

## SNx4AHC244 3 ステート出力、オクタール バッファ / ドライバ

### 1 特長

- 2V~5.5V の範囲の  $V_{CC}$  で動作
- JESD 17 準拠で 250mA 超のラッチアップ性能
- MIL-PRF-38535 準拠の製品については、特に記述のない限り、すべてのパラメータはテスト済みです。その他のすべての製品については、量産プロセスにすべてのパラメータのテストが含まれているとは限りません。

### 2 アプリケーション

- ネットワーク スイッチ
- 電源インフラストラクチャ
- PC およびノートパソコン
- ウェアラブルなヘルスケア / フィットネス機器
- 試験および測定機器

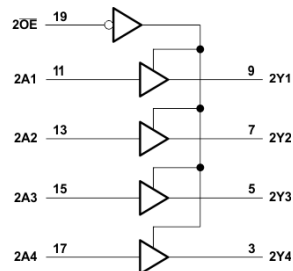
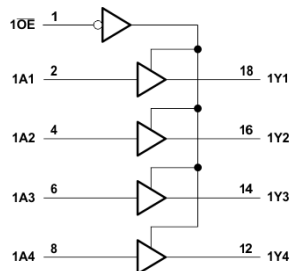
### 3 概要

これらのオクタール バッファ / ライン ドライバは、3 ステート メモリ アドレス ドライバ、クロック ドライバ、バス用レシーバ / トランスミッタの性能と密度を向上することに特化して設計されています。

#### 製品情報

部品番号	パッケージ (1)	パッケージ サイズ (2)	本体サイズ (3)
SN54AHC244	J (CDIP, 20)	24.2mm × 7.62mm	24.2mm × 6.92mm
	W (CFP, 20)	13.09mm × 8.13mm	13.09mm × 6.92mm
	FK (LCCC, 20)	8.89 mm × 8.89 mm	8.89 mm × 8.89 mm
SN74AHC244	DB (SSOP, 20)	7.2mm × 7.8mm	7.50mm × 5.30mm
	DW (SOIC, 20)	12.80mm × 10.3mm	12.8mm × 7.5mm
	N (PDIP, 20)	24.33mm × 9.4mm	25.40mm × 6.35mm
	NS (SOP, 20)	12.60mm × 7.8mm	12.6mm × 5.30mm
	DGV (TVSOP, 20)	5.00mm × 6.4mm	5.00mm × 4.40mm
	PW (TSSOP, 20)	6.50mm × 6.4mm	6.50mm × 4.40mm

- (1) 詳細については、[セクション 11](#) を参照してください。
- (2) パッケージ サイズ (長さ × 幅) は公称値であり、該当する場合はピンも含まれます。
- (3) 本体サイズ (長さ × 幅) は公称値であり、ピンは含まれません。

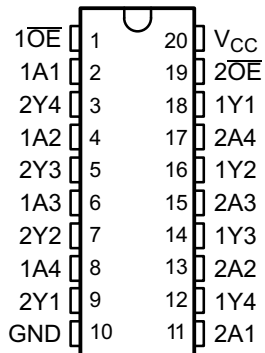


## Table of Contents

<b>1 特長</b> .....	1	7.1 Overview.....	9
<b>2 アプリケーション</b> .....	1	7.2 Functional Block Diagram.....	9
<b>3 概要</b> .....	1	7.3 Feature Description.....	9
<b>4 Pin Configuration and Functions</b> .....	3	7.4 Device Functional Modes.....	9
<b>5 Specifications</b> .....	4	<b>8 Application and Implementation</b> .....	10
5.1 Absolute Maximum Ratings.....	4	8.1 Power Supply Recommendations.....	10
5.2 ESD Ratings.....	4	8.2 Layout.....	10
5.3 Recommended Operating Conditions.....	4	<b>9 Device and Documentation Support</b> .....	11
5.4 Thermal Information.....	5	9.1 Documentation Support.....	11
5.5 Electrical Characteristics.....	5	9.2 ドキュメントの更新通知を受け取る方法.....	11
5.6 Switching Characteristics, $V_{CC} = 3.3V \pm 0.3V$ .....	6	9.3 サポート・リソース.....	11
5.7 Switching Characteristics, $V_{CC} = 5V \pm 0.5V$ .....	6	9.4 Trademarks.....	11
5.8 Noise Characteristics.....	7	9.5 静電気放電に関する注意事項.....	11
5.9 Operating Characteristics.....	7	9.6 用語集.....	11
5.10 Typical Characteristics.....	7	<b>10 Revision History</b> .....	11
<b>6 Parameter Measurement Information</b> .....	8	<b>11 Mechanical, Packaging, and Orderable Information</b> .....	12
<b>7 Detailed Description</b> .....	9		

## 4 Pin Configuration and Functions

SN54AHC244 . . . J OR W PACKAGE  
SN74AHC244 . . . DB, DGV, DW, N, NS, OR PW PACKAGE  
(TOP VIEW)



SN54AHC244 . . . FK PACKAGE  
(TOP VIEW)

