SNx4AC245 Octal Bus Transceivers With 3-State Outputs

1 Features

- V_{CC} operation of 2V to 6V
- Inputs accept voltages to 6V
- Max t_{pd} of 7ns at 5V

2 Applications

- Pro Audio
- Video and Signage
- Appliances
- Factory Automation and Control

3 Description

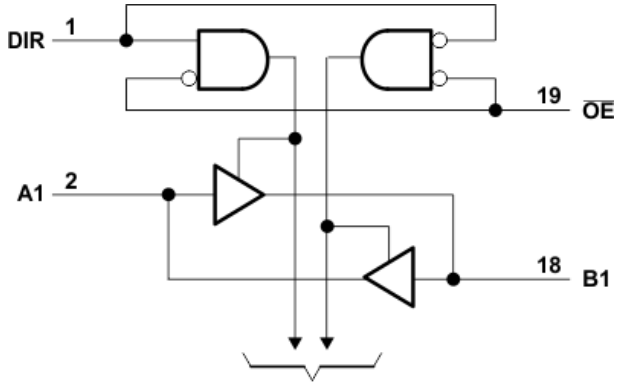
The 'AC245 octal bus transceivers are designed for asynchronous two-way communication between data buses. The control-function implementation minimizes external timing requirements.

The devices allow data transmission from the A bus to the B bus or from the B bus to the A bus, depending on the logic level at the direction-control (DIR) input. The output-enable (OE) input can be used to disable the device so that the buses are effectively isolated.

Device Information

PART NUMBER	PACKAGE(1)	PACKAGE SIZE(2)	BODY SIZE(3)
SNx4AC245	DB (SSOP, 20)	7.2mm × 7.8mm	7.2mm × 5.3mm
	DGS (VSSOP, 20)	5.1mm × 4.9mm	5.1mm × 3mm
	DW (SOIC, 20)	12.8mm × 10.3mm	12.8mm × 7.5mm
	N (PDIP, 20)	24.33mm × 9.4mm	24.33mm × 6.35mm
	NS (SO, 20)	12.6mm × 7.8mm	12.6mm × 5.3mm
	PW (TSSOP, 20)	6.5mm × 6.4mm	6.5mm × 4.4mm
	RKS (VQFN, 20)	4.5mm × 2.5mm	4.5mm × 2.5mm

(1) For more information, see Section 11.
(2) The package size (length × width) is a nominal value and includes pins, where applicable.
(3) The body size (length × width) is a nominal value and does not include pins.



Logic Diagram (Positive Logic)

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4 Pin Configuration and Functions

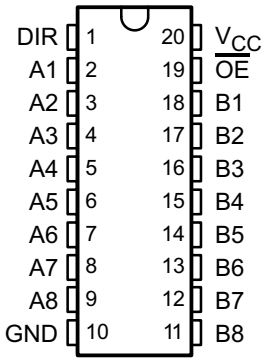

Figure 4-1. SN54AC245 J or W Package; SN74AC245 DB, DGS, DW, N, NS, or PW Package Top View

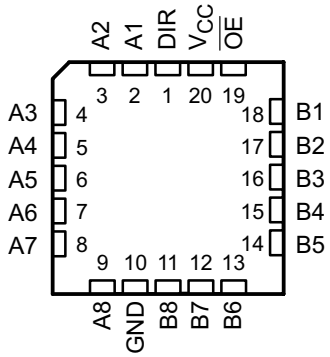

Figure 4-2. SN54AC245 FK Package Top View

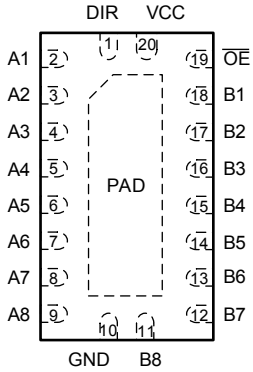

Figure 4-3. SN54AC245 RKS Package Top View

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Pin Functions

PIN		TYPE[1]	DESCRIPTION
NO.	NAME		
1	DIR	I/O	Direction Pin
2	A1	I/O	A1 Input/Output
3	A2	I/O	A2 Input/Output
4	A3	I/O	A3 Input/Output
5	A4	I/O	A4 Input/Output
6	A5	I/O	A5 Input/Output
7	A6	I/O	A6 Input/Output
8	A7	I/O	A7 Input/Output
9	A8	I/O	A8 Input/Output
10	GND	—	Ground Pin
11	B8	I/O	B8 Input/Output
12	B7	I/O	B7 Input/Output
13	B6	I/O	B6 Input/Output
14	B5	I/O	B5 Input/Output
15	B4	I/O	B4 Input/Output
16	B3	I/O	B3 Input/Output
17	B2	I/O	B2 Input/Output
18	B1	I/O	B1 Input/Output
19	OE	I/O	Output Enable
20	VCC	—	Power Pin

(1) Signal Types: I = Input, O = Output, I/O = Input or Output

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5 Specifications

5.1 Absolute Maximum Ratings

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

			MIN	MAX	UNIT
V_{CC}	Supply voltage	−0.5 V to V_{CC} + 0.5 V	−0.5	7	V
V_I	Input voltage(2)	−0.5 V to V_{CC} + 0.5 V			V
V_O	Output voltage(2)	−0.5 V to V_{CC} + 0.5 V			V
I_{IK}	Input clamp current	V_I < 0 or V_I > V_{CC}		±20	mA
I_{OK}	Output clamp current	V_O < 0 or V_O > V_{CC}		±20	mA
I_O	Continuous output current	V_O = 0 to V_{CC}	–65	±50	mA
	Continuous current through V_{CC} or GND			±200	mA
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 ESD Ratings

			VALUE	UNIT
$V_{(ESD)}$	Electrostatic discharge	Human body model (HBM), per ANSI/ESDA/JEDEC JS-001(1)	±3000	V
		Charged-device model (CDM), per JEDEC specification JESD22-C101(2)	±1000	

(1) JEDEC document JEP155 states that 500-V HBM allows safe manufacturing with a standard ESD control process.
(2) JEDEC document JEP157 states that 250-V CDM allows safe manufacturing with a standard ESD control process.

5.3 Recommended Operating Conditions

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

			SN54AC245		SN74AC245		UNIT
			MIN	MAX	MIN	MAX	
V_{CC}	Supply voltage		2	6	2	6	V
V_{IH}	High-level input voltage	V_{CC} = 3 V	2.1		2.1		V
		V_{CC} = 4.5 V	3.15		3.15		
		V_{CC} = 5.5 V	3.85		3.85		
V_{IL}	Low-level input voltage	V_{CC} = 3 V		0.9		0.9	V
		V_{CC} = 4.5 V		1.35		1.35	
		V_{CC} = 5.5 V		1.65		1.65	
V_I	Input voltage		0	V_{CC}	0	V_{CC}	V
V_O	Output voltage		0	V_{CC}	0	V_{CC}	V
I_{OH}	High-level output current	V_{CC} = 3 V		−12		−12	mA
		V_{CC} = 4.5 V		−24		−24	
		V_{CC} = 5.5 V		−24		−24	
I_{OL}	Low-level output current	V_{CC} = 3 V		12		12	mA
		V_{CC} = 4.5 V		24		24	
		V_{CC} = 5.5 V		24		24	
t/v	Input transition rise or fall rate			8		8	ns/V
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.

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5.4 Thermal Information

THERMAL METRIC[1]		SNx4AC245							UNIT
		DB (SSOP)	DGS (VSSOP)	DW (SOIC)	N (PDIP)	NS (SOP)	PW (TSSOP)	RKS (VQFN)	
		20 PINS							
$R_{\theta JA}$	Junction-to-ambient thermal resistance	70	123.5	98.6	69	60	126.6	67.7	°C/W

(1) For more information about traditional and new thermal metrics, see the *Semiconductor and IC Package Thermal Metrics* application report, SPRA953.

5.5 Electrical Characteristics

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

PARAMETER		TEST CONDITIONS	V_{CC}	T_A = 25°C			SN54AC245		SN74AC245		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V_{OH}		I_{OH} = −50 µA	3 V	2.9			2.9		2.9		V
			4.5 V	4.4			4.4		4.4		
			5.5 V	5.4			5.4		5.4		
		I_{OH} = −12 mA	3 V	2.56			2.4		2.46		
		I_{OH} = −24 mA	4.5 V	3.86			3.7		3.76		
			5.5 V	4.86			4.7		4.76		
		I_{OH} = 50 mA[1]	5.5 V				3.85				
		I_{OH} = −75 mA[1]	5.5 V						3.85		
V_{OL}		I_{OL} = 50 µA	3 V		0.002	0.1		0.1		0.1	V
			4.5 V		0.001	0.1		0.1		0.1	
			5.5 V		0.001	0.1		0.1		0.1	
		I_{OL} = 12 mA	3 V			0.36		0.5		0.44	
		I_{OL} = 24 mA	4.5 V			0.36		0.5		0.44	
			5.5 V			0.36		0.5		0.44	
		I_{OL} = 50 mA[1]	5.5 V					1.65			
		I_{OL} = 75 mA[1]	5.5 V							1.65	
I_I	A or B ports[2]	V_I = V_{CC} or 0	5.5 V			±0.1		± 1		± 1	µA
	$\overline{OE}$ or DIR					±0.1		± 1		± 1	
I_{OZ}		V_O = V_{CC} or GND, V_I(OE) = V_{IL} or V_{IH}	5.5 V			±0.5		±10		±5	µA
I_{CC}		V_I = V_{CC} or GND, I_O = 0	5.5 V			4		80		40	µA
C_i		V_I = V_{CC} or GND	5 V		4.5						pF
C_{io}		V_O = V_{CC} or GND	5 V		15						pF

1. Not more than one output should be tested at a time, and the duration of the test should not exceed 2 ms.
2. For I/O ports, the parameter IOZ includes the input leakage current.

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5.6 Switching Characteristics, V_{CC} = 3.3 V 0.3 V

over recommended operating free-air temperature range (unless otherwise noted)
(see Load Circuit and Voltage Waveforms)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			SN54AC245		SN74AC245		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1.5	5	8.5	1	11.5	1	9	ns
t_{PHL}			1.5	5	8.5	1	10	1	9	
t_{PZH}	$\overline{OE}$	A or B	2.5	7	11.5	1	13.5	2	12.5	ns
t_{PZL}			2.5	7.5	12	1	14.5	2	13.5	
t_{PHZ}	$\overline{OE}$	A or B	2	6.5	12	1	13.5	1	12.5	ns
t_{PLZ}			2	7	11.5	1	14	1.5	13	

5.7 Switching Characteristics, V_{CC} = 5 V 5 V

over recommended operating free-air temperature range (unless otherwise noted)
(see Section 6)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	T_A = 25°C			SN54AC245		SN74AC245		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	1.5	3.5	6.5	1	8.5	1	7	ns
t_{PHL}			1.5	3.5	6	1	7.5	1	7	
t_{PZH}	$\overline{OE}$	A or B	1.5	5	8.5	1	10	1	9	ns
t_{PZL}			1.5	5.5	9	1	10.5	1	9.5	
t_{PHZ}	$\overline{OE}$	A or B	1.5	5.5	9	1	10.5	1	10	ns
t_{PLZ}			1.5	5.5	9	1	10.5	1	10	

5.8 Operating Characteristics

V_{CC} = 5 V, T_A = 25°C

PARAMETER		TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance per transceiver	CL = 50 pF, f = 1 MHz	45	pF

