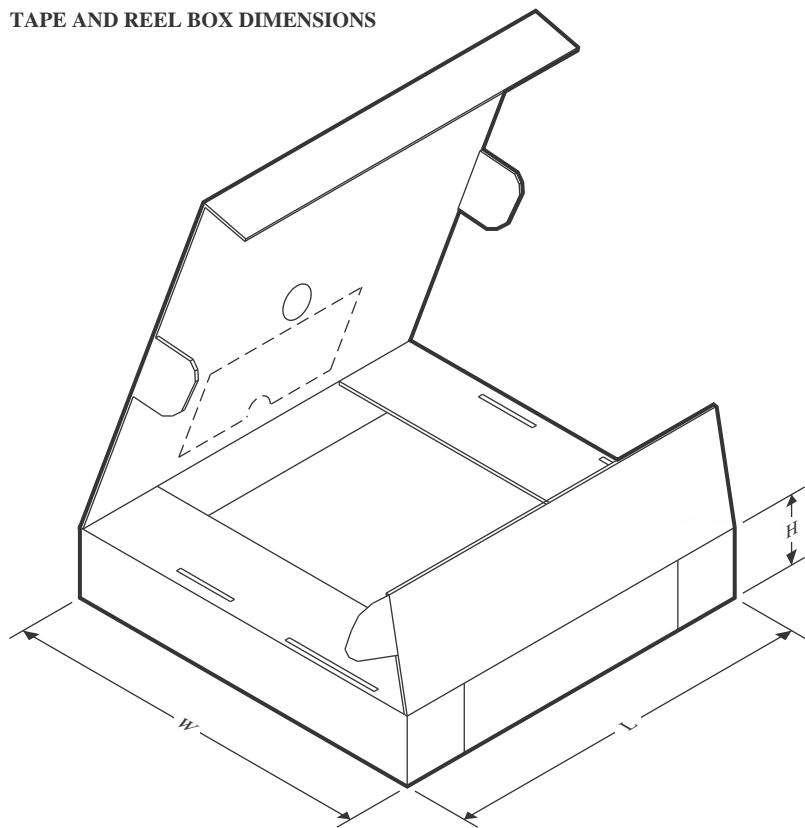
TAPE AND REEL INFORMATION


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


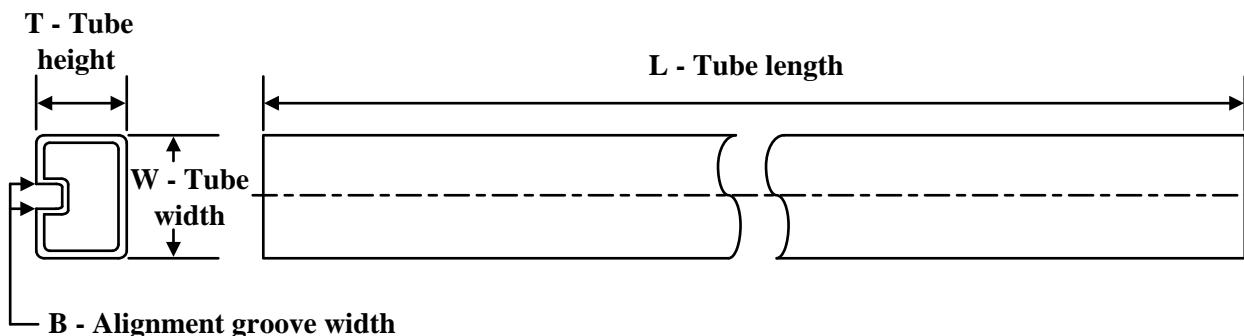
*All dimensions are nominal

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
SN74ABT2240ADBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74ABT2240ADWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
SN74ABT2240ANSR	SOP	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1
SN74ABT2240APWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.0	1.4	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)
SN74ABT2240ABR	SSOP	DB	20	2000	353.0	353.0	32.0
SN74ABT2240ADWR	SOIC	DW	20	2000	356.0	356.0	45.0
SN74ABT2240ANSR	SOP	NS	20	2000	356.0	356.0	45.0
SN74ABT2240APWR	TSSOP	PW	20	2000	353.0	353.0	32.0

TUBE


*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μ m)	B (mm)
5962-9469701Q2A	FK	LCCC	20	55	506.98	12.06	2030	NA
SN74ABT2240ADW	DW	SOIC	20	25	507	12.83	5080	6.6
SN74ABT2240ADW.B	DW	SOIC	20	25	507	12.83	5080	6.6
SN74ABT2240AN	N	PDIP	20	20	506	13.97	11230	4.32
SN74ABT2240AN.B	N	PDIP	20	20	506	13.97	11230	4.32
SN74ABT2240APW	PW	TSSOP	20	70	530	10.2	3600	3.5
SN74ABT2240APW.B	PW	TSSOP	20	70	530	10.2	3600	3.5
SNJ54ABT2240AFK	FK	LCCC	20	55	506.98	12.06	2030	NA

