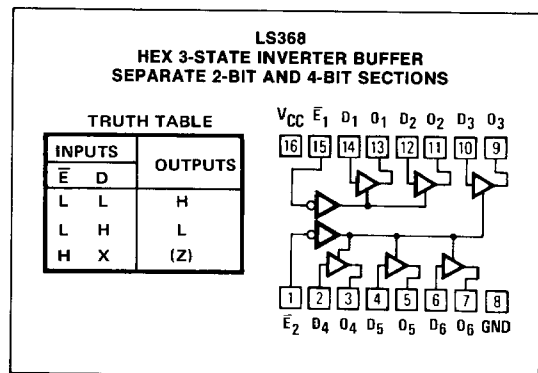
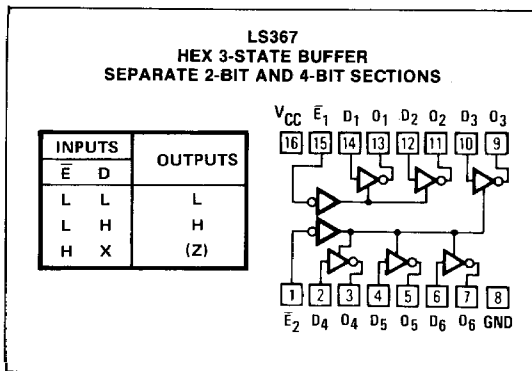
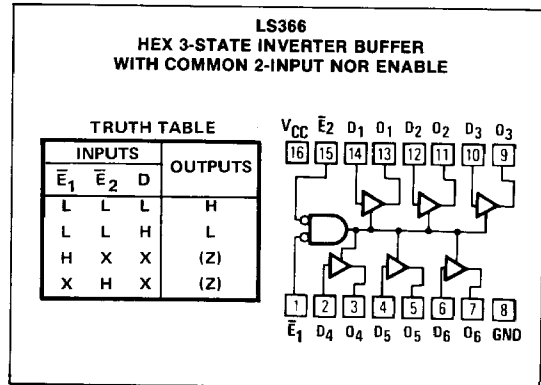
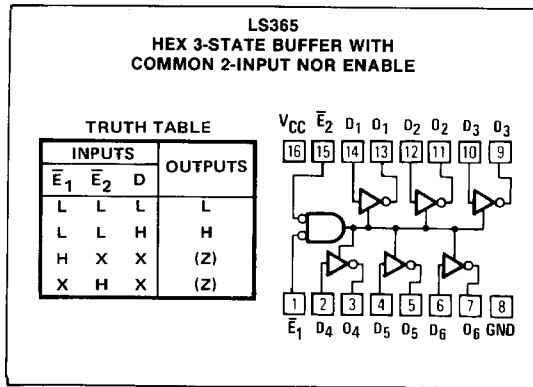


DESCRIPTION

The LS365/366/367/368 are high speed hex buffers with 3-state outputs. They are organized as single 6-bit or 2-bit/4-bit, with inverting or non-inverting data (D) paths. The outputs are designed to drive 15TTL Unit Loads on 60 Low Power Schottky loads when the Enable (\bar{E}) is LOW.

When Output Enable Input (\bar{E}) is HIGH, the outputs are forced to a high impedance "off" state. If the outputs of the 3-state devices are tied together, all but one device must be in the high impedance state to avoid high currents that would exceed the maximum ratings. Designers should ensure that Output Enable signals to 3-state devices whose outputs are tied together are designed so there is no overlap.

PIN-OUT DIAGRAMS



Recommended Operating Conditions

	9LS/54LS			9LS/74LS			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		75	$^{\circ}$ C

Electrical Characteristics Over Recommended Free-Air Temperature Range (Unless Otherwise Noted)

Parameter	Test Conditions*	9LS/54LS			9LS/74LS			Unit
		Min	Typ**	Max	Min	Typ**	Max	
V_{IH}	Guaranteed Input HIGH Voltage for All Inputs	2.0			2.0			V
V_{IL}	Guaranteed Input LOW Voltage for All Inputs			.7	2.0		.8	V
V_{CD}	$V_{CC}=\text{MIN}, I_{IN}=-18\text{mA}$		-0.65	-1.5		-0.65	-1.5	V
V_{OH}	$V_{CC}=\text{MIN}, V_{IN}=V_{IH}$ or V_{IL} per Truth Table	$I_{OH}=-1.0\text{mA}$ $I_{OH}=-2.6\text{mA}$	2.4	3.4				V
V_{OL}	$V_{CC}=\text{MIN}, V_{IN}=V_{IH}$ or V_{IL} per Truth Table	$I_{OL}=12\text{mA}$ $I_{OL}=24\text{mA}$		0.25	0.4		0.25 0.40 0.35 0.5	V
I_{OZH}	$V_{CC}=\text{MAX}, V_{out}=2.4\text{V}, V_E=2.0\text{V}$			20			20	μA
I_{OZL}	$V_{CC}=\text{MAX}, V_{out}=0.4\text{V}, V_E=2.0\text{V}$			-20			-20	μA
I_{IH}	$V_{CC}=\text{MAX}, V_{IN}=2.7\text{V}$			20			20	μA
	$V_{CC}=\text{MAX}, V_{IN}=7.0\text{V}$			-1			-1	mA
I_{IL}	$V_{CC}=\text{MAX}, V_{IN}=0.4\text{V}$			-0.4			-0.4	mA
I_{OS}^{\dagger}	$V_{CC}=\text{MAX}, V_{OUT}=0\text{V}$	-30		-100	-30		-100	mA
I_{CC}	$V_{CC}=\text{MAX}, V_{IN}=0\text{V}, V_E=4.5\text{V}$			13.5	24		13.5 24	mA
		LS365/367 LS366/368		11.8	21		11.8 21	

*For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable device type.

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

\dagger Not more than one output should be shorted at a time.

Switching Characteristics, $V_{CC}=5\text{V}$ Over Recommended Free-Air Temperature Range

Parameter	From (Input)	To (Output)	-55°C			$+25^{\circ}\text{C}$			$+125^{\circ}\text{C}$			Unit
			Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Test Conditions: $C_L=45\text{pF}$ (See Fig. A, page 2-174)												
t_{PLH} (LS365/367)	D_i	O_i		9	14		7	10		9	14	ns
t_{PHL} (LS365/367)				12	20		10	16		12	20	
t_{PLH} (LS366/368)	D_i	O_i		9	14		7	10		9	14	ns
t_{PHL} (LS366/368)				12	20		10	16		12	20	
t_{ZH}	\bar{E}	O_i		12	20		10	16		12	20	ns
t_{ZL}				20	36		18	30		20	36	
Test Conditions: $C_L=5\text{pF}, R_L=667\Omega$ (See Fig. C, page 2-174)												
t_{LZ}	\bar{E}	O_i		12	20		10	15		12	20	ns
t_{HZ}				19	27		17	23		19	27	
Test Conditions: $C_L=125\text{pF}$, (See Fig. A, page 2-174)												
t_{PLH} (LS365/367)	D_i	O_i		12	20		10	15		12	20	ns
t_{PHL} (LS365/367)				15	26		15	21		15	26	
t_{PLH} (LS366/368)	D_i	O_i		12	20		10	15		12	20	ns
t_{PHL} (LS366/368)				15	26		15	21		15	20	
t_{ZH}	\bar{E}	O		16	26		13	20		16	26	ns
t_{ZL}				24	42		21	35		24	40	

Note: AC specification shown under -55°C and $+125^{\circ}\text{C}$ are for 9LS devices only. All 50pF specifications are for 9LS only.