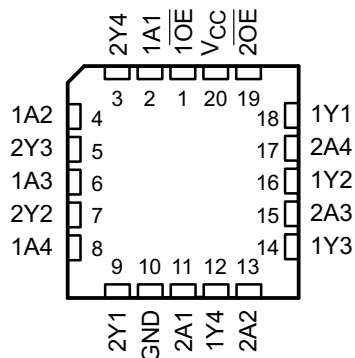


表 4-1. Pin Functions

PIN		I/O	DESCRIPTION
NO.	NAME		
1	1 $\overline{OE}$	I	Output Enable 1
2	1A1	I	1A1 Input
3	2Y4	O	2Y4 Output
4	1A2	I	1A2 Input
5	2Y3	O	2Y3 Output
6	1A3	I	1A3 Input
7	2Y2	O	2Y2 Output
8	1A4	I	1A4 Input
9	2Y1	O	2Y1 Output
10	GND	—	Ground pin
11	2A1	I	2A1 Input
12	1Y4	O	1Y4 Output
13	2A2	I	2A2 Input
14	1Y3	O	1Y3 Output
15	2A3	I	2A3 Input
16	1Y2	O	1Y2 Output
17	2A4	I	2A4 Input
18	1Y1	O	1Y1 Output
19	2 $\overline{OE}$	I	Output Enable 2
20	VCC	—	Power Pin

## 5 Specifications

### 5.1 Absolute Maximum Ratings

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

		MIN	MAX	UNIT
V <sub>CC</sub>	Supply voltage	-0.5	7	V
V <sub>I</sub>	Input voltage <sup>(2)</sup>	-0.5	7	V
V <sub>O</sub>	Output voltage range <sup>(3)</sup>	-0.5	V <sub>CC</sub> + 0.5	V
I <sub>IK</sub>	Input clamp current	V <sub>I</sub> < 0		-20 mA
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> < 0 or V <sub>O</sub> > V <sub>CC</sub>		±20 mA
I <sub>O</sub>	Continuous output current	V <sub>O</sub> = 0 to V <sub>CC</sub>		±25 mA
Continuous current through each V <sub>CC</sub> or GND				±50 mA
T <sub>stg</sub>	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.
- (3) The package thermal impedance is calculated in accordance with JESD 51-7.

### 5.2 ESD Ratings

		VALUE	UNIT
V <sub>(ESD)</sub>	Electrostatic discharge	±2000	V
		±1500	

- (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)<sup>(1)</sup>

		SN54AHC244		SN74AHC244		UNIT
		MIN	MAX	MIN	MAX	
V <sub>CC</sub>	Supply voltage	2	5.5	2	5.5	V
V <sub>IH</sub>	High-level input voltage	V <sub>CC</sub> = 2 V		1.5		V
		V <sub>CC</sub> = 3 V		2.1		
		V <sub>CC</sub> = 5.5 V		3.85		
V <sub>IL</sub>	Low level input voltage	V <sub>CC</sub> = 2 V		0.5		V
		V <sub>CC</sub> = 3 V		0.9		
		V <sub>CC</sub> = 5.5 V		1.65		
V <sub>I</sub>	Input voltage	0	5.5	0	5.5	V
V <sub>O</sub>	Output voltage	0	V <sub>CC</sub>	0	V <sub>CC</sub>	V
I <sub>OH</sub>	High-level output current	V <sub>CC</sub> = 2 V		-50		μA
		V <sub>CC</sub> = 3.3 V ± 0.3 V		-4		
		V <sub>CC</sub> = 5 V ± 0.5 V		-8		
I <sub>OL</sub>	Low level output current	V <sub>CC</sub> = 2 V		50		μA
		V <sub>CC</sub> = 3.3 V ± 0.3 V		4		
		V <sub>CC</sub> = 5 V ± 0.5 V		8		
Δt/Δv	Input transition rise or fall rate	V <sub>CC</sub> = 3.3 V ± 0.3 V		100		ns/V
		V <sub>CC</sub> = 5 V ± 0.5 V		20		

over operating free-air temperature range (unless otherwise noted)<sup>(1)</sup>

		SN54AHC244		SN74AHC244		UNIT
		MIN	MAX	MIN	MAX	
T <sub>A</sub>	Operating free-air temperature	-55	125	-40	125	°C

(1) All unused inputs of the device must be held at V<sub>CC</sub> or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number [SCBA004](#).

## 5.4 Thermal Information

THERMAL METRIC <sup>(1)</sup>	SN74AHC244						UNIT	
	DB	DGV	DW	N	NS	PW		
	20 PINS	20 PINS	20 PINS	20 PINS	20 PINS	20 PINS		
R <sub>θJA</sub>	Junction-to-ambient thermal resistance	99.9	119.2	81.1	54.9	77.6	116.8	°C/W
R <sub>θJC(top)</sub>	Junction-to-case (top) thermal resistance	61.7	34.5	48.9	41.7	42.7	58.5	
R <sub>θJB</sub>	Junction-to-board thermal resistance	55.2	60.7	53.8	35.8	45.7	78.7	
ψ <sub>JT</sub>	Junction-to-top characterization parameter	22.6	1.2	19.5	27.9	10.2	12.6	
ψ <sub>JB</sub>	Junction-to-board characterization parameter	54.8	60.0	53.1	35.7	45.2	77.9	
R <sub>θJC(bot)</sub>	Junction-to-case (bottom) thermal resistance	n/a	n/a	N/A	n/a	N/A	N/A	

