- **2-V to 5.5-V V$_{CC}$ Operation**
- **Max t$_{pd}$ of 6.5 ns at 5 V**
- **Typical V$_{OLP}$ (Output Ground Bounce) <0.8 V at V$_{CC}$ = 3.3 V, T$_A$ = 25°C**
- **Typical V$_{OHV}$ (Output V$_{OH}$ Undershoot) >2.3 V at V$_{CC}$ = 3.3 V, T$_A$ = 25°C**
- **Support Mixed-Mode Voltage Operation on All Ports**
- **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)**
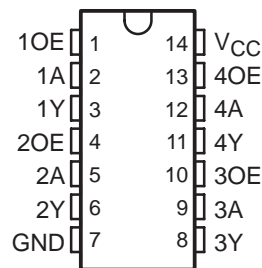 - **1000-V Charged-Device Model (C101)**

description/ordering information

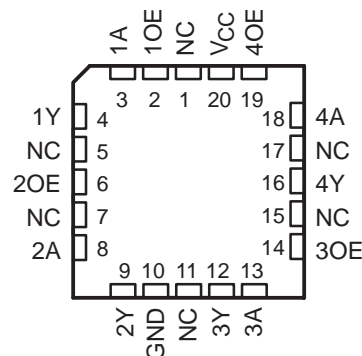These quadruple bus buffer gates are designed for 2-V to 5.5-V V$_{CC}$ operation.

The 'LV126A devices feature independent line drivers with 3-state outputs. Each output is disabled when the associated output-enable (OE) input is low.

To ensure the high-impedance state during power up or power down, OE should be tied to GND through a pulldown resistor; the minimum value of the resistor is determined by the current-sourcing capability of the driver.

SN54LV126A . . . J OR W PACKAGE
SN74LV126A . . . D, DB, DGV, NS, OR PW PACKAGE
(TOP VIEW)

1OE	1	14 V$_{CC}$
1A	2	13 4OE
1Y	3	12 4A
2OE	4	11 4Y
2A	5	10 3OE
2Y	6	9 3A
GND	7	8 3Y

SN54LV126A . . . FK PACKAGE
(TOP VIEW)

Pins (top, left to right): 1A, 1OE, NC, V$_{CC}$, 4OE

1Y	4	18 4A
NC	5	17 NC
2OE	6	16 4Y
NC	7	15 NC
2A	8	14 3OE

Pins (bottom): 2Y, GND, NC, 3Y, 3A

NC – No internal connection

ORDERING INFORMATION

T$_A$	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
−40°C to 85°C	SOIC – D	Tube of 50	SN74LV126AD	LV126A
		Reel of 2500	SN74LV126ADR	
	SOP – NS	Reel of 2000	SN74LV126ANSR	74LV126A
	SSOP – DB	Reel of 2000	SN74LV126ADBR	LV126A
	TSSOP – PW	Tube of 90	SN74LV126APW	LV126A
		Reel of 2000	SN74LV126APWR	
		Reel of 250	SN74LV126APWT	
	TVSOP – DGV	Reel of 2000	SN74LV126ADGVR	LV126A
−55°C to 125°C	CDIP – J	Tube of 25	SNJ54LV126AJ	SNJ54LV126AJ
	CFP – W	Tube of 150	SNJ54LV126AW	SNJ54LV126AW
	LCCC – FK	Tube of 55	SNJ54LV126AFK	SNJ54LV126AFK

† Package drawings, standard packing quantities, thermal data, symbolization, and PCB design guidelines are available at www.ti.com/sc/package.

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.

Copyright © 2005, Texas Instruments Incorporated

TEXAS INSTRUMENTS

FUNCTION TABLE
(each buffer)

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

logic diagram (positive logic)
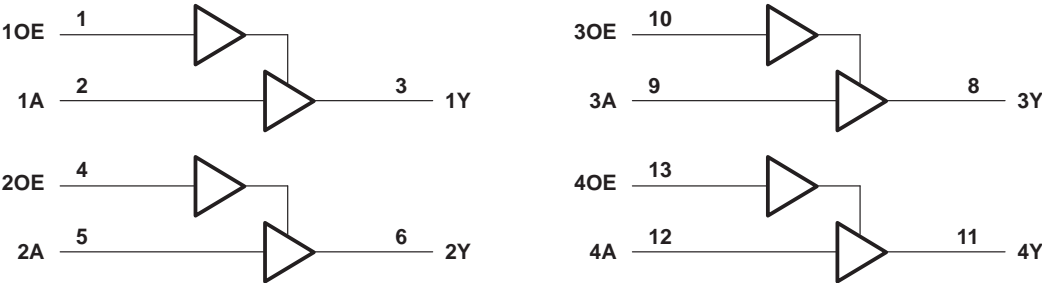
Pin numbers shown are for the D, DB, DGV, J, NS, PW, and W packages.

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

Supply voltage range, V_{CC} .... –0.5 V to 7 V

Input voltage range, V_I (see Note 1) .... –0.5 V to 7 V

Voltage range applied to any output in the high-impedance
   or power-off state, V_O (see Note 1) .... –0.5 V to 7 V

Output voltage range, V_O (see Notes 1 and 2) .... –0.5 V to V_{CC} + 0.5 V

Input clamp current, I_{IK} ($V_I < 0$) .... –20 mA

Output clamp current, I_{OK} ($V_O < 0$) .... –50 mA

Continuous output current, I_O (V_O = 0 to V_{CC}) .... ±35 mA

Continuous current through V_{CC} or GND .... ±70 mA

Package thermal impedance, θ_{JA} (see Note 3): D package .... 86°C/W
                                          DB package .... 96°C/W
                                          DGV package .... 127°C/W
                                          NS package .... 76°C/W
                                          PW package .... 113°C/W

Storage temperature range, T_{stg} .... –65°C to 150°C

† Stresses beyond those listed under "absolute maximum ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

NOTES: 1. The input and output negative-voltage ratings may be exceeded if the input and output current ratings are observed.
      2. This value is limited to 5.5 V maximum.
      3. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions (see Note 4)

