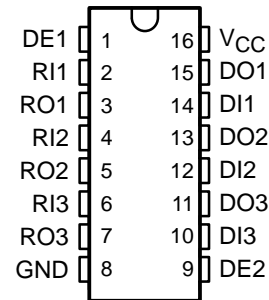
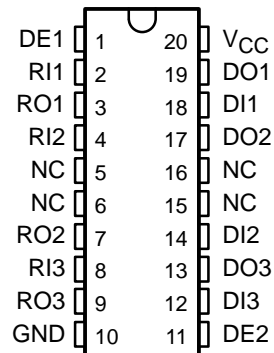


- Meets or Exceeds the Requirements of IBM™ 360/370 Input/Output Interface Specification for 4.5-Mb/s Operation
- Single 5-V Supply
- Uncommitted Emitter-Follower Output Structure for Party-Line Operation
- Driver Output Short-Circuit Protection
- Driver Input/Receiver Output Compatible With TTL
- Receiver Input Resistance . . . 7.4 k $\Omega$  to 20 k $\Omega$
- Ratio Specification for Propagation Delay Time, Low to High/High to Low

**D OR N PACKAGE  
(TOP VIEW)**



**NS PACKAGE  
(TOP VIEW)**



### description/ordering information

The SN751730 triple line driver/receiver is specifically designed to meet the input/output interface specifications for IBM System 360/370. It also is compatible with standard TTL logic and supply voltage levels.

The low-impedance emitter-follower driver outputs of the SN751730 drive terminated lines, such as coaxial cable or twisted pair. Having the outputs uncommitted allows wired-OR logic to be performed in party-line applications. Output short-circuit protection is provided by an internal clamping network that turns on when the output voltage drops below approximately 2.5 V.

An open line affects the receiver input as does a low-level input voltage.

All the driver inputs and receiver outputs are in conventional TTL configuration and the gating can be used during power-up and power-down sequences to ensure that no noise is introduced to the line by pulling either DE1 or DE2 to a low level.

### ORDERING INFORMATION

T <sub>A</sub>	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
0°C to 70°C	PDIP (N)	Tube	SN751730N	SN751730N
		Tube	SN751730D	SN751730
	SOIC (D)	Tape and reel	SN751730DR	
		Tape and reel	SN751730NSR	SN751730

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



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SN751730  
TRIPLE LINE DRIVER/RECEIVER

SLLS062D – MAY 1990 – REVISED AUGUST 2002

Function Tables

EACH DRIVER

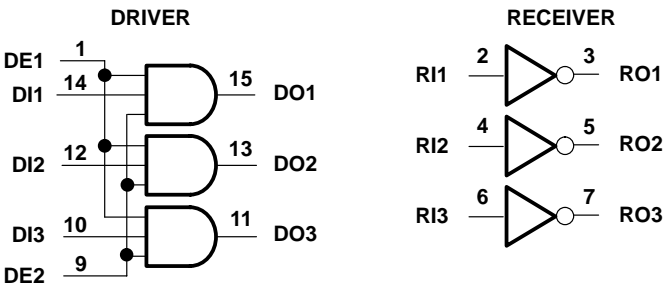
INPUTS			OUTPUT DO
DI	DE1	DE2	
L	X	X	L
X	L	X	L
X	X	L	L
H	H	H	H

