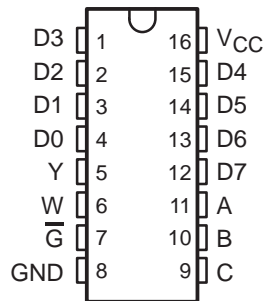


SN54HC151, SN74HC151 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

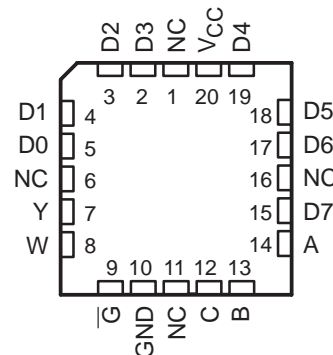
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- Wide Operating Voltage Range of 2 V to 6 V
- Outputs Can Drive Up To 10 LSTTL Loads
- Low Power Consumption, 80- μ A Max I_{CC}
- Typical $t_{pd} = 13$ ns
- ± 6 -mA Output Drive at 5 V
- Low Input Current of 1 μ A Max
- 8-Line to 1-Line Multiplexers Can Perform as:
 - Boolean-Function Generators
 - Parallel-to-Serial Converters
 - Data Source Selectors

SN54HC151 . . . J OR W PACKAGE
SN74HC151 . . . D, N, NS, OR PW PACKAGE
(TOP VIEW)



SN54HC151 . . . FK PACKAGE
(TOP VIEW)



NC – No internal connection

description/ordering information

These data selectors/multiplexers provide full binary decoding to select one of eight data sources. The strobe (\overline{G}) input must be at a low logic level to enable the inputs. A high level at the strobe terminal forces the W output high and the Y output low.

ORDERING INFORMATION

T _A	PACKAGE†		ORDERABLE PART NUMBER	TOP-SIDE MARKING
–40°C to 85°C	PDIP – N	Tube of 25	SN74HC151N	SN74HC151N
	SOIC – D	Tube of 40	SN74HC151D	HC151
		Reel of 2500	SN74HC151DR	
		Reel of 250	SN74HC151DT	
	SOP – NS	Reel of 2000	SN74HC151NSR	HC151
	TSSOP – PW	Tube of 90	SN74HC151PW	HC151
Reel of 2000		SN74HC151PWR		
Reel of 250		SN74HC151PWT		
–55°C to 125°C	CDIP – J	Tube of 25	SNJ54HC151J	SNJ54HC151J
	CFP – W	Tube of 150	SNJ54HC151W	SNJ54HC151W
	LCCC – FK	Tube of 55	SNJ54HC151FK	SNJ54HC151FK

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



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 **TEXAS
INSTRUMENTS**

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On products compliant to MIL-PRF-38535, all parameters are tested unless otherwise noted. On all other products, production processing does not necessarily include testing of all parameters.