GENERIC PACKAGE VIEW

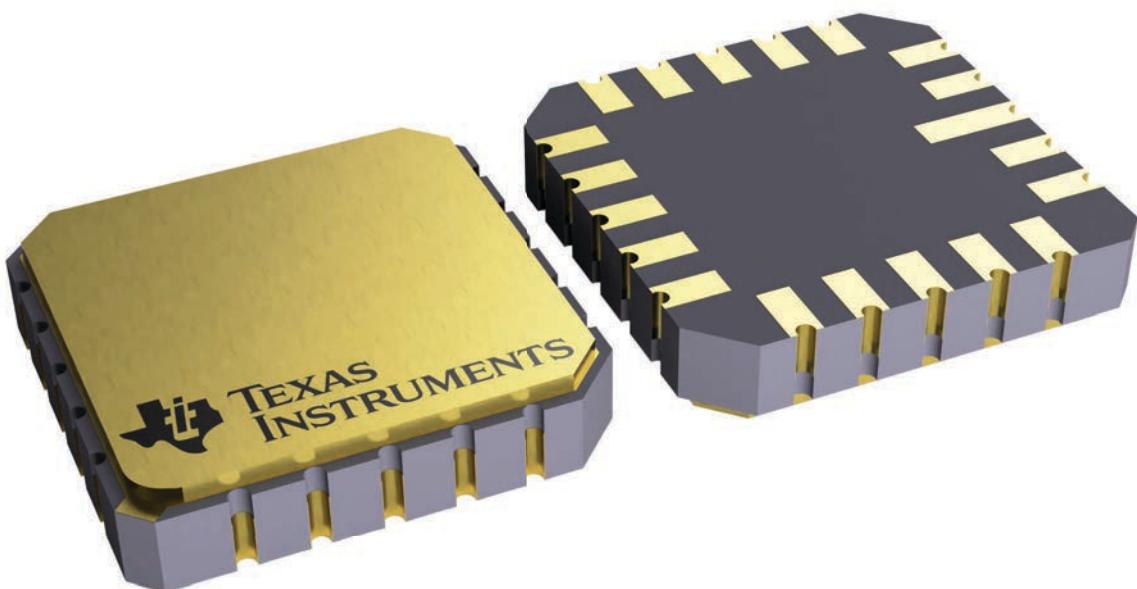
FK 20

LCCC - 2.03 mm max height

8.89 x 8.89, 1.27 mm pitch

LEADLESS CERAMIC CHIP CARRIER

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



4229370VA\

N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



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.

