![Texas Instruments logo] **TEXAS INSTRUMENTS**
www.ti.com

16-BIT BUFFER/DRIVER
WITH 3-STATE OUTPUTS

SCAS250O−JANUARY 1993−REVISED OCTOBER 2005

FEATURES

- **Member of the Texas Instruments Widebus™ Family**
- **Operates From 1.65 V to 3.6 V**
- **Max t_{pd} of 3 ns at 3.3 V**
- **±24-mA Output Drive at 3.3 V**
- **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)**
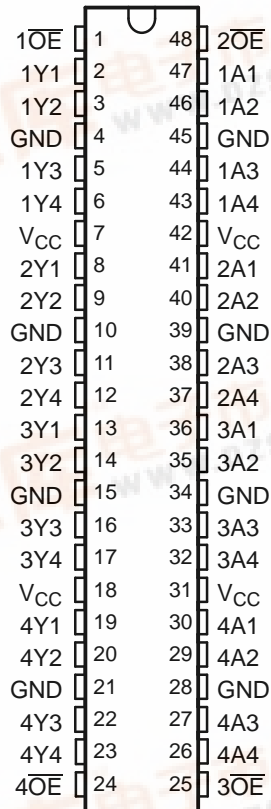
DESCRIPTION/ORDERING INFORMATION

This 16-bit buffer/driver is designed for 1.65-V to 3.6-V V_{CC} operation.

The SN74ALVC16244A is designed specifically to improve the performance and density of 3-state memory-address drivers, clock drivers, and bus-oriented receivers and transmitters.

The device can be used as four 4-bit buffers, two 8-bit buffers, or one 16-bit buffer. It provides true outputs and symmetrical active-low output-enable ($\overline{OE}$) inputs.

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.

DGG OR DL PACKAGE
(TOP VIEW)

1$\overline{OE}$	1	48	2$\overline{OE}$
1Y1	2	47	1A1
1Y2	3	46	1A2
GND	4	45	GND
1Y3	5	44	1A3
1Y4	6	43	1A4
V_{CC}	7	42	V_{CC}
2Y1	8	41	2A1
2Y2	9	40	2A2
GND	10	39	GND
2Y3	11	38	2A3
2Y4	12	37	2A4
3Y1	13	36	3A1
3Y2	14	35	3A2
GND	15	34	GND
3Y3	16	33	3A3
3Y4	17	32	3A4
V_{CC}	18	31	V_{CC}
4Y1	19	30	4A1
4Y2	20	29	4A2
GND	21	28	GND
4Y3	22	27	4A3
4Y4	23	26	4A4
4$\overline{OE}$	24	25	3$\overline{OE}$

ORDERING INFORMATION

T_A	PACKAGE(1)		ORDERABLE PART NUMBER	TOP-SIDE MARKING
−40°C to 85°C	FBGA – GRD	Tape and reel	SN74ALVC16244AGRDR	VC244A
	FBGA – ZRD (Pb-free)		SN74ALVC16244AZRDR	
	SSOP – DL	Tube	SN74ALVC16244ADL	ALVC16244A
		Tape and reel	SN74ALVC16244ADLR	
	TSSOP – DGG	Tape and reel	SN74ALVC16244ADGGR	ALVC16244A
			SN74ALVC16244ADGGRE4	
	VFBGA – GQL	Tape and reel	SN74ALVC16244AGQLR	VC244A
	VFBGA – ZQL (Pb-free)		SN74ALVC16244AZQLR	

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

Copyright © 1993–2005, Texas Instruments Incorporated

TEXAS INSTRUMENTS
www.ti.com

GQL OR ZQL PACKAGE
(TOP VIEW)
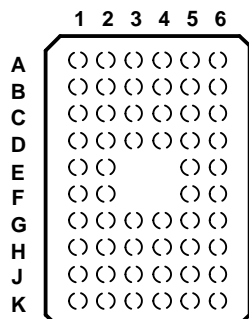
TERMINAL ASSIGNMENTS[1]
(56-Ball GQL/ZQL Package)

	1	2	3	4	5	6
A	1$\overline{OE}$	NC	NC	NC	NC	2$\overline{OE}$
B	1Y2	1Y1	GND	GND	1A1	1A2
C	1Y4	1Y3	V$_{CC}$	V$_{CC}$	1A3	1A4
D	2Y2	2Y1	GND	GND	2A1	2A2
E	2Y4	2Y3			2A3	2A4
F	3Y1	3Y2			3A2	3A1
G	3Y3	3Y4	GND	GND	3A4	3A3
H	4Y1	4Y2	V$_{CC}$	V$_{CC}$	4A2	4A1
J	4Y3	4Y4	GND	GND	4A4	4A3
K	4$\overline{OE}$	NC	NC	NC	NC	3$\overline{OE}$