SN54HC151, SN74HC151

8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

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FUNCTION TABLE

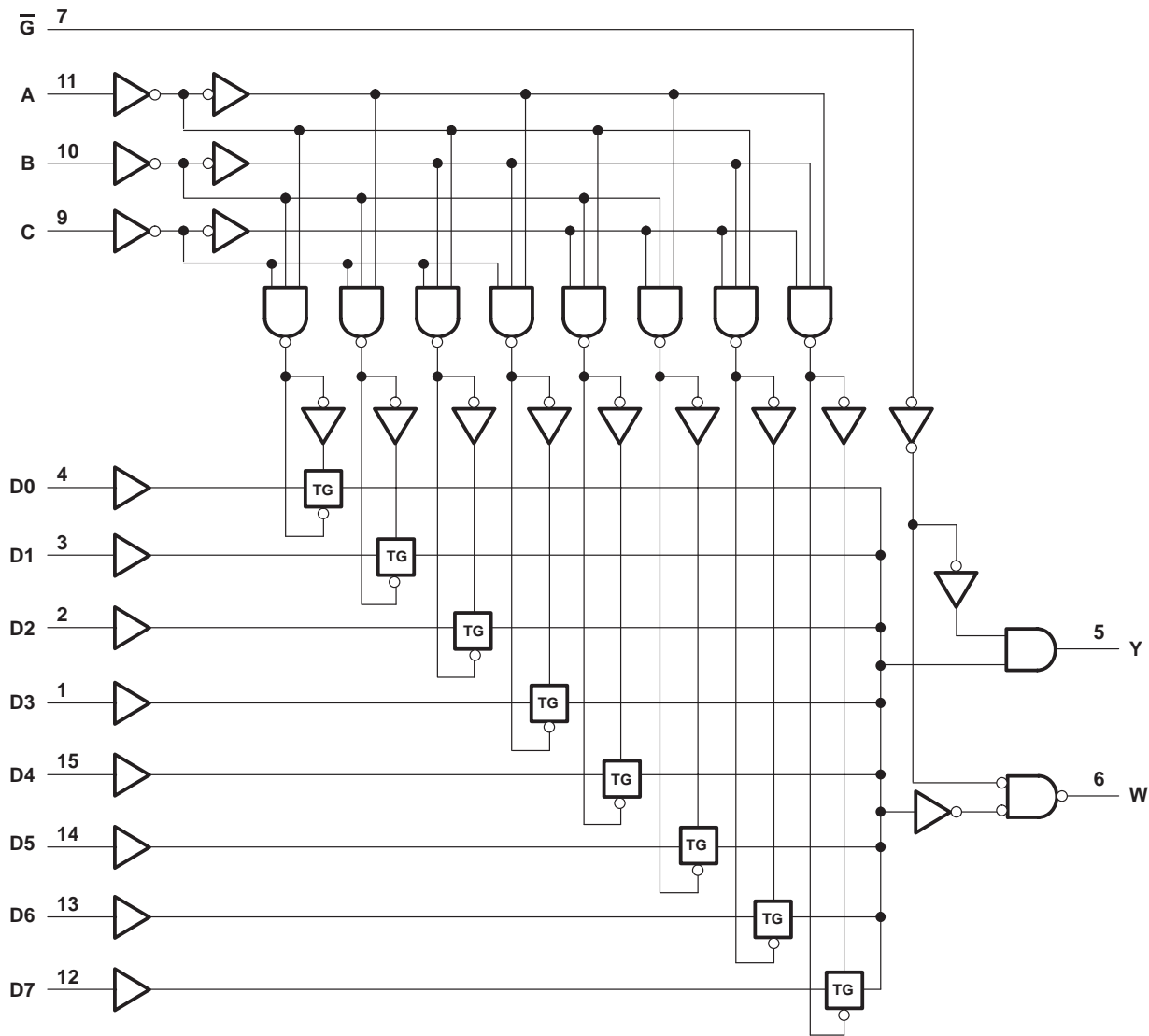
INPUTS				OUTPUTS	
SELECT			STROBE \overline{G}	Y	W
C	B	A			
X	X	X	H	L	H
L	L	L	L	D0	$\overline{D0}$
L	L	H	L	D1	$\overline{D1}$
L	H	L	L	D2	$\overline{D2}$
L	H	H	L	D3	$\overline{D3}$
H	L	L	L	D4	$\overline{D4}$
H	L	H	L	D5	$\overline{D5}$
H	H	L	L	D6	$\overline{D6}$
H	H	H	L	D7	$\overline{D7}$

D0, D1 . . . D7 = the level of the respective D input

SN54HC151, SN74HC151 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

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logic diagram (positive logic)



Pin numbers shown are for the D, J, N, NS, PW, and W packages.

SN54HC151, SN74HC151

8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

SCLS110E – DECEMBER 1982 – REVISED SEPTEMBER 2003

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

Supply voltage range, V_{CC}	-0.5 V to 7 V
Input clamp current, I_{IK} ($V_I < 0$ or $V_I > V_{CC}$) (see Note 1)	± 20 mA
Output clamp current, I_{OK} ($V_O < 0$ or $V_O > V_{CC}$) (see Note 1)	± 20 mA
Continuous output current, I_O ($V_O = 0$ to V_{CC})	± 35 mA
Continuous current through V_{CC} or GND	± 70 mA
Package thermal impedance, θ_{JA} (see Note 2): D package	73°C/W
N package	67°C/W
NS package	64°C/W
PW package	108°C/W
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.