			SN54LV126A		SN74LV126A		UNIT
			MIN	MAX	MIN	MAX	
V_{CC}	Supply voltage		2	5.5	2	5.5	V
V_{IH}	High-level input voltage	$V_{CC} = 2$ V	1.5		1.5		V
		$V_{CC} = 2.3$ V to 2.7 V	$V_{CC} \times 0.7$		$V_{CC} \times 0.7$		
		$V_{CC} = 3$ V to 3.6 V	$V_{CC} \times 0.7$		$V_{CC} \times 0.7$		
		$V_{CC} = 4.5$ V to 5.5 V	$V_{CC} \times 0.7$		$V_{CC} \times 0.7$		
V_{IL}	Low-level input voltage	$V_{CC} = 2$ V		0.5		0.5	V
		$V_{CC} = 2.3$ V to 2.7 V		$V_{CC} \times 0.3$		$V_{CC} \times 0.3$	
		$V_{CC} = 3$ V to 3.6 V		$V_{CC} \times 0.3$		$V_{CC} \times 0.3$	
		$V_{CC} = 4.5$ V to 5.5 V		$V_{CC} \times 0.3$		$V_{CC} \times 0.3$	
V_I	Input voltage		0	5.5	0	5.5	V
V_O	Output voltage	High or low state	0	V_{CC}	0	V_{CC}	V
		3-state	0	5.5	0	5.5	
I_{OH}	High-level output current	$V_{CC} = 2$ V		−50		−50	µA
		$V_{CC} = 2.3$ V to 2.7 V		−2		−2	mA
		$V_{CC} = 3$ V to 3.6 V		−8		−8	
		$V_{CC} = 4.5$ V to 5.5 V		−16		−16	
I_{OL}	Low-level output current	$V_{CC} = 2$ V		50		50	µA
		$V_{CC} = 2.3$ V to 2.7 V		2		2	mA
		$V_{CC} = 3$ V to 3.6 V		8		8	
		$V_{CC} = 4.5$ V to 5.5 V		16		16	
$\Delta t/\Delta v$	Input transition rise or fall rate	$V_{CC} = 2.3$ V to 2.7 V		200		200	ns/V
		$V_{CC} = 3$ V to 3.6 V		100		100	
		$V_{CC} = 4.5$ V to 5.5 V		20		20	
T_A	Operating free-air temperature		−55	125	−40	85	°C

NOTE 4: All unused inputs of the device must be held at V_{CC} or GND to ensure proper device operation. Refer to the TI application report, *Implications of Slow or Floating CMOS Inputs*, literature number SCBA004.

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

PARAMETER		TEST CONDITIONS	V_{CC}	SN54LV126A			SN74LV126A			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
V_{OH}		$I_{OH} = -50$ µA	2 V to 5.5 V	$V_{CC}-0.1$			$V_{CC}-0.1$			V
		$I_{OH} = -2$ mA	2.3 V	2			2			
		$I_{OH} = -8$ mA	3 V	2.48			2.48			
		$I_{OH} = -16$ mA	4.5 V	3.8			3.8			
V_{OL}		$I_{OL} = 50$ µA	2 V to 5.5 V			0.1			0.1	V
		$I_{OL} = 2$ mA	2.3 V			0.4			0.4	
		$I_{OL} = 8$ mA	3 V			0.44			0.44	
		$I_{OL} = 16$ mA	4.5 V			0.55			0.55	
I_I		$V_I = 5.5$ V or GND	0 to 5.5 V			±1			±1	µA
I_{OZ}		$V_O = V_{CC}$ or GND	5.5 V			±5			±5	µA
I_{CC}		$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V			20			20	µA
I_{off}		V_I or $V_O = 0$ to 5.5 V	0			5			5	µA
C_i		$V_I = V_{CC}$ or GND	3.3 V		1.6			1.6		pF

TEXAS INSTRUMENTS

switching characteristics over recommended operating free-air temperature range, V_{CC} = 2.5 V ± 0.2 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			SN54LV126A		SN74LV126A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y			7.1*	13*	1*	15.5*	1	15.5	
t_{en}	OE	Y	C_L = 15 pF		7.4*	13*	1*	15.5*	1	15.5	ns
t_{dis}	OE	Y			5.7*	14.7*	1*	17*	1	17	
t_{pd}	A	Y			9.2	16.5	1	18.5	1	18.5	
t_{en}	OE	Y	C_L = 50 pF		9.5	16.5	1	18.5	1	18.5	ns
t_{dis}	OE	Y			8.1	18.2	1.5	20.5	1	20.5	
$t_{sk(o)}$						2				2	

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

switching characteristics over recommended operating free-air temperature range, V_{CC} = 3.3 V ± 0.3 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			SN54LV126A		SN74LV126A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y			5*	8*	1*	9.5*	1	9.5	
t_{en}	OE	Y	C_L = 15 pF		5.1*	8*	1*	9.5*	1	9.5	ns
t_{dis}	OE	Y			4.4*	9.7*	1*	11.5*	1	11.5	
t_{pd}	A	Y			6.4	11.5	1	13	1	13	
t_{en}	OE	Y	C_L = 50 pF		6.6	11.5	1	13	1	13	ns
t_{dis}	OE	Y			6.1	13.2	1	15	1	15	
$t_{sk(o)}$						1.5				1.5	

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

switching characteristics over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	LOAD CAPACITANCE	T_A = 25°C			SN54LV126A		SN74LV126A		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y			3.5*	5.5*	1*	6.5*	1	6.5	
t_{en}	OE	Y	C_L = 15 pF		3.6*	5.1*	1*	6*	1	6	ns
t_{dis}	OE	Y			3.3*	6.8*	1*	8*	1	8	
t_{pd}	A	Y			4.6	7.5	1	8.5	1	8.5	
t_{en}	OE	Y	C_L = 50 pF		4.6	7.1	1	8	1	8	ns
t_{dis}	OE	Y			4.3	8.8	1	10	1	10	
$t_{sk(o)}$						1				1	

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

TEXAS
INSTRUMENTS

POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

noise characteristics, V_{CC} = 3.3 V, C_L = 50 pF, T_A = 25°C (see Note 5)

