

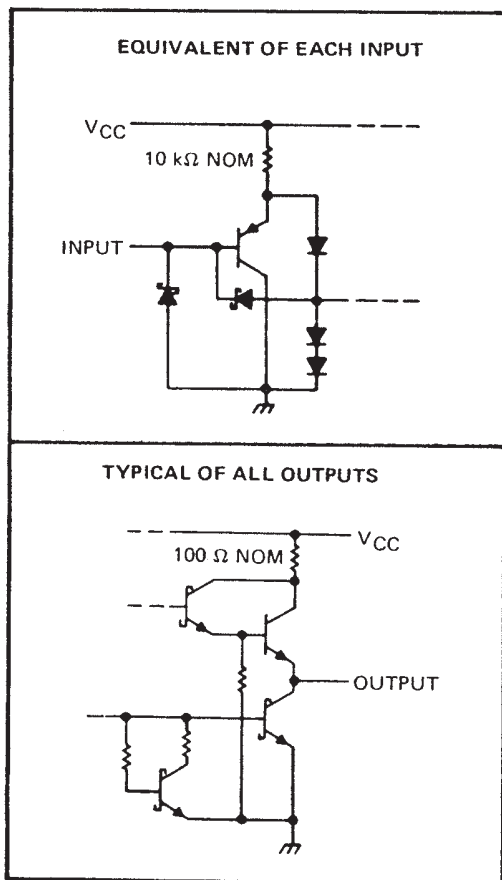
- Mechanically and Functionally Interchangeable With DM71/81LS95 thru DM71/81LS98
- P-N-P Inputs Reduce Bus Loading
- 3-State Outputs Rated at I_{OL} of 12 mA and 24 mA for 54LS and 74LS, Respectively

DEVICE	DATA PATH
'LS465	True
'LS466	Inverting
'LS467	True
'LS468	Inverting

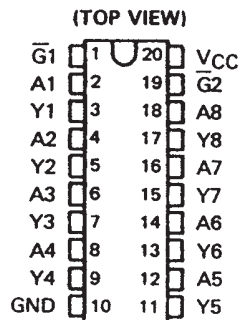
description

These octal buffers utilize the latest low-power Schottky technology. The 'LS465 and 'LS466 have a two-input active-low AND enable gate controlling all eight data buffers. The 'LS467 and 'LS468 have two separate active-low enable inputs each controlling four data buffers. In either case, a high level on any $\bar{G}$ places the affected outputs at high impedance.

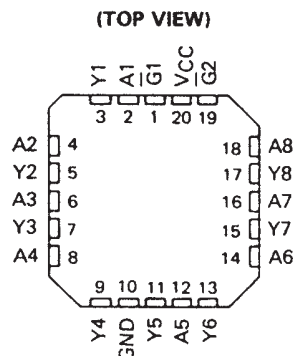
schematics of inputs and outputs



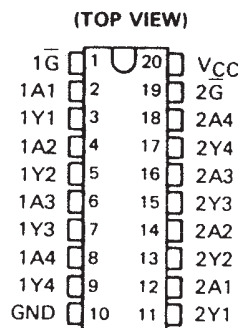
SN54LS465 AND SN54LS466 . . . J PACKAGE
SN74LS465 AND SN74LS466 . . . DW OR N PACKAGE



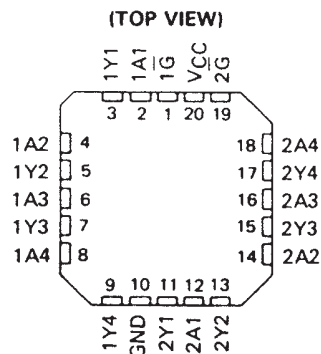
SN54LS465 AND SN54LS466 . . . FK PACKAGE



