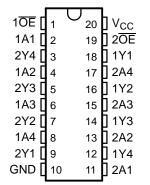
www.ti.com

SCES112F-JULY 1997-REVISED AUGUST 2004

#### **FEATURES**

- Operates From 1.65 V to 3.6 V
- Max t<sub>pd</sub> of 2.8 ns at 3.3 V
- ±24-mA Output Drive at 3.3 V
- Bus Hold on Data Inputs Eliminates the Need for External Pullup/Pulldown Resistors
- Latch-Up Performance Exceeds 250 mA Per JESD 17
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)

# DGV, DW, NS, OR PW PACKAGE (TOP VIEW)



### **DESCRIPTION/ORDERING INFORMATION**

This octal buffer/line driver is designed for 1.65-V to 3.6-V V<sub>CC</sub> operation.

The SN74ALVCH244 is organized as two 4-bit 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,  $\overline{OE}$  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.

Active bus-hold circuitry holds unused or undriven inputs at a valid logic state. Use of pullup or pulldown resistors with the bus-hold circuitry is not recommended.

#### ORDERING INFORMATION

T <sub>A</sub>	PACKAG	iE <sup>(1)</sup>	ORDERABLE PART NUMBER	TOP-SIDE MARKING	
	SOIC - DW	Tube	SN74ALVCH244DW	ALVCH244	
	SOIC - DW	Tape and reel	SN74ALVCH244DWR	ALVON244	
-40°C to 85°C	SOP - NS	Tape and reel	SN74ALVCH244NSR	ALVCH244	
-40 C to 65 C	TOOOD DW	Tube	SN74ALVCH244PW	V/D044	
	TSSOP - PW	Tape and reel	SN74ALVCH244PWR	VB244	
	TVSOP - DGV	Tape and reel	SN74ALVCH244DGVR	VB244	

<sup>(1)</sup> Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

# FUNCTION TABLE (each buffer)

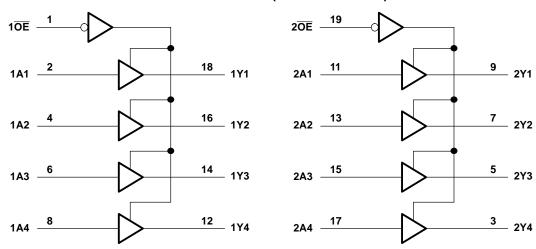
INP	JTS	OUTPUT
ŌĒ	Α	Y
L	Н	Н
L	L	L
Н	X	z



Please be aware that an important notice concerning availability, standard warranty, and use in critical applications of Texas Instruments semiconductor products and disclaimers thereto appears at the end of this data sheet.



### **LOGIC DIAGRAM (POSITIVE LOGIC)**



### **ABSOLUTE MAXIMUM RATINGS**(1)

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

				MIN	MAX	UNIT	
V <sub>CC</sub>	Supply voltage range			-0.5	4.6	V	
V <sub>I</sub>	Input voltage range (2)			-0.5	4.6	V	
Vo	Output voltage range (2)(3)	Output voltage range (2)(3)				V	
I <sub>IK</sub>	Input clamp current	V <sub>I</sub> < 0		-	-50	mA	
I <sub>OK</sub>	Output clamp current	V <sub>O</sub> < 0		-	-50	mA	
Io	Continuous output current			±50	mA		
	Continuous current through V <sub>CC</sub> or GN	D			±100	mA	
		DGV package		-	92		
	Package thermal impedance <sup>(4)</sup>	DW package		-	58	⊢ °C/W I	
$\theta_{JA}$	Fackage thermal impedance (*)	NS package			60		
		PW package			83		
T <sub>stg</sub>	Storage temperature range			-65	150	°C	

<sup>(1)</sup> 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.

<sup>(2)</sup> The input negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.

<sup>(3)</sup> This value is limited to 4.6 V maximum.

<sup>(4)</sup> The package thermal impedance is calculated in accordance with JESD 51-7.