- NOTES: 1. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 2. The package thermal impedance is calculated in accordance with JESD 51-7.

recommended operating conditions (see Note 3)

		SN54HC151			SN74HC151			UNIT
		MIN	NOM	MAX	MIN	NOM	MAX	
V_{CC}	Supply voltage	2	5	6	2	5	6	V
V_{IH}	High-level input voltage	$V_{CC} = 2$ V		1.5	1.5		V	
		$V_{CC} = 4.5$ V		3.15	3.15			
		$V_{CC} = 6$ V		4.2	4.2			
V_{IL}	Low-level input voltage	$V_{CC} = 2$ V			0.5	0.5	V	
		$V_{CC} = 4.5$ V			1.35	1.35		
		$V_{CC} = 6$ V			1.8	1.8		
V_I	Input voltage	0		V_{CC}	0		V_{CC}	V
V_O	Output voltage	0		V_{CC}	0		V_{CC}	V
$\Delta t/\Delta v$	Input transition rise/fall time	$V_{CC} = 2$ V			1000	1000	ns	
		$V_{CC} = 4.5$ V			500	500		
		$V_{CC} = 6$ V			400	400		
T_A	Operating free-air temperature	-55		125	-40		85	°C

NOTE 3: 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.



SN54HC151, SN74HC151 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

SCLS110E – DECEMBER 1982 – REVISED SEPTEMBER 2003

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

PARAMETER	TEST CONDITIONS		V _{CC}	T _A = 25°C			SN54HC151		SN74HC151		UNIT	
				MIN	TYP	MAX	MIN	MAX	MIN	MAX		
V _{OH}	V _I = V _{IH} or V _{IL}	I _{OH} = -20 μA	2 V	1.9	1.998		1.9		1.9	V		
			4.5 V	4.4	4.499		4.4		4.4			
			6 V	5.9	5.999		5.9		5.9			
		I _{OH} = -6 mA	4.5 V	3.98	4.3		3.7		3.84			
		I _{OH} = -7.8 mA	6 V	5.48	5.8		5.2		5.34			
V _{OL}	V _I = V _{IH} or V _{IL}	I _{OL} = 20 μA	2 V		0.002	0.1		0.1		V		
			4.5 V		0.001	0.1		0.1			0.1	
			6 V		0.001	0.1		0.1			0.1	
		I _{OL} = 6 mA	4.5 V		0.17	0.26		0.4			0.33	
		I _{OL} = 7.8 mA	6 V		0.15	0.26		0.4			0.33	
I _I	V _I = V _{CC} or 0		6 V		±0.1	±100		±1000		±1000	nA	
I _{CC}	V _I = V _{CC} or 0, I _O = 0		6 V				8		160		80	μA
C _i			2 V to 6 V			3	10		10		10	pF

switching characteristics over recommended operating free-air temperature range, C_L = 50 pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V _{CC}	T _A = 25°C			SN54HC151		SN74HC151		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t _{pd}	A, B, or C	Y or W	2 V		94	250		360		312	ns
			4.5 V		30	50		73		63	
			6 V		25	43		62		54	
	Any D	Y or W	2 V		74	195		283		244	
			4.5 V		23	39		57		49	
			6 V		20	33		48		41	
	\bar{G}	Y or W	2 V		49	127		185		159	
			4.5 V		15	25		37		32	
			6 V		13	22		32		28	
t _t		Y or W	2 V		22	75		110		95	ns
			4.5 V		9	15		22		19	
			6 V		8	13		19		16	



