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

SDLS179 – JANUARY 1981 – REVISED MARCH 1988

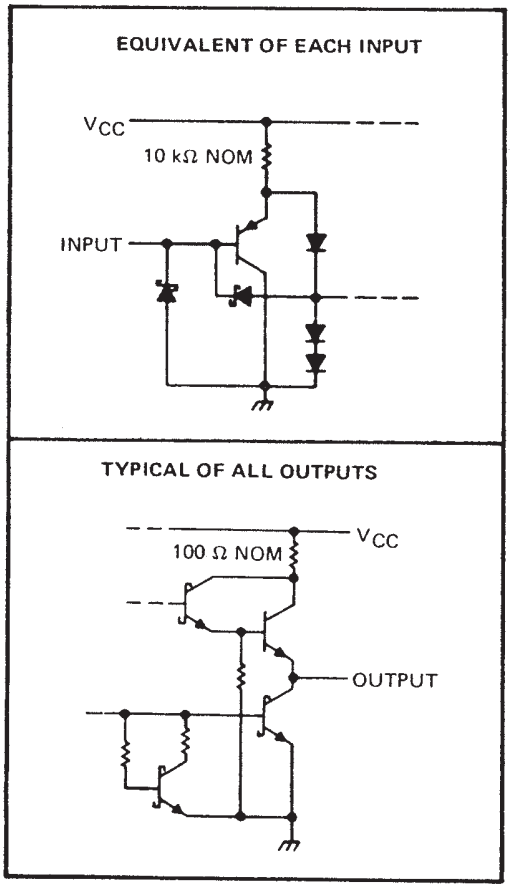
- **Mechanically and Functionally Interchangeable With DM71/81LS95 thru DM71/81LS98**
- **P-N-P Inputs Reduce Bus Loading**
- **3-State Outputs Rated at I_{OL} of 12 mA and 24 mA for 54LS and 74LS, Respectively**

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

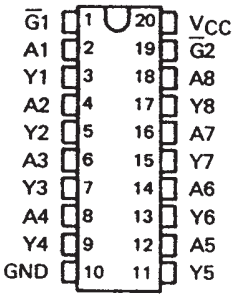
description

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.

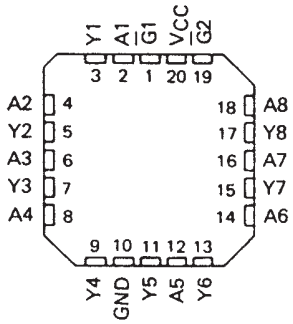
schematics of inputs and outputs



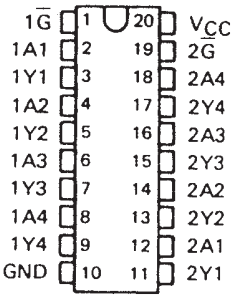
SN54LS465 AND SN54LS466 . . . J PACKAGE
SN74LS465 AND SN74LS466 . . . DW OR N PACKAGE
(TOP VIEW)



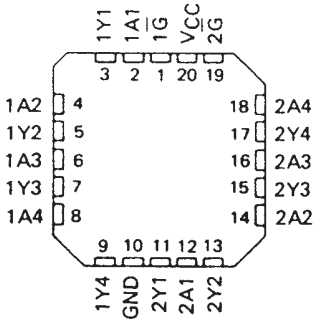
SN54LS465 AND SN54LS466 . . . FK PACKAGE
(TOP VIEW)



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

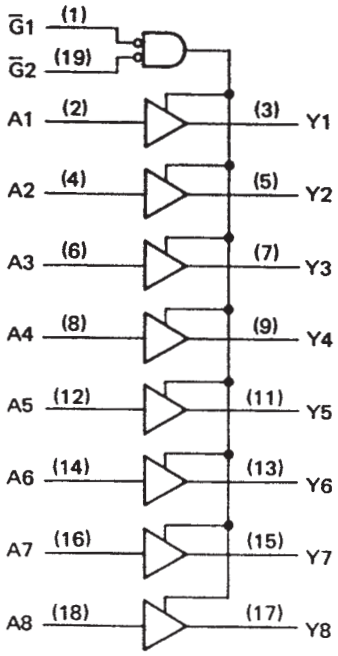


SN54LS467 AND SN54LS468 . . . FK PACKAGE
(TOP VIEW)

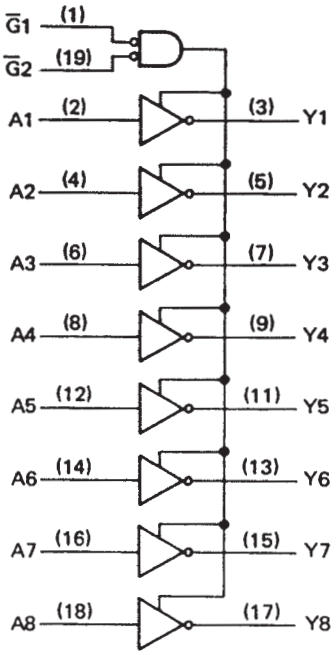


logic diagrams (positive logic)