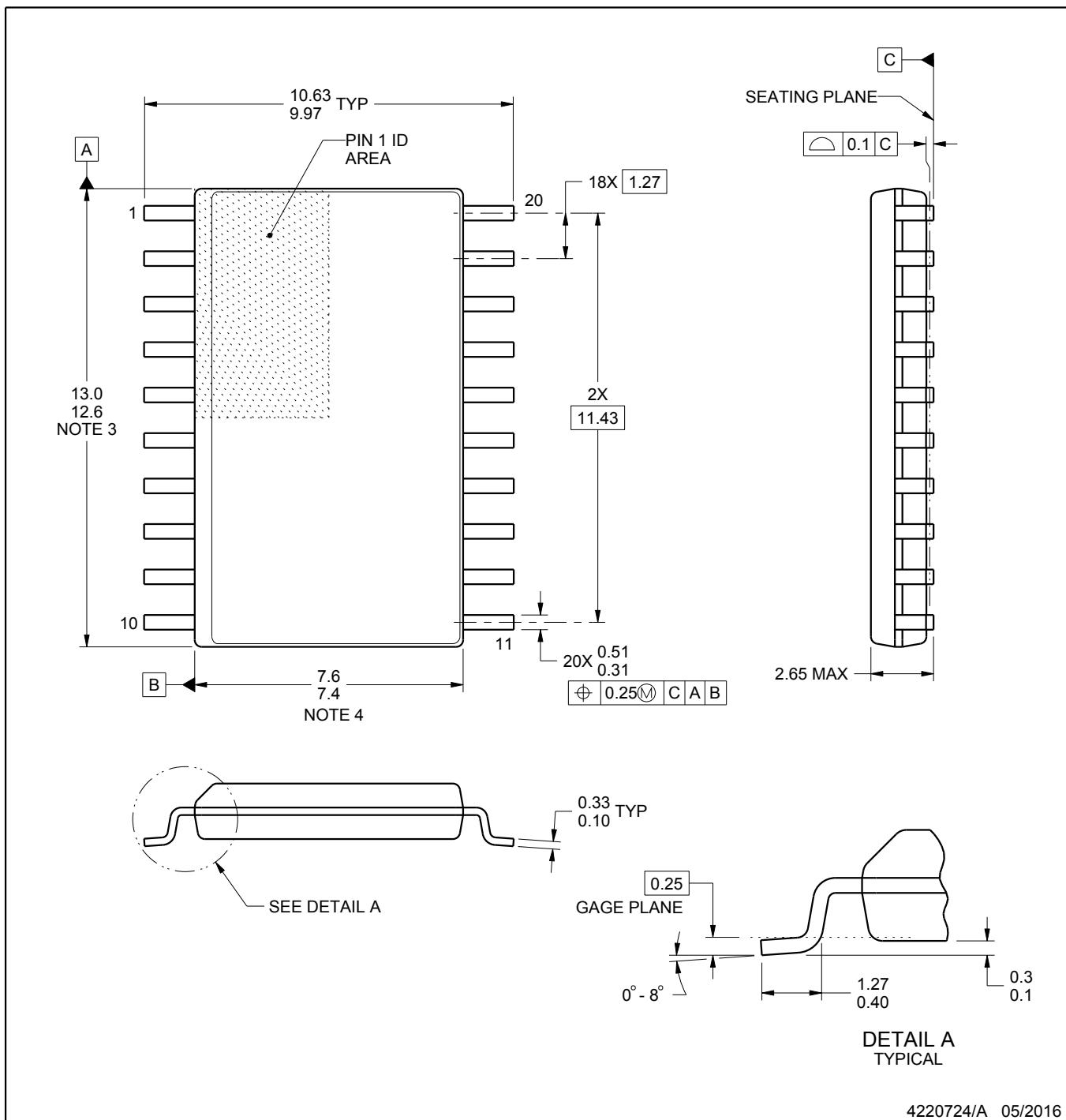
PACKAGE OUTLINE

DW0020A



SOIC - 2.65 mm max height

SOIC



NOTES:

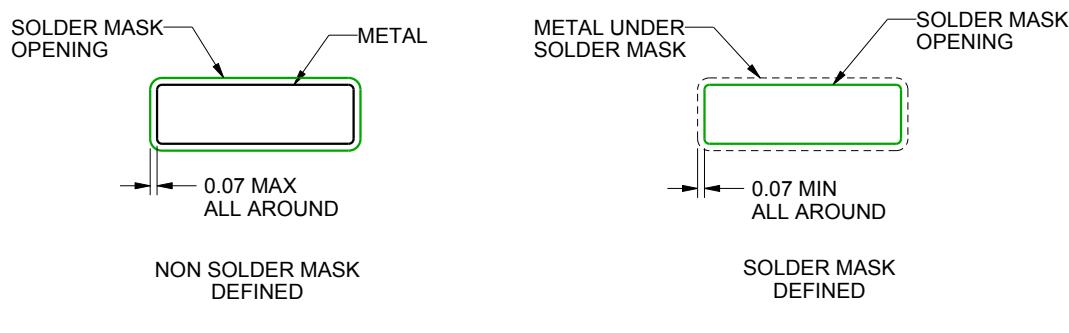
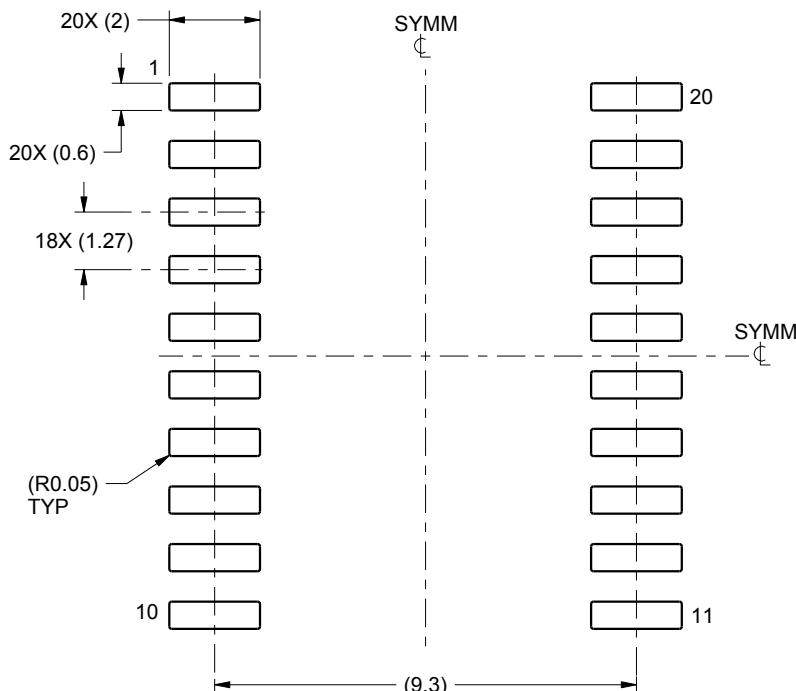
1. All linear dimensions are in millimeters. Dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate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

EXAMPLE BOARD LAYOUT

DW0020A

SOIC - 2.65 mm max height

SOIC



4220724/A 05/2016

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

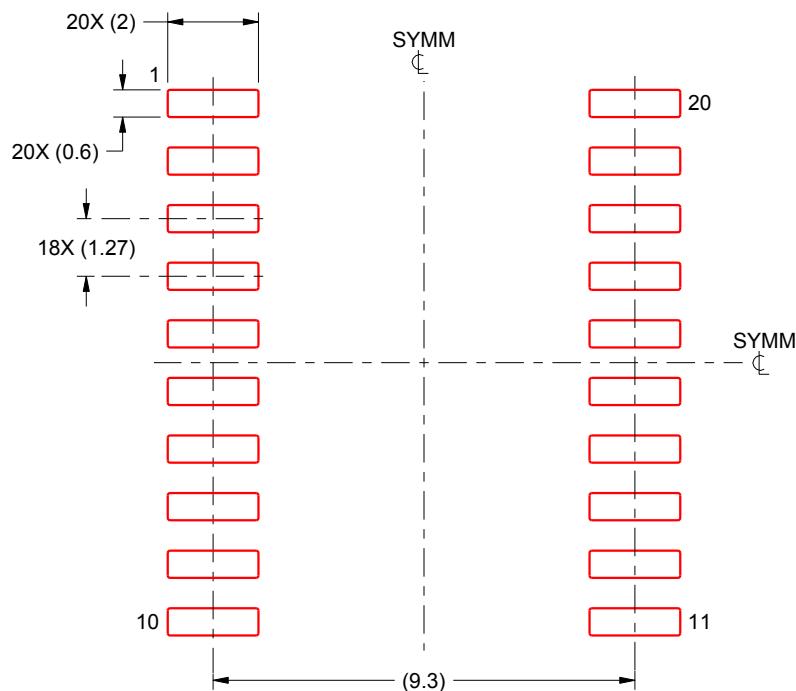
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DW0020A