EACH DRIVER

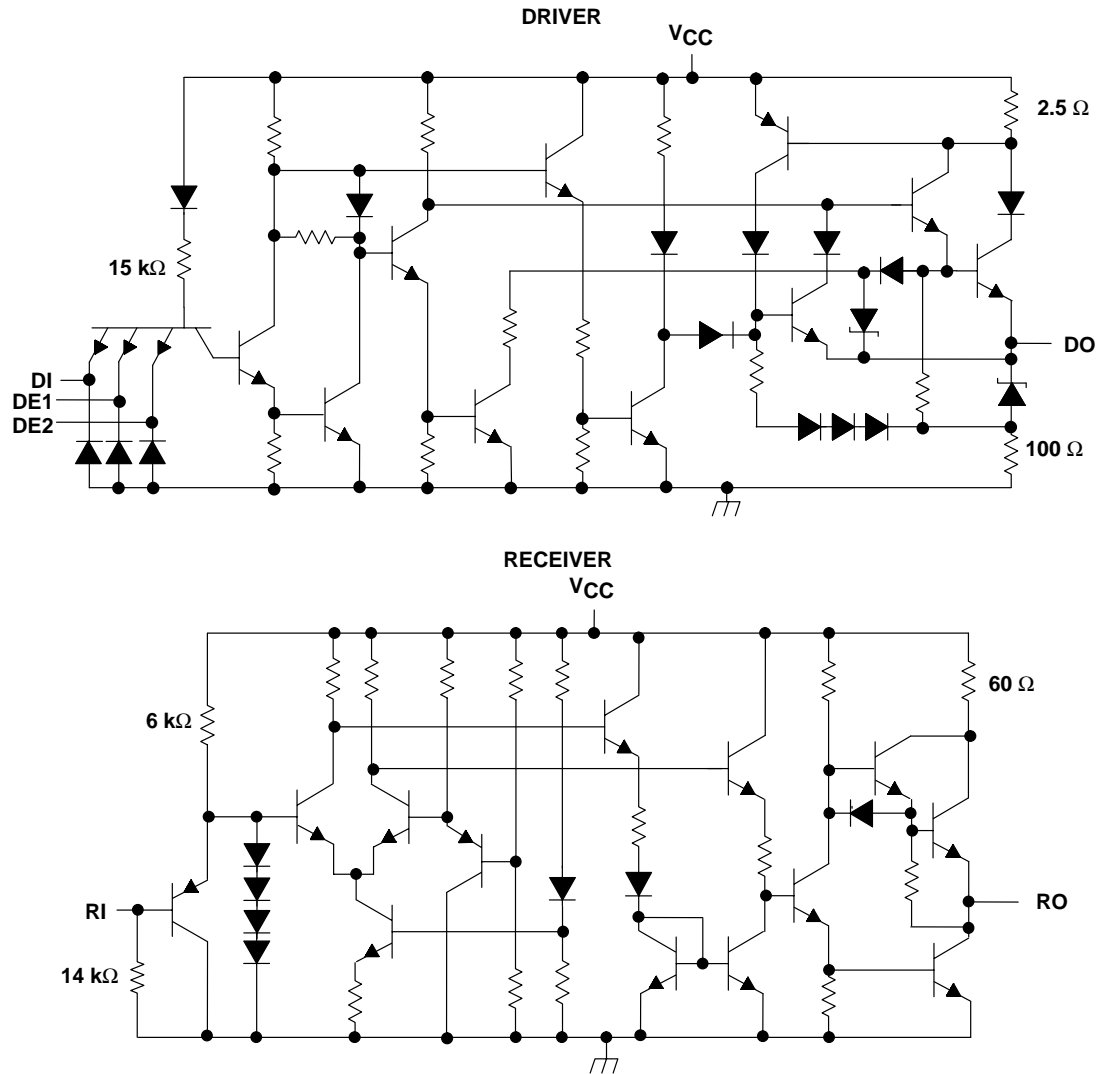
INPUT RI	OUTPUT RO
L	H
H	L
Open	H

H = high level, L = low level,  
X = irrelevant

logic diagram (positive logic)



equivalent schematics of driver and receiver†



† All resistor values are nominal.

# SN751730

## TRIPLE LINE DRIVER/RECEIVER

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### absolute maximum ratings over operating free-air temperature range (unless otherwise noted)<sup>†</sup>

Supply voltage, $V_{CC}$ (see Note 1)	7 V
Input voltage range, $V_I$ : Driver	–0.5 V to 7 V
Receiver	–0.5 V to 7 V
Output voltage range, $V_O$ : Driver	–0.5 V to 7 V
Enable input voltage range	–0.5 V to 7 V
Package thermal impedance, $\theta_{JA}$ (see Note 2): D package	73°C/W
N package	67°C/W
NS package	60°C/W
Operating virtual junction temperature, $T_J$	150°C
Lead temperature 1,6 mm (1/16 inch) from case for 10 seconds	260°C
Storage temperature range, $T_{stg}$	–65°C to 150°C

<sup>†</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.

