

- Member of the Texas Instruments *Widebus*™ Family
- State-of-the-Art *EPIC-II B*™ BiCMOS Design Significantly Reduces Power Dissipation
- Typical V_{OLP} (Output Ground Bounce) < 1 V at $V_{CC} = 5$ V, $T_A = 25^\circ\text{C}$
- Distributed V_{CC} and GND Pin Configuration Minimizes High-Speed Switching Noise
- Flow-Through Architecture Optimizes PCB Layout
- High-Drive Outputs (–32-mA I_{OH} , 64-mA I_{OL})
- Packaged in Plastic 300-mil Shrink Small-Outline (SSOP) Packages

description

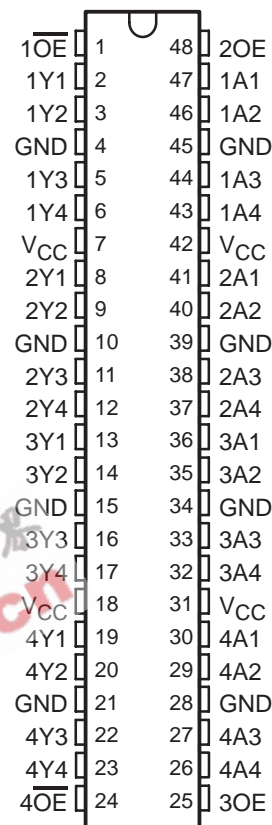
The SN74ABT16241 is a 16-bit buffer and line driver designed specifically to improve both the performance and density of 3-state memory address drivers, clock drivers, and bus-oriented receivers and transmitters. The device can be used as four 4-bit buffers, two 8-bit buffers, or one 16-bit buffer. This device provides true outputs and complementary output-enable (OE and \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. 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.

The SN74ABT16241 is available in TI's shrink small-outline package (DL), which provides twice the I/O pin count and functionality of standard small-outline packages in the same printed-circuit-board area.

The SN74ABT16241 is characterized for operation from –40°C to 85°C.

DL PACKAGE
(TOP VIEW)



FUNCTION TABLE

INPUTS		OUTPUTS 1Y, 4Y	INPUTS		OUTPUTS 2Y, 3Y
$\overline{1OE}, \overline{4OE}$	1A, 4A		2OE, 3OE	2A, 3A	
L	H	H	H	H	H
L	L	L	H	L	L
H	X	Z	L	X	Z

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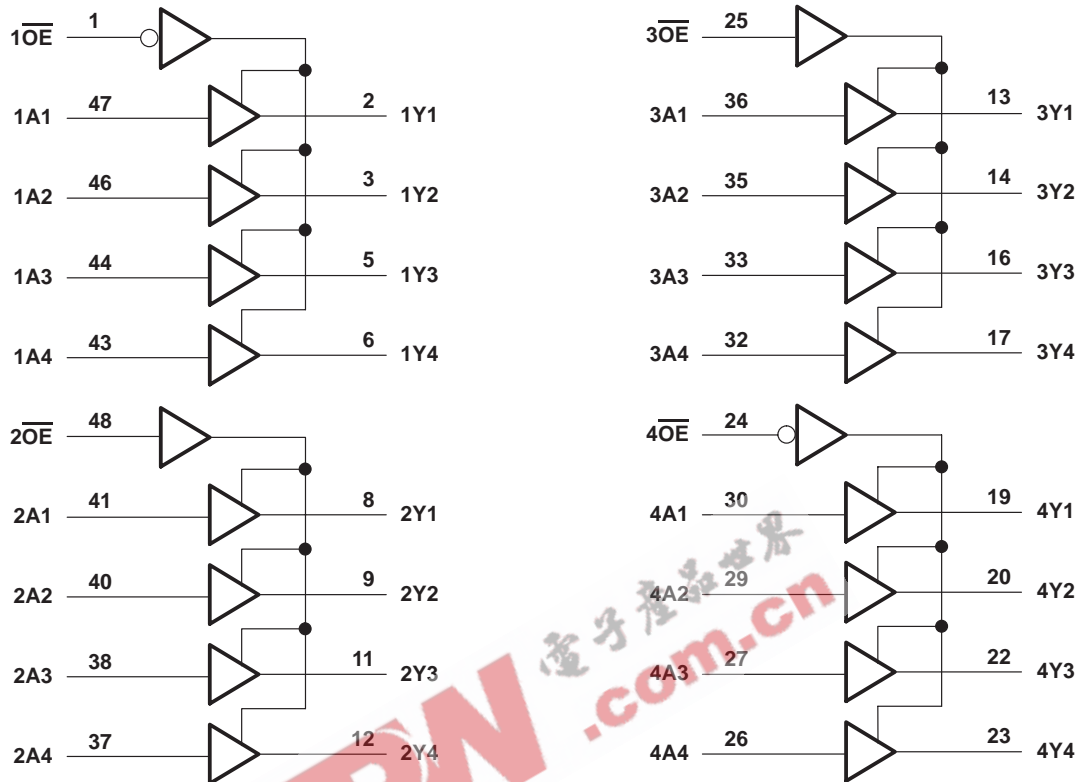
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SN74ABT16241
16-BIT BUFFER/DRIVER
WITH 3-STATE OUTPUTS