PARAMETER		SN74LV126A			UNIT
		MIN	**TYP**	**MAX**	
$V_{OL(P)}$	Quiet output, maximum dynamic V_{OL}		0.3	0.8	V
$V_{OL(V)}$	Quiet output, minimum dynamic V_{OL}		−0.2	−0.8	V
$V_{OH(V)}$	Quiet output, minimum dynamic V_{OH}		3.1		V
$V_{IH(D)}$	High-level dynamic input voltage	2.31			V
$V_{IL(D)}$	Low-level dynamic input voltage			0.97	V

NOTE 5:   Characteristics are for surface-mount packages only.
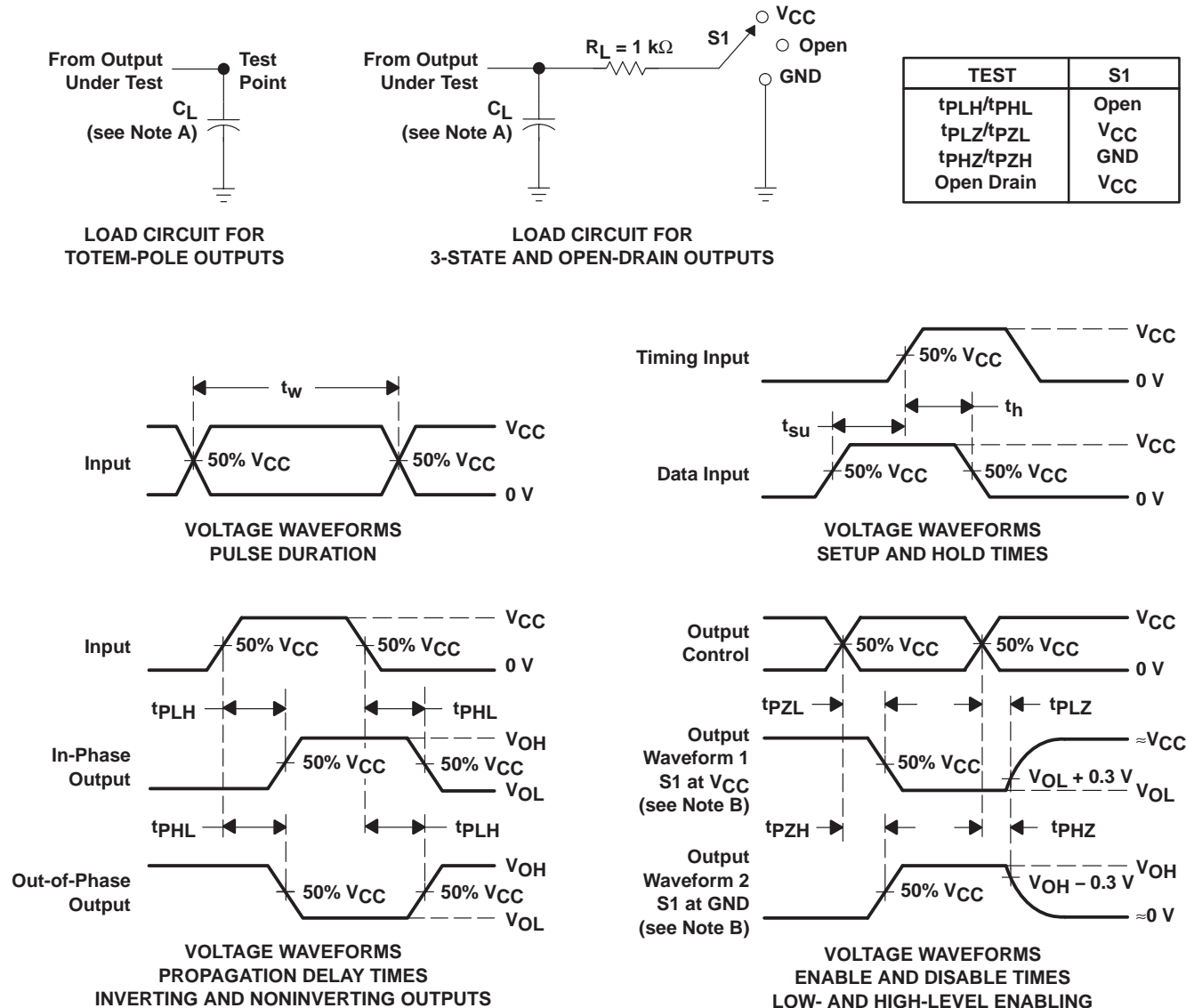
operating characteristics, T_A = 25°C

PARAMETER		TEST CONDITIONS		V_{CC}	TYP	UNIT
C_{pd} Power dissipation capacitance		Outputs enabled	C_L = 50 pF, f = 10 MHz	3.3 V	14.4	pF
				5 V	15.9	

PARAMETER MEASUREMENT INFORMATION

TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{CC}
t_{PHZ}/t_{PZH}	GND
Open Drain	V_{CC}

**LOAD CIRCUIT FOR
TOTEM-POLE OUTPUTS**

**LOAD CIRCUIT FOR
3-STATE AND OPEN-DRAIN OUTPUTS**

**VOLTAGE WAVEFORMS
PULSE DURATION**

**VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES**

**VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
INVERTING AND NONINVERTING OUTPUTS**

**VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES
LOW- AND HIGH-LEVEL ENABLING**

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 ≤ 1 MHz, Z_O = 50 Ω, t_r ≤ 3 ns, t_f ≤ 3 ns.
   D. The outputs are measured one at a time, with one input transition per measurement.
   E. t_{PLZ} and t_{PHZ} are the same as t_{dis}.
   F. t_{PZL} and t_{PZH} are the same as t_{en}.
   G. t_{PHL} and t_{PLH} are the same as t_{pd}.
   H. All parameters and waveforms are not applicable to all devices.