### SN74ALVCH244 OCTAL BUFFER/DRIVER WITH 3-STATE OUTPUTS

### **RECOMMENDED OPERATING CONDITIONS<sup>(1)</sup>**

			MIN	MAX	UNIT	
$V_{CC}$	Supply voltage		1.65	3.6	٧	
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$	$0.65 \times V_{CC}$			
$V_{IH}$	High-level input voltage	$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$	1.7		V	
		$V_{CC} = 2.7 \text{ V to } 3.6 \text{ V}$	2			
		$V_{CC} = 1.65 \text{ V to } 1.95 \text{ V}$		$0.35 \times V_{CC}$		
$V_{IL}$	Low-level input voltage	$V_{CC} = 2.3 \text{ V to } 2.7 \text{ V}$		0.7	V	
		$V_{CC} = 2.7 \text{ V to } 3.6 \text{ V}$		0.8		
V <sub>I</sub>	Input voltage		0	V <sub>CC</sub>	V	
Vo	Output voltage		0	V <sub>CC</sub>	V	
		V <sub>CC</sub> = 1.65 V		-4		
	Himb lovel output outpost	V <sub>CC</sub> = 2.3 V		-12		
I <sub>OH</sub>	nigri-level output current	V <sub>CC</sub> = 2.7 V		-12	mA	
	High-level output current	V <sub>CC</sub> = 3 V		-24		
		V <sub>CC</sub> = 1.65 V		4		
	Low lovel output ourrent	V <sub>CC</sub> = 2.3 V		12		
l <sub>OL</sub>	Low-level output current	V <sub>CC</sub> = 2.7 V		12	mA	
		V <sub>CC</sub> = 3 V		24		
Δt/Δν	Input transition rise or fall rate	•		5	ns/V	
T <sub>A</sub>	Operating free-air temperature		-40	85	°C	

<sup>(1)</sup> All unused control 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.



### **ELECTRICAL CHARACTERISTICS**

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

PA	RAMETER	TEST CONDITIONS	V <sub>cc</sub>	MIN TYP(1)	MAX	UNIT		
		$I_{OH} = -100 \mu A$	1.65 V to 3.6 V	V <sub>CC</sub> - 0.2				
		$I_{OH} = -4 \text{ mA}$	1.65 V	1.2		Ì		
		I <sub>OH</sub> = -6 mA	2.3 V	2				
V <sub>OH</sub>	V <sub>OL</sub>		2.3 V	1.7		V		
		$I_{OH} = -12 \text{ mA}$	2.7 V	2.2		ı		
	$V_{OH} = \begin{cases} I_{OH} = -100 \ \mu A & 1.65 \ V \ to \ 3.6 \ V & V_{CC} \cdot 0.2 \\ I_{OH} = -4 \ mA & 1.65 \ V & 1.2 \\ I_{OH} = -6 \ mA & 2.3 \ V & 2 \\ & 2.3 \ V & 1.7 \\ \hline & 2.7 \ V & 2.2 \\ \hline & 3 \ V & 2.4 \\ \hline & 1_{OH} = -24 \ mA & 3 \ V & 2 \\ \hline & I_{OL} = 100 \ \mu A & 1.65 \ V \ to \ 3.6 \ V \\ \hline & I_{OL} = 4 \ mA & 1.65 \ V & 0.0 \\ \hline & I_{OL} = 6 \ mA & 2.3 \ V \\ \hline & I_{OL} = 6 \ mA & 2.3 \ V \\ \hline & I_{OL} = 12 \ mA & 2.3 \ V \\ \hline & I_{OL} = 12 \ mA & 3.6 \ V & 0.0 \\ \hline & I_{OL} = 24 \ mA & 3.6 \ V & 0.0 \\ \hline & I_{I} & V_{I} = V_{CC} \ or \ GND & 3.6 \ V & 0.0 \\ \hline & V_{I} = 0.7 \ V & 1.65 \ V & 