SN54HC151, SN74HC151 8-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS

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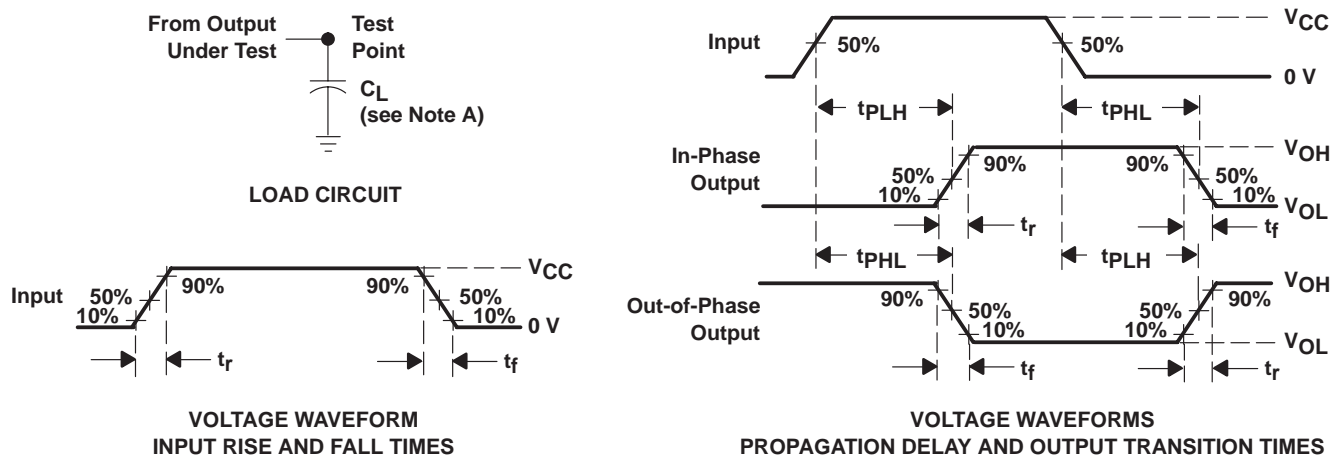
switching characteristics over recommended operating free-air temperature range, $C_L = 150$ pF (unless otherwise noted) (see Figure 1)

PARAMETER	FROM (INPUT)	TO (OUTPUT)	V_{CC}	$T_A = 25^\circ\text{C}$			SN54HC151		SN74HC151		UNIT
				MIN	TYP	MAX	MIN	MAX	MIN	MAX	
t_{pd}	A, B, or C	Y or W	2 V		107	350		525		440	ns
			4.5 V		33	70		105		88	
			6 V		30	59		89		76	
	Any D	Y or W	2 V		90	275		415		345	
			4.5 V		29	51		83		69	
			6 V		25	47		72		59	
	\overline{G}	Y or W	2 V		67	205		310		255	
			4.5 V		21	41		62		51	
			6 V		18	35		53		43	
t_t		Y or W	2 V		51	210		315		265	ns
			4.5 V		16	42		63		53	
			6 V		14	36		53		45	

operating characteristics, $T_A = 25^\circ\text{C}$

PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd} Power dissipation capacitance	No load	70	pF

PARAMETER MEASUREMENT INFORMATION



- NOTES: A. C_L includes probe and test-fixture capacitance.
 B. Phase relationships between waveforms were chosen arbitrarily. All input pulses are supplied by generators having the following characteristics: $PRR \leq 1$ MHz, $Z_O = 50 \Omega$, $t_r = 6$ ns, $t_f = 6$ ns.
 C. The outputs are measured one at a time with one input transition per measurement.
 D. t_{PLH} and t_{PHL} are the same as t_{pd} .

Figure 1. Load Circuit and Voltage Waveforms

J (R-GDIP-T**)

14 LEADS SHOWN

CERAMIC DUAL IN-LINE PACKAGE



DIM \ PINS **	14	16	18	20
A	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC	0.300 (7,62) BSC
B MAX	0.785 (19,94)	.840 (21,34)	0.960 (24,38)	1.060 (26,92)
B MIN	—	—	—	—
C MAX	0.300 (7,62)	0.300 (7,62)	0.310 (7,87)	0.300 (7,62)
C MIN	0.245 (6,22)	0.245 (6,22)	0.220 (5,59)	0.245 (6,22)



4040083/F 03/03

- NOTES:
- All linear dimensions are in inches (millimeters).
 - This drawing is subject to change without notice.
 - This package is hermetically sealed with a ceramic lid using glass frit.
 - Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
 - Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

FK (S-CQCC-N**)