NOTES: 1. All voltage values are with respect to network ground terminal.  
2. The package thermal impedance is calculated in accordance with JESD 51-7.

### recommended operating conditions

		MIN	NOM	MAX	UNIT
$V_{CC}$	Supply voltage	4.75	5	5.25	V
$V_{IH}$	High-level input voltage	Driver, Enable		2	V
		Receiver		1.55	
$V_{IL}$	Low-level input voltage	Driver, Enable		0.8	V
		Receiver		1.15	
$T_A$	Operating free-air temperature	0		70	°C



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## DRIVER SECTION

**electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)**

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
V <sub>IK</sub>	Input clamp voltage	V <sub>CC</sub> = 4.75 V, I <sub>L</sub> = –18 mA			–1.5	V
V <sub>OH</sub>	High-level output voltage	V <sub>CC</sub> = 4.75 V, I <sub>OH</sub> = –59.3 mA	V <sub>IH</sub> = 2 V, T <sub>A</sub> = 25°C	3.11		V
		V <sub>CC</sub> = 5.25 V, I <sub>OH</sub> = –78.1 mA	V <sub>IH</sub> = 2 V,		4.10	
		V <sub>CC</sub> = 4.75 V, R <sub>L</sub> = 51.4 Ω	V <sub>IH</sub> = 2 V,	3.05		
		V <sub>CC</sub> = 5.25 V, R <sub>L</sub> = 56.9 Ω	V <sub>IH</sub> = 2 V,		4.20	
V <sub>ODH</sub>	Differential high-level output voltage	R <sub>L</sub> = 46.3 Ω or 56.9 Ω			0.50	V
V <sub>OL</sub>	Low-level output voltage	V <sub>CC</sub> = 5.25 V, V <sub>IL</sub> = 0.8 V, V <sub>IH</sub> = 4.5 V	I <sub>OL</sub> = –0.24 mA		0.15	V
			R <sub>L</sub> = 56.9 Ω		0.15	
I <sub>IH</sub>	High-level input current	DI DE	V <sub>CC</sub> = 5.25 V, V <sub>IH</sub> = 2.7 V		20	μA
					60	
I <sub>IL</sub>	Low-level input current	DI DE	V <sub>CC</sub> = 5.25 V, V <sub>IH</sub> = 0.4 V		–400	μA
					–1200	
I <sub>OH</sub>	High-level output current	V <sub>CC</sub> = 4.75 V, V <sub>OH</sub> = 5 V	V <sub>IL</sub> = 0		100	μA
			V <sub>IH</sub> = 4.5 V		100	
I <sub>OS</sub>	Short-circuit output current†	V <sub>CC</sub> = 5.25 V	V <sub>IH</sub> = 4.5 V		–30	mA
I <sub>CCH</sub>	Supply current (total package)	V <sub>CC</sub> = 5.25 V, No load	V <sub>I(D)</sub> = 4.5 V, V <sub>I(R)</sub> = 0		47	mA
I <sub>CCL</sub>			V <sub>I(D)</sub> = 0, V <sub>I(R)</sub> = 4.5 V		80	

† Not more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.

### switching characteristics, V<sub>CC</sub> = 5 V ±5%, T<sub>A</sub> = 25°C

PARAMETER		TEST CONDITIONS		MIN	TYP	MAX	UNIT
t <sub>PLH</sub>	Propagation delay time, low- to high-level output	R <sub>L</sub> = 47.5 Ω, See Figure 1	See Figure 1	6.5	12	18.5	ns
t <sub>PHL</sub>	Propagation delay time, high- to low-level output			6.5	12	18.5	ns
Δt <sub>pd</sub>	Differential propagation delay time‡			10			ns
t <sub>r</sub>	Output rise time	V <sub>CC</sub> = 5 V, R <sub>L</sub> = 47.5 Ω, See Figure 1	V <sub>O</sub> = 0.15 V to 3.05 V, C <sub>L</sub> = 10.2 pF,	5	10		ns
t <sub>f</sub>	Output fall time			5	13		ns
SR	Slew rate	V <sub>O</sub> = 1 V to 3 V average, R <sub>L</sub> = 47.5 Ω, See Figure 1		0.65			V/ns