(1) For more information about traditional and new thermal metrics, see the *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 <sub>CC</sub>	T <sub>A</sub> = 25°C			SN54AHC244		SN74AHC244		UNIT
			MIN	TYP	MAX	MIN	MAX	MIN	MAX	
V <sub>OH</sub>	I <sub>OH</sub> = -50 μA	2 V	1.9	2	1.9	1.9	1.9	1.9	V	
		3 V	2.9	3	2.9	2.9	2.9			
		4.5 V	4.4	4.5	4.4	4.4	4.4			
	I <sub>OH</sub> = -4 mA	3 V	2.58		2.48	2.48	2.48			
		4.5 V	3.94		3.8	3.8	3.8			
V <sub>OL</sub>	I <sub>OL</sub> = 50 μA	2 V		0.1	0.1	0.1	0.1	V		
		3 V		0.1	0.1	0.1	0.1			
		4.5 V		0.1	0.1	0.1	0.1			
	I <sub>OL</sub> = 4 mA	3 V		0.36	0.5	0.44	0.44			
		4.5 V		0.36	0.5	0.44	0.44			
I <sub>I</sub>	V <sub>I</sub> = 5.5 V or GND	0 V to 5.5 V		±0.1	±1 <sup>(1)</sup>	±1	±1	μA		
I <sub>OZ</sub>	V <sub>O</sub> = V <sub>CC</sub> or GND, V <sub>I</sub> (OE) = V <sub>IL</sub> or V <sub>IH</sub>	5.5 V		±0.25	±2.5	±2.5	±2.5	μA		
I <sub>CC</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND, I <sub>O</sub> = 0	5.5 V		4	40	40	40	μA		
C <sub>i</sub>	V <sub>I</sub> = V <sub>CC</sub> or GND	5 V		2	10		10	pF		
C <sub>o</sub>	V <sub>O</sub> = V <sub>CC</sub> or GND	5 V		3.5				pF		

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested at V<sub>CC</sub> = 0 V.

## 5.6 Switching Characteristics, $V_{CC} = 3.3V \pm 0.3V$

over recommended operating free-air temperature range,  $V_{CC} = 3.3V \pm 0.3V$  (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN54AHC244		SN74AHC244		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{PLH}$	A	Y	$C_L = 15\text{pF}$	5.8 <sup>(1)</sup>	8.4 <sup>(1)</sup>	1 <sup>(1)</sup>	10 <sup>(1)</sup>	1	10	ns	
$t_{PHL}$				5.8 <sup>(1)</sup>	8.4 <sup>(1)</sup>	1 <sup>(1)</sup>	10 <sup>(1)</sup>	1	10		
$t_{PZH}$	$\overline{OE}$	Y	$C_L = 15\text{pF}$	6.6 <sup>(1)</sup>	10.6 <sup>(1)</sup>	1 <sup>(1)</sup>	12.5 <sup>(1)</sup>	1	12.5	ns	
$t_{PZL}$				6.6 <sup>(1)</sup>	10.6 <sup>(1)</sup>	1 <sup>(1)</sup>	12.5 <sup>(1)</sup>	1	12.5		
$t_{PHZ}$	$\overline{OE}$	Y	$C_L = 15\text{pF}$	5 <sup>(1)</sup>	9.7 <sup>(1)</sup>	1 <sup>(1)</sup>	11 <sup>(1)</sup>	1	11	ns	
$t_{PLZ}$				5 <sup>(1)</sup>	9.7 <sup>(1)</sup>	1 <sup>(1)</sup>	11 <sup>(1)</sup>	1	11		
$t_{PLH}$	A	Y	$C_L = 50\text{pF}$	8.3	11.9	1	13.5	1	13.5	ns	
$t_{PHL}$				8.3	11.9	1	13.5	1	13.5		
$t_{PZH}$	$\overline{OE}$	Y	$C_L = 50\text{pF}$	9.1	14.1	1	16	1	16	ns	
$t_{PZL}$				9.1	14.1	1	16	1	16		
$t_{PHZ}$	$\overline{OE}$	Y	$C_L = 50\text{pF}$	10.3	14	1	16	1	16	ns	
$t_{PLZ}$				10.3	14	1	16	1	16		
$t_{sk(o)}$			$C_L = 50\text{pF}$		1.5 <sup>(2)</sup>				1.5	ns	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

(2) On products compliant to MIL-PRF-38535, this parameter does not apply.

## 5.7 Switching Characteristics, $V_{CC} = 5V \pm 0.5V$

over recommended operating free-air temperature range,  $V_{CC} = 5V \pm 0.5V$  (unless otherwise noted) (see [Load Circuit and Voltage Waveforms](#))