LEADLESS CERAMIC CHIP CARRIER

28 TERMINAL SHOWN

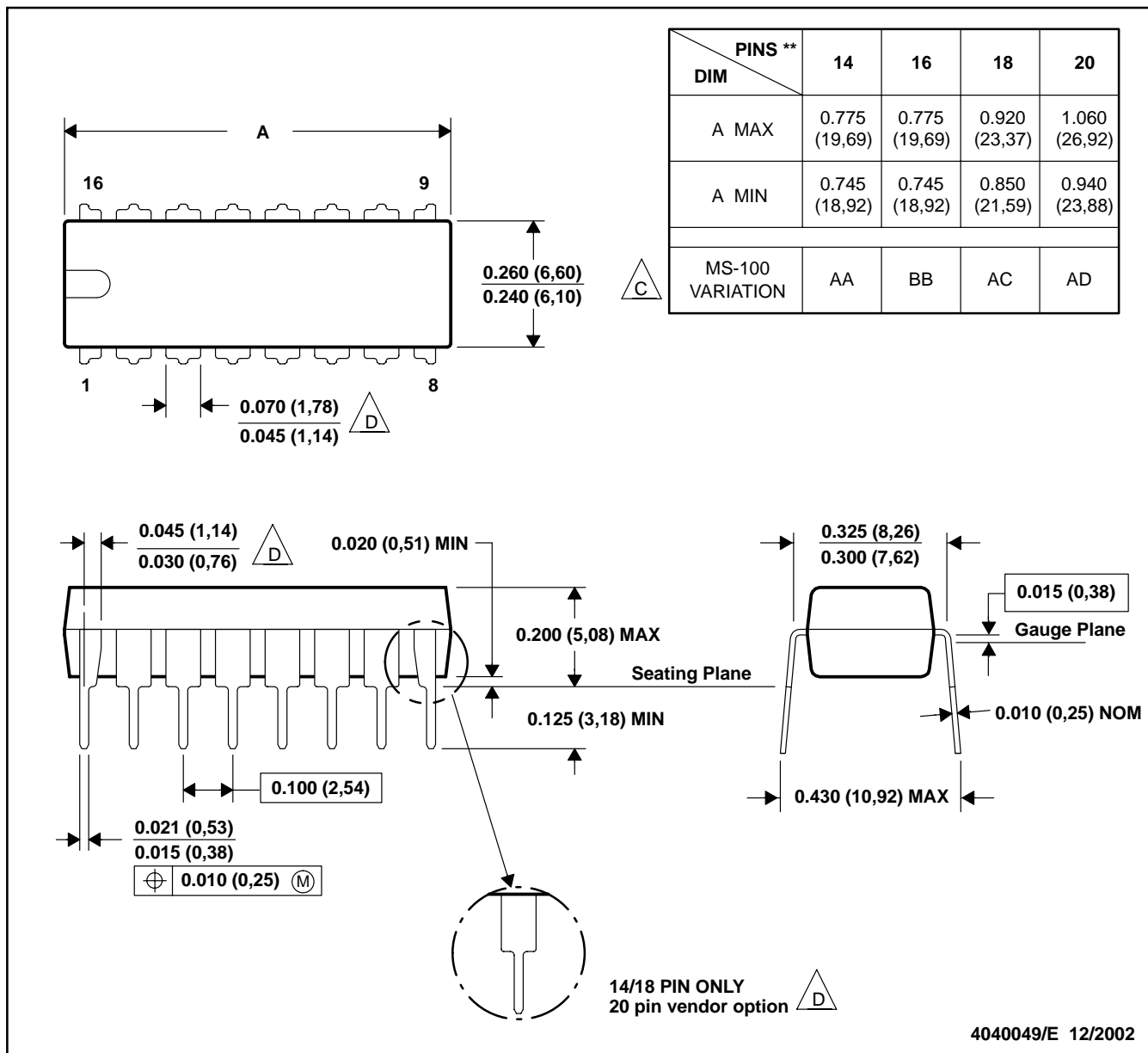


- NOTES:
- A. All linear dimensions are in inches (millimeters).
 - B. This drawing is subject to change without notice.
 - C. This package can be hermetically sealed with a metal lid.
 - D. The terminals are gold plated.
 - E. Falls within JEDEC MS-004

N (R-PDIP-T**)

PLASTIC DUAL-IN-LINE PACKAGE

16 PINS SHOWN



- 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.

D (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

8 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 MS-012

MECHANICAL DATA

NS (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14-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 flash or protrusion, not to exceed 0,15.

PW (R-PDSO-G**)

PLASTIC SMALL-OUTLINE PACKAGE

14 PINS SHOWN



4040064/F 01/97

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

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