‡ Δt<sub>pd</sub> = |t<sub>PLH</sub> – t<sub>PHL</sub>|

# SN751730

## TRIPLE LINE DRIVER/RECEIVER

SLLS062D – MAY 1990 – REVISED AUGUST 2002

### RECEIVER SECTION

electrical characteristics over recommended ranges of supply voltage and operating free-air temperature (unless otherwise noted)

PARAMETER		TEST CONDITIONS		MIN	MAX	UNIT
$V_{OH}$	High-level output voltage	$V_{CC} = 4.75\text{ V}$ , $I_{OH} = -400\text{ }\mu\text{A}$	$V_I = 1.15\text{ V}$ ,	2.7		V
$V_{OL}$	Low-level output voltage	$V_{CC} = 4.75\text{ V}$ , $V_{IH} = 1.55\text{ V}$	$I_{OL} = 8\text{ mA}$		0.5	V
			$I_{OL} = 4\text{ mA}$		0.4	
$r_I$	Input resistance	$V_{CC} = 0$ ,	$V_I = 0.15\text{ V to } 3.9\text{ V}$	7.4	20	k $\Omega$
$I_{IH}$	High-level input current	$V_{CC} = 4.75\text{ V}$ ,	$V_{IH} = 3.11\text{ V}$		0.42	mA
$I_{IL}$	Low-level input current	$V_{CC} = 5.25\text{ V}$ ,	$V_{IL} = 0.15\text{ V}$	-0.24	0.04	mA
$I_{OS}^\dagger$	Short-circuit output current	$V_{CC} = 5.25\text{ V}$ ,	$V_{IL} = 0$	-20	-100	mA
$I_{CCH}$	Supply current (total package)	$V_{CC} = 5.25\text{ V}$ , No load	$V_{I(D)} = 4.5\text{ V}$ , $V_{I(R)} = 0$		47	mA
$I_{CCL}$			$V_{I(D)} = 0$ , $V_{I(R)} = 4.5\text{ V}$		80	

$^\dagger$  Not more than one output should be shorted at a time, and duration of the short circuit should not exceed one second.

switching characteristics,  $V_{CC} = 5\text{ V} \pm 5\%$ ,  $T_A = 25^\circ\text{C}$

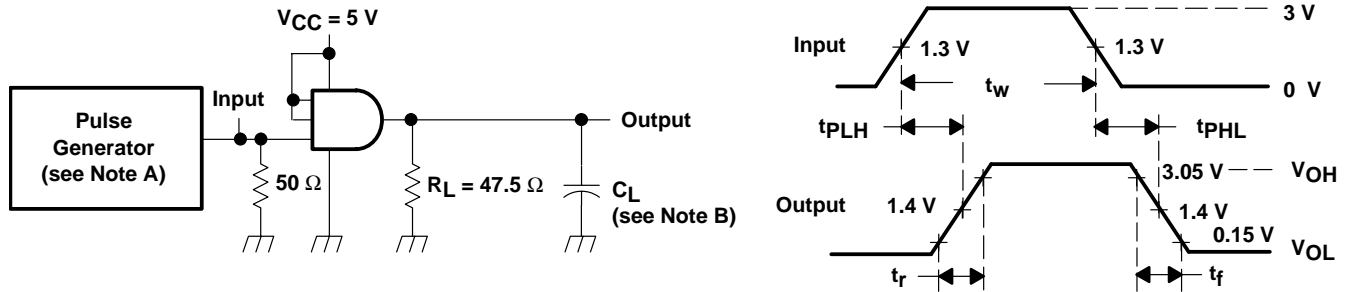
PARAMETER	TEST CONDITIONS	MIN	TYP	MAX	UNIT
$t_{PLH}$	Propagation delay time, low- to high-level output	7.5	12	19.5	ns
$t_{PHL}$	Propagation delay time, high- to low-level output	7.5	12	19.5	ns
$\Delta t_{pd}^\ddagger$	Differential propagation delay time			10	ns

$^\ddagger \Delta t_{pd} = |t_{PLH} - t_{PHL}|$



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## PARAMETER MEASUREMENT INFORMATION