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	$T_A = 25^\circ\text{C}$			SN54AHC244		SN74AHC244		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
$t_{PLH}$	A	Y	$C_L = 15\text{pF}$	3.9 <sup>(1)</sup>	5.5 <sup>(1)</sup>	1 <sup>(1)</sup>	6.5 <sup>(1)</sup>	1	6.5	ns	
$t_{PHL}$				3.9 <sup>(1)</sup>	5.5 <sup>(1)</sup>	1 <sup>(1)</sup>	6.5 <sup>(1)</sup>	1	6.5		
$t_{PZH}$	$\overline{OE}$	Y	$C_L = 15\text{pF}$	4.7 <sup>(1)</sup>	7.3 <sup>(1)</sup>	1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	8.5	ns	
$t_{PZL}$				4.7 <sup>(1)</sup>	7.3 <sup>(1)</sup>	1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	8.5		
$t_{PHZ}$	$\overline{OE}$	Y	$C_L = 15\text{pF}$	5 <sup>(1)</sup>	7.2 <sup>(1)</sup>	1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	8.5	ns	
$t_{PLZ}$				5 <sup>(1)</sup>	7.2 <sup>(1)</sup>	1 <sup>(1)</sup>	8.5 <sup>(1)</sup>	1	8.5		
$t_{PLH}$	A	Y	$C_L = 50\text{pF}$	5.4	7.5	1	8.5	1	8.5	ns	
$t_{PHL}$				5.4	7.5	1	8.5	1	8.5		
$t_{PZH}$	$\overline{OE}$	Y	$C_L = 50\text{pF}$	6.2	9.3	1	10.5	1	10.5	ns	
$t_{PZL}$				6.2	9.3	1	10.5	1	10.5		
$t_{PHZ}$	$\overline{OE}$	Y	$C_L = 50\text{pF}$	6.7	9.2	1	10.5	1	10.5	ns	
$t_{PLZ}$				6.7	9.2	1	10.5	1	10.5		
$t_{sk(o)}$			$C_L = 50\text{pF}$		1 <sup>(2)</sup>				1	ns	

(1) On products compliant to MIL-PRF-38535, this parameter is not production tested.

(2) On products compliant to MIL-PRF-38535, this parameter does not apply.

### 5.8 Noise Characteristics

$V_{CC} = 5\text{ V}$ ,  $C_L = 50\text{ pF}$ ,  $T_A = 25^\circ\text{C}$  (1)

PARAMETER		SN74AHC244			UNIT
		MIN	TYP	MAX	
$V_{OL(P)}$	Quiet output, maximum dynamic $V_{OL}$		0.5		V
$V_{OL(V)}$	Quiet output, minimum dynamic $V_{OL}$		-0.2		V
$V_{OH(V)}$	Quiet output, minimum dynamic $V_{OH}$		4.8		V
$V_{IH(D)}$	High-level dynamic input voltage	3.5			V
$V_{IL(D)}$	Low-level dynamic input voltage			1.5	V

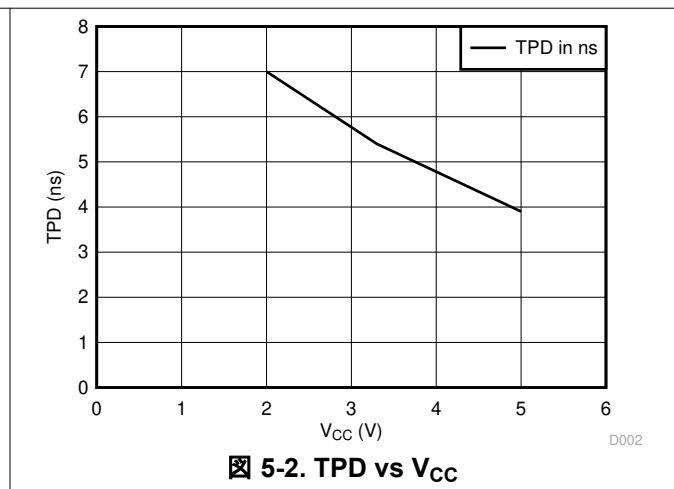
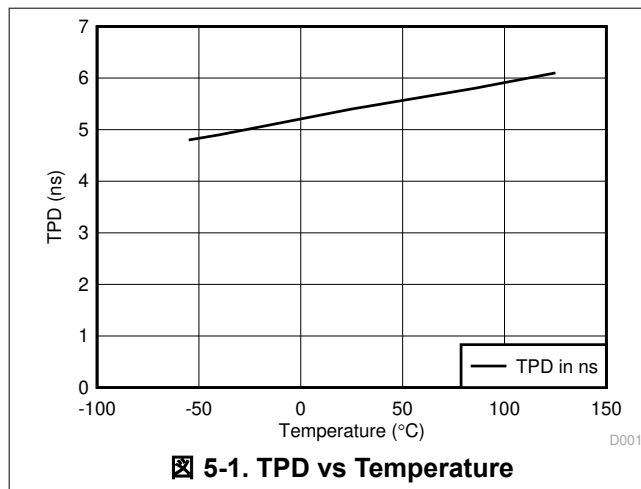
(1) Characteristics are for surface-mount packages only.

### 5.9 Operating Characteristics

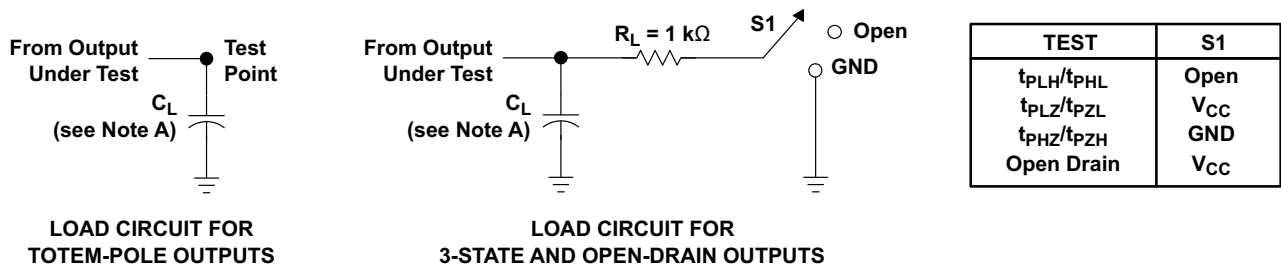
$V_{CC} = 5\text{ V}$ ,  $T_A = 25^\circ\text{C}$