Figure 1. Load Circuit and Voltage Waveforms

![Texas Instruments logo]

PACKAGING INFORMATION

Orderable Device	Status [1]	Package Type	Package Drawing	Pins	Package Qty	Eco Plan [2]	Lead/Ball Finish	MSL Peak Temp [3]
SN74LV126AD	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADBR	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADBRE4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADBRG4	ACTIVE	SSOP	DB	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADE4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADG4	ACTIVE	SOIC	D	14	50	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADGVR	ACTIVE	TVSOP	DGV	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADGVRE4	ACTIVE	TVSOP	DGV	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADGVRG4	ACTIVE	TVSOP	DGV	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADR	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADRE4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ADRG4	ACTIVE	SOIC	D	14	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ANSR	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ANSRE4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126ANSRG4	ACTIVE	SO	NS	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APW	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWE4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWG4	ACTIVE	TSSOP	PW	14	90	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWR	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWRE4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWRG4	ACTIVE	TSSOP	PW	14	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWT	ACTIVE	TSSOP	PW	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWTE4	ACTIVE	TSSOP	PW	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LV126APWTG4	ACTIVE	TSSOP	PW	14	250	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

[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] 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.

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.
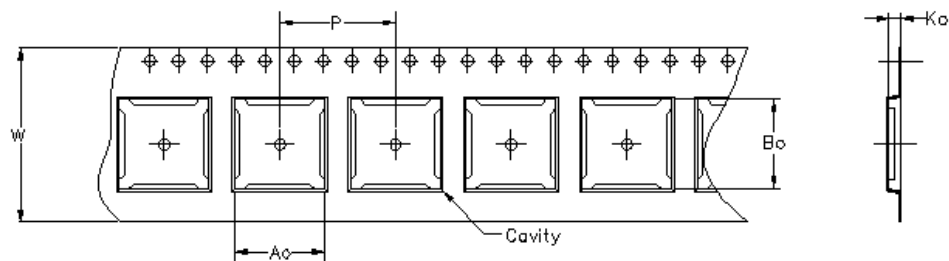
Carrier tape design is defined largely by the component lentgh, width, and thickness.

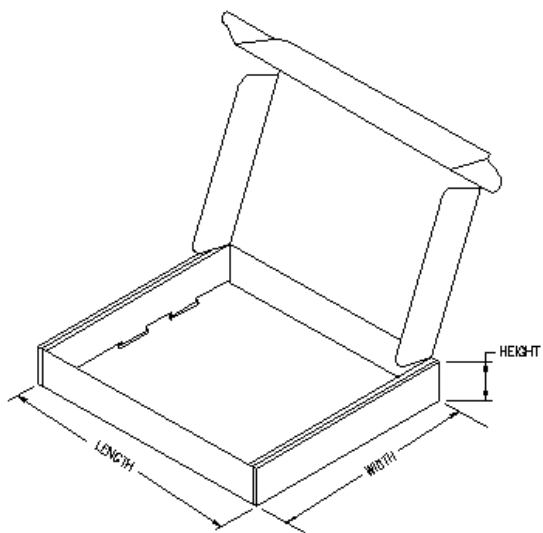| Ao = Dimension designed to accommodate the component width. |
| Bo = Dimension designed to accommodate the component length. |
| Ko = Dimension designed to accommodate the component thickness. |
| W = Overall width of the carrier tape. |
| P = Pitch between successive cavity centers. |

Sprocket Holes

Pocket Quadrants
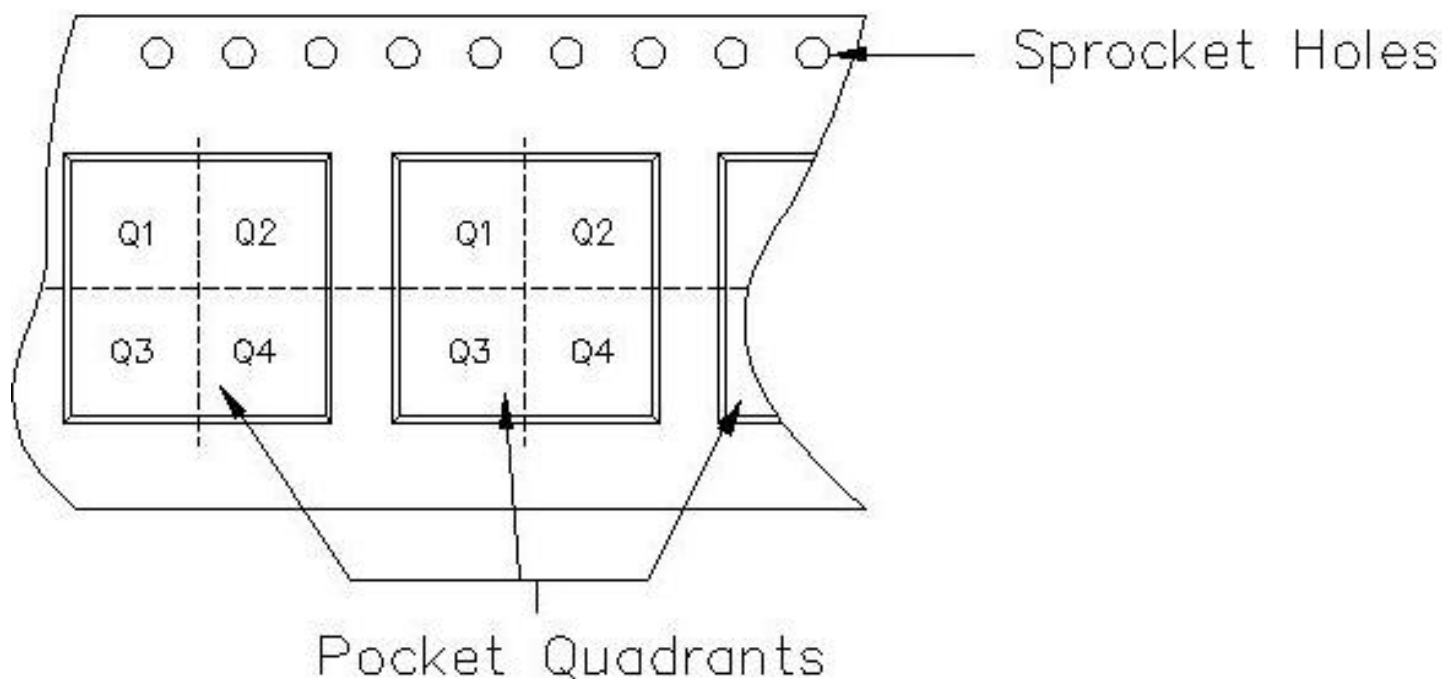
TAPE AND REEL INFORMATION