SN54LS467 AND SN54LS468 . . . J PACKAGE
SN74LS467 AND SN74LS468 . . . DW OR N PACKAGE



SN54LS467 AND SN54LS468 . . . FK PACKAGE

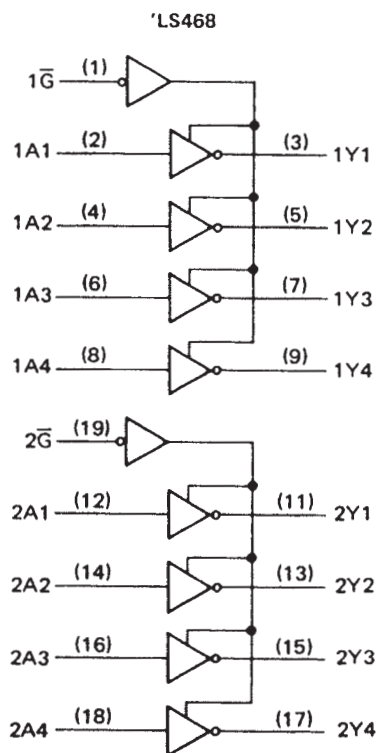
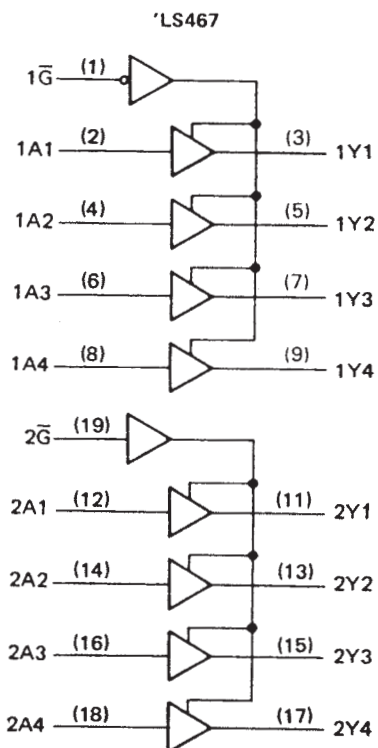
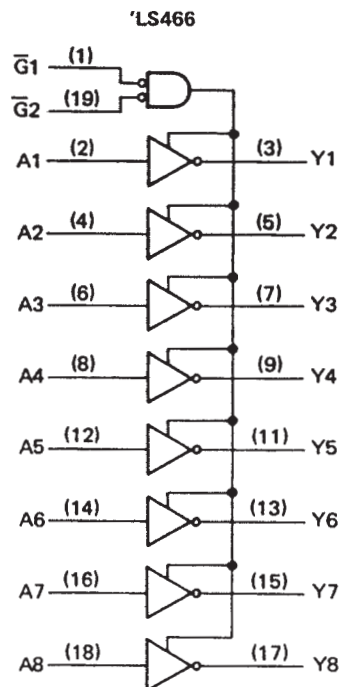
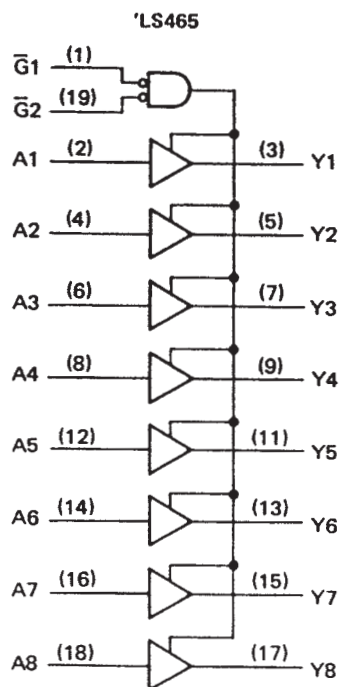


SN54LS465 THRU SN54LS468, SN74LS465 THRU SN74LS468

OCTAL BUFFERS WITH 3-STATE OUTPUTS

SDLS179 – JANUARY 1981 – REVISED MARCH 1988

logic diagrams (positive logic)



Pin numbers shown are for DW, J, and N packages.