(1)   NC – No internal connection

GRD OR ZRD PACKAGE
(TOP VIEW)
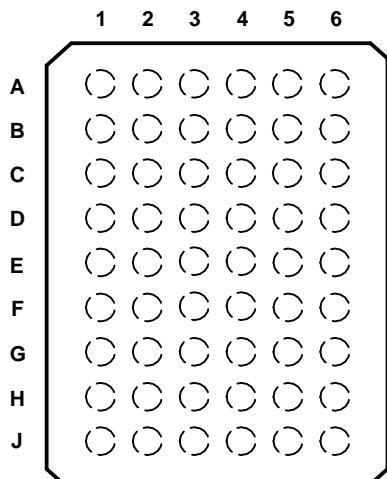
TERMINAL ASSIGNMENTS[1]
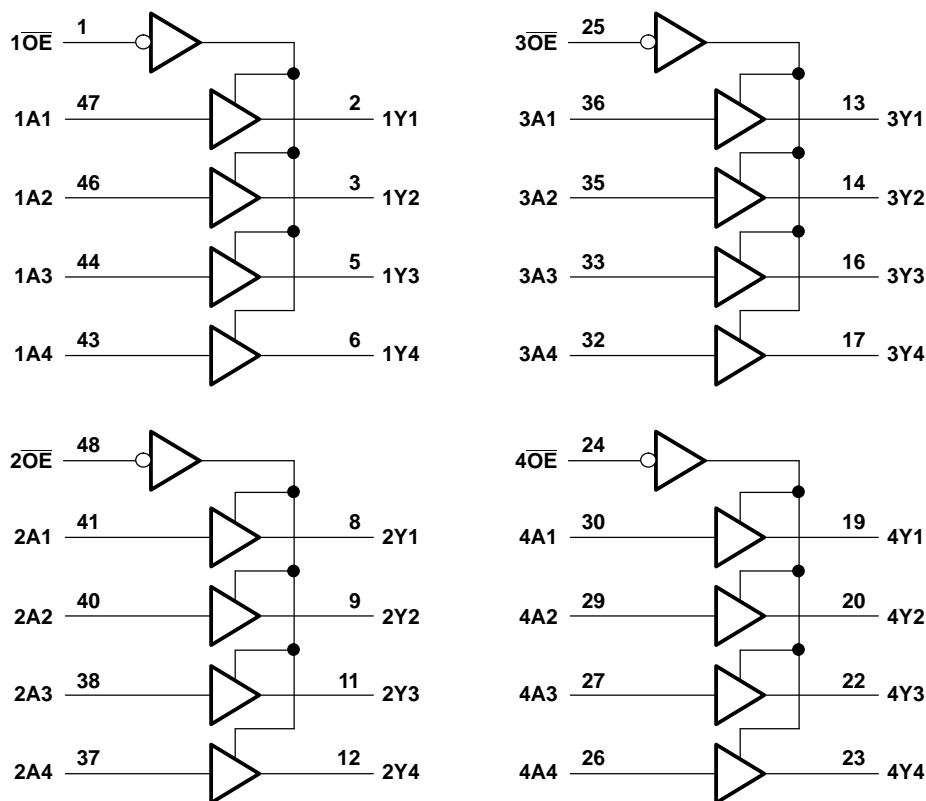### (54-Ball GRD/ZRD Package)

	1	2	3	4	5	6
A	1Y1	NC	1$\overline{OE}$	2$\overline{OE}$	NC	1A1
B	1Y3	1Y2	NC	NC	1A2	1A3
C	2Y1	1Y4	V$_{CC}$	V$_{CC}$	1A4	2A1
D	2Y3	2Y2	GND	GND	2A2	2A3
E	3Y1	2Y4	GND	GND	2A4	3A1
F	3Y3	3Y2	GND	GND	3A2	3A3
G	4Y1	3Y4	V$_{CC}$	V$_{CC}$	3A4	4A1
H	4Y3	4Y2	NC	NC	4A2	4A3
J	4Y4	NC	4$\overline{OE}$	3$\overline{OE}$	NC	4A4

(1)   NC – No internal connection

FUNCTION TABLE
(EACH 4-BIT BUFFER)

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

LOGIC DIAGRAM (POSITIVE LOGIC)

1$\overline{\text{OE}}$	1
1A1	47		2	1Y1
1A2	46		3	1Y2
1A3	44		5	1Y3
1A4	43		6	1Y4

3$\overline{\text{OE}}$	25
3A1	36		13	3Y1
3A2	35		14	3Y2
3A3	33		16	3Y3
3A4	32		17	3Y4

2$\overline{\text{OE}}$	48
2A1	41		8	2Y1
2A2	40		9	2Y2
2A3	38		11	2Y3
2A4	37		12	2Y4

4$\overline{\text{OE}}$	24
4A1	30		19	4Y1
4A2	29		20	4Y2
4A3	27		22	4Y3
4A4	26		23	4Y4

Pin numbers shown are for the DGG and DL packages.

Absolute Maximum Ratings[1]

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

			MIN	MAX	UNIT
V_{CC}	Supply voltage range		−0.5	4.6	V
V_I	Input voltage range[2]	Control Inputs[3]	−0.5	V_{CC} + 0.5	V
		Data Inputs	-0.5	4.6	
V_O	Output voltage range[2][3]		−0.5	V_{CC} + 0.5	V
I_{IK}	Input clamp current	V_I < 0		−50	mA
I_{OK}	Output clamp current	V_O < 0		−50	mA
I_O	Continuous output current			±50	mA
	Continuous current through each V_{CC} or GND			±100	mA
θ_{JA}	Package thermal impedance[4]	DGG package		70	°C/W
		DL package		63	
		GQL/ZQL package		42	
		GRD/ZRD package		36	
T_{stg}	Storage temperature range		−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 negative-voltage and output voltage ratings may be exceeded if the input and output current ratings are observed.
(3) This value is limited to 4.6 V maximum.
(4) The package thermal impedance is calculated in accordance with JESD 51-7.