Device	Package	Pins	Site	Reel Diameter (mm)	Reel Width (mm)	A0 (mm)	B0 (mm)	K0 (mm)	P1 (mm)	W (mm)	Pin1 Quadrant
SN74LV126ADBR	DB	14	MLA	330	16	8.2	6.6	2.5	12	16	Q1
SN74LV126ADGVR	DGV	14	MLA	330	12	6.8	4.0	1.6	8	16	Q1
SN74LV126ADR	D	14	MLA	330	16	6.5	9.0	2.1	8	16	Q1
SN74LV126ANSR	NS	14	MLA	330	16	8.2	10.5	2.5	12	16	Q1
SN74LV126APWR	PW	14	MLA	330	12	7.0	5.6	1.6	8	12	Q1
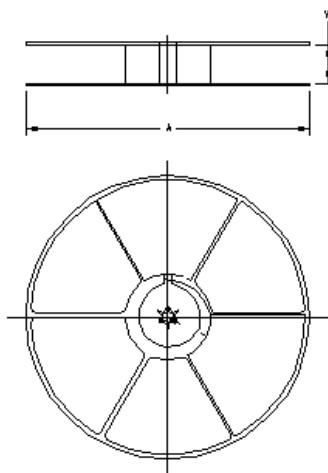
TAPE AND REEL BOX INFORMATION

Device	Package	Pins	Site	Length (mm)	Width (mm)	Height (mm)
SN74LV126ADBR	DB	14	MLA	342.9	336.6	28.58
SN74LV126ADGVR	DGV	14	MLA	338.1	340.5	20.64
SN74LV126ADR	D	14	MLA	342.9	336.6	28.58
SN74LV126ANSR	NS	14	MLA	342.9	336.6	28.58
SN74LV126APWR	PW	14	MLA	338.1	340.5	20.64

DGV (R-PDSO-G)** PLASTIC SMALL-OUTLINE

24 PINS SHOWN
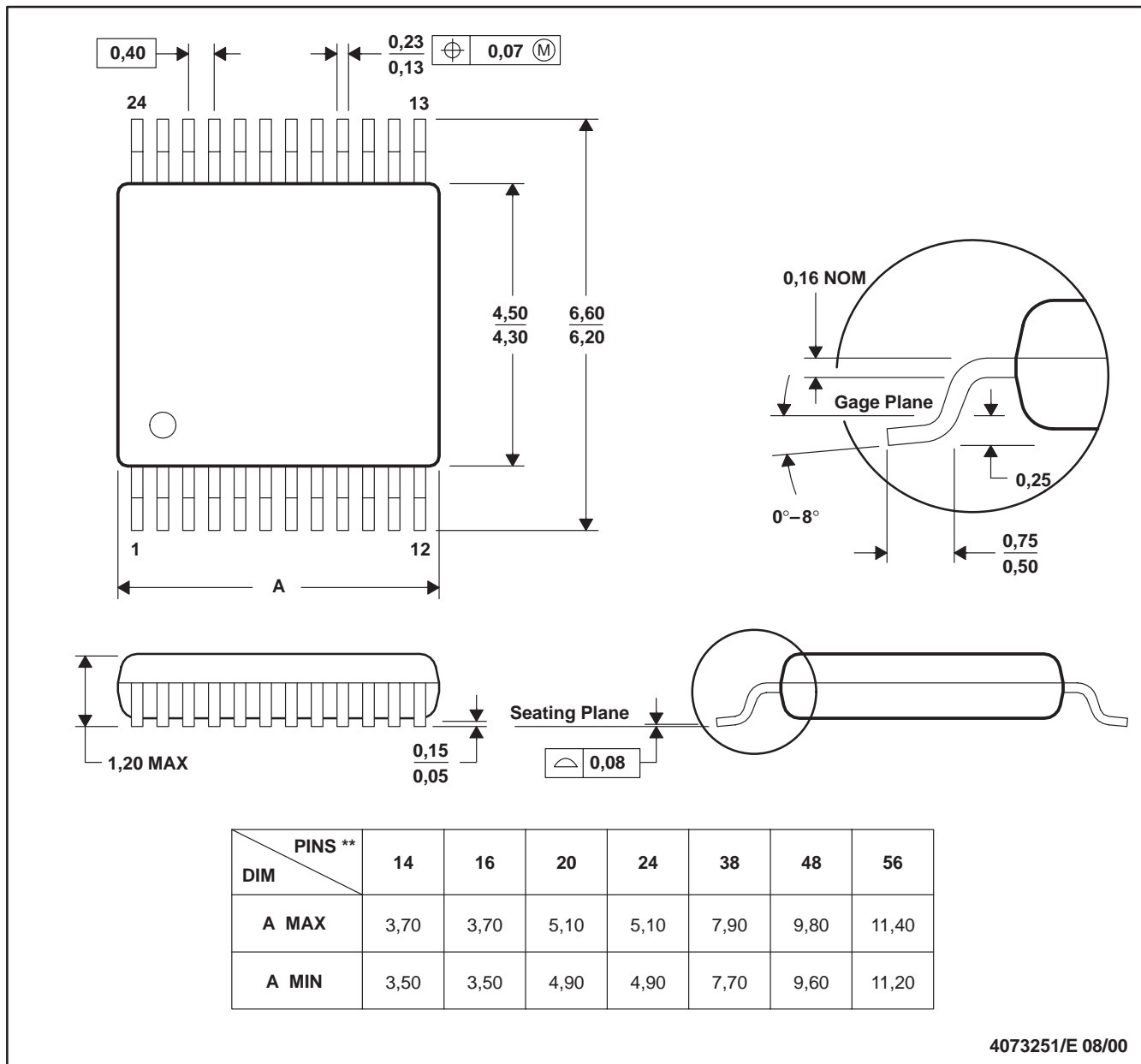
PINS ** DIM	14	16	20	24	38	48	56
A MAX	3,70	3,70	5,10	5,10	7,90	9,80	11,40
A MIN	3,50	3,50	4,90	4,90	7,70	9,60	11,20