PARAMETER		TEST CONDITIONS		TYP	UNIT
$C_{pd}$	Power dissipation capacitance	No load,	$f = 1\text{ MHz}$	8.6	pF

### 5.10 Typical Characteristics

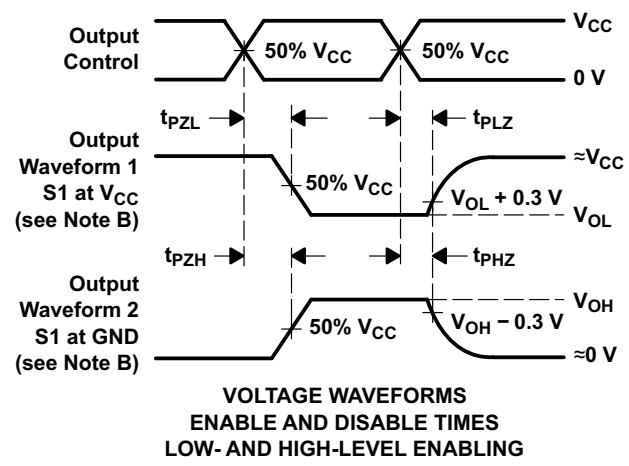
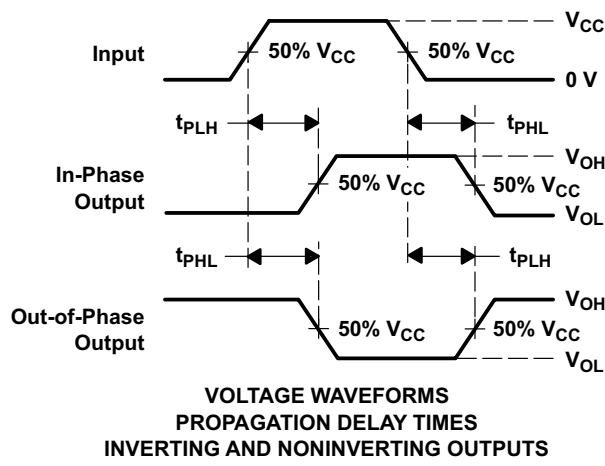
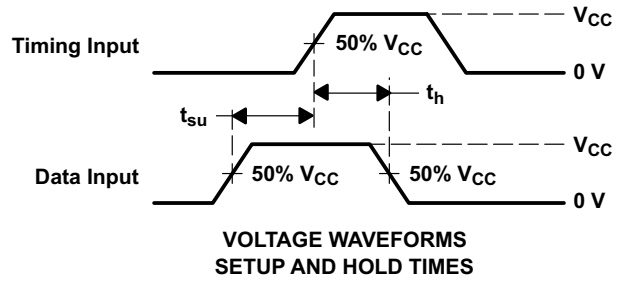
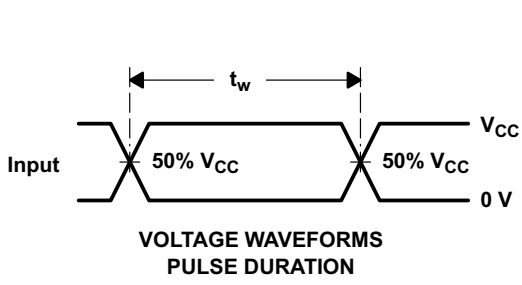


## 6 Parameter Measurement Information



LOAD CIRCUIT FOR TOTEM-POLE OUTPUTS

LOAD CIRCUIT FOR 3-STATE AND OPEN-DRAIN OUTPUTS



- 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:  $PRR \leq 1$  MHz,  $Z_O = 50 \Omega$ ,  $t_r \leq 3$  ns,  $t_f \leq 3$  ns.
  - D. The outputs are measured one at a time with one input transition per measurement.
  - E. All parameters and waveforms are not applicable to all devices.

图 6-1. Load Circuit and Voltage Waveforms



## 7 Detailed Description

### 7.1 Overview

The SNx4AHC244 devices are organized as two 4-bit buffers/line drivers with separate output-enable ( $\overline{OE}$ ) inputs. When  $\overline{OE}$  is low, the device passes data from the A inputs to the Y outputs. When  $\overline{OE}$  is high, the outputs are in the high-impedance state. 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

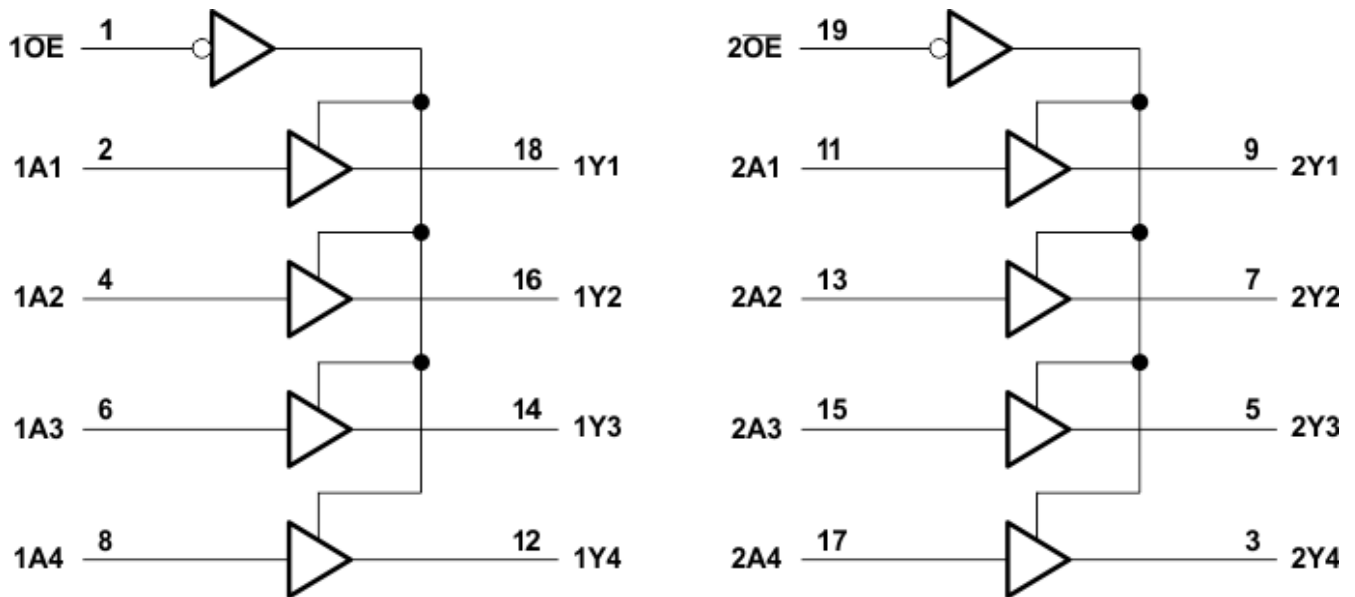


図 7-1. Logic Diagram (Positive Logic)

### 7.3 Feature Description

- $V_{CC}$  is optimized at 5 V
- Allows down voltage translation
  - Inputs accept  $V_{IH}$  levels of 5.5 V
- Slow edge rates minimize output ringing

### 7.4 Device Functional Modes

表 7-1. Function Table  
(Each 4-Bit Buffer/Driver)

INPUTS		OUTPUT
OE	A	Y
L	H	H
L	L	L
H	X	Z

## 8 Application and Implementation

### 注

以下のアプリケーション情報は、TI の製品仕様に含まれるものではなく、TI ではその正確性または完全性を保証いたしません。個々の目的に対する製品の適合性については、お客様の責任で判断していただくことになります。お客様は自身の設計実装を検証しテストすることで、システムの機能を確認する必要があります。

### 8.1 Power Supply Recommendations

The power supply can be any voltage between the Min and Max supply voltage rating located in the [Recommended Operating Conditions](#) table.

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

### 8.2 Layout

#### 8.2.1 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. [図 8-1](#) 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 I/Os, so they cannot float when disabled.

#### 8.2.2 Layout Example

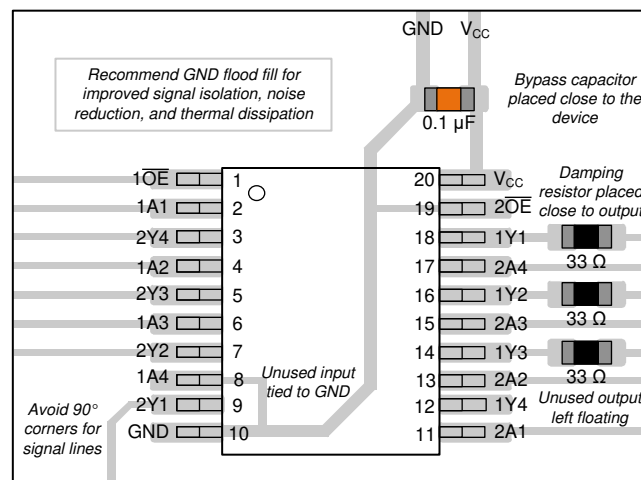


図 8-1. Example Layout for the SN74AHC244

## 9 Device and Documentation Support

### 9.1 Documentation Support

#### 9.1.1 Related Documentation

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.

表 9-1. Related Links

PARTS	PRODUCT FOLDER	SAMPLE & BUY	TECHNICAL DOCUMENTS	TOOLS & SOFTWARE	SUPPORT & COMMUNITY
SN54AHC244	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>
SN74AHC244	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>	<a href="#">Click here</a>

### 9.2 ドキュメントの更新通知を受け取る方法

ドキュメントの更新についての通知を受け取るには、[www.tij.co.jp](http://www.tij.co.jp) のデバイス製品フォルダを開いてください。[通知] をクリックして登録すると、変更されたすべての製品情報に関するダイジェストを毎週受け取ることができます。変更の詳細については、改訂されたドキュメントに含まれている改訂履歴をご覧ください。

### 9.3 サポート・リソース

[テキサス・インスツルメンツ E2E™ サポート・フォーラム](#) は、エンジニアが検証済みの回答と設計に関するヒントをエキスパートから迅速かつ直接得ることができる場所です。既存の回答を検索したり、独自の質問をしたりすることで、設計に必要な支援を迅速に得ることができます。