SN74ALVC16244A
16-BIT BUFFER/DRIVER
WITH 3-STATE OUTPUTS

TEXAS INSTRUMENTS
www.ti.com

Recommended Operating Conditions[1]

			MIN	MAX	UNIT
V_{CC}	Supply voltage		1.65	3.6	V
V_{IH}	High-level input voltage	V_{CC} = 1.65 V to 1.95 V	$0.65 \times V_{CC}$		V
		V_{CC} = 2.3 V to 2.7 V	1.7		
		V_{CC} = 2.7 V to 3.6 V	2		
V_{IL}	Low-level input voltage	V_{CC} = 1.65 V to 1.95 V		$0.35 \times V_{CC}$	V
		V_{CC} = 2.3 V to 2.7 V		0.7	
		V_{CC} = 2.7 V to 3.6 V		0.8	
V_I	Input voltage	Control Inputs	0	V_{CC}	V
		Data Inputs	0	3.6	
V_O	Output voltage		0	V_{CC}	V
I_{OH}	High-level output current	V_{CC} = 1.65 V		−4	mA
		V_{CC} = 2.3 V		−12	
		V_{CC} = 2.7 V		−12	
		V_{CC} = 3 V		−24	
I_{OL}	Low-level output current	V_{CC} = 1.65 V		4	mA
		V_{CC} = 2.3 V		12	
		V_{CC} = 2.7 V		12	
		V_{CC} = 3 V		24	
$\Delta t/\Delta v$	Input transition rise or fall rate			10	ns/V
T_A	Operating free-air temperature		−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.

Electrical Characteristics

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

PARAMETER		TEST CONDITIONS	V_{CC}	MIN	TYP[1]	MAX	UNIT
V_{OH}		I_{OH} = −100 µA	1.65 V to 3.6 V	V_{CC} − 0.2			V
		I_{OH} = −4 mA	1.65 V	1.2			
		I_{OH} = −6 mA	2.3 V	2			
		I_{OH} = −12 mA	2.3 V	1.7			
			2.7 V	2.2			
			3 V	2.4			
		I_{OH} = −24 mA	3 V	2			
V_{OL}		I_{OL} = 100 µA	1.65 V to 3.6 V			0.2	V
		I_{OL} = 4 mA	1.65 V			0.45	
		I_{OL} = 6 mA	2.3 V			0.4	
		I_{OL} = 12 mA	2.3 V			0.7	
			2.7 V			0.4	
		I_{OL} = 24 mA	3 V			0.55	
I_I		V_I = V_{CC} or GND	3.6 V			±5	µA
I_{OZ}		V_O = V_{CC} or GND	3.6 V			±10	µA
I_{CC}		V_I = V_{CC} or GND, I_O = 0	3.6 V			40	µA
ΔI_{CC}		One input at V_{CC} − 0.6 V, Other inputs at V_{CC} or GND	3 V to 3.6 V			750	µA
C_i	Control inputs	V_I = V_{CC} or GND	3.3 V		3		pF
	Data inputs				6		

(1) All typical values are at V_{CC} = 3.3 V, T_A = 25°C.

TEXAS INSTRUMENTS
www.ti.com

SN74ALVC16244A
16-BIT BUFFER/DRIVER
WITH 3-STATE OUTPUTS
SCAS250O−JANUARY 1993−REVISED OCTOBER 2005

Electrical Characteristics (continued)

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

PARAMETER		TEST CONDITIONS	V_{CC}	MIN TYP[1] MAX	UNIT
C_o	Outputs	$V_O = V_{CC}$ or GND	3.3 V	7	pF

Switching Characteristics

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

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 1.8 V	V_{CC} = 2.5 V ± 0.2 V		V_{CC} = 2.7 V		V_{CC} = 3.3 V ± 0.3 V		UNIT
			TYP	MIN	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A	Y	(1)	1	3.7		3.6	1	3	ns
t_{en}	$\overline{OE}$	Y	(1)	1	5.7		5.4	1	4.4	ns
t_{dis}	$\overline{OE}$	Y	(1)	1	5.2		4.6	1	4.1	ns

(1) This information was not available at the time of publication.

Operating Characteristics

$T_A = 25°C$

PARAMETER		TEST CONDITIONS	V_{CC} = 1.8 V	V_{CC} = 2.5 V	V_{CC} = 3.3 V	UNIT
			TYP	TYP	TYP	
C_{pd} Power dissipation capacitance	Outputs enabled	C_L = 50 pF, f = 10 MHz	(1)	16	19	pF
	Outputs disabled		(1)	4	5	

(1) This information was not available at the time of publication.

SN74ALVC16244A
16-BIT BUFFER/DRIVER
WITH 3-STATE OUTPUTS
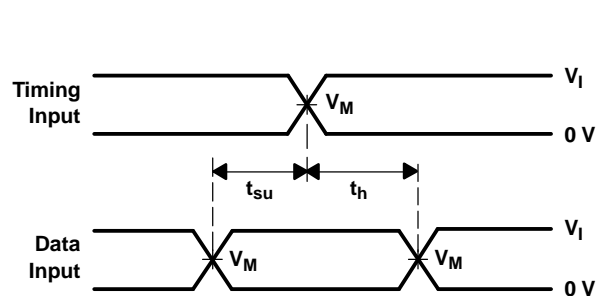SCAS250O−JANUARY 1993−REVISED OCTOBER 2005