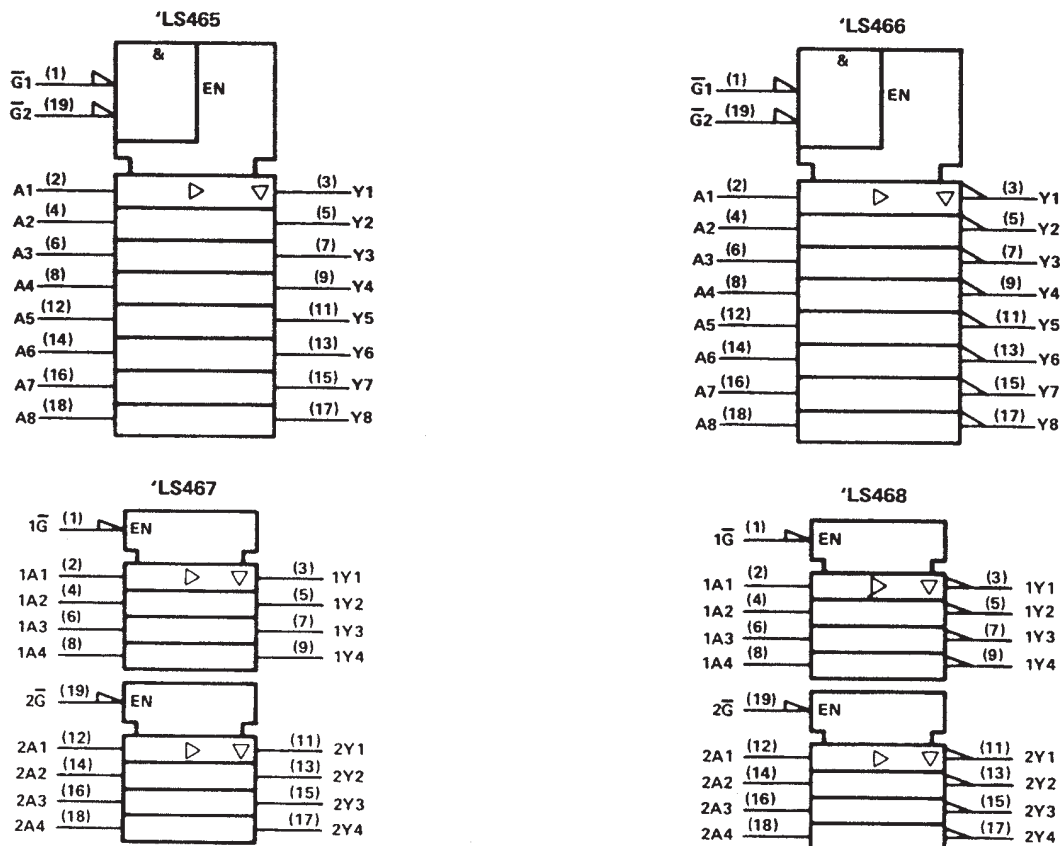


POST OFFICE BOX 655303 • DALLAS, TEXAS 75265

SN54LS465 THRU SN54LS468, SN74LS465 THRU SN74LS468 OCTAL BUFFERS WITH 3-STATE OUTPUTS

SDLS179 – JANUARY 1981 – REVISED MARCH 1988

logic symbols†



†These symbols are in accordance with ANSI/IEEE Std. 91-1984 and IEC Publication 617-12.
Pin numbers shown are for DW, J, and N packages.