5.9 Typical Characteristics

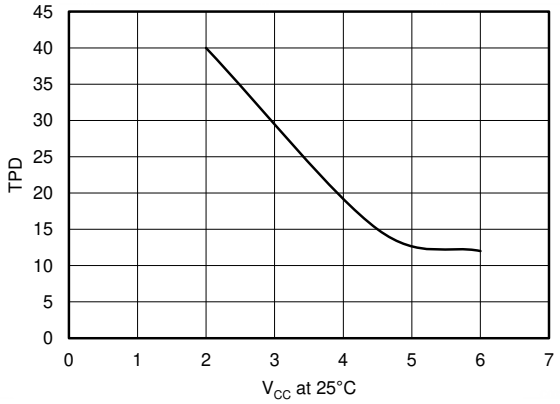

Figure 5-1. TPD vs V_{CC} at 25°C

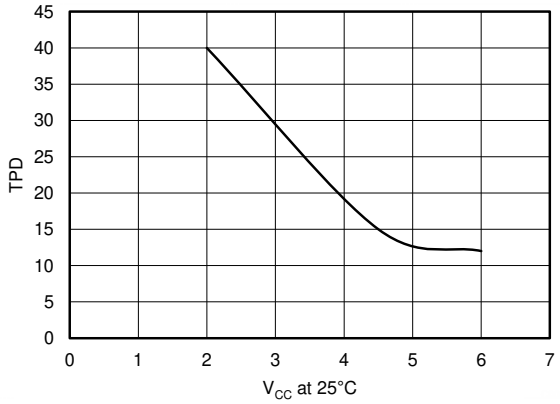

Figure 5-2. TPD vs V_{CC} at 25°C

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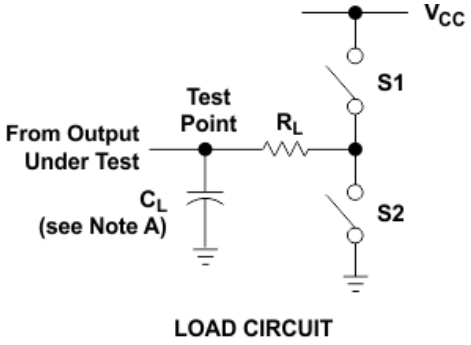
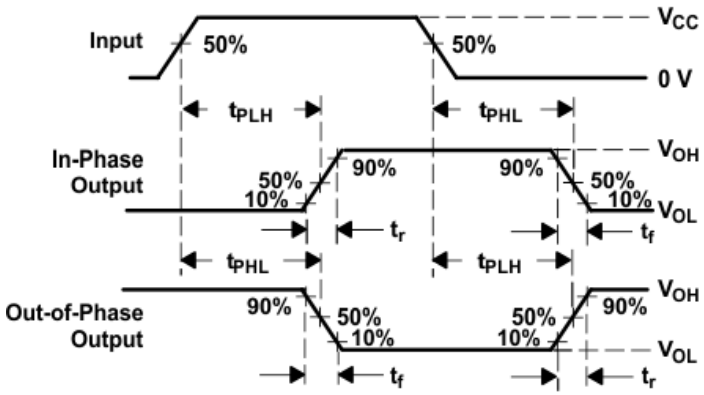
6 Parameter Measurement Information

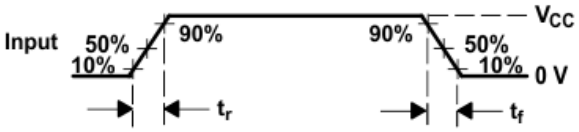


LOAD CIRCUIT

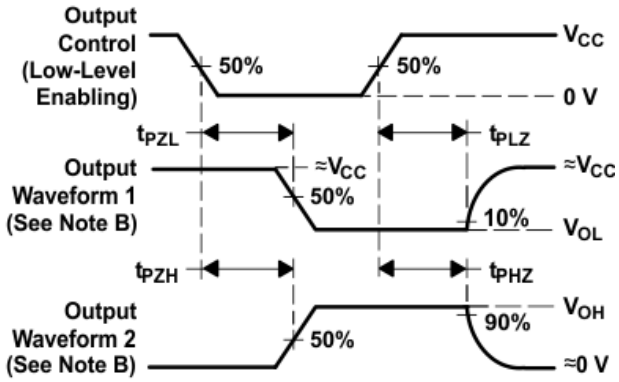
PARAMETER		R_L	C_L	S1	S2
t_{en}	t_{PZH}	1 kΩ	50 pF or 150 pF	Open	Closed
	t_{PZL}			Closed	Open
t_{dis}	t_{PHZ}	1 kΩ	50 pF	Open	Closed
	t_{PLZ}			Closed	Open
t_{pd} or t_t		--	50 pF or 150 pF	Open	Open



VOLTAGE WAVEFORMS
PROPAGATION DELAY AND OUTPUT TRANSITION TIMES



VOLTAGE WAVEFORM
INPUT RISE AND FALL TIMES



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES FOR 3-STATE OUTPUTS

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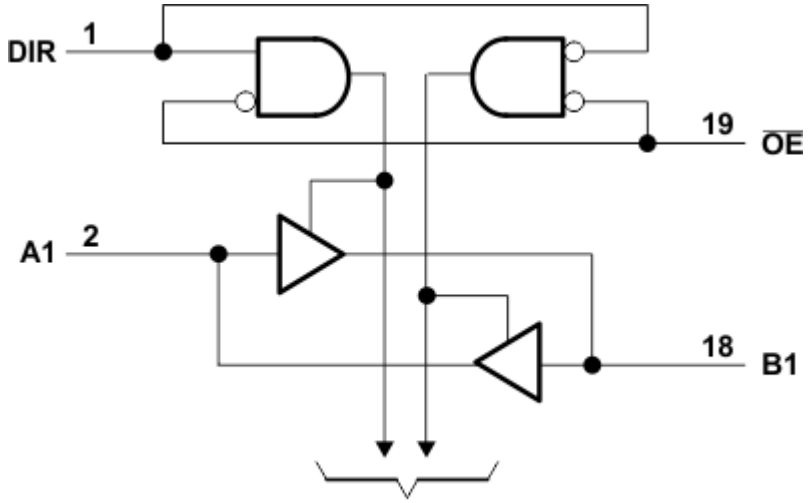
7 Detailed Description

7.1 Overview

These octal bus transceivers are designed for asynchronous two-way communication between data buses. The control-function implementation minimizes external timing requirements. The SNx4AC245 devices allow data transmission from the A bus to the B bus or from the B bus to the A bus, depending on the logic level at the direction-control (DIR) input. The output-enable (OE) input can be used to disable the device so that the buses are effectively isolated. To ensure the high-impedance state during power up or power down, 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.

7.2 Functional Block Diagram



Logic Diagram (Positive Logic)

7.3 Feature Description

The SNx4AC245 devices have a wide operating V_{CC} range from 2 V to 6 V with slower edge rates to minimize output ringing.

7.4 Device Functional Modes

Table 7-1 lists the function modes of the SNx4AC245.

Table 7-1. Function Table

INPUTS(1)		OPERATION
$\overline{OE}$	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

(1) H = High Voltage Level, L = Low Voltage Level, X = Don't Care

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8 Application Information Disclaimer

Note

Information in the following applications sections is not part of the TI component specification, and TI does not warrant its accuracy or completeness. TI's customers are responsible for determining suitability of components for their purposes, as well as validating and testing their design implementation to confirm system functionality.

8.1 Application Information

The SNx4AC245 is a low-drive CMOS device that can be used for a multitude of bus interface type applications where output ringing is a concern. The low drive and slow edge rates will minimize overshoot and undershoot on the outputs.

8.2 Typical Application

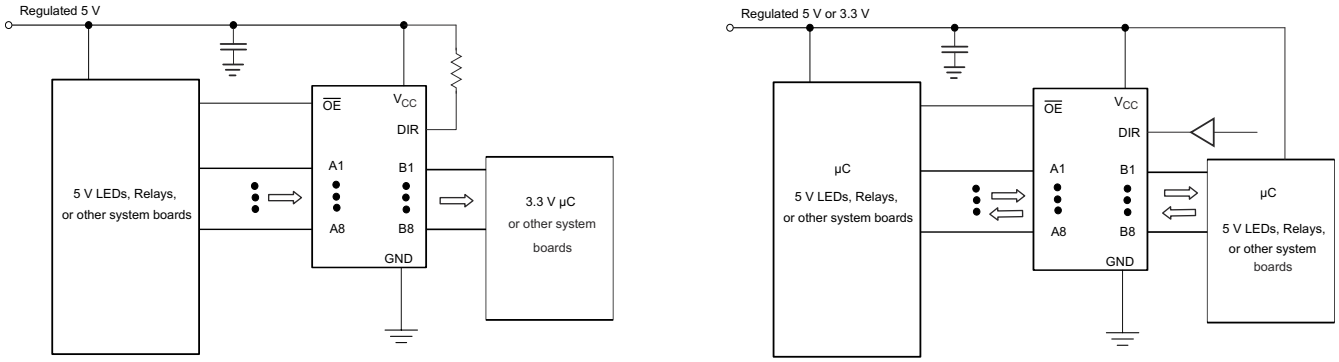

Figure 8-1. Typical Application Schematic

8.2.1 Design Requirements

This device uses CMOS technology and has balanced output drive. Care should be taken to avoid bus contention because it can drive currents that would exceed maximum limits. Outputs can be combined to produce higher drive but the high drive will also create faster edges into light loads, so routing and load conditions should be considered to prevent ringing.

8.2.2 Detailed Design Procedure

1. Recommended Input Conditions
   - Rise time and fall time specs: See (Δt/ΔV) in the *Section 5.3*.
   - Specified high and low levels: See (V_{IH} and V_{IL}) in the *Section 5.3*.
2. Recommend Output Conditions
   - Load currents should not exceed 25 mA per output and 75 mA total for the part.
   - Outputs should not be pulled above V_{CC}.

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8.3 Power Supply Recommendations

The power supply can be any voltage between the MIN and MAX supply voltage rating located in the *Section 5.3*.

Each V_{CC} pin should have a good bypass capacitor to prevent power disturbance. For devices with a single supply, 0.1 µF is recommended; if there are multiple V_{CC} pins, then 0.01 µF or 0.022 µF is recommended for each power pin. It is acceptable to parallel multiple bypass caps to reject different frequencies of noise. A 0.1 µF and a 1 µF are commonly used in parallel. The bypass capacitor should be installed as close to the power pin as possible for best results.

8.4 Layout

8.4.1 Layout Guidelines

When using multiple-bit logic devices, inputs should never float.

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 input pins should not be left unconnected because the undefined voltages at the outside connections result in undefined operational states. Section 8.4.2 specifies the rules that must be observed under all circumstances. All unused inputs of digital logic devices must be connected to a high or low bias to prevent them from floating. The logic level that should be applied to any particular unused input depends on the function of the device. Generally they will be tied to GND or V_{CC}, whichever makes more sense or is more convenient. It is generally acceptable to float outputs, unless the part is a transceiver. If the transceiver has an output enable pin, it will disable the output section of the part when asserted. This will not disable the input section of the IOs, so they cannot float when disabled.

8.4.2 Layout Example

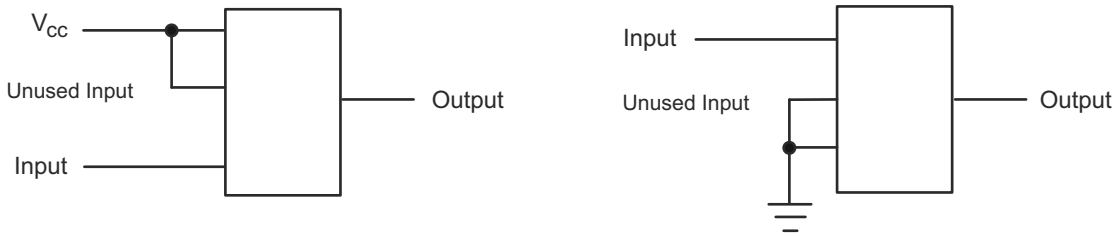

Figure 8-2. Layout Diagram

9 Device and Documentation Support

9.1 Documentation Support

9.1.1 Related Links

The table below lists quick access links. Categories include technical documents, support and community resources, tools and software, and quick access to sample or buy.

Table 9-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN54AC245	Click here	Click here	Click here	Click here	Click here
SN74AC245	Click here	Click here	Click here	Click here	Click here

9.2 Receiving Notification of Documentation Updates

To receive notification of documentation updates, navigate to the device product folder on ti.com. Click on *Notifications* 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.

9.3 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.

9.4 Trademarks

TI E2E™ is a trademark of Texas Instruments.
All trademarks are the property of their respective owners.

9.5 Electrostatic Discharge Caution

This integrated circuit can be damaged by ESD. Texas Instruments recommends that all integrated circuits be handled with appropriate precautions. Failure to observe proper handling and installation procedures can cause damage.

ESD damage can range from subtle performance degradation to complete device failure. Precision integrated circuits may be more susceptible to damage because very small parametric changes could cause the device not to meet its published specifications.

9.6 Glossary

TI Glossary — This glossary lists and explains terms, acronyms, and definitions.

10 Revision History

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

Changes from Revision H (March 2024) to Revision I (April 2024)	Page
• Updated thermal values for RθJA: DW = 58 to 98.6, PW = 83 to 126.6, all values in °C/W	6

Changes from Revision G (January 2023) to Revision H (March 2024)	Page
• Added DGS and RKS packages to *Device Information* table, *Pin Configuration and Functions* section and *Thermal Information* table	1
• Changed *Package Information* to *Device Information* and added package size to table	1

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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.