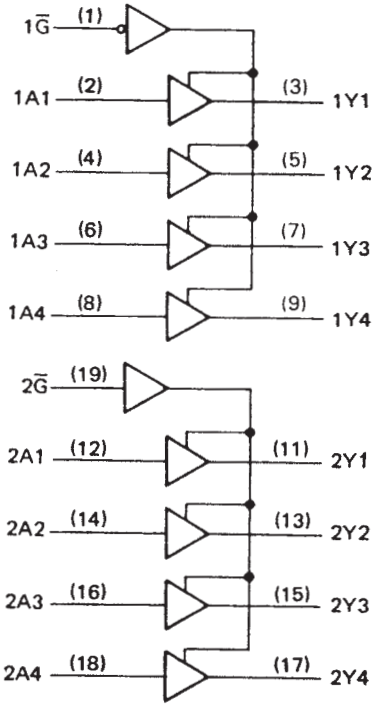
'LS465



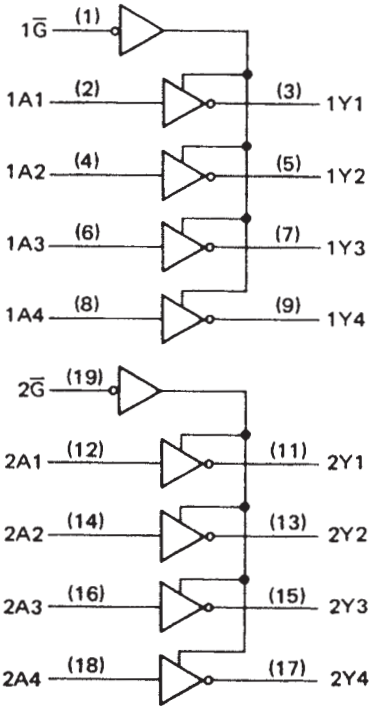
'LS466



'LS467

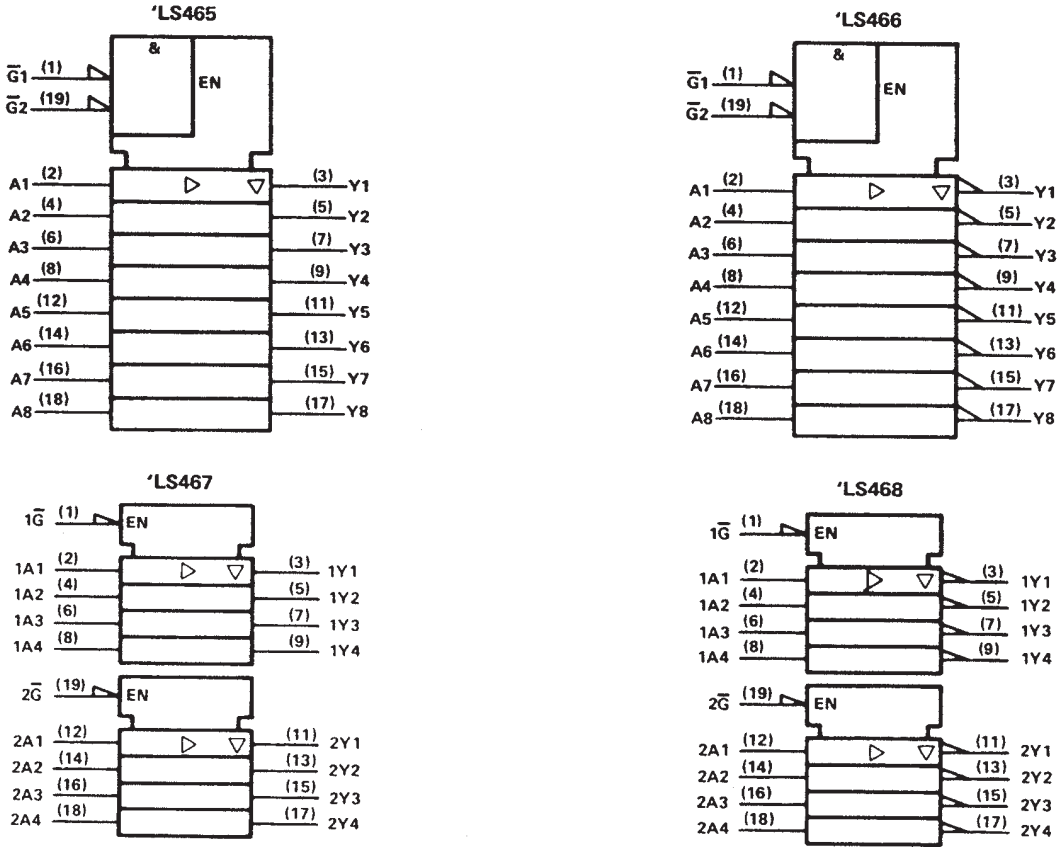


'LS468



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

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

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	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}	$\overline{G}$ ↑	Y			30	45		30	45	ns

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

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