TEXAS INSTRUMENTS
www.ti.com

PARAMETER MEASUREMENT INFORMATION
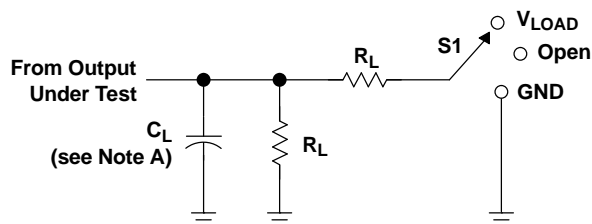
LOAD CIRCUIT

TEST	S1
t_{pd}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

V_{CC}	INPUT		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_I	t_r/t_f					
1.8 V	V_{CC}	≤2 ns	V_{CC}/2	2 × V_{CC}	30 pF	1 kΩ	0.15 V
2.5 V ± 0.2 V	V_{CC}	≤2 ns	V_{CC}/2	2 × V_{CC}	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 ± 0.3 V	2.7 V	≤2.5 ns	1.5 V	6 V	50 pF	500 Ω	0.3 V

VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES

VOLTAGE WAVEFORMS
PULSE DURATION
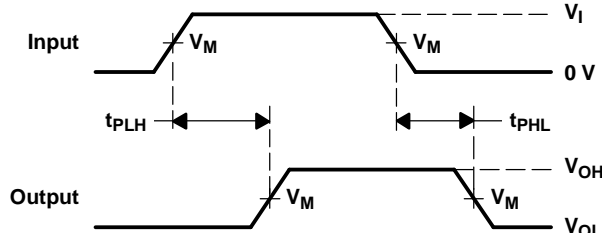
VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES
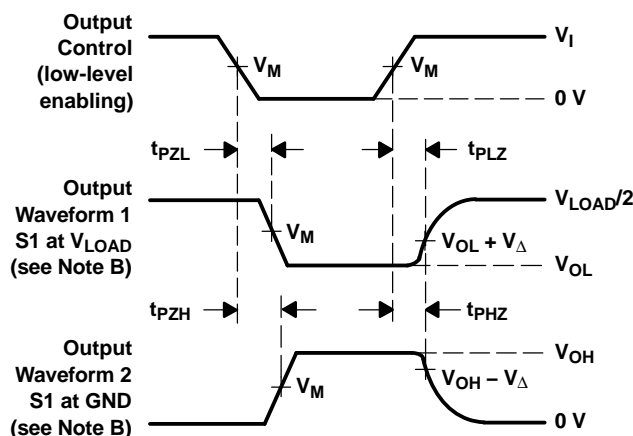
VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES

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 ≤ 10 MHz, Z_O = 50 Ω.
      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_{PZL} and t_{PZH} are the same as t_{en}.
      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

PACKAGING INFORMATION

Orderable Device	Status (1)	Package Type	Package Drawing	Pins	Package Qty	Eco Plan (2)	Lead/Ball Finish	MSL Peak Temp (3)
74ALVC16244ADGGRE4	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
74ALVC16244ADLRG4	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ALVC16244ADGGR	ACTIVE	TSSOP	DGG	48	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ALVC16244ADL	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ALVC16244ADLG4	ACTIVE	SSOP	DL	48	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ALVC16244ADLR	ACTIVE	SSOP	DL	48	1000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74ALVC16244AGQLR	ACTIVE	BGA MICROSTAR JUNIOR	GQL	56	1000	TBD	SNPB	Level-1-240C-UNLIM
SN74ALVC16244AGRDR	ACTIVE	BGA MICROSTAR JUNIOR	GRD	54	1000	TBD	SNPB	Level-1-240C-UNLIM
SN74ALVC16244AZQLR	ACTIVE	BGA MICROSTAR JUNIOR	ZQL	56	1000	Green (RoHS & no Sb/Br)	SNAGCU	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.
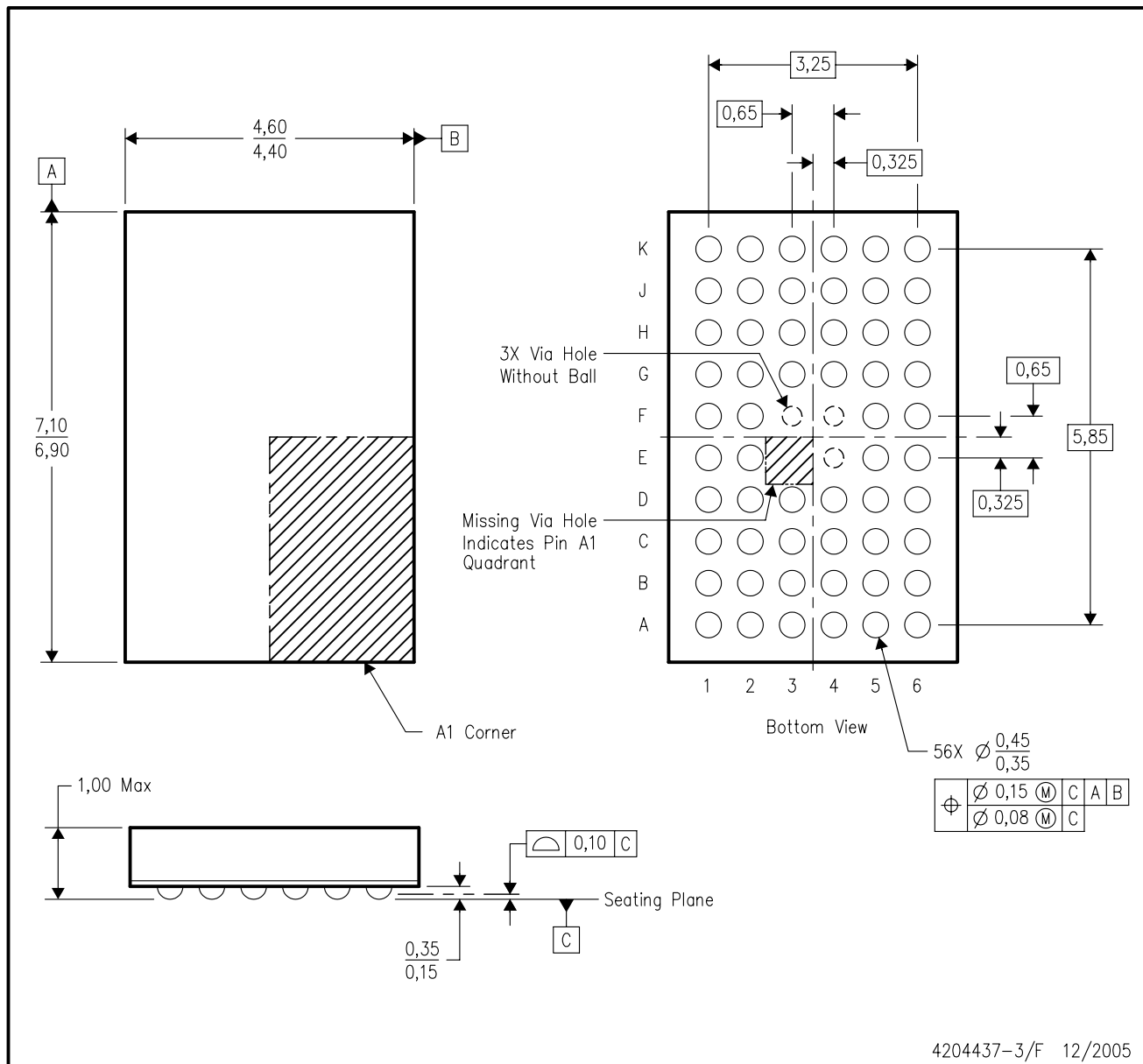
ZQL (R−PBGA−N56) PLASTIC BALL GRID ARRAY

