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

SDLS179

D2631, JANUARY 1981 – REVISED MARCH 1988

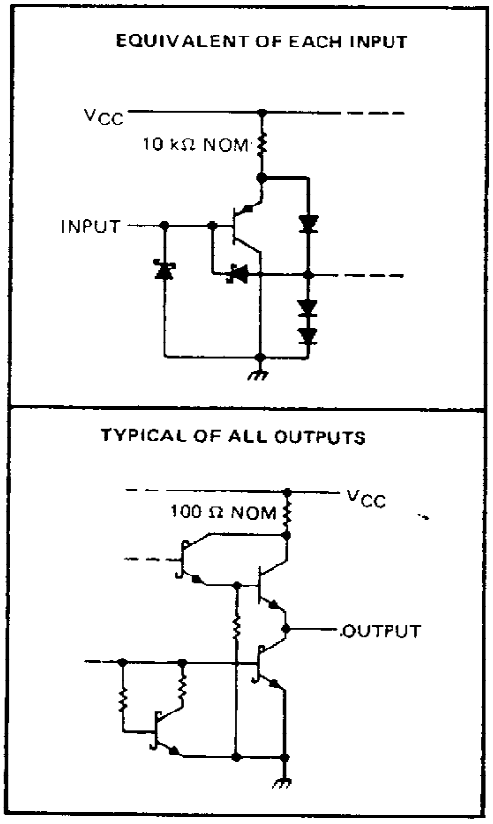
- **Mechanically and Functionally Interchangeable With DM71/81LS95 thru DM71/81LS98**
- **P-N-P Inputs Reduce Bus Loading**
- **3-State Outputs Rated at I_{OL} of 12 mA and 24 mA for 54LS and 74LS, Respectively**

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

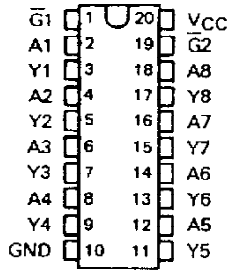
description

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 $\overline{G}$ places the affected outputs at high impedance.

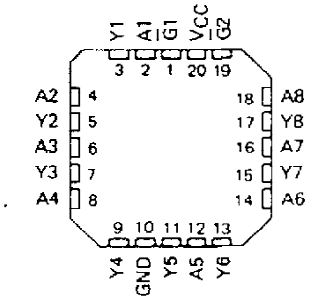
schematics of inputs and outputs



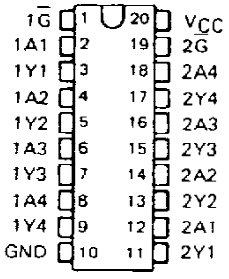
SN54LS465 AND SN54LS466 . . . J PACKAGE
SN74LS465 AND SN74LS466 . . . DW OR N PACKAGE
(TOP VIEW)



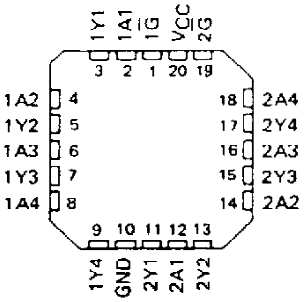
SN54LS465 AND SN54LS466 . . . FK PACKAGE
(TOP VIEW)



SN54LS467 AND SN54LS468 . . . J PACKAGE
SN74LS467 AND SN74LS468 . . . DW OR N PACKAGE
(TOP VIEW)



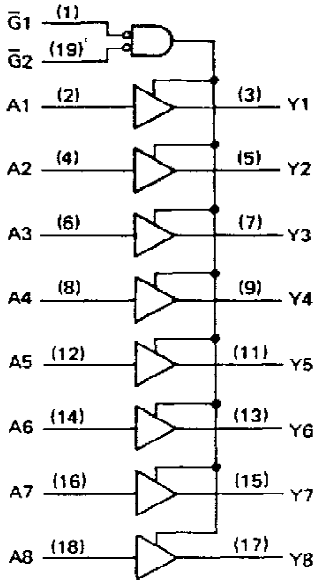
SN54LS467 AND SN54LS468 . . . FK PACKAGE
(TOP VIEW)



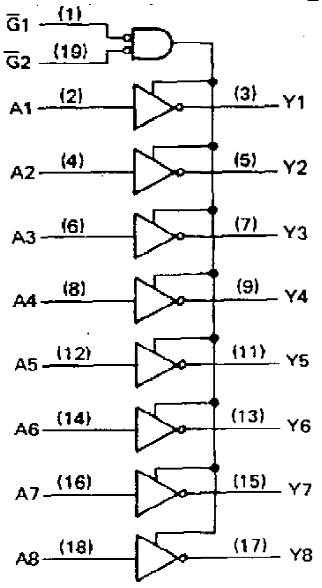
PRODUCTION DATA documents contain information current as of publication date. Products conform to specifications per the terms of Texas Instruments standard warranty. Production processing does not necessarily include testing of all parameters.