0.0 \\ \hline & V_{I} = 0.7 \ V & 2.3 \ V & 45 \\ \hline & V_{I} = 0.7 \ V & 2.3 \ V & 45 \\ \hline & V_{I} = 0.8 \ V & 3 \ V & 75 \\ \hline & V_{I} = 2 \ V & 3 \ V & 75 \\ \hline & V_{I} = 0 \ to \ 3.6 \ V & 3.6 \ V & 3.6 \ V & 3.6 \ V \\ \hline & I_{CC} & V_{I} = V_{CC} \ or \ GND & I_{O} = 0 \\ \hline & \Delta_{ICC} & One \ input at \ V_{CC} \ or \ GND & 3.3 \ V & 6.6 \\ \hline & Control \ inputs & V_{I} = V_{CC} \ or \ GND & Other \ inputs at \ V_{CC} \ or \ GND & 3.3 \ V & 6.6 \\ \hline \end{tabular}$		ı					
$V_{OH} = \begin{array}{ c c c c c } \hline & I_{OH} = -100 \ \mu A \\ \hline & I_{OH} = -4 \ m A \\ \hline & I_{OH} = -6 \ m A \\ \hline & I_{OH} = -12 \ m A \\ \hline & I_{OH} = -24 \ m A \\ \hline & I_{OH} = -24 \ m A \\ \hline & I_{OL} = 100 \ \mu A \\ \hline & I_{OL} = 4 \ m A \\ \hline & I_{OL} = 6 \ m A \\ \hline & I_{OL} = 12 \ m A \\ \hline & I_{OL} = 12 \ m A \\ \hline & I_{OL} = 24 \ m A \\ \hline & I_{I} & V_{I} = V_{CC} \ or \ GND \\ \hline & V_{I} = 0.58 \ V \\ \hline & V_{I} = 1.07 \ V \\ \hline & V_{I} = 0.7 \ V \\ \hline & V_{I} = 0.7 \ V \\ \hline & V_{I} = 0.7 \ V \\ \hline & V_{I} = 0.8 \ V \\ \hline & V_{I} = 0.8 \ V \\ \hline & V_{I} = 0.7 \ V \\ \hline & V_{I} = 0.$	3 V	2		ı				
		$I_{OL} = 100 \mu A$	1.65 V to 3.6 V		0.2	1		
		I <sub>OL</sub> = 4 mA	1.65 V		0.45	Ì		
<b> </b> ,,		$I_{OL} = 6 \text{ mA}$	2.3 V		0.4			
VOL		1 40 1	2.3 V		0.7	V		
		$I_{OL} = 12 \text{ mA}$	2.7 V		0.4			
		I <sub>OL</sub> = 24 mA	3 V		0.2 0.45 0.4 0.7 0.4 0.55 ±5 µ ±500 ±10 µ 750 µ 4.5 6	ı		
I <sub>I</sub>		$V_I = V_{CC}$ or GND	3.6 V		±5	μΑ		
		V <sub>I</sub> = 0.58 V	1.65 V	(2)				
		V <sub>I</sub> = 1.07 V	1.65 V	(2)		ı		
$\begin{array}{c c} V_{OL} & & \\ \hline I_{I} & & \\ \hline I_{I(hold)} & & \\ \hline I_{OZ} & & \\ \hline I_{CC} & & \\ \hline C_{i} & & \\ \hline \end{array}$	V <sub>I</sub> = 0.7 V	2.3 V	45					
I <sub>I(hold)</sub>		V <sub>I</sub> = 1.7 V	2.3 V	-45		μΑ		
		V <sub>I</sub> = 0.8 V	3 V	75		ı		
		V <sub>I</sub> = 2 V	3 V	-75		Ì		
		$V_1 = 0 \text{ to } 3.6 \text{ V}^{(3)}$	3.6 V		±500	ı		
loz		$V_O = V_{CC}$ or GND	3.6 V	,	±10	μΑ		
I <sub>CC</sub>		$V_I = V_{CC}$ or GND, $I_O = 0$	3.6 V		10	μΑ		
		One input at V <sub>CC</sub> - 0.6 V, Other inputs at V <sub>CC</sub> or GND	3 V to 3.6 V		750	μΑ		
	Control inputs		227	4.5				
	Data inputs	AI = ACC OL GIAD	3.3 V	6		pF		
Co	Outputs	$V_O = V_{CC}$ or GND	3.3 V	8		pF		