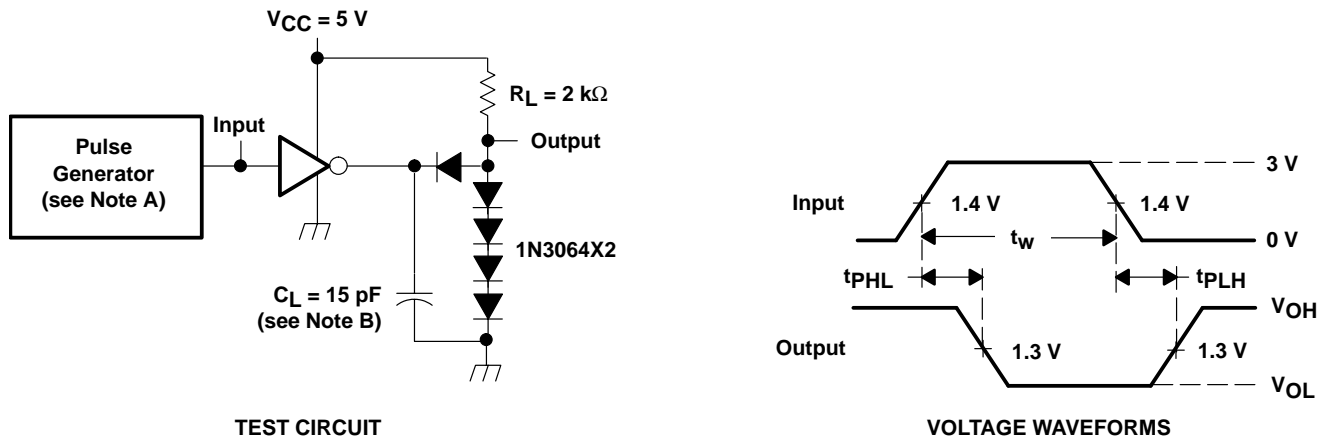


TEST CIRCUIT

VOLTAGE WAVEFORMS

NOTES: A. The pulse generator has the following characteristics:  $Z_O \approx 50 \Omega$ ,  $t_W \leq 500 \text{ ns}$ ,  $\text{PRR} \leq 1 \text{ MHz}$ ,  $t_f \leq 6 \text{ ns}$ ,  $t_r \leq 15 \text{ ns}$ .  
B.  $C_L$  includes probe and jig capacitance.

Figure 1. Driver Test Circuit and Voltage Waveforms



TEST CIRCUIT

VOLTAGE WAVEFORMS

NOTES: A. The pulse generator has the following characteristics:  $Z_O \approx 50 \Omega$ ,  $t_W \leq 500 \text{ ns}$ ,  $\text{PRR} \leq 1 \text{ MHz}$ ,  $t_f \leq 10 \text{ ns}$ ,  $t_r \leq 10 \text{ ns}$ .  
B.  $C_L$  includes probe and jig capacitance.

Figure 2. Receiver Test Circuit and Voltage Waveforms

## 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>
SN751730D	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
SN751730DE4	ACTIVE	SOIC	D	16	40	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
SN751730DR	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
SN751730DRE4	ACTIVE	SOIC	D	16	2500	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-2-260C-1YEAR
SN751730N	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN751730NE4	ACTIVE	PDIP	N	16	25	Pb-Free (RoHS)	CU NIPDAU	N / A for Pkg Type
SN751730NSR	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN751730NSRE4	ACTIVE	SO	NS	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM

<sup>(1)</sup> 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.

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

<sup>(2)</sup> 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)

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

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## N (R-PDIP-T\*\*)

16 PINS SHOWN

## PLASTIC DUAL-IN-LINE PACKAGE



PINS **	14	16	18	20
DIM				
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	AA	BB	AC	AD