logic diagrams (positive logic)

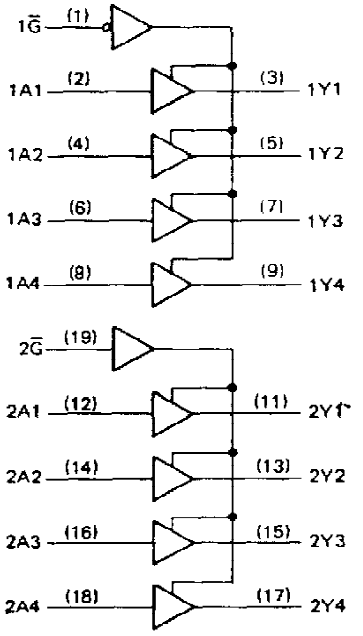
'LS465



'LS466



'LS467



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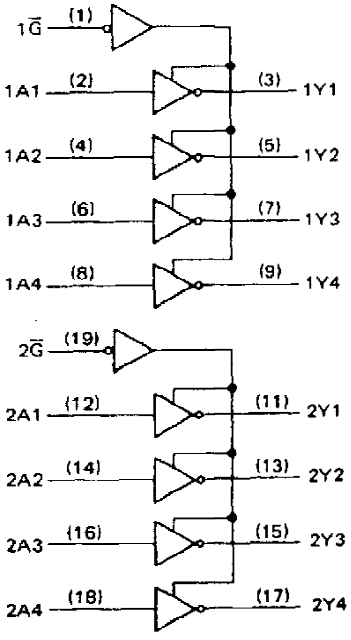

Pin numbers shown are for DW, J, and N packages.

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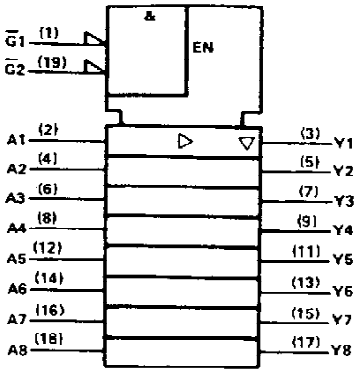
logic symbols†

'LS465



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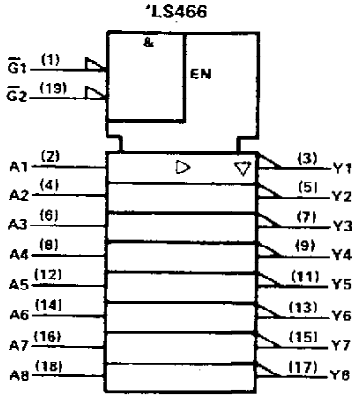
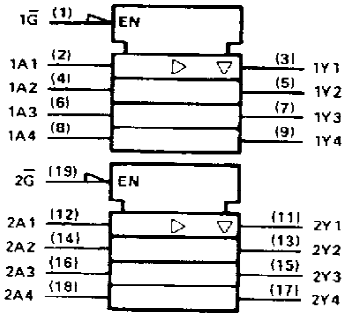
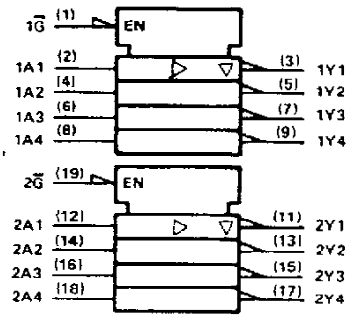


'LS467



'LS468



†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

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		2.4	3.3					V
			I_{OH} = −2.6 mA					2.4	3.1		
V_{OL}	Low-level output voltage	V_{CC} = MIN, V_{IH} = 2 V, V_{IL} = V_{IL} max	I_{OL} = 12 mA			0.25	0.4		0.25	0.4	V
			I_{OL} = 24 mA						0.35	0.5	
I_{OZH}	Off-state output current, high-level voltage applied	V_{CC} = MAX, V_{IH} = 2 V, V_{IL} = V_{IL} max, 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_{IL} = V_{IL} max, 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	'LS465, 'LS467	V_{CC} = MAX	Outputs low		19	32		19	32	mA
				Outputs high		13	22		13	22	
				Output Hi-Z		22	37		22	37	
		'LS466, 'LS468		Outputs low		14	23		14	23	
				Outputs high		6	10		6	10	
				Outputs Hi-Z		17	28		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 V, T_A = 25°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 V, T_A = 25°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 Ω, C_L = 45 pF		9	15		7	12	ns
t_{PHL}	Ai	Yi			12	18		9	15	ns
t_{PZH}	$\overline{G}$ ↓	Y			25	40		25	40	ns
t_{PZL}	$\overline{G}$ ↓	Y			29	45		29	45	ns
t_{PHZ}	$\overline{G}$ ↑	Y	R_L = 667 Ω, C_L = 5 pF		25	40		25	40	ns
t_{PLZ}	G ↑	Y			30	45		30	45	ns

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

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