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

Supply voltage, V_{CC} (see Note 1)	7 V
Input voltage	7 V
Off-state output voltage	5.5 V
Operating free-air temperature range: SN54LS465 thru SN54LS468	–55°C to 125°C
SN74LS465 thru SN74LS468	0°C to 70°C
Storage temperature range	–65°C to 150°C

NOTE 1: Voltage values are with respect to the network ground terminal.

recommended operating conditions

	SN54LS'			SN74LS'			UNIT
	MIN	NOM	MAX	MIN	NOM	MAX	
Supply voltage, V_{CC}	4.5	5	5.5	4.75	5	5.25	V
High-level output current, I_{OH}			–1			–2.6	mA
Low-level output current, I_{OL}			12			24	mA
Operating free-air temperature, T_A	–55		125	0		70	°C



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SN54LS465 THRU SN54LS468, SN74LS465 THRU SN74LS468

OCTAL BUFFERS WITH 3-STATE OUTPUTS

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

PARAMETER		TEST CONDITIONS†	SN54LS'			SN74LS'			UNIT
			MIN	TYP‡	MAX	MIN	TYP‡	MAX	
V _{IH}	High-level input voltage		2			2			V
V _{IL}	Low-level input voltage		0.7			0.8			V
V _{IK}	Input clamp voltage	V _{CC} = MIN, I _I = -18 mA	-1.5			-1.5			V
V _{OH}	High-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = V _{IL} max	I _{OH} = -1 mA I _{OH} = -2.6 mA			2.4 3.1			V
V _{OL}	Low-level output voltage	V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = V _{IL} max	I _{OL} = 12 mA I _{OL} = 24 mA			0.25 0.4 0.25 0.4 0.35 0.5			V
I _{OZH}	Off-state output current, high-level voltage applied	V _{CC} = MAX, V _{IH} = 2 V, V _O = 2.7 V	20			20			μA
I _{OZL}	Off-state output current, low-level voltage applied	V _{CC} = MAX, V _{IH} = 2 V, V _O = 0.4 V	-20			-20			μA
I _I	Input current at maximum input voltage	V _{CC} = MAX, V _I = 7 V	0.1			0.1			mA
I _{IH}	High-level input current	V _{CC} = MAX, V _I = 2.7 V	20			20			μA
I _{IL}	Low-level input current	V _{CC} = MAX, V _I = 0.4 V	-0.2			-0.2			mA
I _{OS}	Short-circuit output current§	V _{CC} = MAX, V _O = 0 V	-30 -130			-30 -130			mA
I _{CC}	Supply current	V _{CC} = MAX	Outputs low			19 32			mA
			Outputs high			13 22			
			Output Hi-Z			22 37			
			Outputs low			14 23			
			Outputs high			6 10			
			Outputs Hi-Z			17 28			

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

‡ All typical values are at $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$.

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

switching characteristics, $V_{CC} = 5 \text{ V}, T_A = 25^\circ\text{C}$, see note 2

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	'LS465, 'LS467			'LS466, 'LS468			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
t_{PLH}	Ai	Yi	$R_L = 667 \Omega, C_L = 45 \text{ pF}$	9	15		7	12		ns
t_{PHL}	Ai	Yi		12	18		9	15		ns
t_{PZH}	$\bar{G} \downarrow$	Y		25	40		25	40		ns
t_{PZL}	$\bar{G} \downarrow$	Y		29	45		29	45		ns
t_{PHZ}	$\bar{G} \uparrow$	Y	$R_L = 667 \Omega, C_L = 5 \text{ pF}$	25	40		25	40		ns
t_{PLZ}	$\bar{G} \uparrow$	Y		30	45		30	45		ns

NOTE 2: Load circuits and voltage waveforms are shown in Section 1.