リンクされているコンテンツは、各寄稿者により「現状のまま」提供されるものです。これらはテキサス・インスツルメンツの仕様を構成するものではなく、必ずしもテキサス・インスツルメンツの見解を反映したものではありません。テキサス・インスツルメンツの[使用条件](#)を参照してください。

### 9.4 Trademarks

テキサス・インスツルメンツ E2E™ is a trademark of Texas Instruments.  
すべての商標は、それぞれの所有者に帰属します。

### 9.5 静電気放電に関する注意事項



この IC は、ESD によって破損する可能性があります。テキサス・インスツルメンツは、IC を取り扱う際には常に適切な注意を払うことを推奨します。正しい取り扱いおよび設置手順に従わない場合、デバイスを破損するおそれがあります。

ESD による破損は、わずかな性能低下からデバイスの完全な故障まで多岐にわたります。精密な IC の場合、パラメータがわずかに変化するだけで公表されている仕様から外れる可能性があるため、破損が発生しやすくなっています。

### 9.6 用語集

[テキサス・インスツルメンツ用語集](#) この用語集には、用語や略語の一覧および定義が記載されています。

## 10 Revision History

資料番号末尾の英字は改訂を表しています。その改訂履歴は英語版に準じています。

Changes from Revision L (July 2024) to Revision M (January 2025)	Page
• Updated HBM and CDM values in <i>ESD Ratings</i> table.....	4
Changes from Revision K (July 2013) to Revision L (July 2024)	Page
• ドキュメントの構造レイアウトを現在の標準に更新.....	1
• 「製品情報」表に SOP および TVSOP パッケージ、パッケージ サイズ、ミリタリー パッケージを追加.....	1
• 「製品情報」表から VQFN を削除.....	1

- Updated R $\theta$ JA values: PW = 105.4 to 116.8, DW = 83.0 to 81.1, NS = 80.4 to 77.6; Updated PW, DW, and NS packages for R $\theta$ JC(top), R $\theta$ JB,  $\Psi$ JT,  $\Psi$ JB, and R $\theta$ JC(bot), all values in °C/W ..... 5
- 

## 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
5962-9678201Q2A	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201Q2A SNJ54AHC244FK	<a href="#">Samples</a>
5962-9678201QRA	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201QR A SNJ54AHC244J	<a href="#">Samples</a>
5962-9678201QSA	ACTIVE	CFP	W	20	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201QS A SNJ54AHC244W	<a href="#">Samples</a>
5962-9678201VRA	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201VR A SNV54AHC244J	<a href="#">Samples</a>
5962-9678201VSA	ACTIVE	CFP	W	20	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201VS A SNV54AHC244W	<a href="#">Samples</a>
SN74AHC244DBR	ACTIVE	SSOP	DB	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA244	<a href="#">Samples</a>
SN74AHC244DBRE4	ACTIVE	SSOP	DB	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA244	<a href="#">Samples</a>
SN74AHC244DGVR	ACTIVE	TVSOP	DGV	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA244	<a href="#">Samples</a>
SN74AHC244DW	OBSOLETE	SOIC	DW	20		TBD	Call TI	Call TI	-40 to 125	AHC244	
SN74AHC244DWR	ACTIVE	SOIC	DW	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC244	<a href="#">Samples</a>
SN74AHC244DWRG4	ACTIVE	SOIC	DW	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC244	<a href="#">Samples</a>
SN74AHC244N	ACTIVE	PDIP	N	20	20	RoHS & Green	NIPDAU	N / A for Pkg Type	-40 to 125	SN74AHC244N	<a href="#">Samples</a>
SN74AHC244NSR	ACTIVE	SOP	NS	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	AHC244	<a href="#">Samples</a>
SN74AHC244PW	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI	-40 to 125	HA244	
SN74AHC244PWR	ACTIVE	TSSOP	PW	20	2000	RoHS & Green	NIPDAU   SN	Level-1-260C-UNLIM	-40 to 85	HA244	<a href="#">Samples</a>
SN74AHC244PWRE4	ACTIVE	TSSOP	PW	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA244	<a href="#">Samples</a>

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
SN74AHC244PWRG4	ACTIVE	TSSOP	PW	20	2000	RoHS & Green	NIPDAU	Level-1-260C-UNLIM	-40 to 125	HA244	<a href="#">Samples</a>
SNJ54AHC244FK	ACTIVE	LCCC	FK	20	55	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201Q2A SNJ54AHC244FK	<a href="#">Samples</a>
SNJ54AHC244J	ACTIVE	CDIP	J	20	20	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201QR A SNJ54AHC244J	<a href="#">Samples</a>
SNJ54AHC244W	ACTIVE	CFP	W	20	25	Non-RoHS & Green	SNPB	N / A for Pkg Type	-55 to 125	5962-9678201QS A SNJ54AHC244W	<a href="#">Samples</a>

(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.