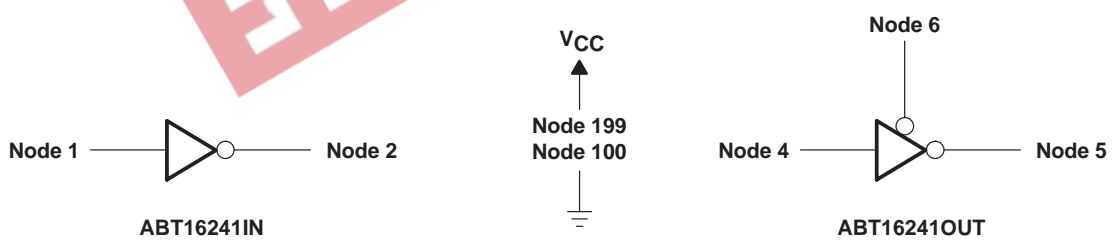
SCBS347 – MAY 1994

SPICE I/O MODEL

logic diagram (positive logic)



SPICE block diagram



SPICE FUNCTION TABLE

NODE		OPERATION	NODE			OPERATION
1	2		4	5	6	
L	H	Input	L	H	L	Output
H	L	Input	H	L	L	Output
X	X		X	Z	H	Hi-Z

SPICE netlist

```

* ABT16241 SPICE I/O MODEL SUBCIRCUIT
* ADVANCED BUS INTERFACE
* ADVANCED SYSTEM LOGIC, TEXAS INSTRUMENTS
*
* SUBCIRCUITS: ABT16241IN, ABT16241OUT
*
* PACKAGE PARASITICS
* .LIB 'PKGS.LIB' SSOP48
*
* PROCESS MODELS
* .LIB 'EPIC2B.LIB' NOMINAL_L13
* .LIB 'EPIC2B.LIB' STRONG_L13
* .LIB 'EPIC2B.LIB' WEAK_L13
*
* ABT16241 INPUT SUBCIRCUIT
* NODES:
*
* INPUT NODE
* INTERNAL OUTPUT NODE
* VCC GND
*
* .SUBCKT ABT16241IN
* 1 2 199 100
* X_PKGIN 1 1001 SSOP48_47
* X_PKGVCC 199 1199 SSOP48_07
* X_PKGGND 100 1100 SSOP48_04
* XABT16241IN 1001 2 1199 1100 ABT16241__IN
* .ENDS ABT16241IN
*
* ABT16241 OUTPUT SUBCIRCUIT
* NODES:
*
* INTERNAL INPUT NODE
* OUTPUT NODE
* INTERNAL OE NODE
* VCC GND
*
* .SUBCKT ABT16241OUT
* 4 5 6 199 100
* X_PKGOUT 5 1005 SSOP48_02
* X_PKGVCC 199 1199 SSOP48_07
* X_PKGGND 100 1100 SSOP48_04
* XABT16241OUT 4 1005 6 1199 1100 ABT16241__OUT
* .ENDS ABT16241OUT
*
* .SUBCKT ABT16241__IN
* 501 502 599 500
* XP1 502 504 506 599 PM WP=200U LP=0.8U
* XP2 509 502 599 599 PM WP=20U LP=0.8U
* XP3 506 509 599 599 PM WP=85U LP=0.8U
* XP4 508 500 599 599 PM WP=50U LP=0.8U
* XN1 502 504 500 500 NM WN=220U LN=0.8U
* XN2 509 502 500 500 NM WN=20U LN=0.8U
* XN4 599 500 508 500 NM WN=20U LN=0.8U
* QA 599 508 507 Q2_NPN 10
* QB 599 507 506 Q5_NPN 60
* Q_ESD1 501 500 500 Q7_NPN 200
* Q_ESD 504 505 500 Q5_NPN 46
* XR1 506 507 507 507 RMOS WR=4U RES=6K
* RESD1 501 504 50 50
* RESD2 505 500 1K
* CBP 501 500 0.3P
* CL 502 500 0.2P
* .ENDS ABT16241__IN
*
* .SUBCKT ABT16241__OUT
* 601 602 603 699 600
* XP1 605 603 699 699 PM WP=200U LP=0.8U
* XP4 601 603 621 699 PM WP=40U LP=0.8U
* XP5 613 601 605 699 PM WP=30U LP=0.8U
* XP10 618 603 699 699 PM WP=50U LP=0.8U
* XP11 607 612 605 699 PM WP=60U LP=0.8U
* XN1 607 601 608 600 NM WN=100U LN=0.8U

```

SN74ABT16241
16-BIT BUFFER/DRIVER
WITH 3-STATE OUTPUTS

SPICE I/O MODEL

SCBS347 - MAY 1994

SPICE netlist (continued)

```

XN2      606  619  607  600  NM      WN=50U      LN=0.8U
XN3      608  609  600  600  NM      WN=25U      LN=0.8U
XN4      608  603  600  600  NM      WN=80U      LN=0.8U
XN6      613  603  600  600  NM      WN=25U      LN=0.8U
XN7      602  621  600  600  NM      WN=100U     LN=0.8U
XN8      621  603  600  600  NM      WN=10U      LN=0.8U
XN9      601  622  621  600  NM      WN=20U      LN=0.8U
XN10     619  619  620  600  NM      WN=25U      LN=0.8U
XN11     620  604  602  600  NM      WN=25U      LN=0.8U
XN12     613  601  600  600  NM      WN=40U      LN=0.8U
QM1      616  615  602      Q9_NPN      200
QM2      602  608  600      Q1I_NPN     600
QM3      614  613  615      Q4_NPN      15
QD4      614  614  616      Q2_NPN      8
QDR1     615  615  613      Q2_NPN      8
D1       613  614      D1_GDS      156
D2       699  617      D9_GSD      4700
XR1      606  605  605  605  RMOS     WR=6U      RES=1K
XR2      607  606  606  606  RMOS     WR=4U      RES=3K
XR3      614  605  605  605  RMOS     WR=6U      RES=1K
R4       616  617      10
XR10     619  618  618  618  RMOS     WR=3U      RES=20K
XPVREF   670  603  699  699  PM       WP=50U     LP=0.8U
XNVREF   671  671  600  600  NM      WN=30U     LN=0.8U
XRVREF1  604  670  670  670  RMOS     WR=3U      RES=20K
XRVREF2  671  604  604  604  RMOS     WR=3U      RES=1.5K
XNCLAMP  673  612  674  600  NM      WN=250U    LN=0.8U
DCLAMP1  608  673      D6_GSD      800
DCLAMP2  674  602      D6_GSD      800
XPNOR1   675  609  699  699  PM       WP=30U     LP=0.8U
XPNOR2   612  611  675  699  PM       WP=30U     LP=0.8U
XNNOR1   612  611  600  600  NM      WN=6U      LN=0.8U
XNNOR2   612  609  600  600  NM      WN=6U      LN=0.8U
XP_INV1  609  601  699  699  PM       WP=20U     LP=0.8U
XN_INV1  609  601  600  600  NM      WN=10U     LN=0.8U
XP_INV2  622  603  699  699  PM       WP=15U     LP=0.8U
XN_INV2  622  603  600  600  NM      WN=5U      LN=0.8U
XP_INV3  610  603  699  699  PM       WP=4U      LP=0.8U
XN_INV3  610  603  600  600  NM      WN=4U      LN=0.8U
XP_INV4  611  610  699  699  PM       WP=4U      LP=0.8U
XN_INV4  611  610  600  600  NM      WN=4U      LN=0.8U
CBP      602  600      0.3P
.ENDS ABT16241__OUT
*

```

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74ABT16241DGGR	OBSOLETE	TSSOP	DGG	48		TBD	Call TI	Call TI
SN74ABT16241DL	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI
SN74ABT16241DLR	OBSOLETE	SSOP	DL	48		TBD	Call TI	Call TI

⁽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) 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.

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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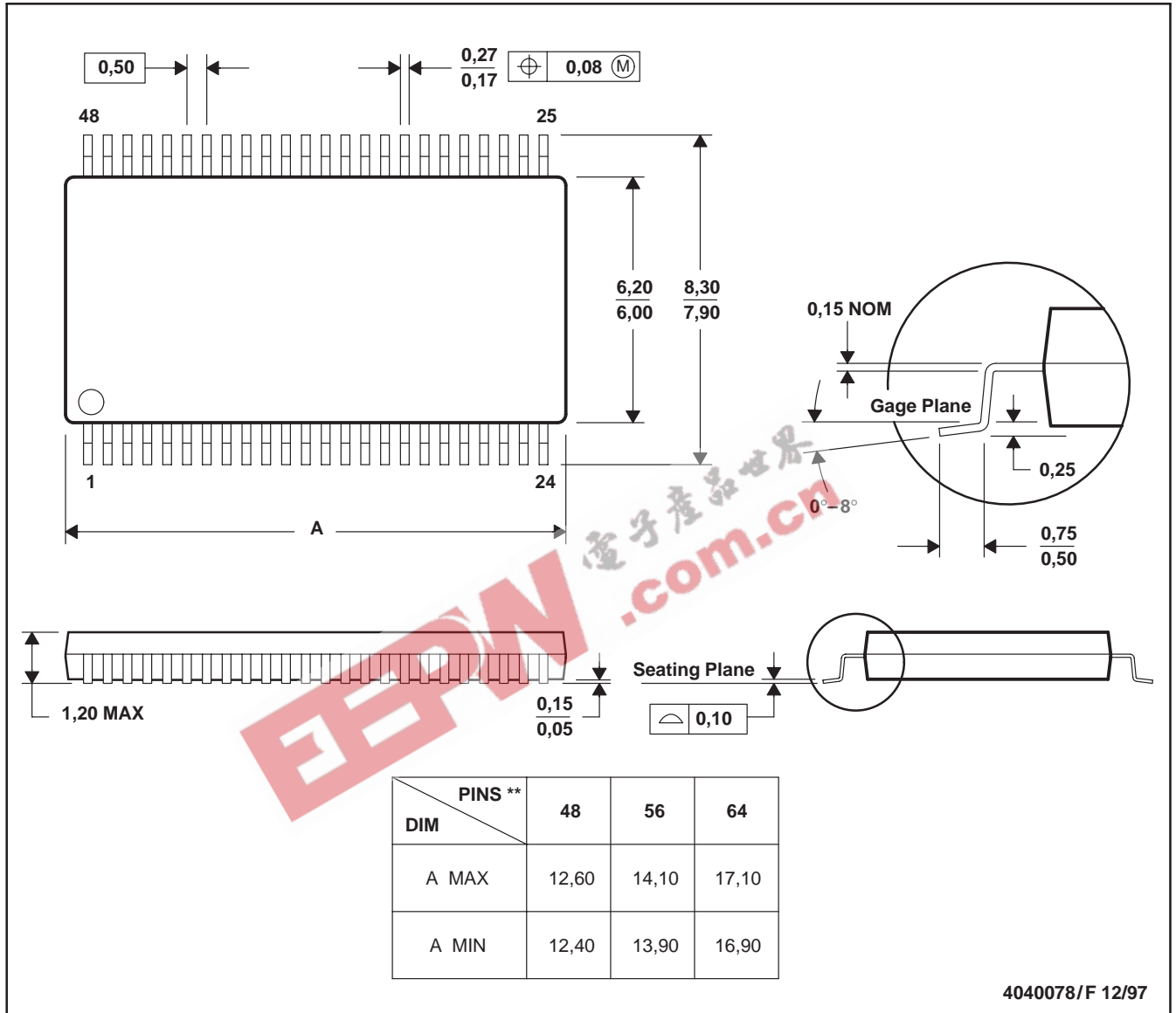
MECHANICAL DATA

MTSS003D – JANUARY 1995 – REVISED JANUARY 1998

DGG (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

48 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 protrusion not to exceed 0,15.
 - D. Falls within JEDEC MO-153

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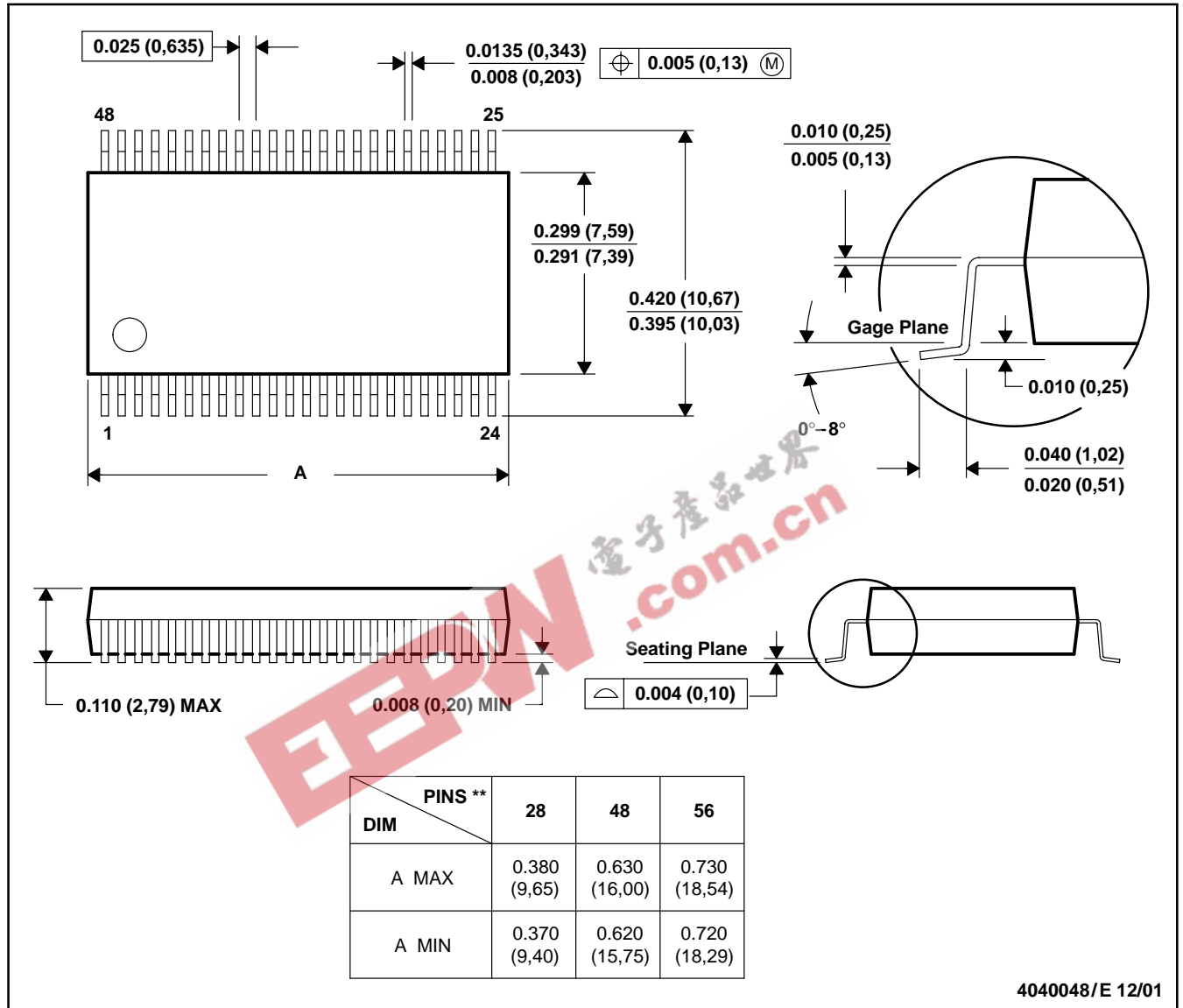
MECHANICAL DATA

MSS0001C – JANUARY 1995 – REVISED DECEMBER 2001

DL (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

48 PINS SHOWN



- 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

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