4073251/E 08/00
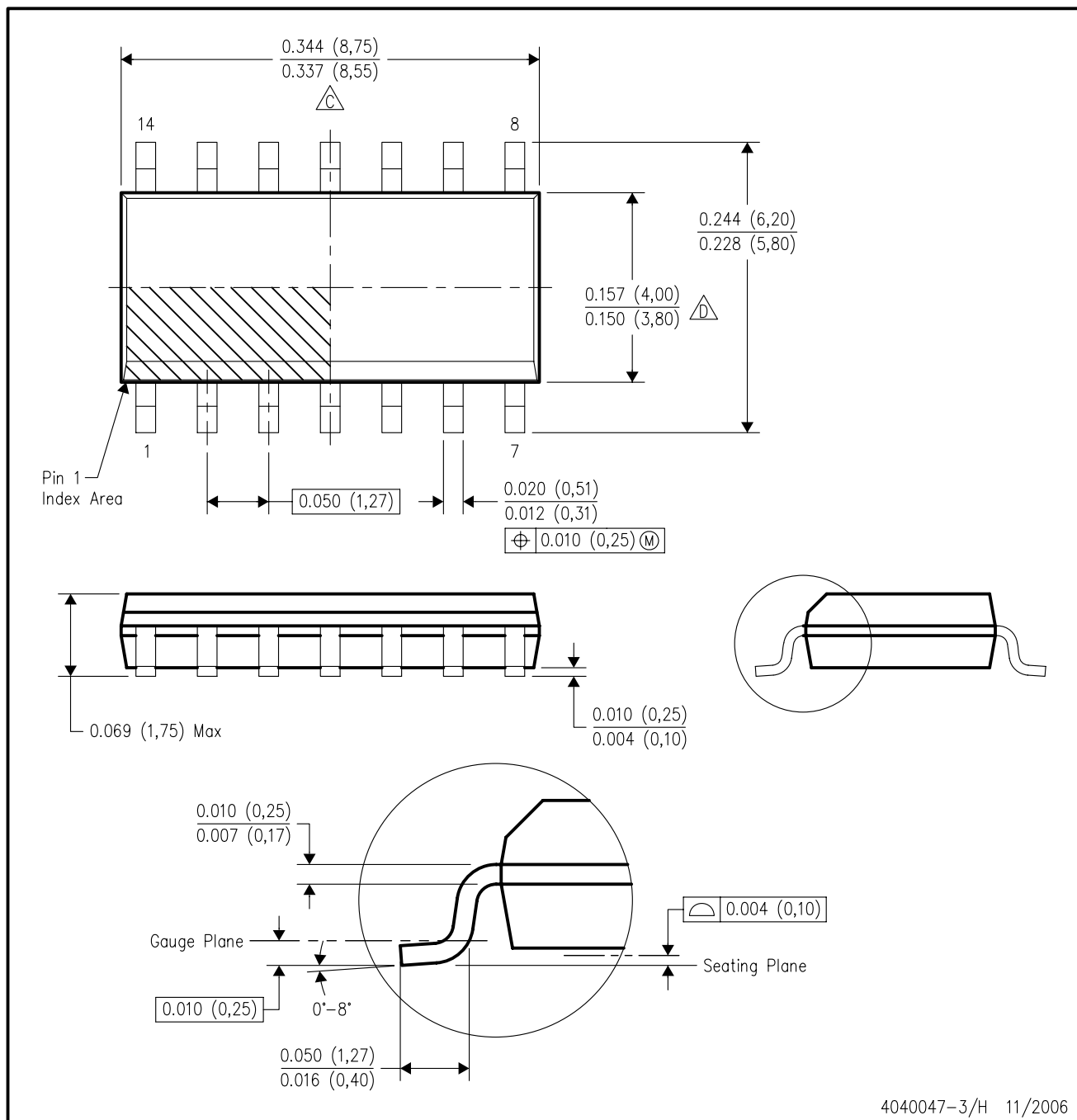
NOTES: A. All linear dimensions are in millimeters.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion, not to exceed 0,15 per side.
D. Falls within JEDEC: 24/48 Pins – MO-153
14/16/20/56 Pins – MO-194

D (R−PDSO−G14)   **PLASTIC SMALL−OUTLINE PACKAGE**

$$\frac{0.344\ (8,75)}{0.337\ (8,55)}$$

⟨C⟩

14   8

$$\frac{0.244\ (6,20)}{0.228\ (5,80)}$$

$$\frac{0.157\ (4,00)}{0.150\ (3,80)}$$ ⟨D⟩

1   7

Pin 1
Index Area

0.050 (1,27)

$$\frac{0.020\ (0,51)}{0.012\ (0,31)}$$

⊕ | 0.010 (0,25) Ⓜ

0.069 (1,75) Max

$$\frac{0.010\ (0,25)}{0.004\ (0,10)}$$

$$\frac{0.010\ (0,25)}{0.007\ (0,17)}$$

Gauge Plane

⌒ | 0.004 (0,10)

Seating Plane

0.010 (0,25)   0°−8°

$$\frac{0.050\ (1,27)}{0.016\ (0,40)}$$

4040047−3/H   11/2006

NOTES: A.   All linear dimensions are in inches (millimeters).
          B.   This drawing is subject to change without notice.
      ⟨C⟩ Body length does not include mold flash, protrusions, or gate burrs. Mold flash, protrusions, or gate burrs shall not exceed .006 (0,15) per end.
      ⟨D⟩ Body width does not include interlead flash. Interlead flash shall not exceed .017 (0,43) per side.
         E.   Reference JEDEC MS−012 variation AB.