PACKAGING INFORMATION

Orderable Device	Status ⁽¹⁾	Package Type	Package Drawing	Pins	Package Qty	Eco Plan ⁽²⁾	Lead/Ball Finish	MSL Peak Temp ⁽³⁾
SN74LS465DW	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS465DWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS465DWE4	ACTIVE	SOIC	DW	20	25	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS465DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS465DWR	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS465DWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS465DWRE4	ACTIVE	SOIC	DW	20	2000	Green (RoHS & no Sb/Br)	CU NIPDAU	Level-1-260C-UNLIM
SN74LS465N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS465N	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS465NE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS465NE4	ACTIVE	PDIP	N	20	20	Pb-Free (RoHS)	CU NIPDAU	Level-NC-NC-NC
SN74LS466DW	OBSOLETE	SOIC	DW	20		TBD	Call TI	Call TI
SN74LS466DWR	OBSOLETE	SOIC	DW	20		TBD	Call TI	Call TI
SN74LS466N	OBSOLETE	PDIP	N	20		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.

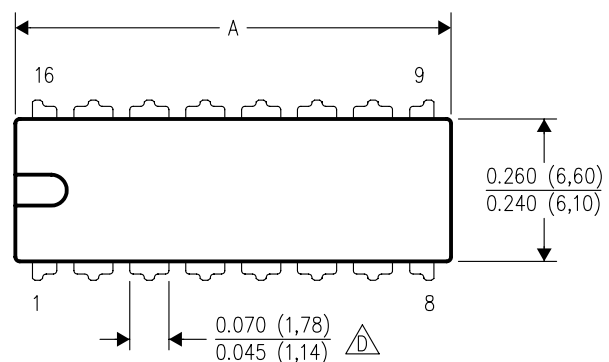
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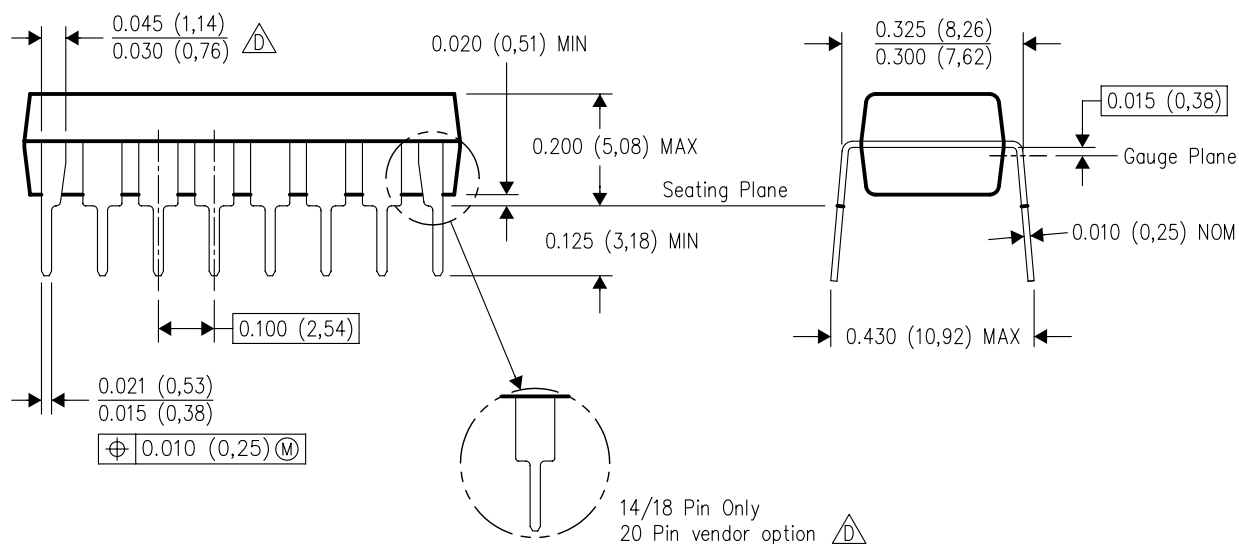
N (R-PDIP-T**)

16 PINS SHOWN

PLASTIC DUAL-IN-LINE PACKAGE



PINS ** DIM	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	AA	BB	AC	AD

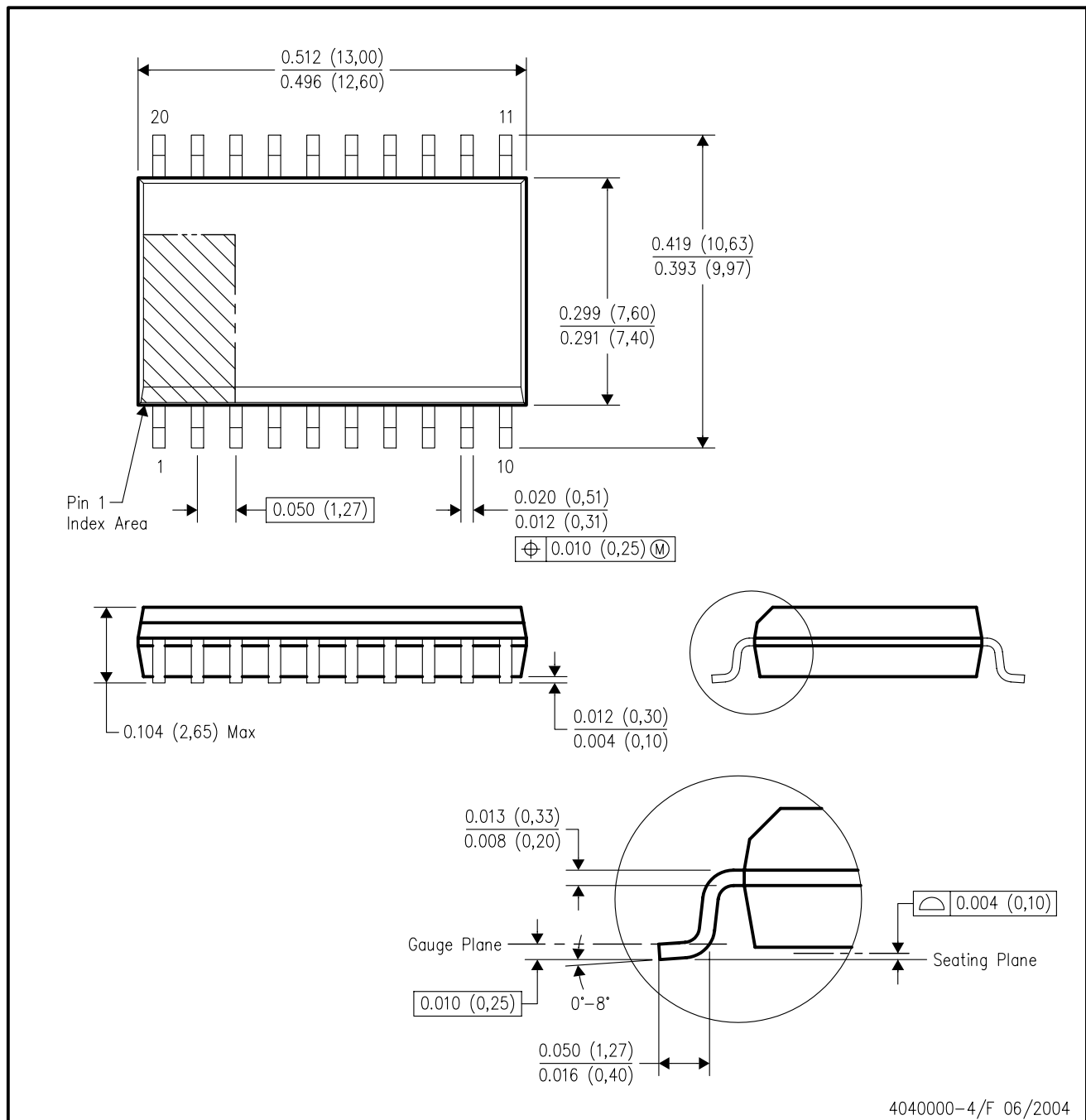


4040049/E 12/2002

- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 -  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.

DW (R-PDSO-G20)

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-013 variation AC.

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