### **SWITCHING CHARACTERISTICS**

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V <sub>CC</sub> = 1.8 V	$V_{CC}$ = 2.5 V $\pm$ 0.2 V		V <sub>CC</sub> = 2.7 V		V <sub>CC</sub> = 3.3 V ± 0.3 V		UNIT
	(INFOT)	(001701)	TYP	MIN	MAX	MIN	MAX	MIN	MAX	
t <sub>pd</sub>	Α	Υ	(1)	1	3.1		3.1	1.1	2.8	ns
t <sub>en</sub>	ŌĒ	Y	(1)	1.5	5.4		5.3	1.5	4.5	ns
t <sub>dis</sub>	ŌĒ	Y	(1)	1	4.1		4.4	1.7	4.2	ns

<sup>(1)</sup> This information was not available at the time of publication.

All typical values are at V<sub>CC</sub> = 3.3 V, T<sub>A</sub> = 25°C. This information was not available at the time of publication.

This is the bus-hold maximum dynamic current. It is the minimum overdrive current required to switch the input from one state to another.







### **OPERATING CHARACTERISTICS**

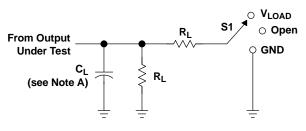
 $T_A = 25^{\circ}C$ 

	PARAMETER	TEST CONDITIONS	V <sub>CC</sub> = 1.8 V TYP	V <sub>CC</sub> = 2.5 V TYP	V <sub>CC</sub> = 3.3 V TYP	UNIT	
Power dissipation capacitance		Outputs enabled	C <sub>1</sub> = 0. f = 10 MHz	(1)	22	28	pF
Cpd	per buffer/driver	Outputs disabled	$C_L = 0$ , $I = 10$ MHZ	(1)	1.5	4	ρг

<sup>(1)</sup> This information was not available at the time of publication.



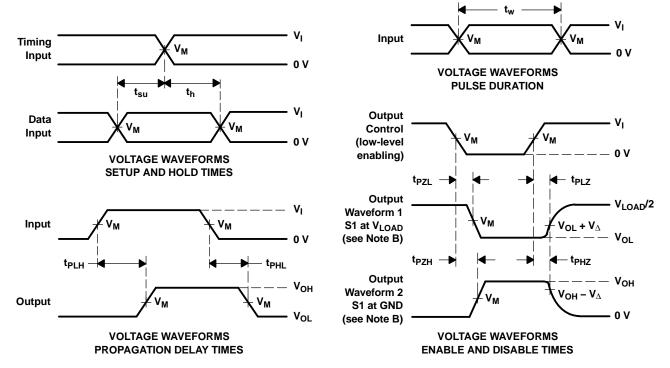
### PARAMETER MEASUREMENT INFORMATION



TEST	<b>S</b> 1
t <sub>pd</sub>	Open
t <sub>PLZ</sub> /t <sub>PZL</sub>	V <sub>LOAD</sub>
t <sub>PHZ</sub> /t <sub>PZH</sub>	GND

LOAD CIRCUIT

V	IN	PUT	V	, , , , , , , , , , , , , , , , , , ,	•	В	, I
V <sub>CC</sub>	VI	t <sub>r</sub> /t <sub>f</sub>	V <sub>M</sub>	V <sub>LOAD</sub>	CL	R <sub>L</sub>	$oldsymbol{V}_\Delta$
1.8 V ± 0.15 V	V <sub>CC</sub>	≤2 ns	V <sub>CC</sub> /2	2×V <sub>CC</sub>	30 pF	<b>1 k</b> Ω	0.15 V
2.5 V $\pm$ 0.2 V	V <sub>CC</sub>	≤2 ns	V <sub>CC</sub> /2	2×V <sub>CC</sub>	30 pF	500 Ω	0.15 V
2.7 V	2.7 V	≤2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 V
3.3 V $\pm$ 0.3 V	2.7 V	≤2.5 ns	1.5 V	6 V	50 pF	<b>500</b> Ω	0.3 V



NOTES: A. C<sub>L</sub> 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,  $Z_{\Omega}$  = 50  $\Omega$ .
- D. The outputs are measured one at a time, with one transition per measurement.
- E.  $t_{PLZ}$  and  $t_{PHZ}$  are the same as  $t_{dis}$ .
- F. t<sub>PZL</sub> and t<sub>PZH</sub> are the same as t<sub>en</sub>.
- G.  $t_{PLH}$  and  $t_{PHL}$  are the same as  $t_{pd}$ .
- H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

28-Aug-2010

### **PACKAGING INFORMATION**

Orderable Device	Status <sup>(1)</sup>	Package Type	Package Drawing	Pins	Package Qty	Eco Plan <sup>(2)</sup>	Lead/ Ball Finish	MSL Peak Temp <sup>(3)</sup>	Samples (Requires Login)
74ALVCH244DGVRE4	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
74ALVCH244DGVRG4	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
SN74ALVCH244DGVR	ACTIVE	TVSOP	DGV	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
SN74ALVCH244DW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
SN74ALVCH244DWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
SN74ALVCH244DWG4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
SN74ALVCH244DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
SN74ALVCH244DWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
SN74ALVCH244DWRG4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
SN74ALVCH244PW	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
SN74ALVCH244PWE4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
SN74ALVCH244PWG4	ACTIVE	TSSOP	PW	20	70	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Purchase Samples
SN74ALVCH244PWLE	OBSOLETE	TSSOP	PW	20		TBD	Call TI	Call TI	Replaced by SN74ALVCH244PWR
SN74ALVCH244PWR	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
SN74ALVCH244PWRE4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office
SN74ALVCH244PWRG4	ACTIVE	TSSOP	PW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM	Contact TI Distributor or Sales Office

<sup>&</sup>lt;sup>(1)</sup> The marketing status values are defined as follows:



### PACKAGE OPTION ADDENDUM

28-Aug-2010

ACTIVE: Product device recommended for new designs.

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

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

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

**OBSOLETE:** TI has discontinued the production of the device.

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

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

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

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

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

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

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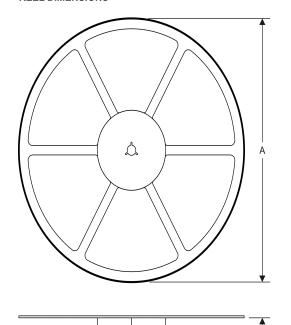
In no event shall TI's liability arising out of such information exceed the total purchase price of the TI part(s) at issue in this document sold by TI to Customer on an annual basis.

### PACKAGE MATERIALS INFORMATION

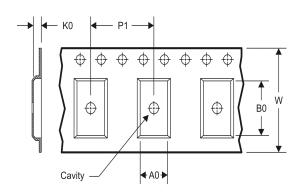
www.ti.com 14-Jul-2012

### TAPE AND REEL INFORMATION

### **REEL DIMENSIONS**



### **TAPE DIMENSIONS**



A0	Dimension designed to accommodate the component width
В0	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

### TAPE AND REEL INFORMATION

\*All dimensions are nominal

Device	Package Type	Package Drawing		SPQ	Reel Diameter (mm)	Reel Width W1 (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74ALVCH244DGVR	TVSOP	DGV	20	2000	330.0	12.4	6.9	5.6	1.6	8.0	12.0	Q1
SN74ALVCH244DWR	SOIC	DW	20	2000	330.0	24.4	10.8	13.0	2.7	12.0	24.0	Q1
SN74ALVCH244PWR	TSSOP	PW	20	2000	330.0	16.4	6.95	7.1	1.6	8.0	16.0	Q1

**PACKAGE MATERIALS INFORMATION** 

www.ti.com 14-Jul-2012



\*All dimensions are nominal

A MI GITTOTO GITO TOTALING.							
Device	Package Type	Package Drawing	Pins	SPQ	Length (mm)	Width (mm)	Height (mm)
SN74ALVCH244DGVR	TVSOP	DGV	20	2000	367.0	367.0	35.0
SN74ALVCH244DWR	SOIC	DW	20	2000	367.0	367.0	45.0
SN74ALVCH244PWR	TSSOP	PW	20	2000	367.0	367.0	38.0

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

### **24 PINS SHOWN**

### **PLASTIC SMALL-OUTLINE**



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 DW (R-PDSO-G20)

### PLASTIC SMALL OUTLINE



NOTES: A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M-1994.

- B. This drawing is subject to change without notice.
- C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
- D. Falls within JEDEC MS-013 variation AC.



PW (R-PDSO-G20)

### PLASTIC SMALL OUTLINE



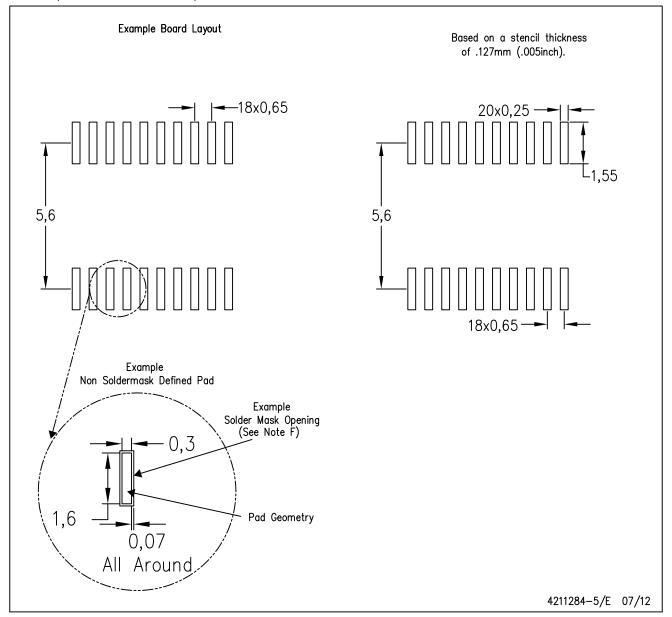
NOTES:

- A. All linear dimensions are in millimeters. Dimensioning and tolerancing per ASME Y14.5M—1994.
- B. This drawing is subject to change without notice.
- Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed 0,15 each side.
- Body width does not include interlead flash. Interlead flash shall not exceed 0,25 each side.
- E. Falls within JEDEC MO-153



## PW (R-PDSO-G20)

### PLASTIC SMALL OUTLINE



NOTES:

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



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