TEXAS INSTRUMENTS
www.ti.com

MECHANICAL DATA

14-PINS SHOWN

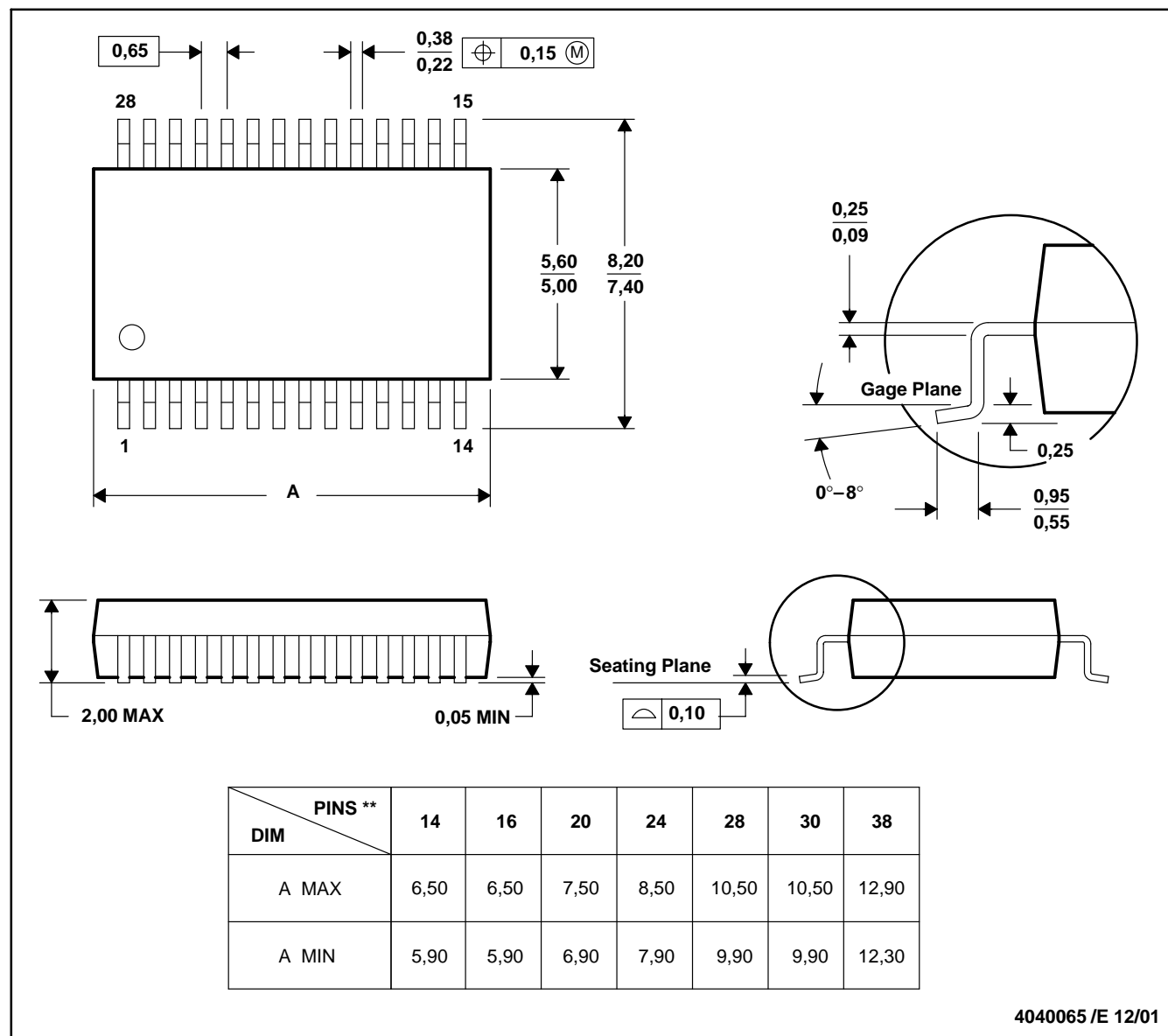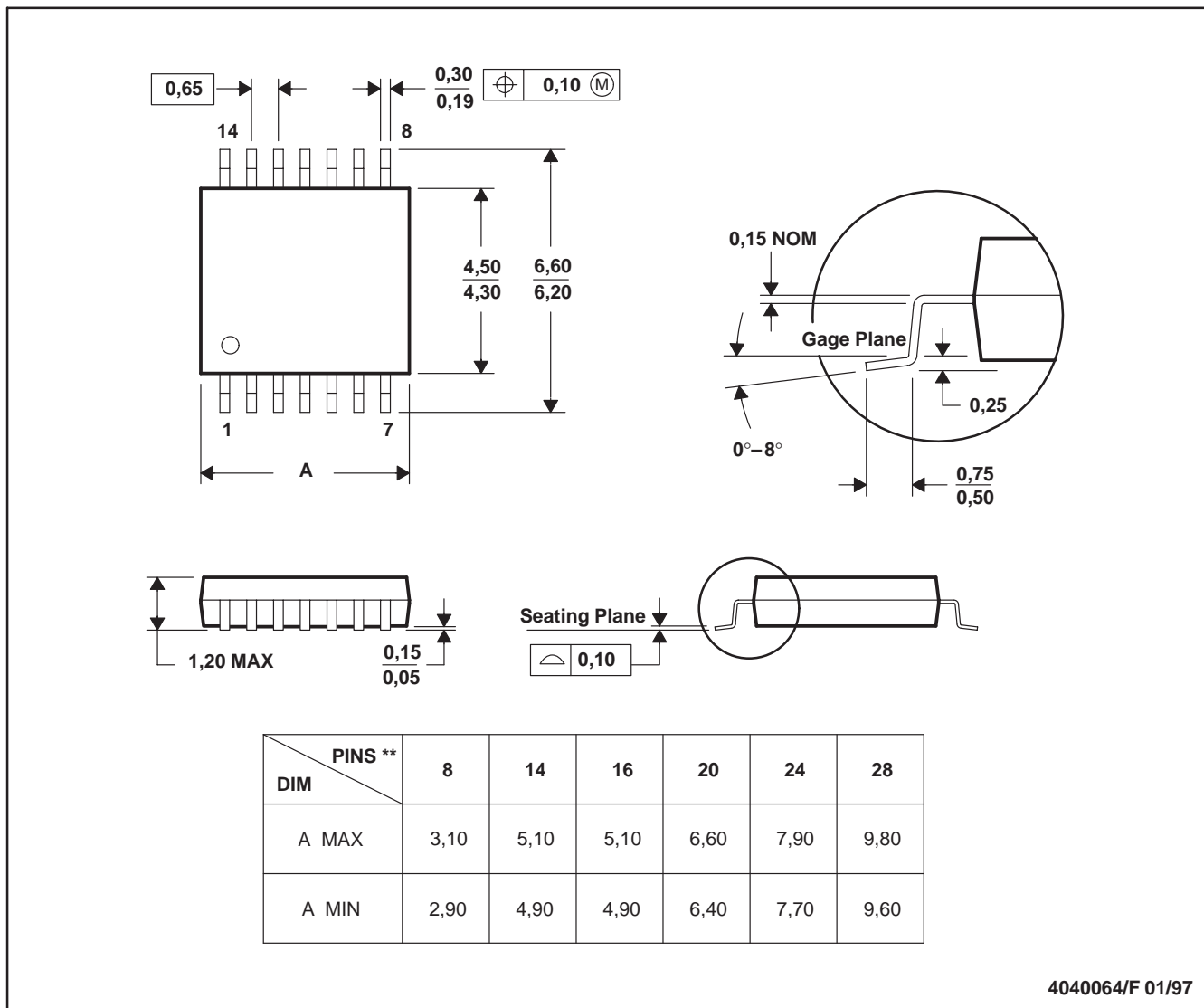| DIM	PINS **	14	16	20	24
A MAX		10,50	10,50	12,90	15,30
A MIN		9,90	9,90	12,30	14,70