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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)
5962-87758012A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-87758012A SNJ54AC 245FK
5962-8775801RA	Active	Production	CDIP (J) | 20	20 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8775801RA SNJ54AC245J
5962-8775801SA	Active	Production	CFP (W) | 20	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8775801SA SNJ54AC245W
SN74AC245DBR	Active	Production	SSOP (DB) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245DBR.A	Active	Production	SSOP (DB) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245DGSR	Active	Production	VSSOP (DGS) | 20	5000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245DGSR.A	Active	Production	VSSOP (DGS) | 20	5000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245DW	Obsolete	Production	SOIC (DW) | 20	-	-	Call TI	Call TI	-40 to 85	AC245
SN74AC245DWR	Active	Production	SOIC (DW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245DWR.A	Active	Production	SOIC (DW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245DWRE4	Active	Production	SOIC (DW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245N	NRND	Production	PDIP (N) | 20	20 | TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74AC245N
SN74AC245N.A	NRND	Production	PDIP (N) | 20	20 | TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74AC245N
SN74AC245NE4	NRND	Production	PDIP (N) | 20	20 | TUBE	Yes	NIPDAU	N/A for Pkg Type	-40 to 85	SN74AC245N
SN74AC245NSR	Active	Production	SOP (NS) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245NSR.A	Active	Production	SOP (NS) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245PW	Obsolete	Production	TSSOP (PW) | 20	-	-	Call TI	Call TI	-40 to 85	AC245
SN74AC245PWR	Active	Production	TSSOP (PW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245PWR.A	Active	Production	TSSOP (PW) | 20	2000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245RKSR	Active	Production	VQFN (RKS) | 20	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SN74AC245RKSR.A	Active	Production	VQFN (RKS) | 20	3000 | LARGE T&R	Yes	NIPDAU	Level-1-260C-UNLIM	-40 to 85	AC245
SNJ54AC245FK	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-87758012A SNJ54AC 245FK

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)
SNJ54AC245FK.A	Active	Production	LCCC (FK) | 20	55 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-87758012A SNJ54AC 245FK
SNJ54AC245J	Active	Production	CDIP (J) | 20	20 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8775801RA SNJ54AC245J
SNJ54AC245J.A	Active	Production	CDIP (J) | 20	20 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8775801RA SNJ54AC245J
SNJ54AC245W	Active	Production	CFP (W) | 20	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8775801SA SNJ54AC245W
SNJ54AC245W.A	Active	Production	CFP (W) | 20	25 | TUBE	No	SNPB	N/A for Pkg Type	-55 to 125	5962-8775801SA SNJ54AC245W

(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.

Important Information and Disclaimer: The information provided on this page represents TI's knowledge and belief as of the date that it is provided. TI bases its knowledge and belief on information provided by third parties, and makes no representation or warranty as to the accuracy of such information. Efforts are underway to better integrate information from third parties. TI has taken and continues to take reasonable steps to provide representative and accurate information but may not have conducted destructive testing or chemical analysis on incoming materials and chemicals. TI and TI suppliers consider certain information to be proprietary, and thus CAS numbers and other limited information may not be available for release.

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 SN54AC245, SN74AC245 :

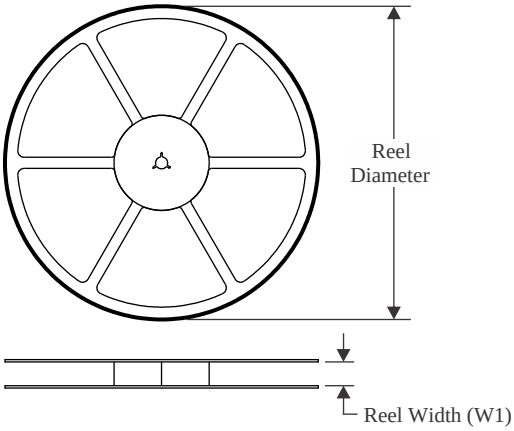
- Catalog : SN74AC245
- Automotive : SN74AC245-Q1, SN74AC245-Q1
- Enhanced Product : SN74AC245-EP, SN74AC245-EP
- Military : SN54AC245
- Space : SN54AC245-SP

NOTE: Qualified Version Definitions:

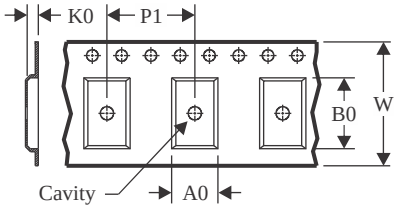
- Catalog - TI's standard catalog product
- Automotive - Q100 devices qualified for high-reliability automotive applications targeting zero defects
- Enhanced Product - Supports Defense, Aerospace and Medical Applications
- Military - QML certified for Military and Defense Applications
- Space - Radiation tolerant, ceramic packaging and qualified for use in Space-based application

TAPE AND REEL INFORMATION

REEL DIMENSIONS

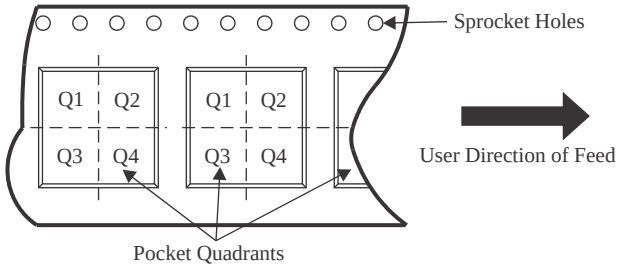


TAPE DIMENSIONS



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

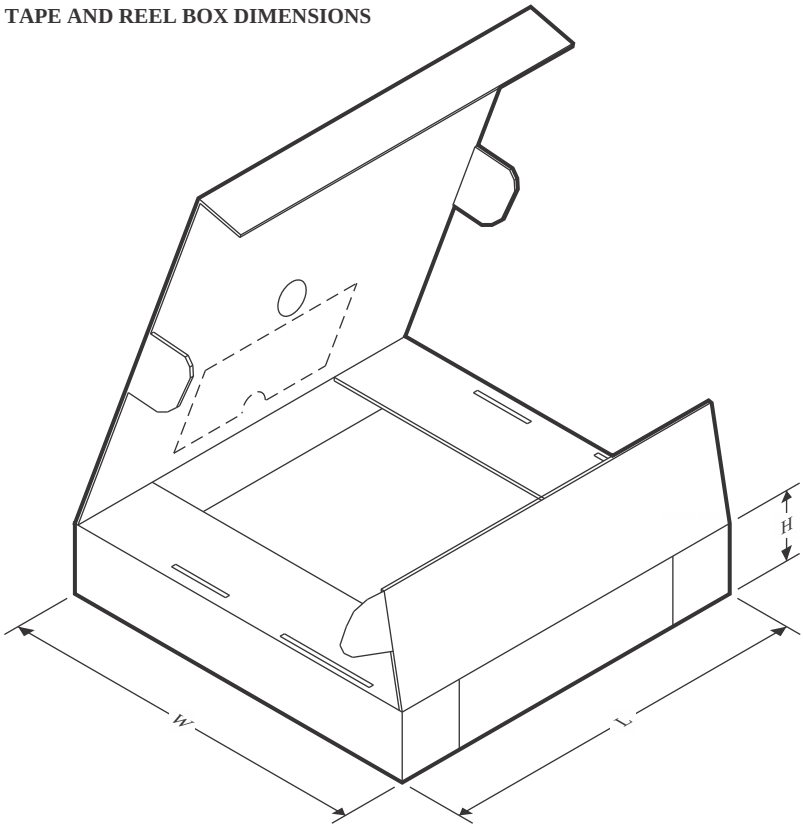
QUADRANT ASSIGNMENTS FOR PIN 1 ORIENTATION IN TAPE



*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
SN74AC245DBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74AC245DGSR	VSSOP	DGS	20	5000	330.0	16.4	5.4	5.4	1.45	8.0	16.0	Q1
SN74AC245DWR	SOIC	DW	20	2000	330.0	24.4	10.9	13.3	2.7	12.0	24.0	Q1
SN74AC245NSR	SOP	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1
SN74AC245PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.0	1.4	8.0	16.0	Q1
SN74AC245RKSR	VQFN	RKS	20	3000	180.0	12.4	2.8	4.8	1.2	4.0	12.0	Q1

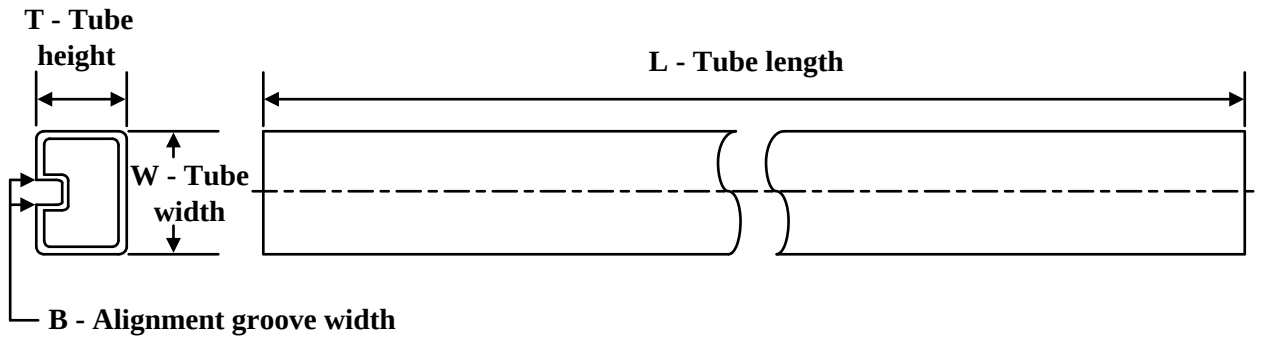
TAPE AND REEL BOX DIMENSIONS



*All dimensions are nominal

Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74AC245DBR	SSOP	DB	20	2000	353.0	353.0	32.0
SN74AC245DGSR	VSSOP	DGS	20	5000	353.0	353.0	32.0
SN74AC245DWR	SOIC	DW	20	2000	356.0	356.0	45.0
SN74AC245NSR	SOP	NS	20	2000	356.0	356.0	45.0
SN74AC245PWR	TSSOP	PW	20	2000	353.0	353.0	32.0
SN74AC245RKSR	VQFN	RKS	20	3000	210.0	185.0	35.0

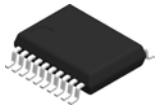
TUBE



*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (µm)	B (mm)
5962-87758012A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-8775801SA	W	CFP	20	25	506.98	26.16	6220	NA
SN74AC245N	N	PDIP	20	20	506	13.97	11230	4.32
SN74AC245N.A	N	PDIP	20	20	506	13.97	11230	4.32
SN74AC245NE4	N	PDIP	20	20	506	13.97	11230	4.32
SNJ54AC245FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AC245FK.A	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AC245W	W	CFP	20	25	506.98	26.16	6220	NA
SNJ54AC245W.A	W	CFP	20	25	506.98	26.16	6220	NA

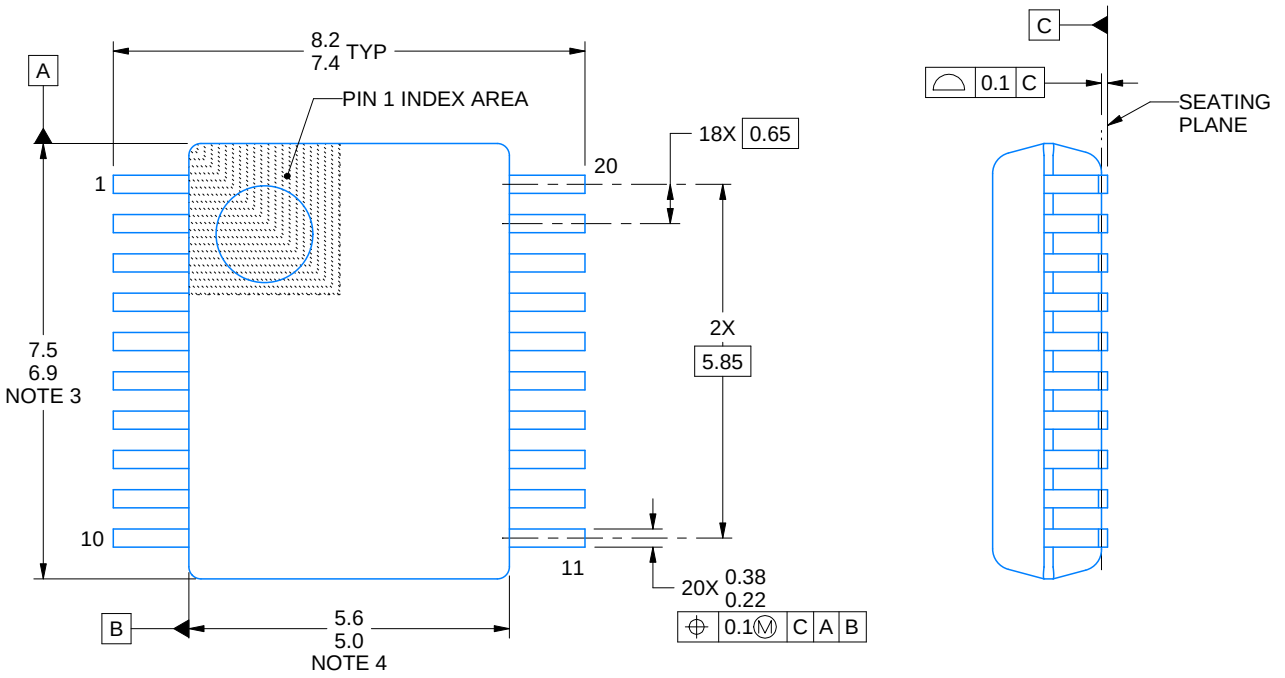
DB0020A

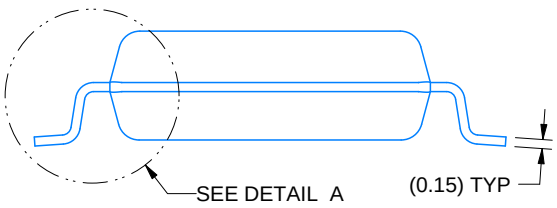


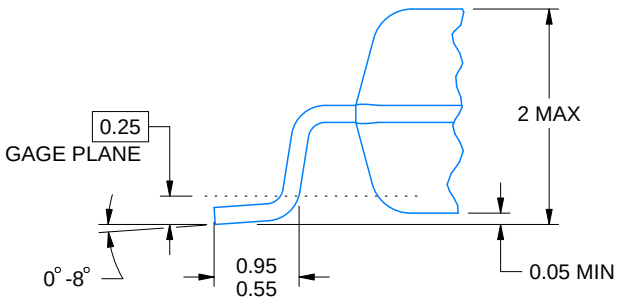
PACKAGE OUTLINE

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE





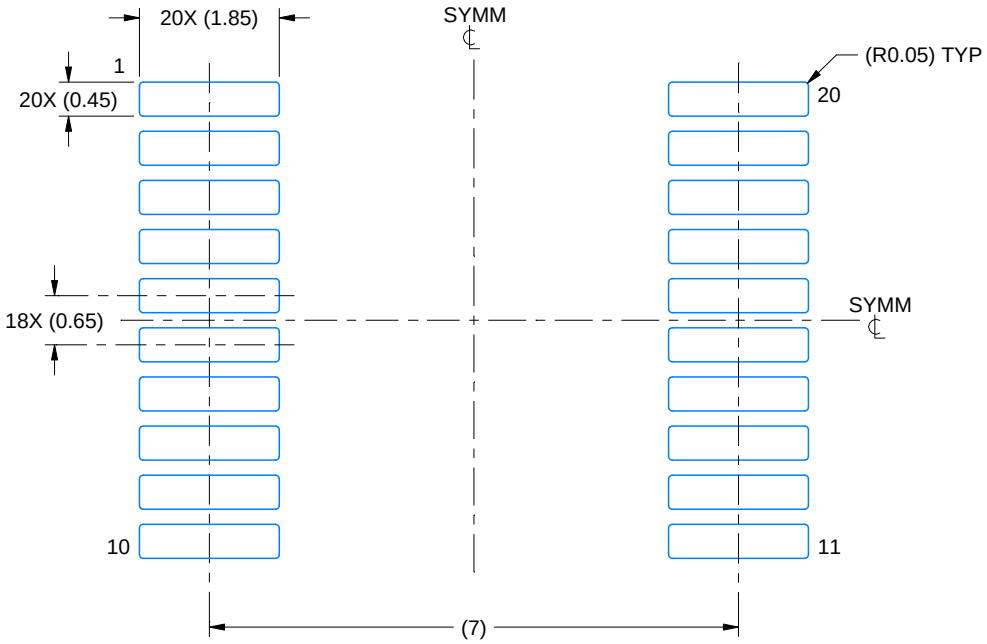


DETAIL A
TYPICAL

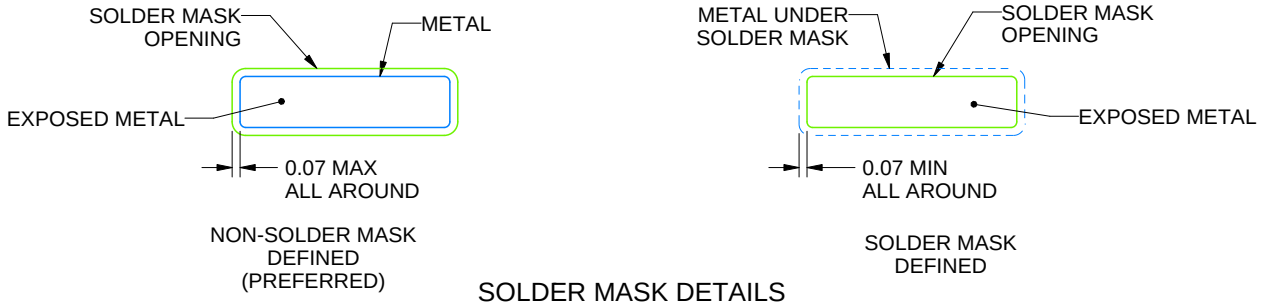
4214851/B 08/2019

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.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X



SOLDER MASK DETAILS

4214851/B 08/2019

NOTES: (continued)

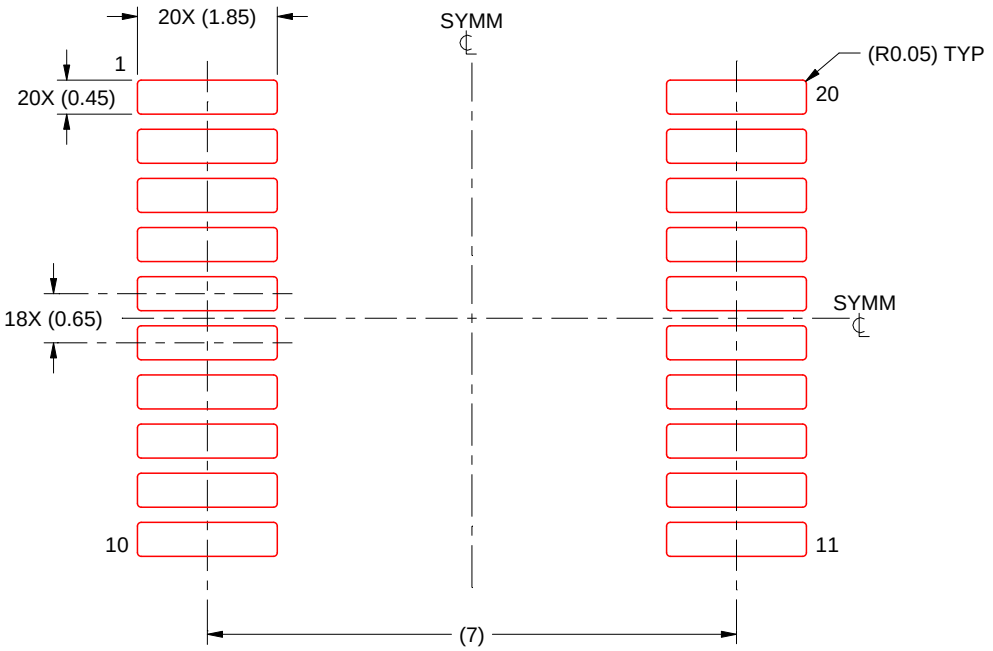
6. Publication IPC-7351 may have alternate designs.
7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

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.