SOIC - 2.65 mm max height

SOIC



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

4220724/A 05/2016

NOTES: (continued)

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

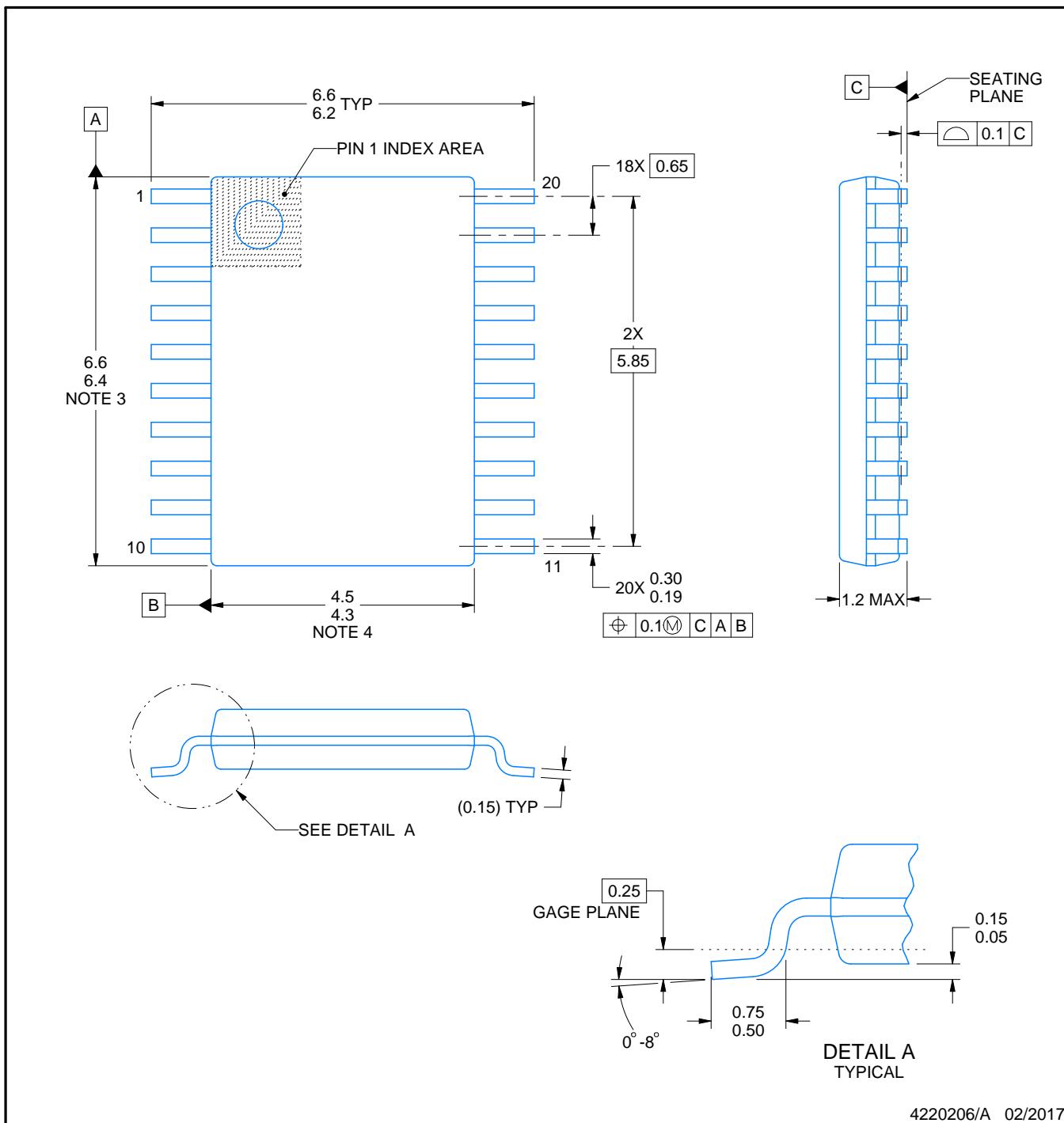
PACKAGE OUTLINE

PW0020A



TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



NOTES:

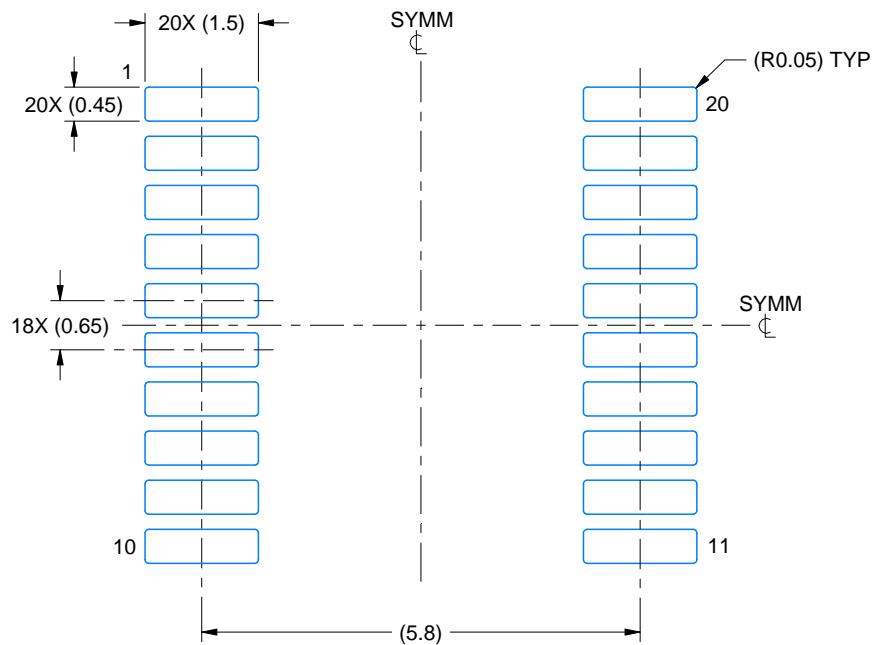
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or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

EXAMPLE BOARD LAYOUT

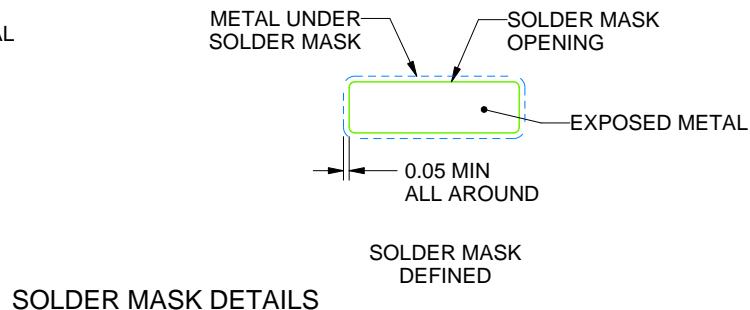
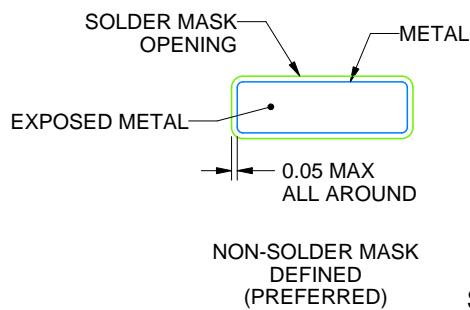
PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



4220206/A 02/2017

NOTES: (continued)

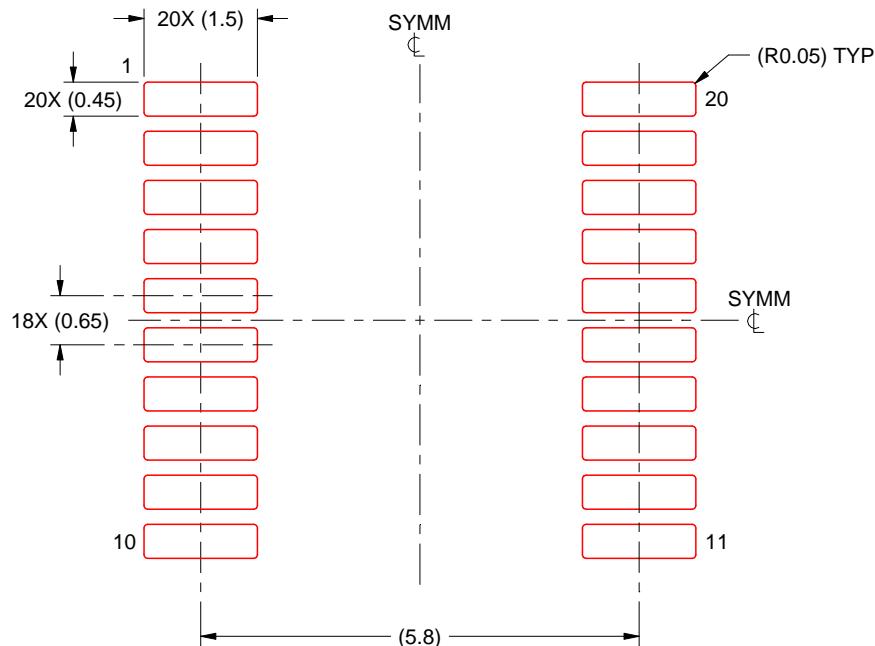
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

PW0020A

TSSOP - 1.2 mm max height

SMALL OUTLINE PACKAGE



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

4220206/A 02/2017

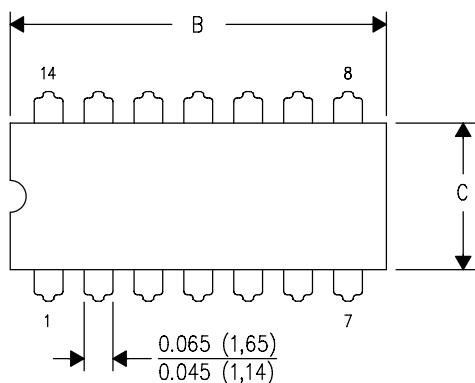
NOTES: (continued)

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

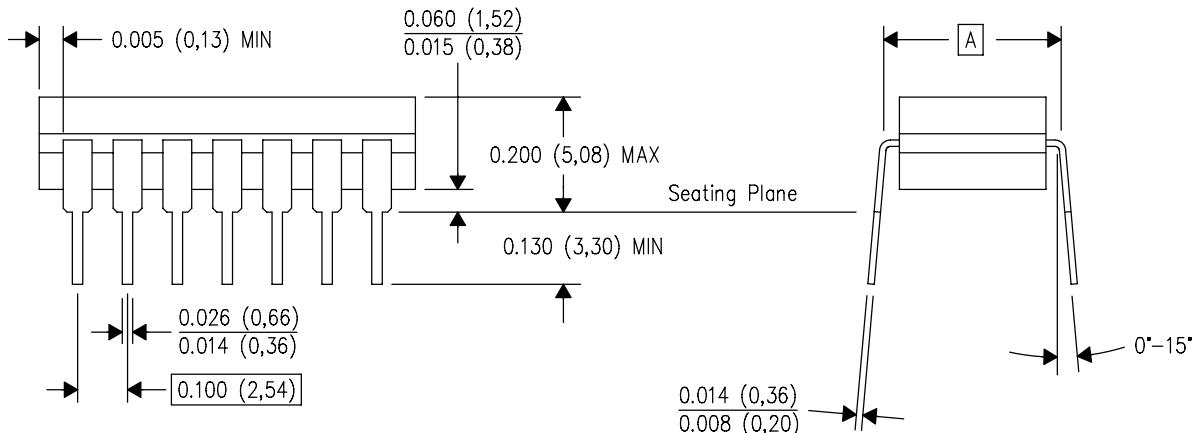
J (R-GDIP-T**)

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.

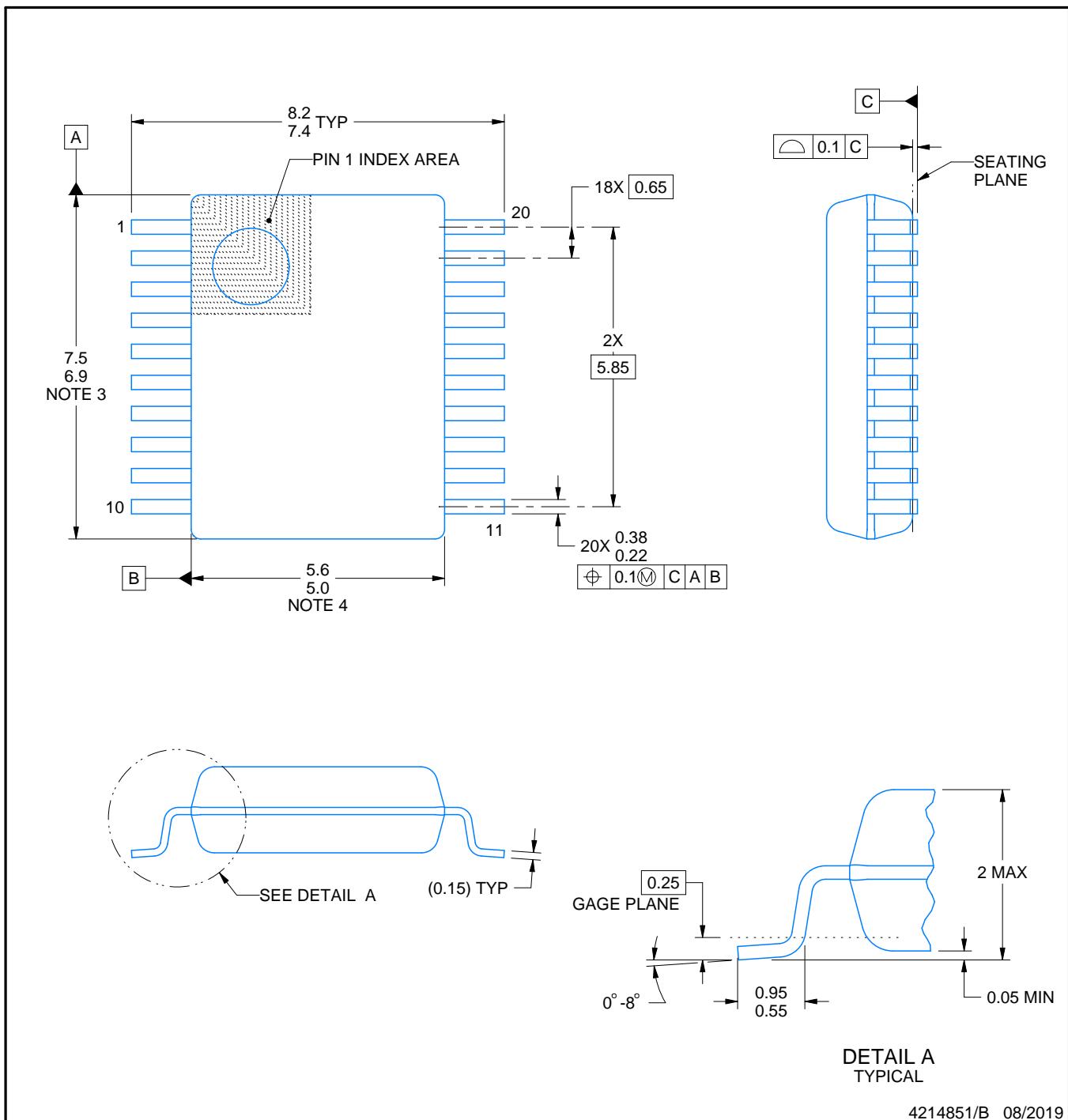
PACKAGE OUTLINE

DB0020A



SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



NOTES:

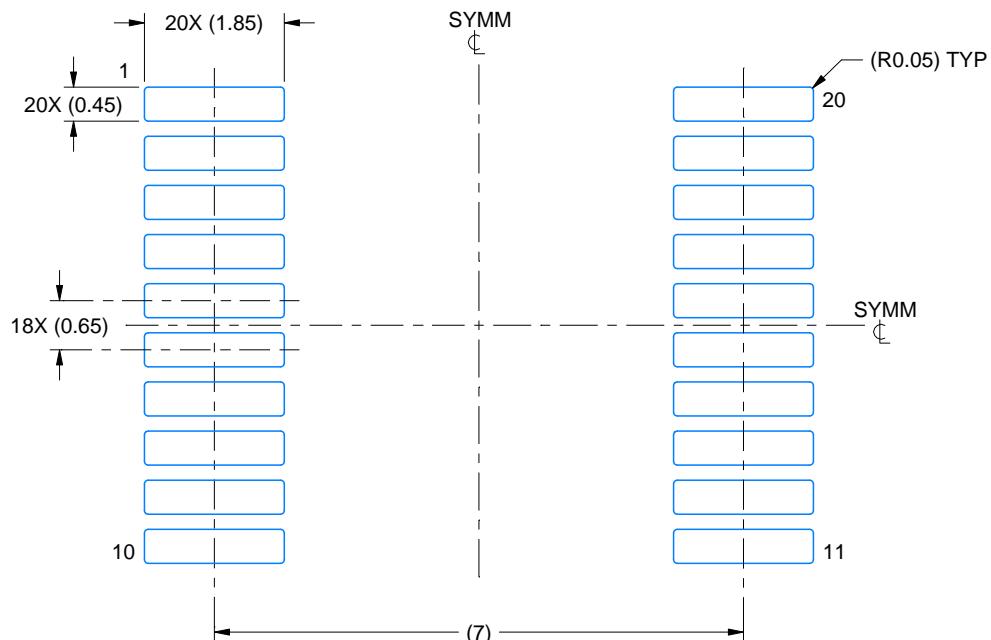
1. All linear dimensions are in millimeters. Any dimensions in parenthesis are for reference only. Dimensioning and tolerancing per ASME Y14.5M.
2. This drawing is subject to change without notice.
3. This dimension does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or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

EXAMPLE BOARD LAYOUT

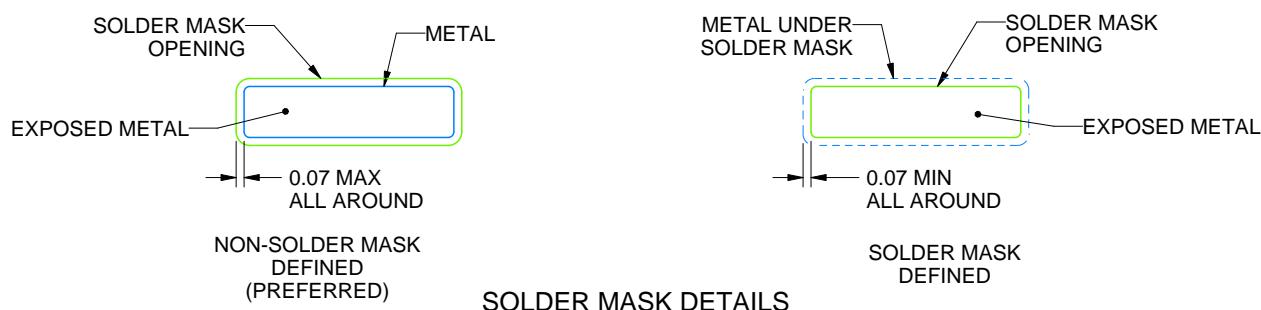
DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

4214851/B 08/2019

NOTES: (continued)