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.

MECHANICAL DATA

DB (R-PDSO-G**)   **PLASTIC SMALL-OUTLINE**

28 PINS SHOWN

DIM \ PINS **	14	16	20	24	28	30	38
A MAX	6,50	6,50	7,50	8,50	10,50	10,50	12,90
A MIN	5,90	5,90	6,90	7,90	9,90	9,90	12,30

4040065 /E 12/01

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.
        D. Falls within JEDEC MO-150

TEXAS
INSTRUMENTS
POST OFFICE BOX 655303 ● DALLAS, TEXAS 75265

PW (R-PDSO-G)**   **PLASTIC SMALL-OUTLINE PACKAGE**

14 PINS SHOWN

PINS ** DIM	8	14	16	20	24	28
A MAX	3,10	5,10	5,10	6,60	7,90	9,80
A MIN	2,90	4,90	4,90	6,40	7,70	9,60

4040064/F 01/97

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.
        D. Falls within JEDEC MO-153

TEXAS INSTRUMENTS

POST OFFICE BOX 655303 ● DALLAS, TEXAS 75265

IMPORTANT NOTICE

Texas Instruments Incorporated and its subsidiaries (TI) reserve the right to make corrections, modifications, enhancements, improvements, and other changes to its products and services at any time and to discontinue any product or service without notice. Customers should obtain the latest relevant information before placing orders and should verify that such information is current and complete. All products are sold subject to TI's terms and conditions of sale supplied at the time of order acknowledgment.

TI warrants performance of its hardware products to the specifications applicable at the time of sale in accordance with TI's standard warranty. Testing and other quality control techniques are used to the extent TI deems necessary to support this warranty. Except where mandated by government requirements, testing of all parameters of each product is not necessarily performed.

TI assumes no liability for applications assistance or customer product design. Customers are responsible for their products and applications using TI components. To minimize the risks associated with customer products and applications, customers should provide adequate design and operating safeguards.

TI does not warrant or represent that any license, either express or implied, is granted under any TI patent right, copyright, mask work right, or other TI intellectual property right relating to any combination, machine, or process in which TI products or services are used. Information published by TI regarding third-party products or services does not constitute a license from TI to use such products or services or a warranty or endorsement thereof. Use of such information may require a license from a third party under the patents or other intellectual property of the third party, or a license from TI under the patents or other intellectual property of TI.

Reproduction of TI information in TI data books or data sheets is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices. Reproduction of this information with alteration is an unfair and deceptive business practice. TI is not responsible or liable for such altered documentation. Information of third parties may be subject to additional restrictions.

Resale of TI products or services with statements different from or beyond the parameters stated by TI for that product or service voids all express and any implied warranties for the associated TI product or service and is an unfair and deceptive business practice. TI is not responsible or liable for any such statements.

TI products are not authorized for use in safety-critical applications (such as life support) where a failure of the TI product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use. Buyers represent that they have all necessary expertise in the safety and regulatory ramifications of their applications, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of TI products in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by TI. Further, Buyers must fully indemnify TI and its representatives against any damages arising out of the use of TI products in such safety-critical applications.

TI products are neither designed nor intended for use in military/aerospace applications or environments unless the TI products are specifically designated by TI as military-grade or "enhanced plastic." Only products designated by TI as military-grade meet military specifications. Buyers acknowledge and agree that any such use of TI products which TI has not designated as military-grade is solely at the Buyer's risk, and that they are solely responsible for compliance with all legal and regulatory requirements in connection with such use.

TI products are neither designed nor intended for use in automotive applications or environments unless the specific TI products are designated by TI as compliant with ISO/TS 16949 requirements. Buyers acknowledge and agree that, if they use any non-designated products in automotive applications, TI will not be responsible for any failure to meet such requirements.

Following are URLs where you can obtain information on other Texas Instruments products and application solutions:

Products		Applications	
Amplifiers	amplifier.ti.com	Audio	www.ti.com/audio
Data Converters	dataconverter.ti.com	Automotive	www.ti.com/automotive
DSP	dsp.ti.com	Broadband	www.ti.com/broadband
Interface	interface.ti.com	Digital Control	www.ti.com/digitalcontrol
Logic	logic.ti.com	Military	www.ti.com/military
Power Mgmt	power.ti.com	Optical Networking	www.ti.com/opticalnetwork
Microcontrollers	microcontroller.ti.com	Security	www.ti.com/security
RFID	www.ti-rfid.com	Telephony	www.ti.com/telephony
Low Power Wireless	www.ti.com/lpw	Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless