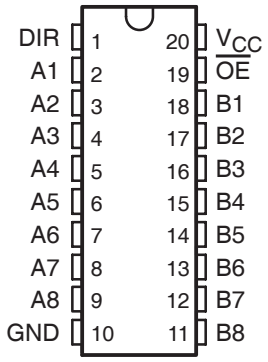
- **3-State Outputs Drive Bus Lines or Buffer Memory Address Registers**
- **Package Options Include Plastic Small-Outline (DB) Packages and Plastic 300-mil DIPs (N)**

DB OR N PACKAGE
(TOP VIEW)



description

The SN74F2245 is designed for asynchronous communication between data buses. The devices transmit data from the A bus to the B bus or from the B bus to the A bus depending upon the logic level at the direction-control (DIR) input. The output-enable ($\overline{OE}$) input disables the device so the buses are effectively isolated.

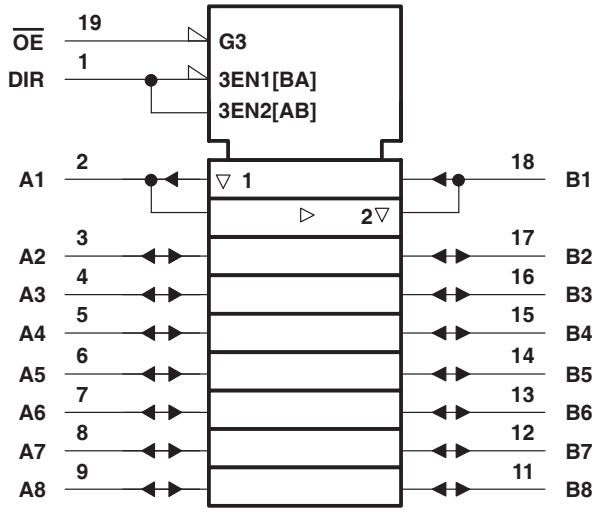
Both A and B outputs can sink up to 12 mA; 25-Ω resistors are included in the lower output circuit to reduce overshoot and undershoot.

The SN74F2245 is characterized for operation from 0°C to 70°C.

FUNCTION TABLE

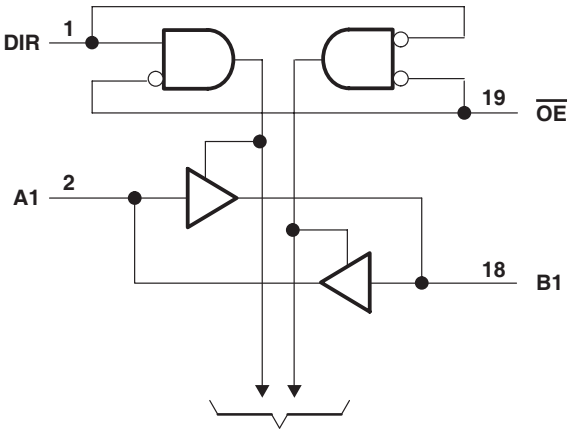
INPUTS		OPERATION
$\overline{OE}$	DIR	
L	L	B data to A bus
L	H	A data to B bus
H	X	Isolation

logic symbol†



† This symbol is in accordance with ANSI/IEEE Std 91-1984 and IEC Publication 617-12.

logic diagram (positive logic)



TEXAS INSTRUMENTS
POST OFFICE BOX 655303 • DALLAS, TEXAS 75265
POST OFFICE BOX 1443 • HOUSTON, TEXAS 77251–1443

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 (except I/O ports) (see Note 1) . . . . . –1.2 V to 7 V
Input current range . . . . . –30 mA to 5 mA
Voltage range applied to any output in the disabled or power-off state . . . . . –0.5 V to 5.5 V
Voltage range applied to any output in the high state . . . . . –0.5 V to V_{CC}
Current into any output in the low state . . . . . 30 mA
Operating free-air temperature range, T_A . . . . . 0°C to 70°C
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.

NOTE 1: The input voltage ratings may be exceeded provided the input current ratings are observed.

recommended operating conditions

		MIN	NOM	MAX	UNIT
V_{CC}	Supply voltage	4.5	5	5.5	V
V_{IH}	High-level input voltage	2			V
V_{IL}	Low-level input voltage			0.8	V
I_{IK}	Input clamp current			–18	mA
I_{OH}	High-level output current			– 3	mA
I_{OL}	Low-level output current			12	mA
T_A	Operating free-air temperature	0		70	°C

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

PARAMETER		TEST CONDITIONS		MIN	TYP‡	MAX	UNIT
V_{IK}		V_{CC} = 4.5 V,	I_I = –18 mA			–1.2	V
V_{OH}	Any output	V_{CC} = 4.5 V	I_{OH} = – 1 mA	2.5	3.4		V
			I_{OH} = – 3 mA	2.4	3.3		
		V_{CC} = 4.75 V,	I_{OH} = –1 mA to – 3 mA	2.7			
V_{OL}	Any output	V_{CC} = 4.5 V	I_{OL} = 1 mA		0.2	0.5	V
			I_{OL} = 12 mA		0.5	0.75	
I_I	A and B	V_{CC} = 5.5 V	V_I = 5.5 V			1	mA
	DIR and $\overline{OE}$		V_I = 7 V			0.1	
I_{IH}§	A and B	V_{CC} = 5.5 V,	V_I = 2.7 V			70	μA
	DIR and $\overline{OE}$					20	
I_{IL}§	A and B	V_{CC} = 5.5 V,	V_I = 0.5 V			–0.5	mA
	DIR and $\overline{OE}$					– 0.5	
I_{OS}¶	A and B	V_{CC} = 5.5 V,	V_O = 0	–50		–120	mA
I_{CC}		V_{CC} = 5.5 V	Outputs high		62	90	mA
			Outputs low		73	105	
			Outputs disabled		72	100	

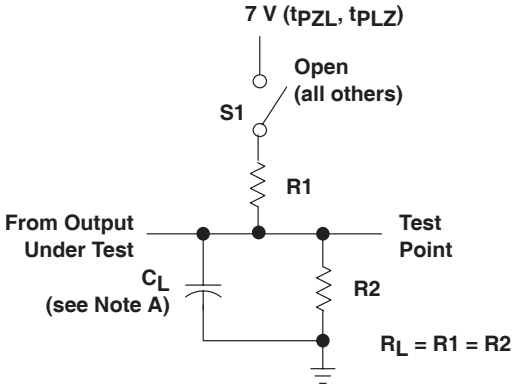
‡ All typical values are at V_{CC} = 5 V, T_A = 25°C.
§ For I/O ports, the parameters I_{IH} and I_{IL} include the off-state output current.
¶ Not more than one output should be shorted at a time, and the duration of the short circuit should not exceed one second.

switching characteristics (see Figure 1)

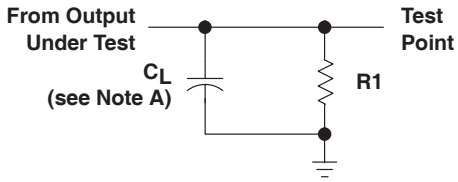
PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC} = 5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = 25°C			V_{CC} = 4.5 V to 5.5 V, C_L = 50 pF, R1 = 500 Ω, R2 = 500 Ω, T_A = MIN to MAX†		UNIT
			MIN	TYP	MAX	MIN	MAX	
t_{PLH}	A or B	B or A	2.5	3.9	5.5	2.1	6.6	ns
t_{PHL}			3.1	4.6	6.6	2.9	7.1	
t_{PZH}	$\overline{OE}$	A or B	2.4	4.8	7.3	1.6	8.5	ns
t_{PZL}			3.6	6.6	10.6	3	12	
t_{PHZ}	$\overline{OE}$	A or B	2.3	4.3	6.3	2	7.5	ns
t_{PLZ}			2	4	5.8	1.9	6.8	

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

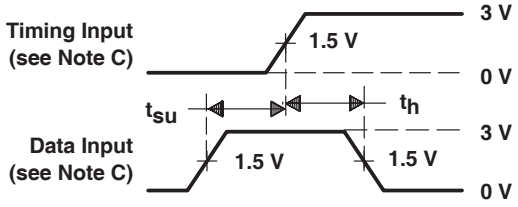
PARAMETER MEASUREMENT INFORMATION



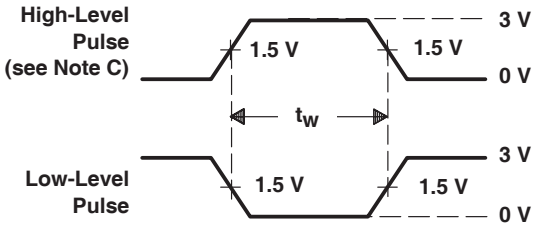
LOAD CIRCUIT FOR
3-STATE AND OPEN-COLLECTOR OUTPUTS



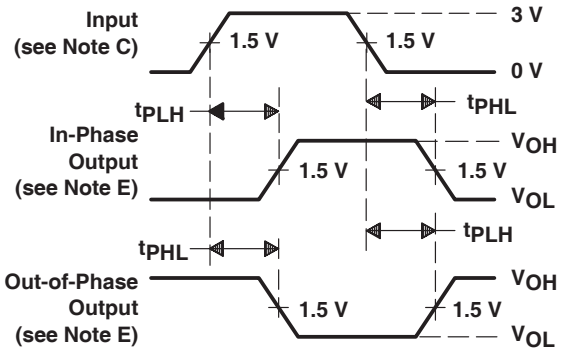
LOAD CIRCUIT FOR
TOTEM-POLE OUTPUTS



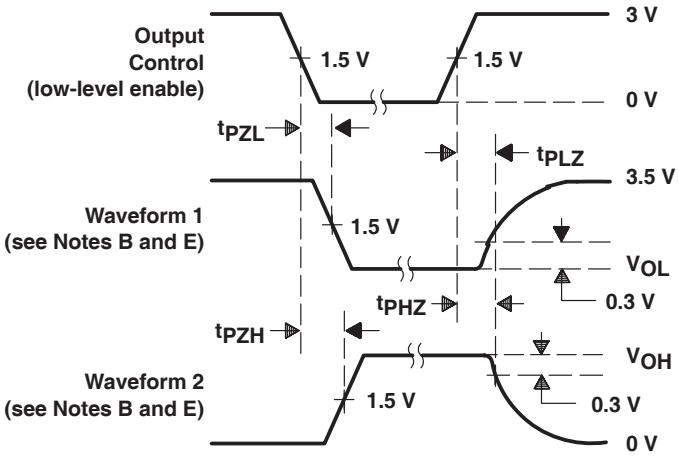
VOLTAGE WAVEFORMS
SETUP AND HOLD TIMES



VOLTAGE WAVEFORMS
PULSE DURATION



VOLTAGE WAVEFORMS
PROPAGATION DELAY TIMES (see Note D)



VOLTAGE WAVEFORMS
ENABLE AND DISABLE TIMES, 3-STATE 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 ≤ 1 MHz, $t_r = t_f \leq 2.5$ ns, duty cycle = 50%.
D. When measuring propagation delay times of 3-state outputs, switch S1 is open.
E. The outputs are measured one at a time with one transition per measurement.

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)	Samples (Requires Login)
SN74F2245DBR	OBSOLETE	SSOP	DB	20		TBD	Call TI	Call TI	Samples Not Available
SN74F2245DW	OBSOLETE	SOIC	DW	20		TBD	Call TI	Call TI	Samples Not Available
SN74F2245DWR	OBSOLETE	SOIC	DW	20		TBD	Call TI	Call TI	Samples Not Available
SN74F2245N	OBSOLETE	PDIP	N	20		TBD	Call TI	Call TI	Samples Not Available

(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.

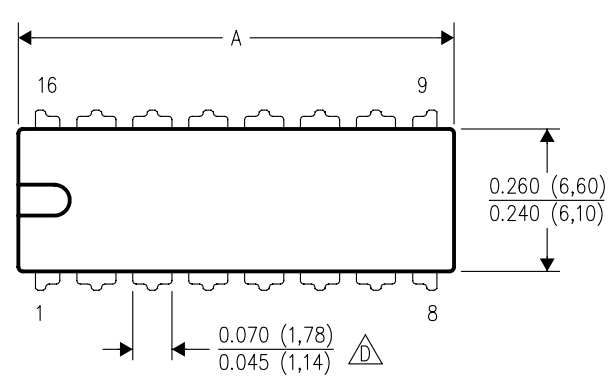
(2) Eco Plan - The planned eco-friendly classification: Pb-Free (RoHS), Pb-Free (RoHS Exempt), or Green (RoHS & no Sb/Br) - please check http://www.ti.com/productcontent for the latest availability information and additional product content details.
TBD: The Pb-Free/Green conversion plan has not been 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.

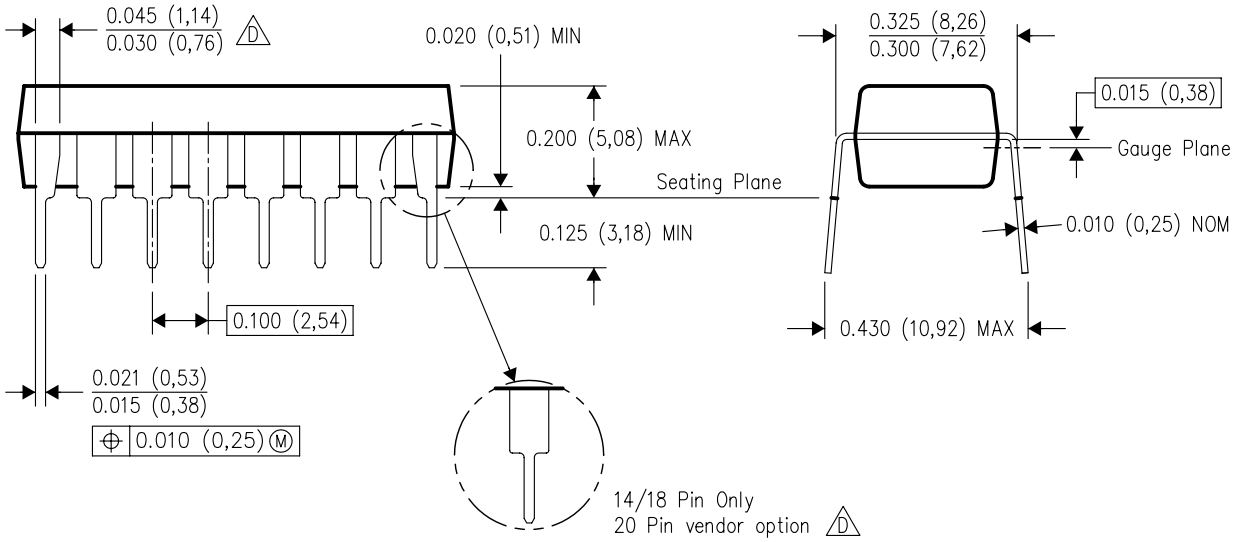
N (R–PDIP–T**)

PLASTIC DUAL–IN–LINE PACKAGE

16 PINS SHOWN



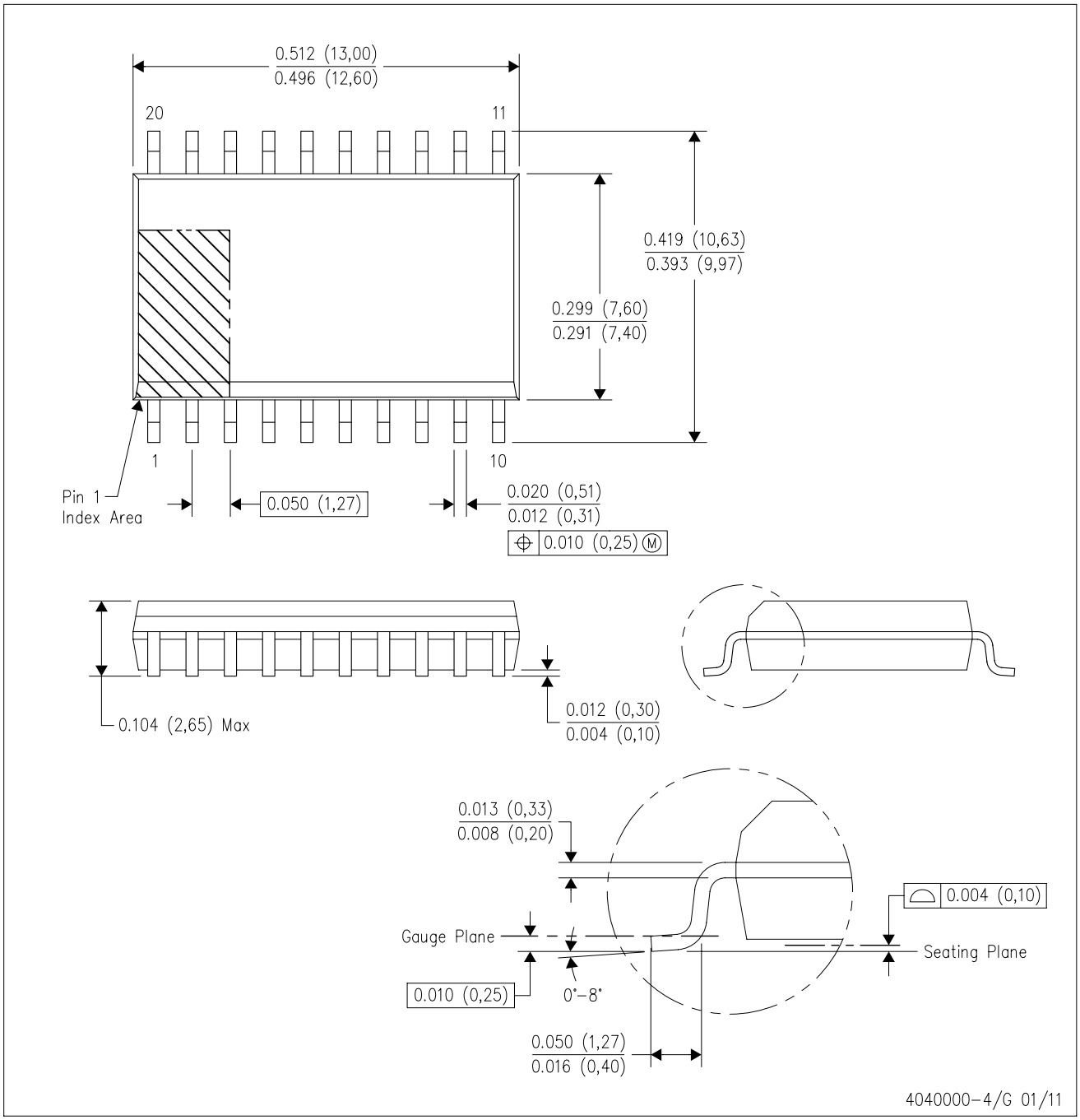
DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS–001 VARIATION (C)	AA	BB	AC	AD



4040049/E 12/2002

NOTES:
A. All linear dimensions are in inches (millimeters).
B. This drawing is subject to change without notice.
C. Falls within JEDEC MS–001, except 18 and 20 pin minimum body length (Dim A).
D. The 20 pin end lead shoulder width is a vendor option, either half or full width.

DW (R–PDSO–G20) PLASTIC SMALL OUTLINE

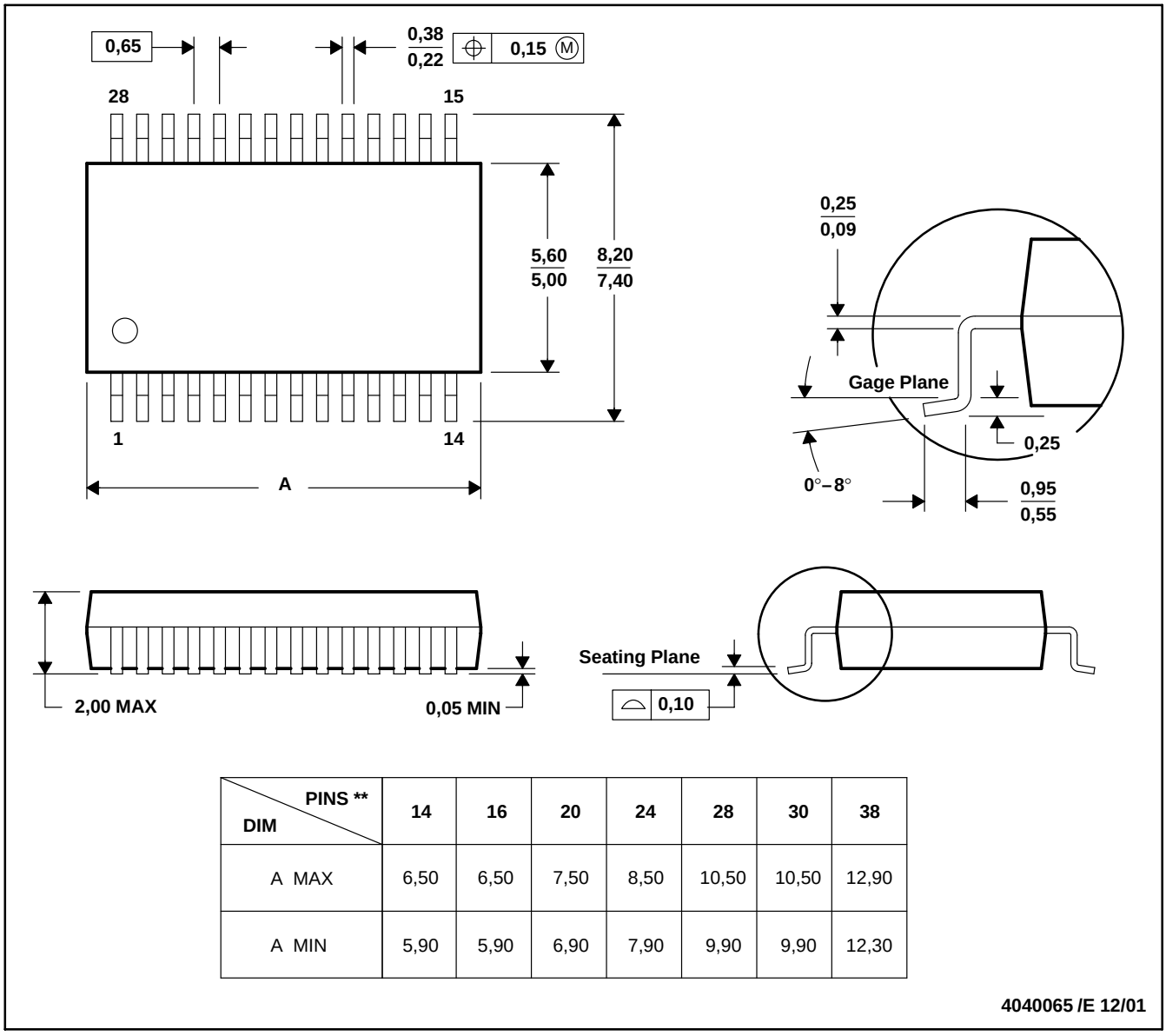


NOTES:
A. All linear dimensions are in inches (millimeters). Dimensioning and tolerancing per ASME Y14.5M–1994.
B. This drawing is subject to change without notice.
C. Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
D. Falls within JEDEC MS–013 variation AC.

MSSO002E – JANUARY 1995 – REVISED DECEMBER 2001

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

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