6. Publication IPC-7351 may have alternate designs.

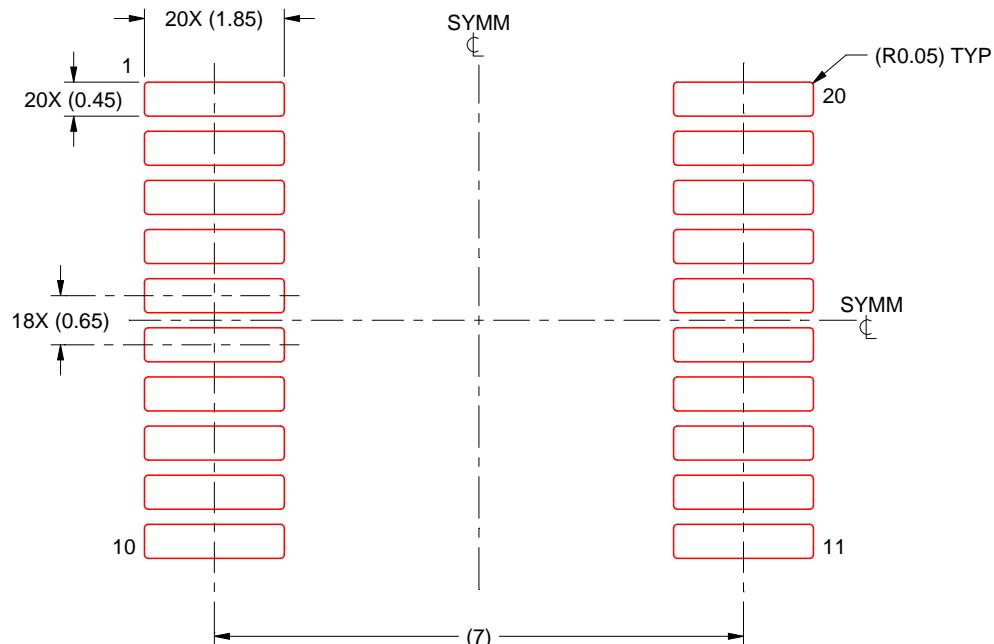
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

EXAMPLE STENCIL DESIGN

DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



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

4214851/B 08/2019

NOTES: (continued)

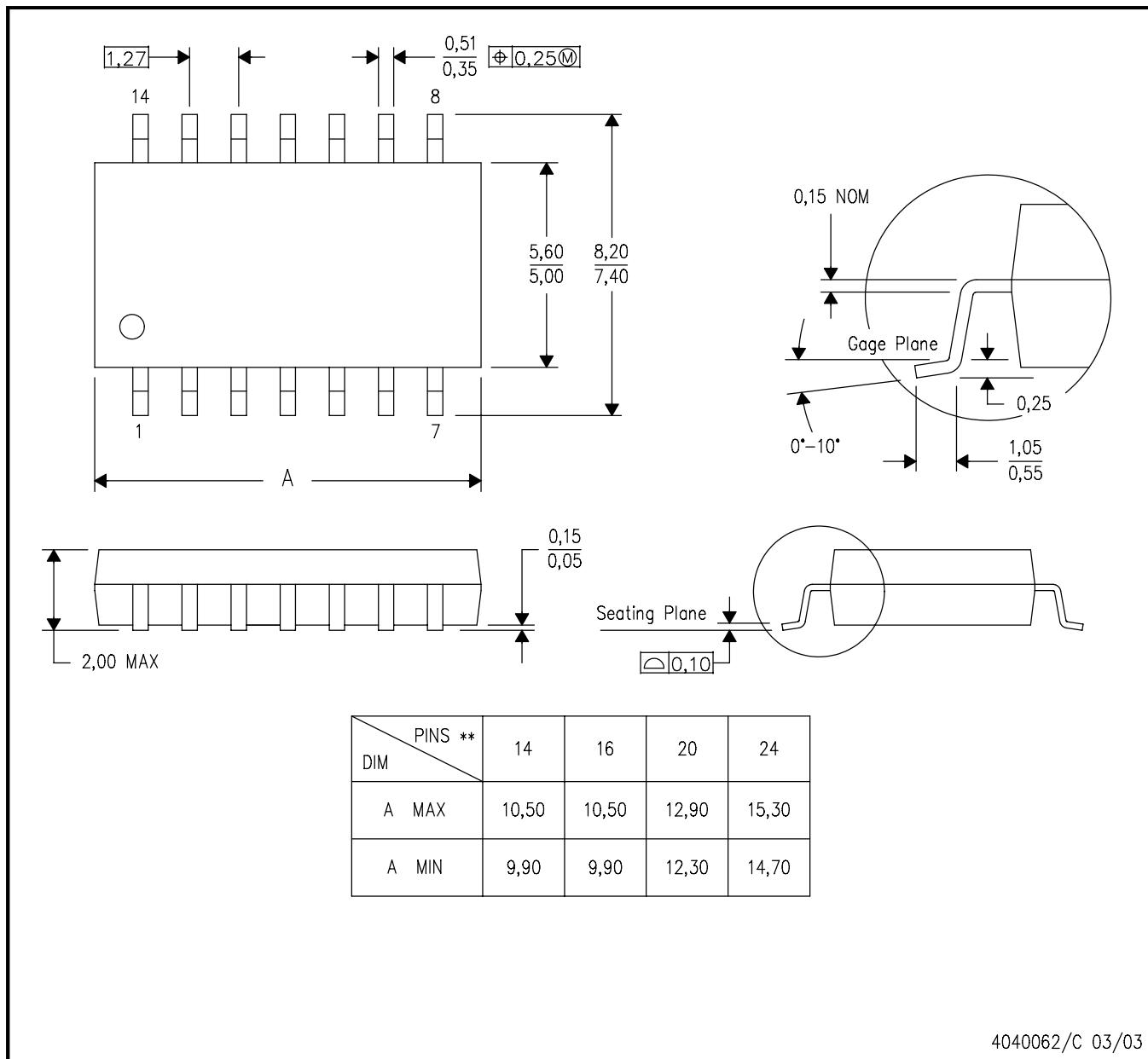
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

MECHANICAL DATA

NS (R-PDSO-G)**

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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