GENERIC PACKAGE VIEW

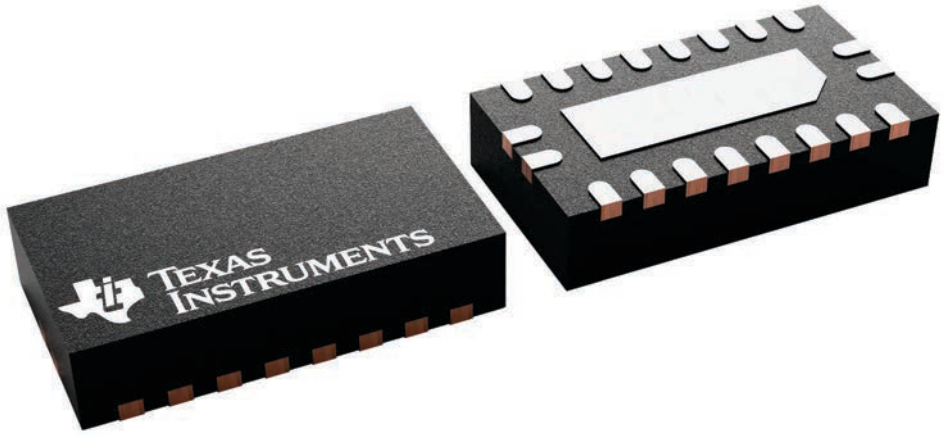
RKS 20

VQFN - 1 mm max height

2.5 x 4.5, 0.5 mm pitch

PLASTIC QUAD FLATPACK - NO LEAD

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



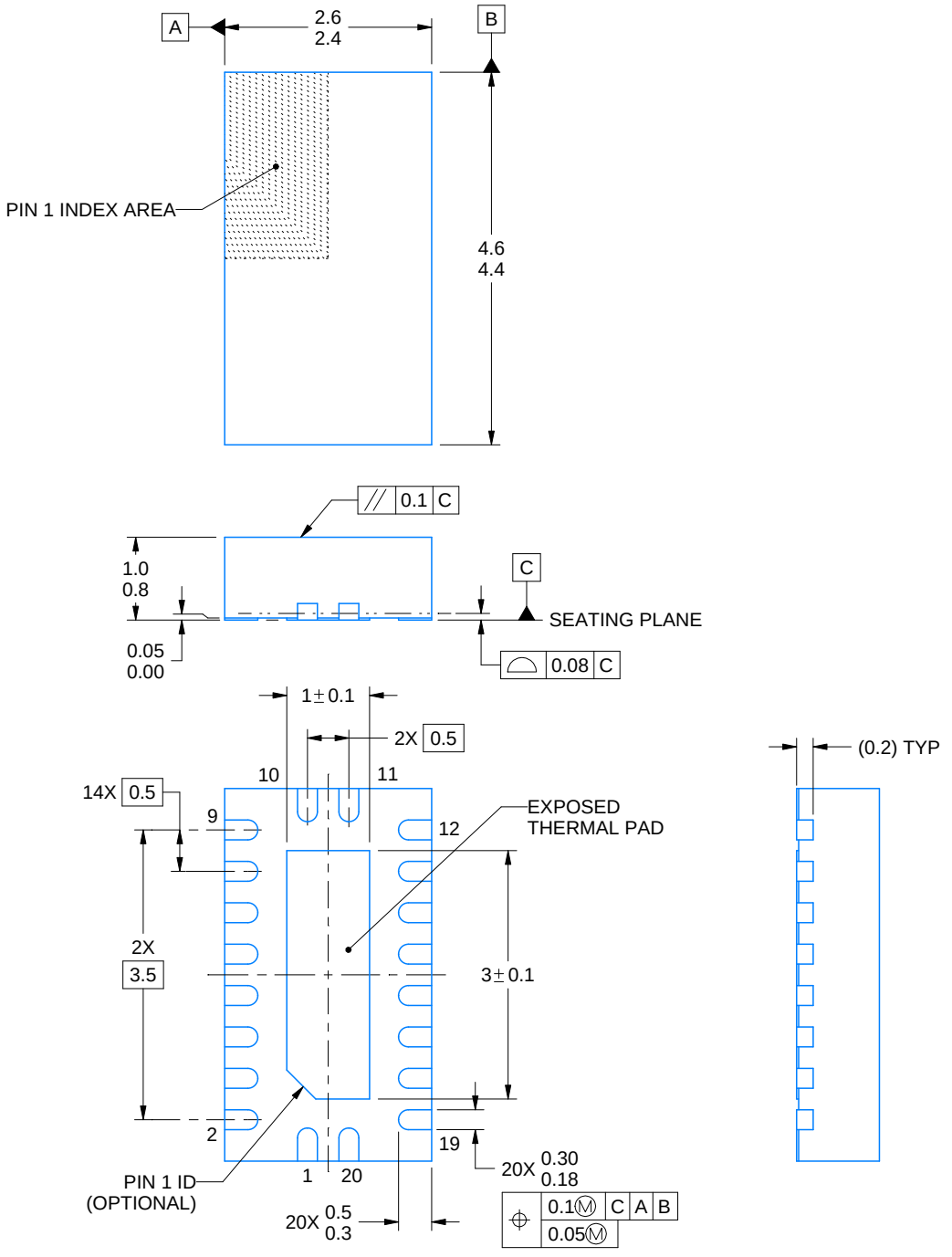
4226872/A

PACKAGE OUTLINE

RKS0020A

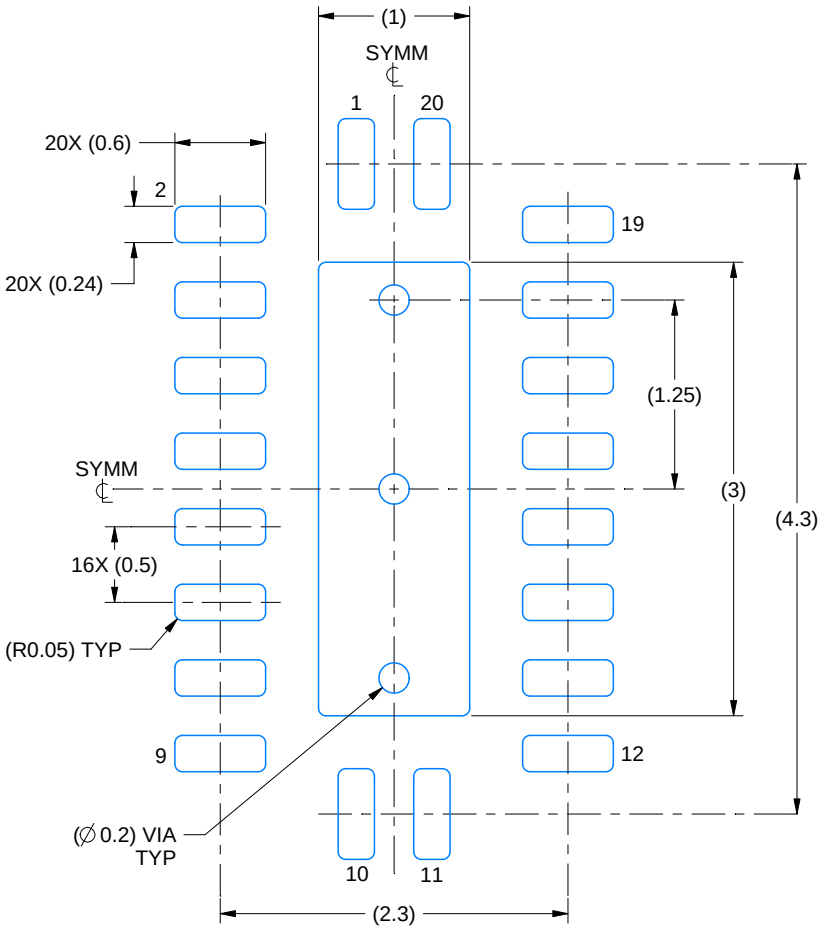
VQFN - 1 mm max height

PLASTIC QUAD FLATPACK - NO LEAD

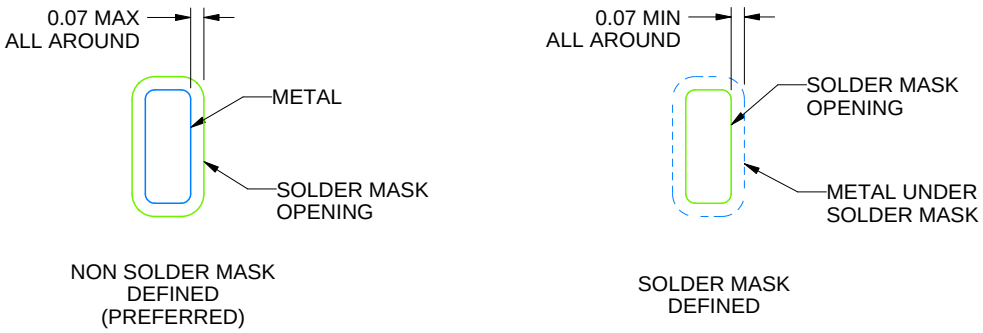


NOTES:

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. The package thermal pad must be soldered to the printed circuit board for thermal and mechanical performance.



LAND PATTERN EXAMPLE
SCALE:20X

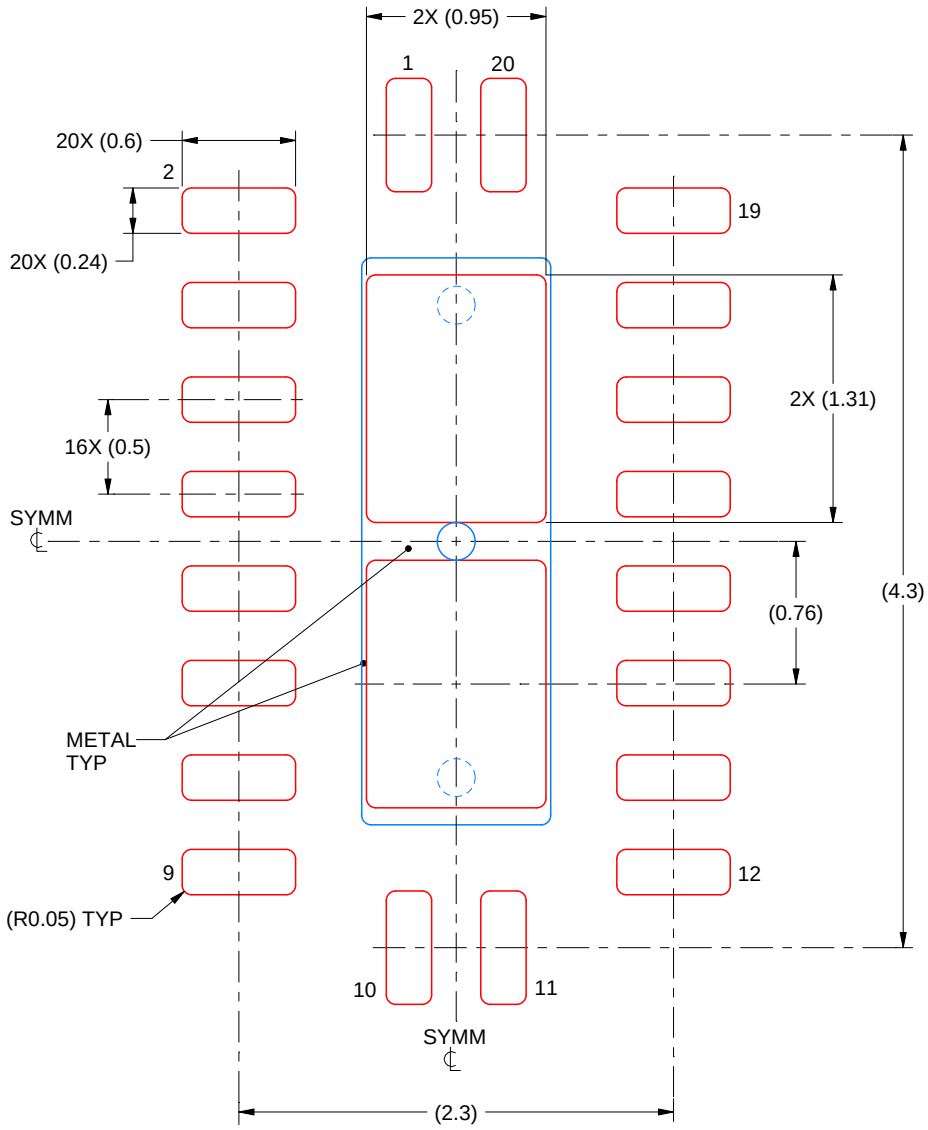


SOLDER MASK DETAILS

4222490/B 02/2021

NOTES: (continued)

4. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature number SLUA271 (www.ti.com/lit/slua271).
5. Vias are optional depending on application, refer to device data sheet. If some or all are implemented, recommended via locations are shown.



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL

EXPOSED PAD
83% PRINTED SOLDER COVERAGE BY AREA
SCALE:25X

4222490/B 02/2021

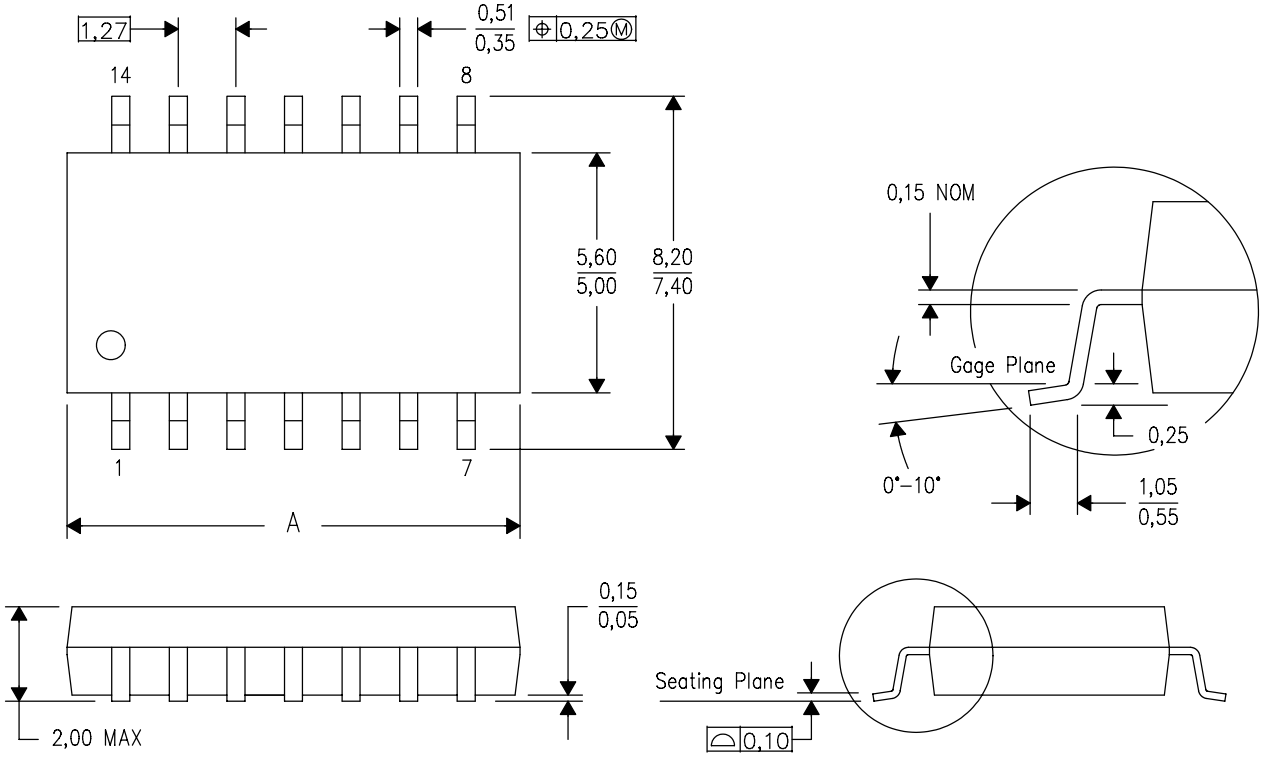
NOTES: (continued)

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

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

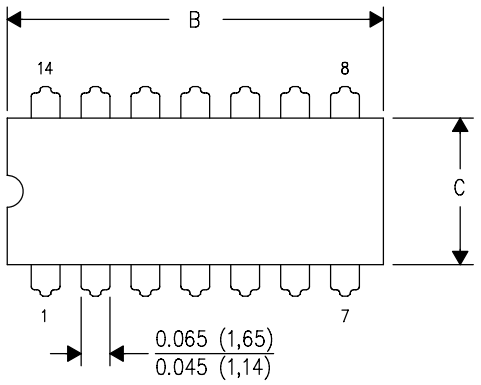
4040062/C 03/03

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.

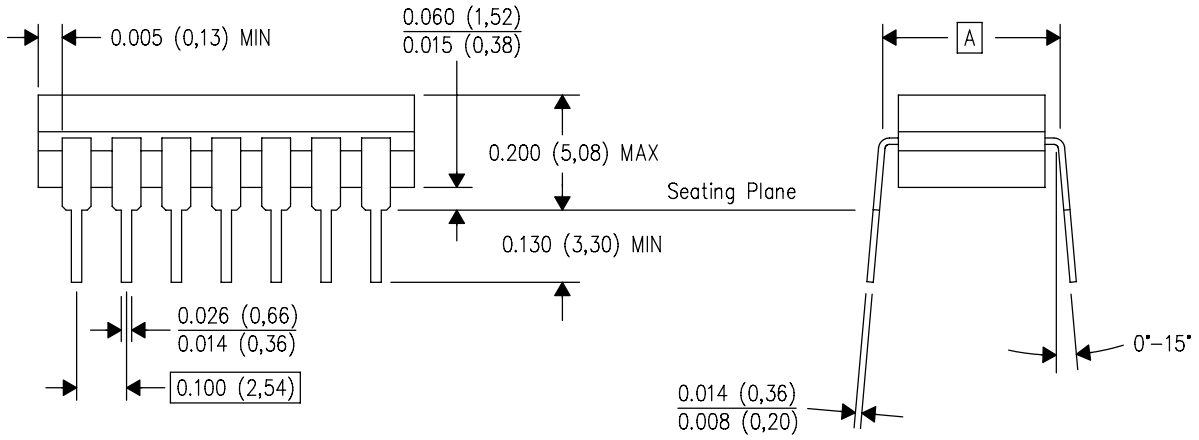
J (R–GDIP–T**)

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.

GENERIC PACKAGE VIEW

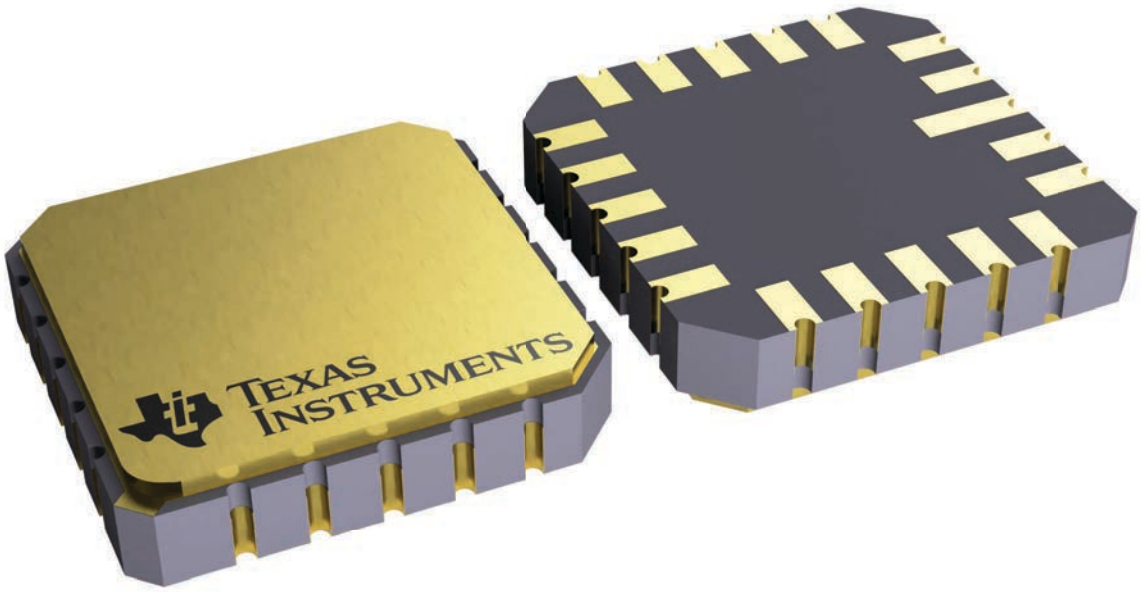
FK 20

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.

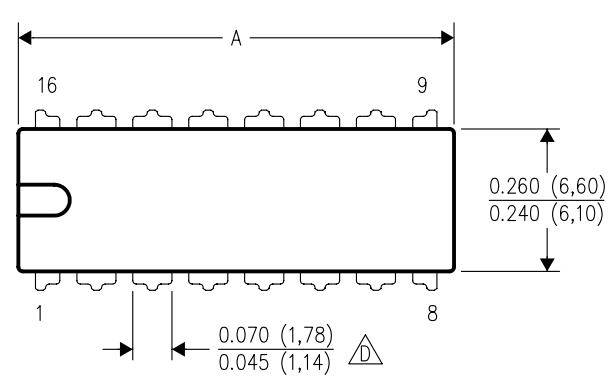


4229370VA\

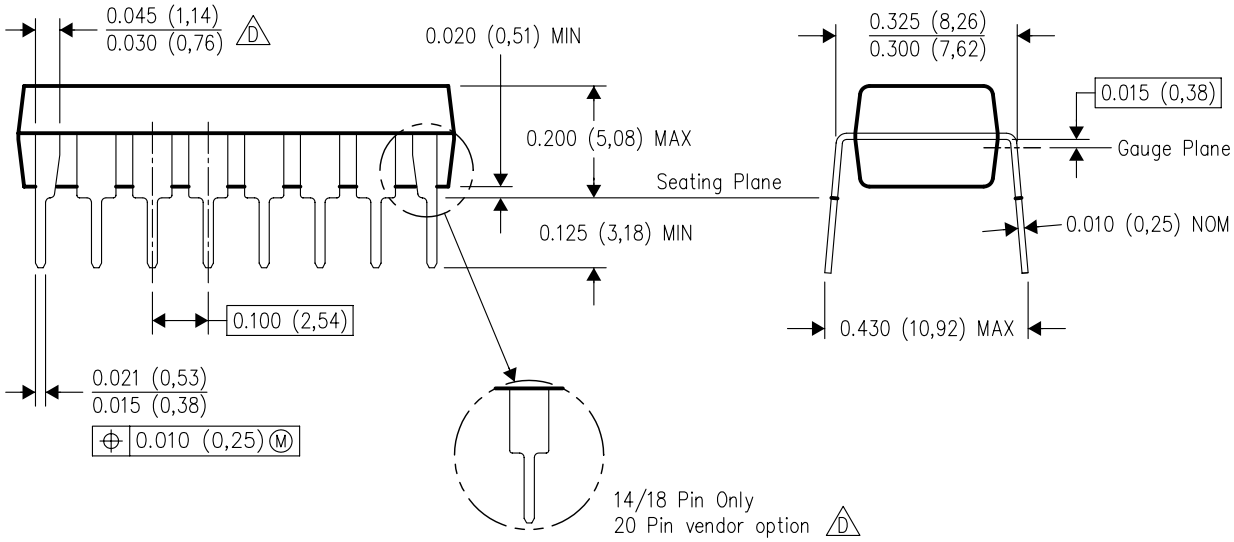
N (R–PDIP–T**)

PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN

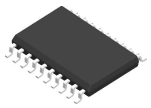


DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS–001 VARIATION (C)	AA	BB	AC	AD



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.

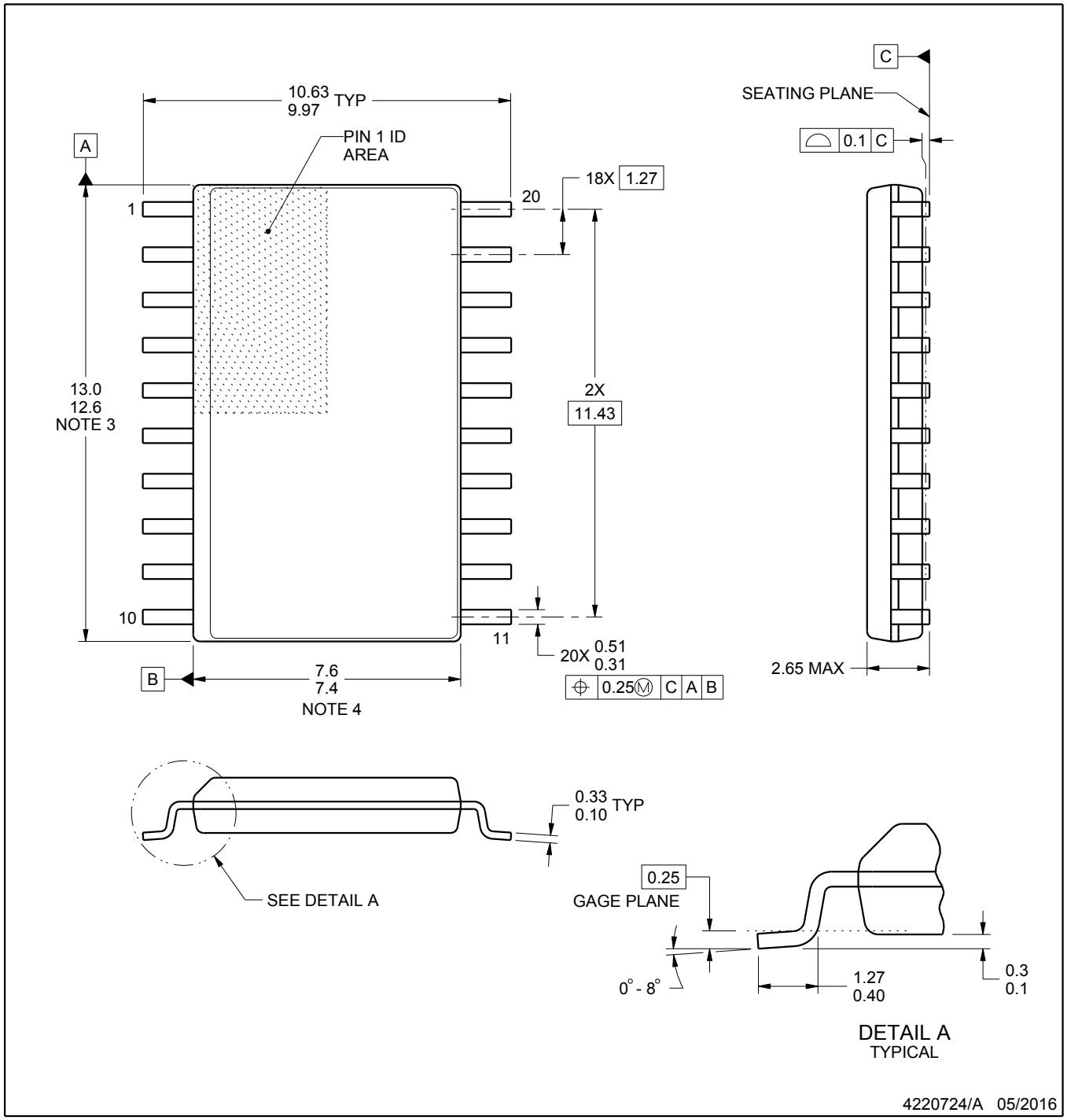


PACKAGE OUTLINE

DW0020A

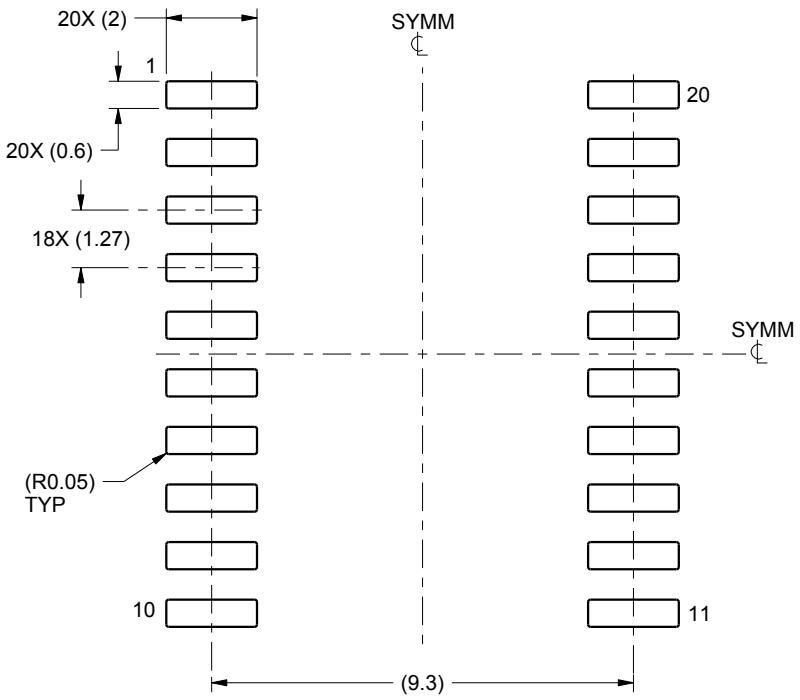
SOIC - 2.65 mm max height

SOIC

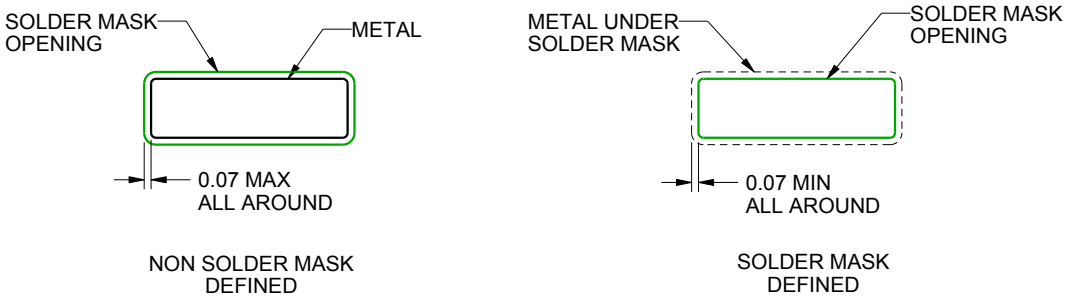


NOTES:

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.



LAND PATTERN EXAMPLE
SCALE:6X

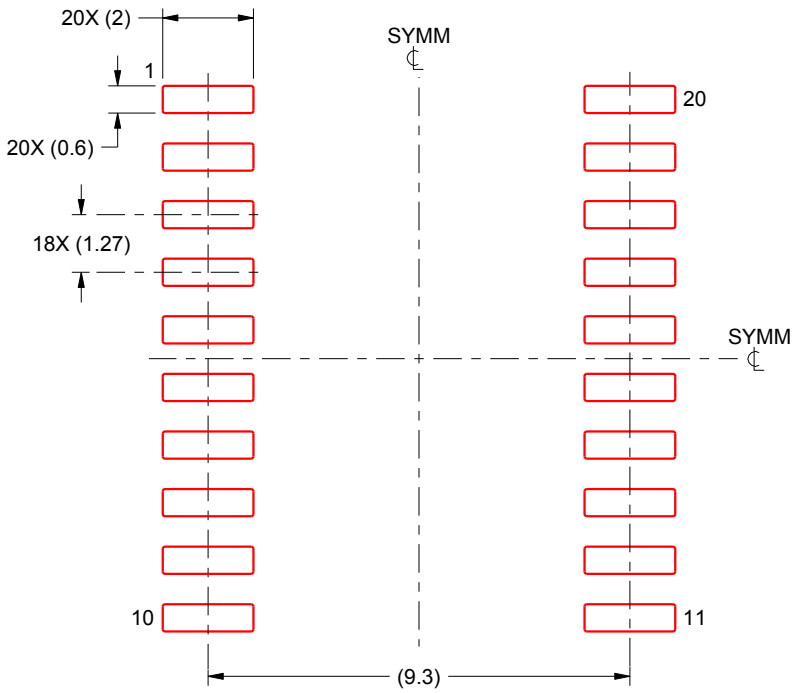


SOLDER MASK DETAILS

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.



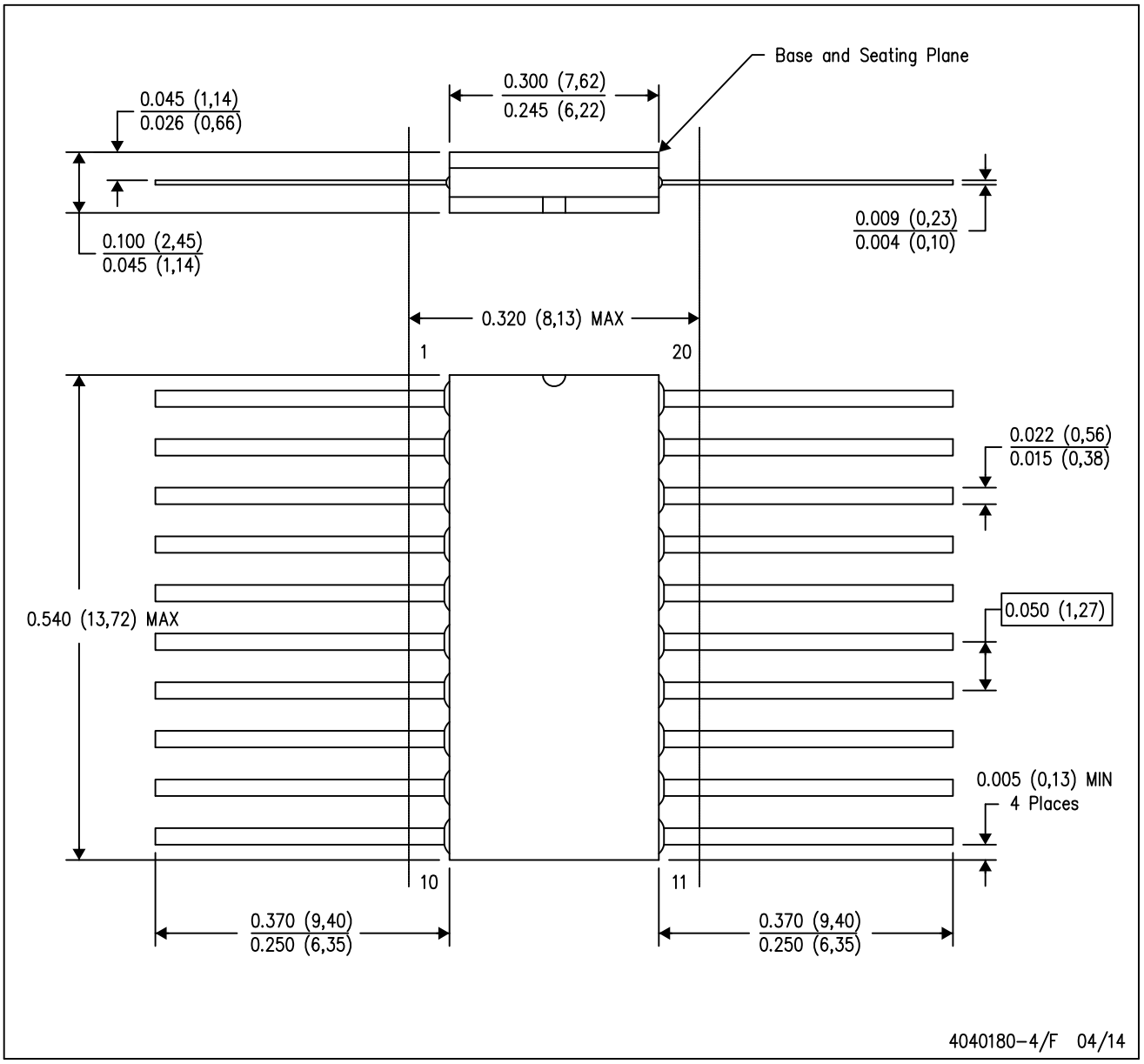
SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE:6X

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.

W (R–GDFP–F20) CERAMIC DUAL FLATPACK



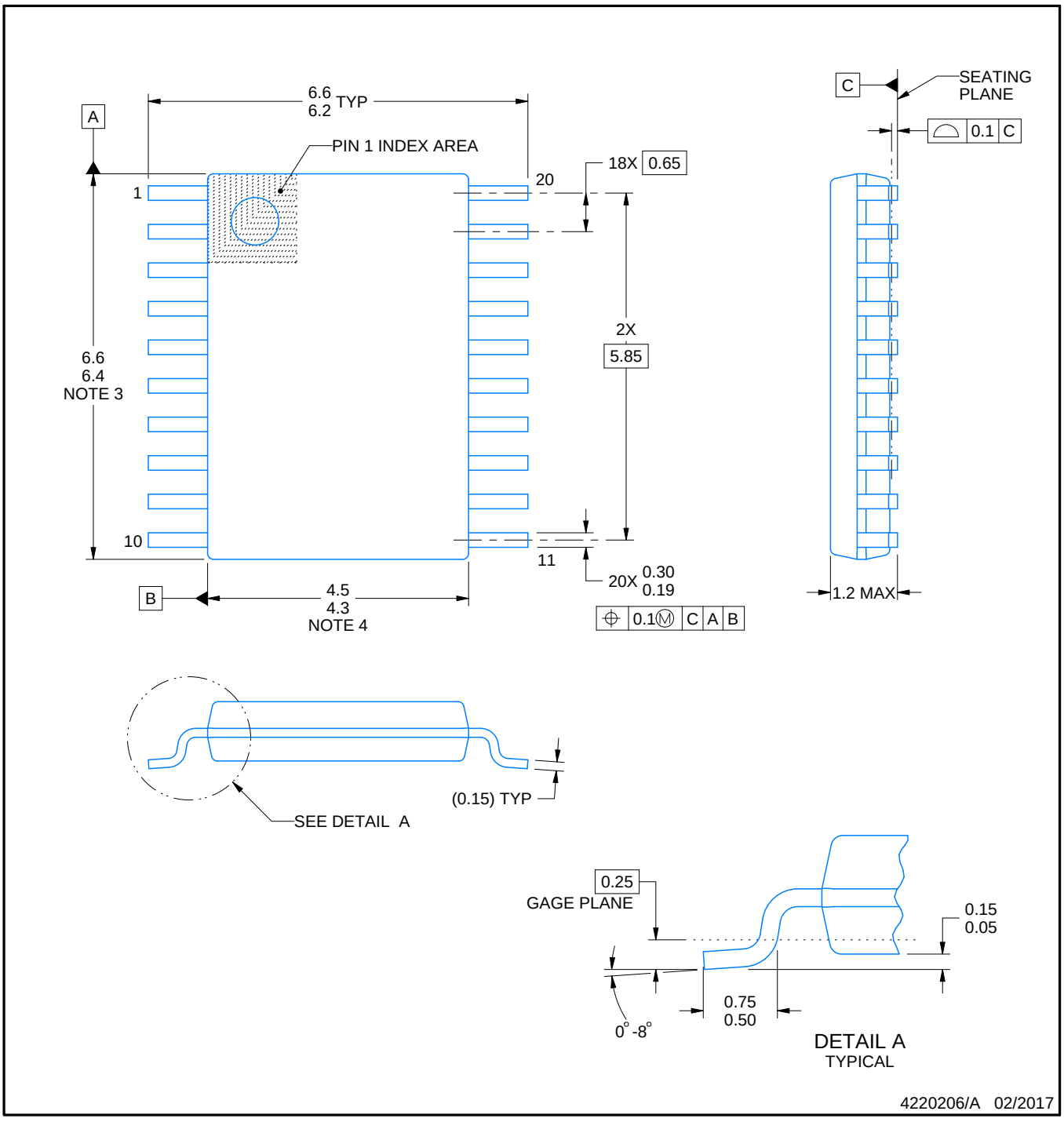
NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. This package can be hermetically sealed with a ceramic lid using glass frit.
D. Index point is provided on cap for terminal identification only.
E. Falls within Mil–Std 1835 GDFP2–F20

PACKAGE OUTLINE

PW0020A

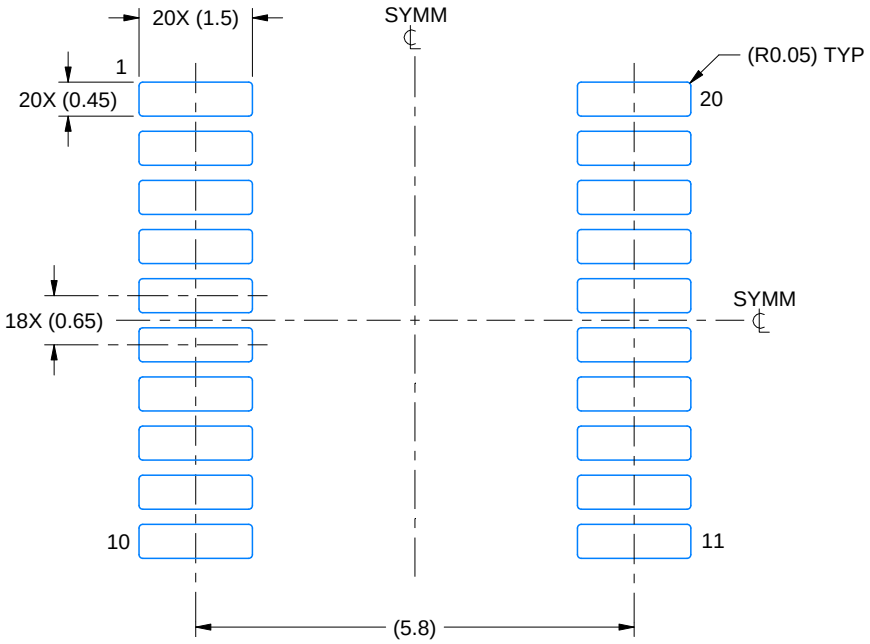
TSSOP - 1.2 mm max height

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.



LAND PATTERN EXAMPLE
EXPOSED METAL SHOWN
SCALE: 10X

NON-SOLDER MASK DEFINED (PREFERRED)

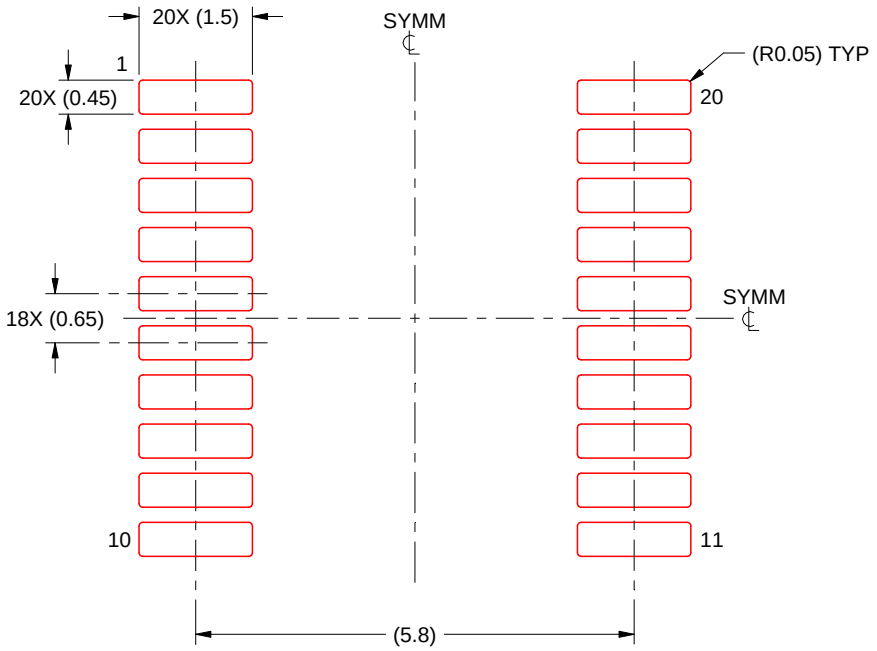
SOLDER MASK DEFINED

SOLDER MASK DETAILS

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.



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

4220206/A 02/2017

NOTES: (continued)

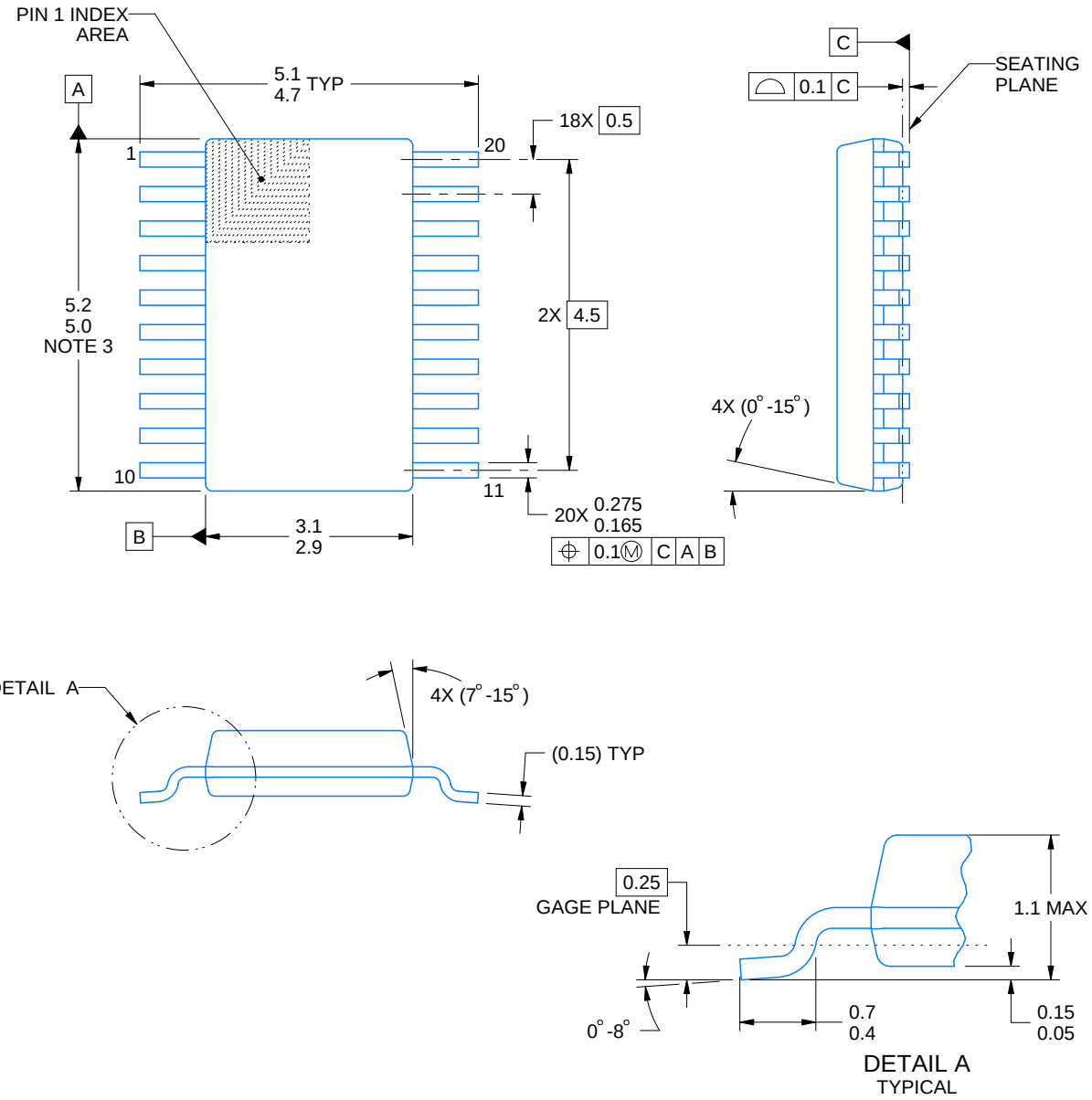
8. Laser cutting apertures with trapezoidal walls and rounded corners may offer better paste release. IPC-7525 may have alternate design recommendations.
9. Board assembly site may have different recommendations for stencil design.

PACKAGE OUTLINE

DGS0020A

VSSOP - 1.1 mm max height

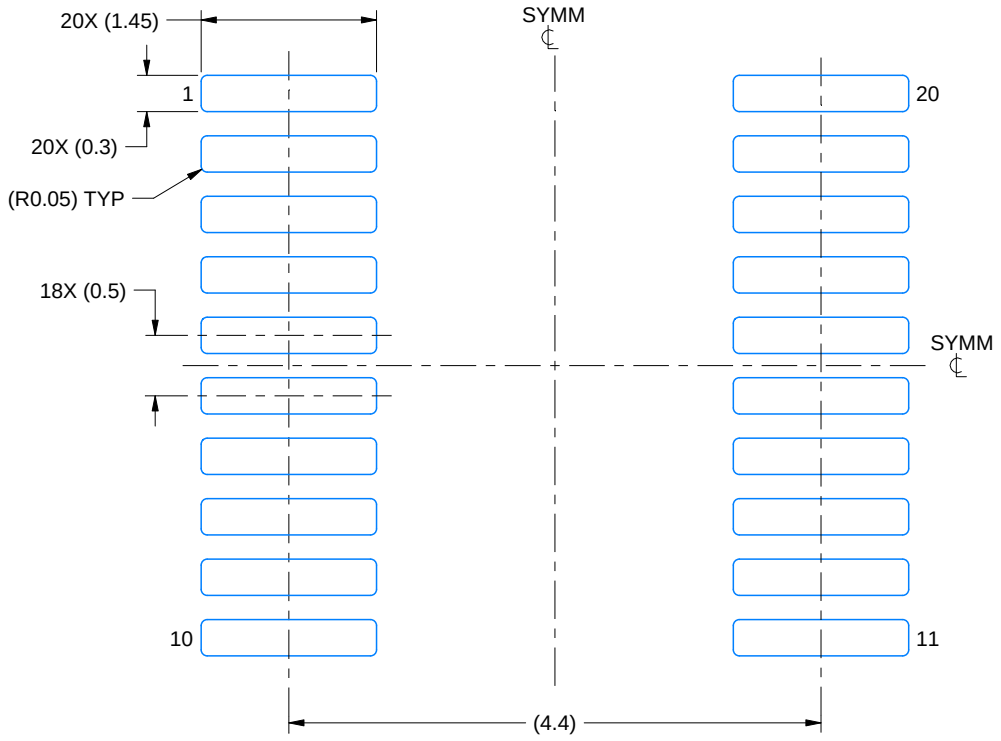
SMALL OUTLINE PACKAGE



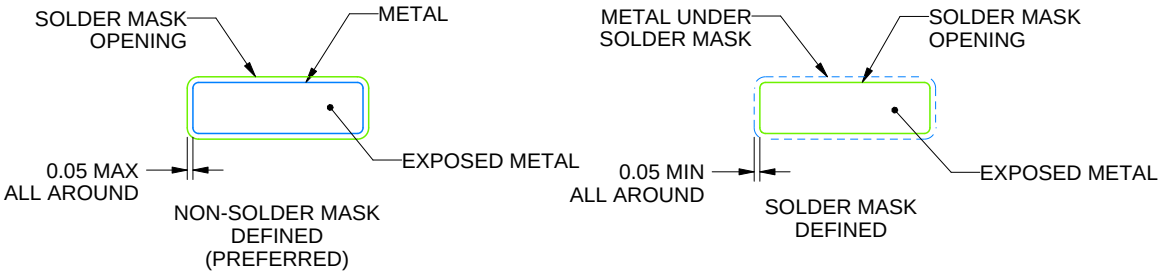
PowerPAD is a trademark of Texas Instruments.

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. No JEDEC registration as of September 2020.
5. Features may differ or may not be present.



LAND PATTERN EXAMPLE
SCALE: 16X

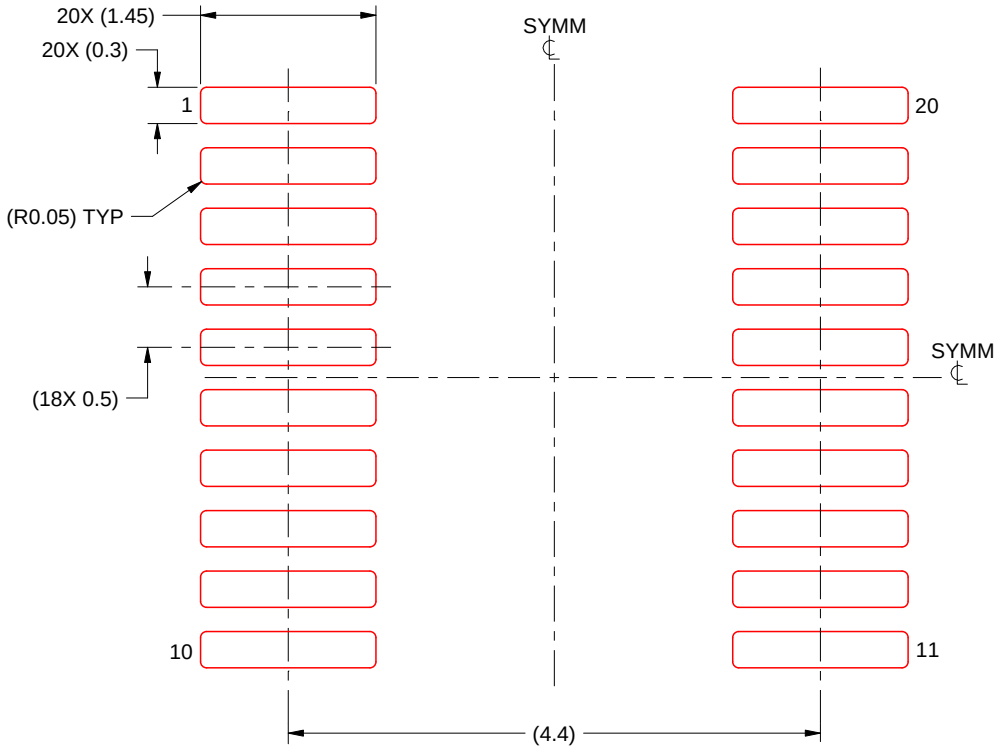


SOLDER MASK DETAILS

4226367/A 10/2020

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.
8. This package is designed to be soldered to a thermal pad on the board. For more information, see Texas Instruments literature numbers SLMA002 (www.ti.com/lit/slma002) and SLMA004 (www.ti.com/lit/slma004).
9. Size of metal pad may vary due to creepage requirement.
10. Vias are optional depending on application, refer to device data sheet. It is recommended that vias under paste be filled, plugged or tented.



SOLDER PASTE EXAMPLE
BASED ON 0.125 mm THICK STENCIL
SCALE: 16X

4226367/A 10/2020

NOTES: (continued)

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

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