4,60
4,40

A

7,10
6,90

B

A1 Corner

1,00 Max

0,10 C

Seating Plane

0,35
0,15

C

3,25

0,65

0,325

K
J
H
G
F
E
D
C
B
A

1 2 3 4 5 6

3X Via Hole
Without Ball

Missing Via Hole
Indicates Pin A1
Quadrant

Bottom View

0,65

0,325

5,85

56X Ø 0,45
        0,35

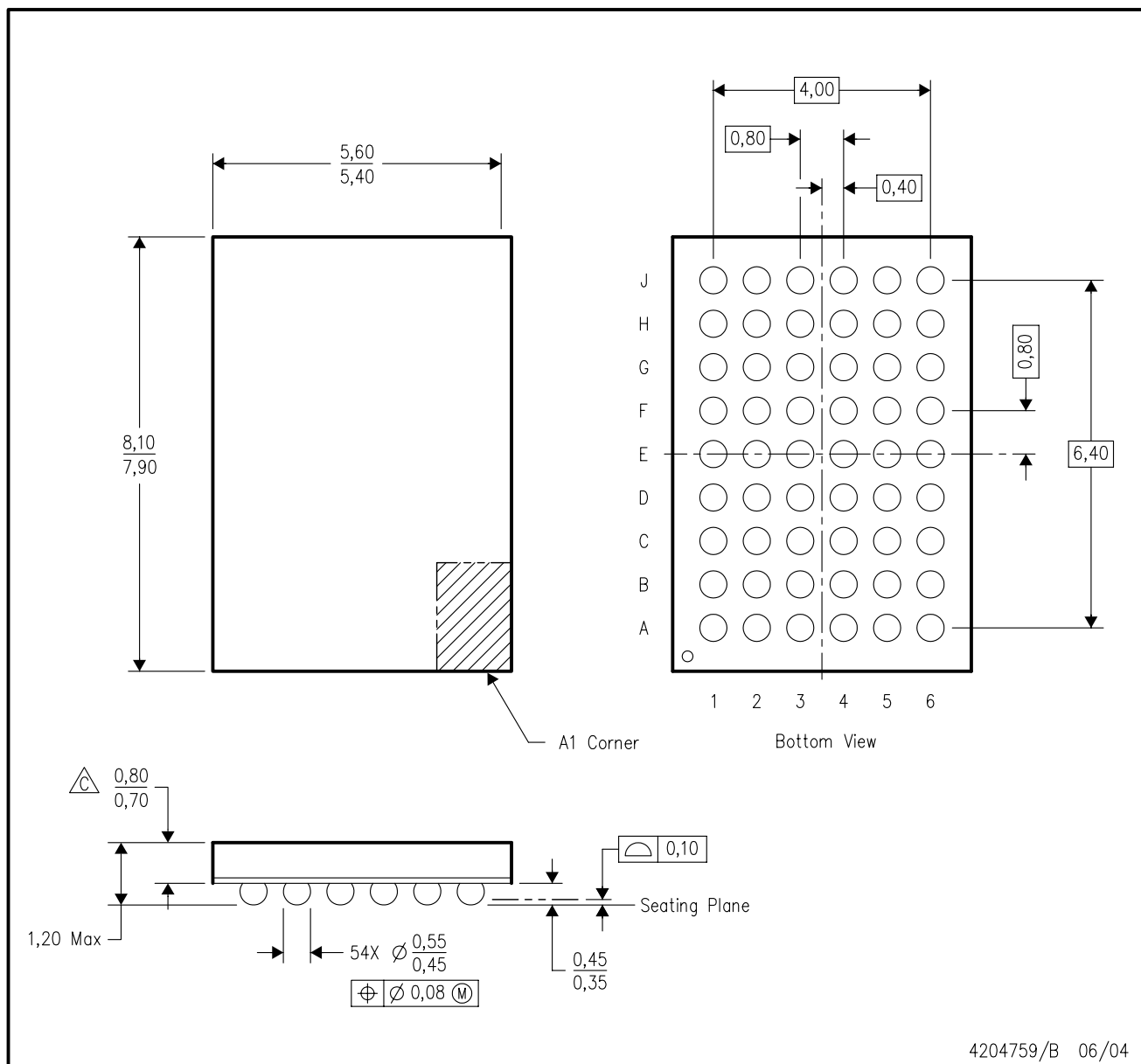⊕ Ø 0,15 Ⓜ C A B
   Ø 0,08 Ⓜ C

4204437−3/F   12/2005

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.
         C.   Falls within JEDEC MO−225 variation BA.
         D.   This package is lead−free.   Refer to the 56 GQL package (drawing 4200583) for tin−lead (SnPb).

GRD (R−PBGA−N54)   PLASTIC BALL GRID ARRAY

5,60
5,40

8,10
7,90

A1 Corner

4,00

0,80

0,40

J
H
G
F
E
D
C
B
A

1 2 3 4 5 6

Bottom View

0,80

6,40

△C 0,80
     0,70

0,10

Seating Plane

1,20 Max

54X Ø 0,55
        0,45

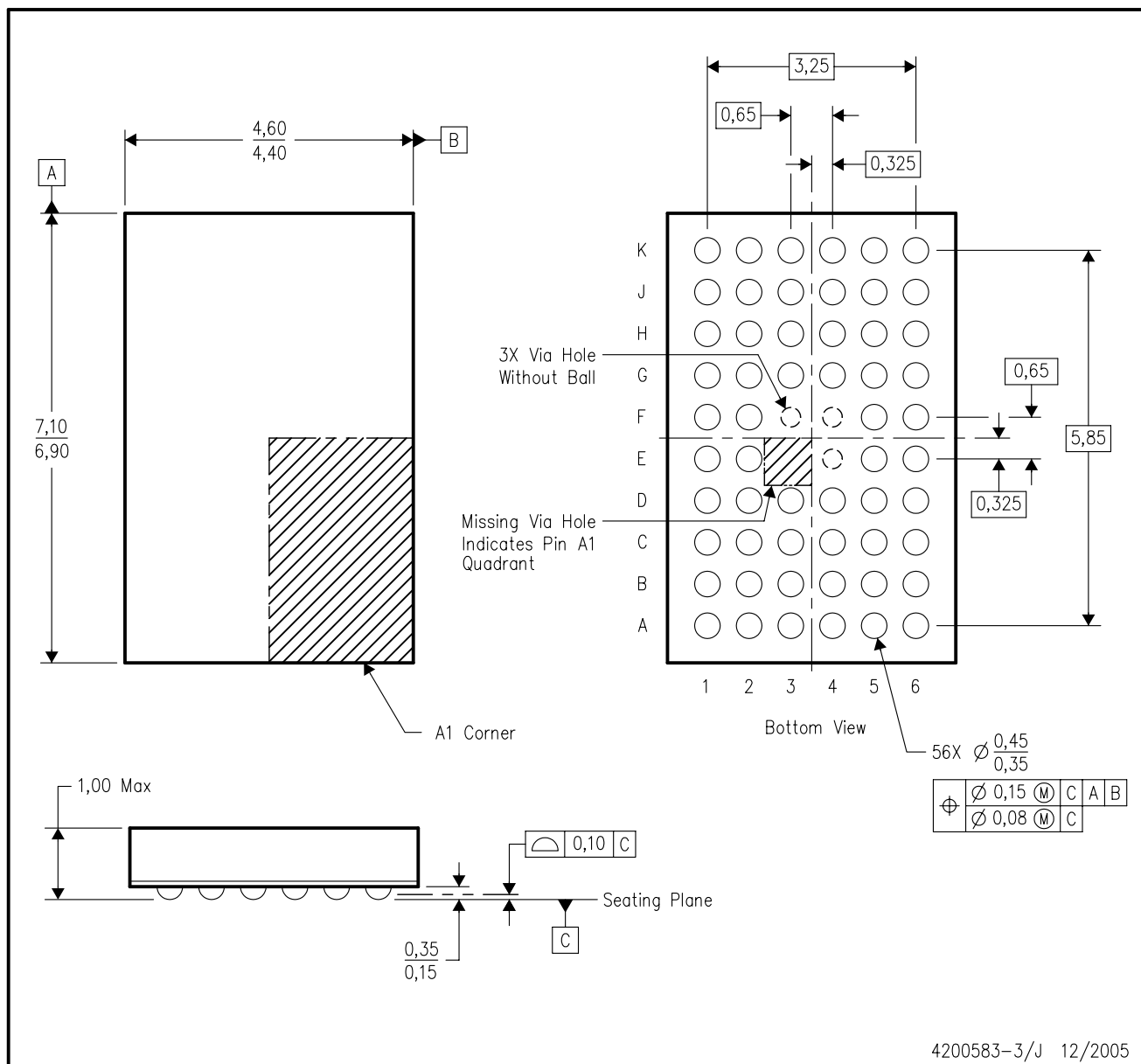0,45
0,35

⊕ Ø 0,08 Ⓜ

4204759/B 06/04

NOTES: A.   All linear dimensions are in millimeters.
          B.   This drawing is subject to change without notice.
         △C   Falls within JEDEC MO−205 variation DD.
          D.   This package is tin−lead (SnPb). Refer to the 54 ZRD package (drawing 4204760) for lead−free.

GQL (R−PBGA−N56)   PLASTIC BALL GRID ARRAY

3,25

4,60 / 4,40   B

0,65

0,325

A

7,10 / 6,90

K
J
H

3X Via Hole
Without Ball

G

F

0,65

E

5,85

D

0,325

Missing Via Hole
Indicates Pin A1
Quadrant

C

B

A

1   2   3   4   5   6

Bottom View

A1 Corner

56X Ø 0,45 / 0,35

⌖ Ø 0,15 Ⓜ C A B
Ø 0,08 Ⓜ C

1,00 Max

⌒ 0,10 C

Seating Plane

0,35 / 0,15

C

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.
         C.   Falls within JEDEC MO−225 variation BA.
         D.   This package is tin−lead (SnPb). Refer to the 56 ZQL package (drawing 4204437) for lead−free.
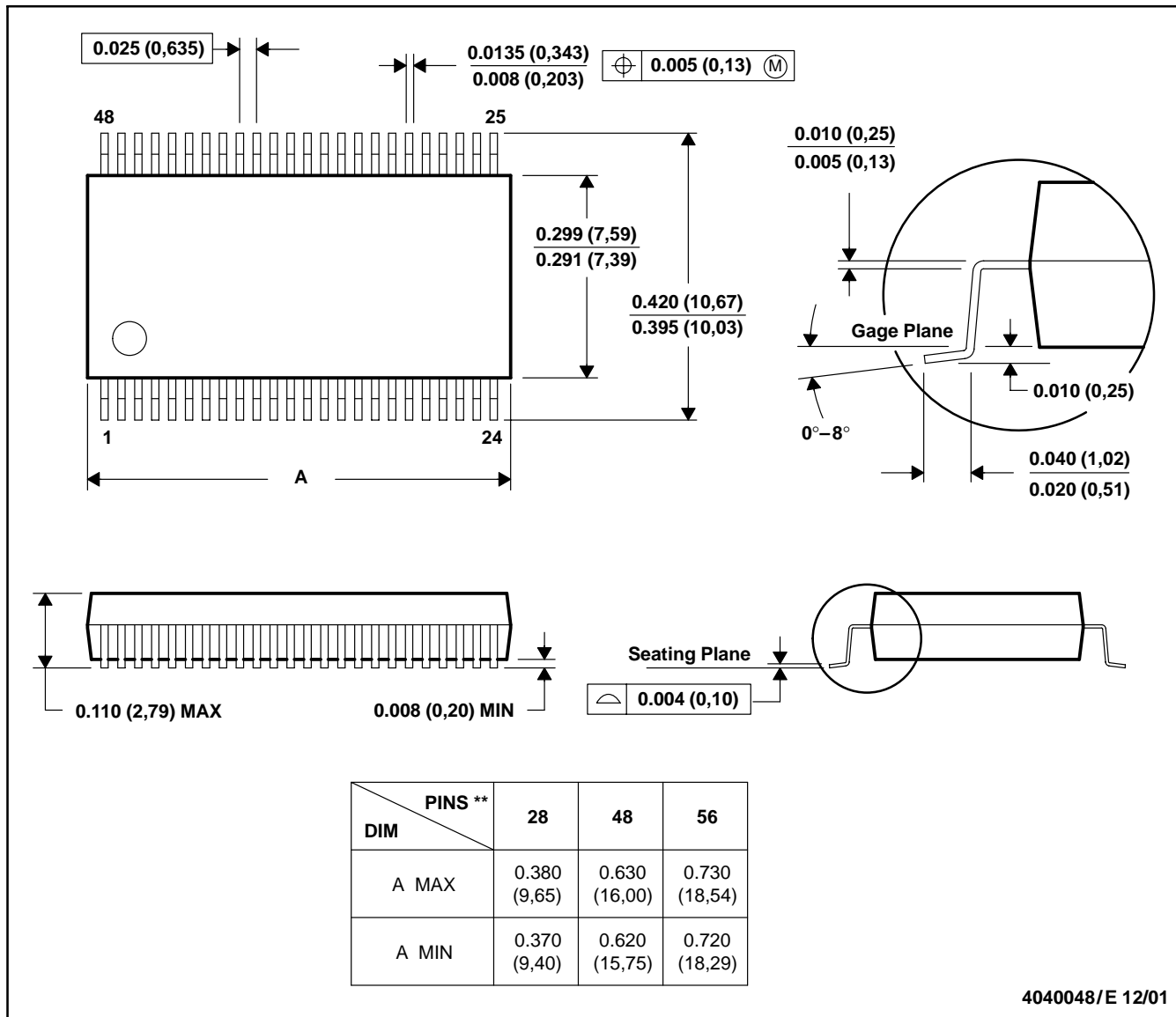
TEXAS
INSTRUMENTS
www.ti.com

DL (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

48 PINS SHOWN

0.025 (0,635)

0.0135 (0,343) / 0.008 (0,203)

⌖ 0.005 (0,13) Ⓜ

48   25

0.299 (7,59) / 0.291 (7,39)

0.420 (10,67) / 0.395 (10,03)

0.010 (0,25) / 0.005 (0,13)

Gage Plane

0.010 (0,25)

0°–8°

0.040 (1,02) / 0.020 (0,51)

1   24

A

0.110 (2,79) MAX   0.008 (0,20) MIN

Seating Plane

⌒ 0.004 (0,10)

PINS ** / DIM	28	48	56
A MAX	0.380 (9,65)	0.630 (16,00)	0.730 (18,54)
A MIN	0.370 (9,40)	0.620 (15,75)	0.720 (18,29)

4040048/E 12/01

NOTES: A. All linear dimensions are in inches (millimeters).
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).
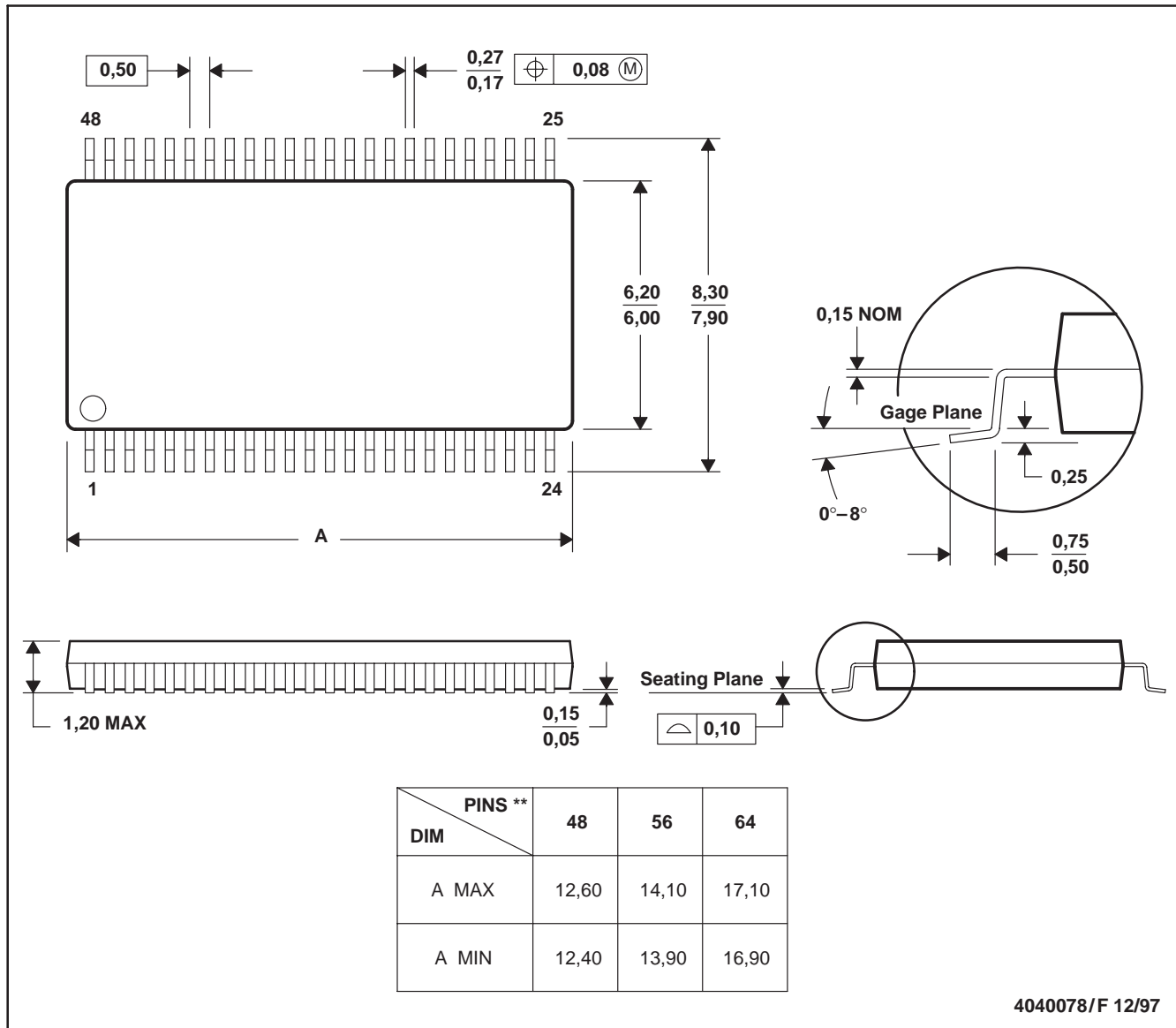D. Falls within JEDEC MO-118

TEXAS INSTRUMENTS

MECHANICAL DATA

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

48 PINS SHOWN

PINS **	48	56	64
DIM			
A MAX	12,60	14,10	17,10
A MIN	12,40	13,90	16,90

4040078 / F 12/97

NOTES: A. All linear dimensions are in millimeters.
   B. This drawing is subject to change without notice.
   C. Body dimensions do not include mold protrusion not to exceed 0,15.
   D. Falls within JEDEC MO-153

TEXAS INSTRUMENTS

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 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.

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.

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
Low Power Wireless	www.ti.com/lpw	Telephony	www.ti.com/telephony
		Video & Imaging	www.ti.com/video
		Wireless	www.ti.com/wireless

Mailing Address: Texas Instruments
                     Post Office Box 655303 Dallas, Texas 75265

Copyright © 2006, Texas Instruments Incorporated