**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 SN54AHC244, SN54AHC244-SP, SN74AHC244 :**

- Catalog : [SN74AHC244](#), [SN54AHC244](#)
  
- Automotive : [SN74AHC244-Q1](#), [SN74AHC244-Q1](#)
  
- Enhanced Product : [SN74AHC244-EP](#), [SN74AHC244-EP](#)
  
- Military : [SN54AHC244](#)
  
- Space : [SN54AHC244-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**

**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
SN74AHC244DBR	SSOP	DB	20	2000	330.0	16.4	8.2	7.5	2.5	12.0	16.0	Q1
SN74AHC244DGVR	TVSOP	DGV	20	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74AHC244DWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.3	2.7	12.0	24.0	Q1
SN74AHC244DWR	SOIC	DW	20	2000	330.0	24.4	10.9	13.3	2.7	12.0	24.0	Q1
SN74AHC244NSR	SOP	NS	20	2000	330.0	24.4	8.4	13.0	2.5	12.0	24.0	Q1
SN74AHC244PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.0	1.4	8.0	16.0	Q1
SN74AHC244PWRG4	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)
SN74AHC244DBR	SSOP	DB	20	2000	356.0	356.0	35.0
SN74AHC244DGVR	TVSOP	DGV	20	2000	356.0	356.0	35.0
SN74AHC244DWR	SOIC	DW	20	2000	356.0	356.0	45.0
SN74AHC244DWR	SOIC	DW	20	2000	367.0	367.0	45.0
SN74AHC244NSR	SOP	NS	20	2000	367.0	367.0	45.0
SN74AHC244PWR	TSSOP	PW	20	2000	356.0	356.0	35.0
SN74AHC244PW RG4	TSSOP	PW	20	2000	367.0	367.0	38.0

**TUBE**


\*All dimensions are nominal

Device	Package Name	Package Type	Pins	SPQ	L (mm)	W (mm)	T (μm)	B (mm)
5962-9678201Q2A	FK	LCCC	20	55	506.98	12.06	2030	NA
5962-9678201QSA	W	CFP	20	25	506.98	26.16	6220	NA
5962-9678201VSA	W	CFP	20	25	506.98	26.16	6220	NA
SN74AHC244N	N	PDIP	20	20	506	13.97	11230	4.32
SNJ54AHC244FK	FK	LCCC	20	55	506.98	12.06	2030	NA
SNJ54AHC244W	W	CFP	20	25	506.98	26.16	6220	NA

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:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - This package is hermetically sealed with a ceramic lid using glass frit.
  - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
  - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

DGV (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE

24 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 per side.  
 D. Falls within JEDEC: 24/48 Pins – MO-153  
 14/16/20/56 Pins – MO-194

## 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



- 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.

# DW0020A



# PACKAGE OUTLINE

## SOIC - 2.65 mm max height

SOIC



# EXAMPLE BOARD LAYOUT

DW0020A

SOIC - 2.65 mm max height

SOIC



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.



# 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.

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

PW0020A



**PACKAGE OUTLINE**  
**TSSOP - 1.2 mm max height**

SMALL OUTLINE PACKAGE



4220206/A 02/2017

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.

# DB0020A



# PACKAGE OUTLINE

## SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



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.

# EXAMPLE BOARD LAYOUT

DB0020A

SSOP - 2 mm max height

SMALL OUTLINE PACKAGE



LAND PATTERN EXAMPLE  
EXPOSED METAL SHOWN  
SCALE: 10X



4214851/B 08/2019

NOTES: (continued)

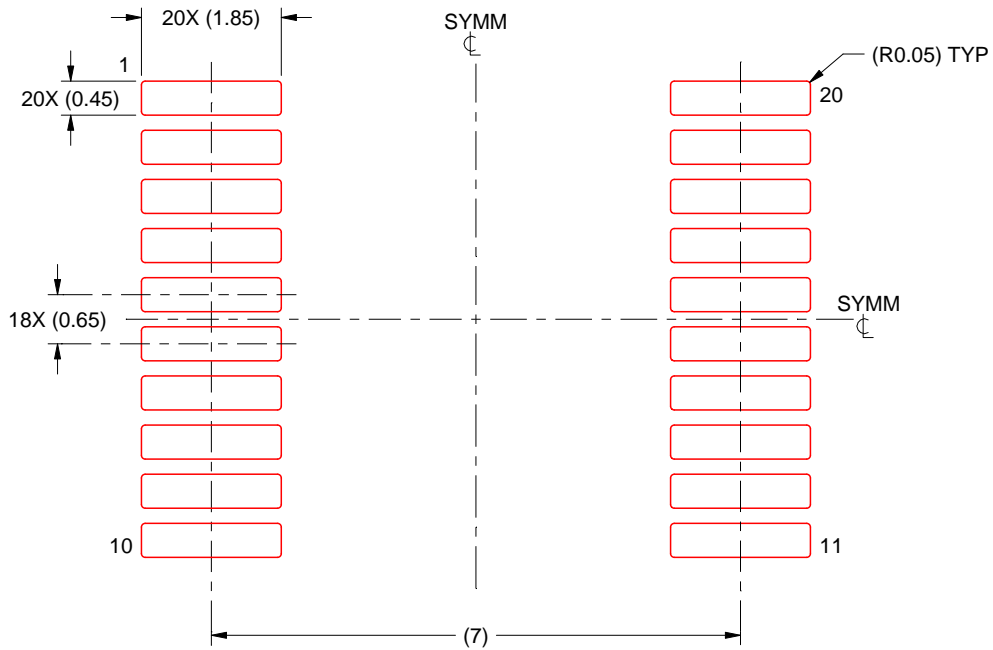
- 6. Publication IPC-7351 may have alternate designs.
- 7. Solder mask tolerances between and around signal pads can vary based on board fabrication site.

# 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.

## 重要なお知らせと免責事項

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