14/18 Pin Only  
20 Pin vendor option

4040049/E 12/2002

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

## D (R-PDSO-G16)

## PLASTIC SMALL-OUTLINE PACKAGE



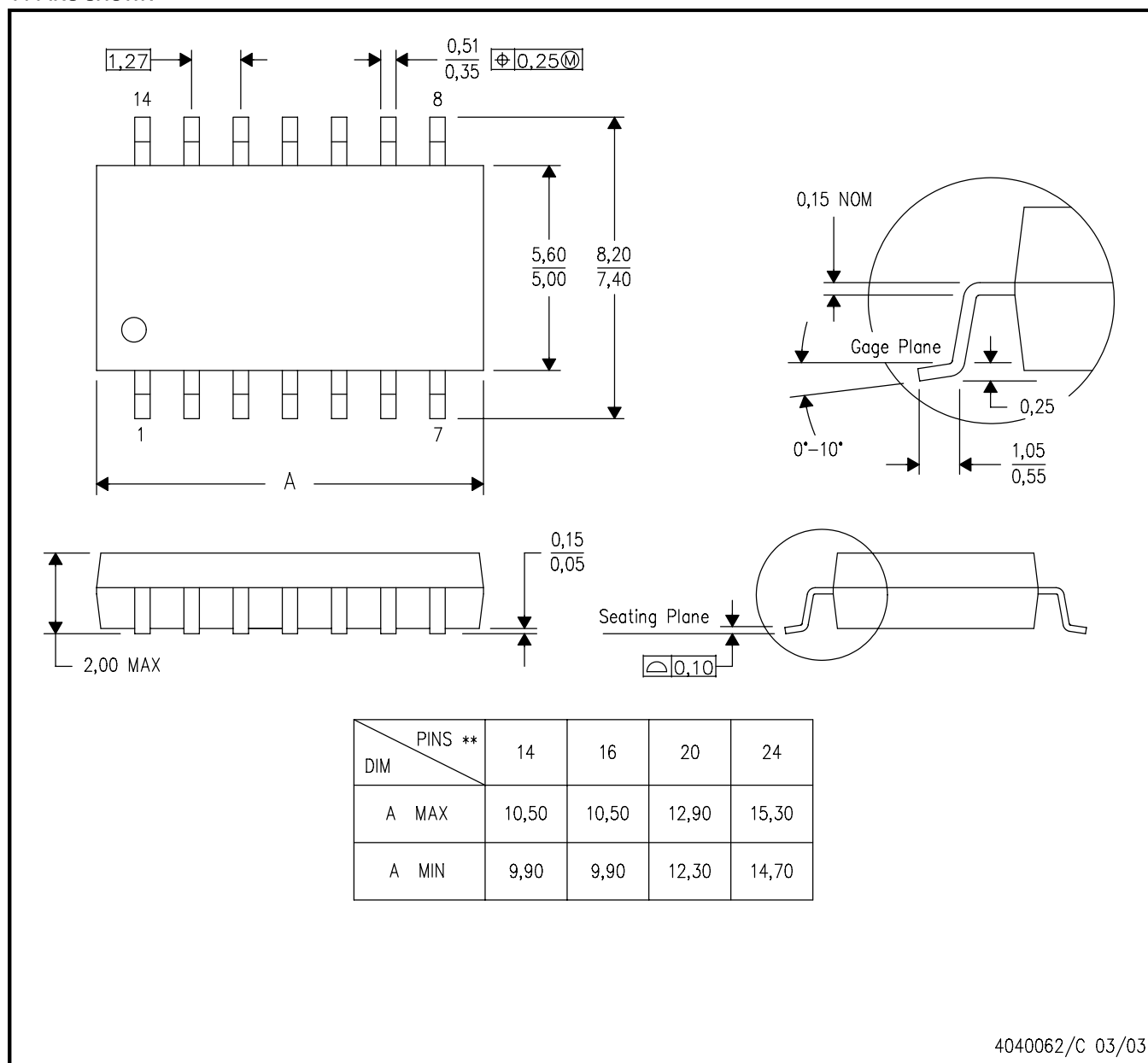
- NOTES:
- All linear dimensions are in inches (millimeters).
  - This drawing is subject to change without notice.
  - Body dimensions do not include mold flash or protrusion not to exceed 0.006 (0,15).
  - Falls within JEDEC MS-012 variation AC.

# MECHANICAL DATA

NS (R-PDSO-G\*\*)

PLASTIC SMALL-OUTLINE PACKAGE

14-PINS SHOWN



- NOTES:
- All linear dimensions are in millimeters.
  - This drawing is subject to change without notice.
  - Body dimensions do not include mold flash or protrusion, not to exceed 0,15.

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