Ⓜ *MOTOROLA*

SN54/74LS365A
## SN54/74LS366A
SN54/74LS367A
SN54/74LS368A

3-STATE HEX BUFFERS

These devices 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 15 TTL Unit Loads or 60 Low Power Schottky loads when the Enable (E) is LOW.

When the Output Enable (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.
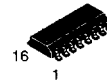
3-STATE HEX BUFFERS

LOW POWER SCHOTTKY
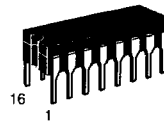
J SUFFIX
CERAMIC
CASE 620-09

N SUFFIX
PLASTIC
CASE 648-08

D SUFFIX
SOIC
CASE 751B-03

ORDERING INFORMATION

SN54LSXXXJ   Ceramic
SN74LSXXXN   Plastic
SN74LSXXXD   SOIC

GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V_{CC}	Supply Voltage	54	4.5	5.0	5.5	V
		74	4.75	5.0	5.25	
T_A	Operating Ambient Temperature Range	54	−55	25	125	°C
		74	0	25	70	
I_{OH}	Output Current — High	54			−1.0	mA
		74			−2.6	
I_{OL}	Output Current — Low	54			12	mA
		74			24	

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HEX 3-STATE BUFFER WITH
COMMON 2-INPUT NOR ENABLE
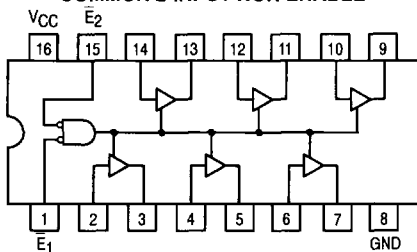
TRUTH TABLE

INPUTS			OUTPUT
$\overline{E}_1$	$\overline{E}_2$	D	
L	L	L	L
L	L	H	H
H	X	X	(Z)
X	H	X	(Z)

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HEX 3-STATE INVERTER BUFFER
WITH COMMON 2-INPUT NOR ENABLE
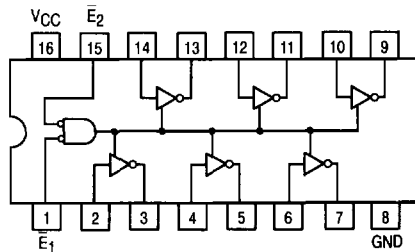
TRUTH TABLE

INPUTS			OUTPUT
$\overline{E}_1$	$\overline{E}_2$	D	
L	L	L	H
L	L	H	L
H	X	X	(Z)
X	H	X	(Z)

SN54/74LS367A
HEX 3-STATE BUFFER
SEPARATE 2-BIT AND 4-BIT SECTIONS
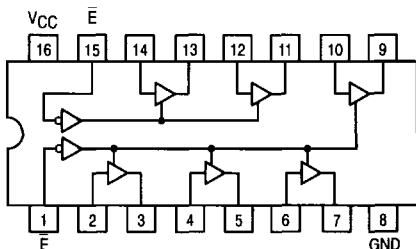
TRUTH TABLE

INPUTS		OUTPUT
$\overline{E}$	D	
L	L	L
L	H	H
H	X	(Z)

SN54/74LS368A
HEX 3-STATE INVERTER BUFFER
SEPARATE 2-BIT AND 4-BIT SECTIONS
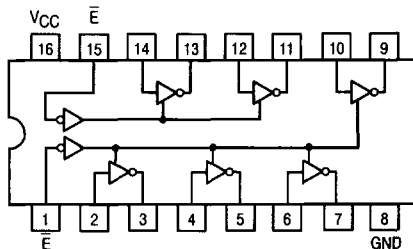
TRUTH TABLE

INPUTS		OUTPUT
$\overline{E}$	D	
L	L	H
L	H	L
H	X	(Z)

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DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter		Min	Typ	Max	Unit	Test Conditions	
V_{IH}	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage for All Inputs	
V_{IL}	Input LOW Voltage	54			0.7	V	Guaranteed Input LOW Voltage for All Inputs	
		74			0.8			
V_{IK}	Input Clamp Diode Voltage			−0.65	−1.5	V	V_{CC} = MIN, I_{IN} = − 18 mA	
V_{OH}	Output HIGH Voltage	54	2.4	3.4		V	V_{CC} = MIN, I_{OH} = MAX, V_{IN} = V_{IH} or V_{IL} per Truth Table	
		74	2.4	3.1		V		
V_{OL}	Output LOW Voltage	54, 74		0.25	0.4	V	I_{OL} = 12 mA	V_{CC} = V_{CC} MIN, V_{IN} = V_{IL} or V_{IH} per Truth Table
		74		0.35	0.5	V	I_{OL} = 24 mA	
I_{OZH}	Output Off Current HIGH				20	µA	V_{CC} = MAX, V_{OUT} = 2.7 V	
I_{OZL}	Output Off Current LOW				−20	µA	V_{CC} = MAX, V_{OUT} = 0.4 V	
I_{IH}	Input HIGH Current				20	µA	V_{CC} = MAX, V_{IN} = 2.7 V	
					0.1	mA	V_{CC} = MAX, V_{IN} = 7.0 V	
I_{IL}	Input LOW Current $\overline{E}$ Inputs				−0.4	mA	V_{CC} = MAX, V_{IN} = 0.4 V	
	D Inputs				−20	µA	V_{CC} = MAX, V_{IN} = 0.5 V Either $\overline{E}$ Input at 2.0 V	
					−0.4	mA	V_{CC} = MAX, V_{IN} = 0.4 V Both $\overline{E}$ Inputs at 0.4 V	
I_{OS}	Short Circuit Current (Note 1)		−40		−225	mA	V_{CC} = MAX	
I_{CC}	Power Supply Current LS365A, 367A				24	mA	V_{CC} = MAX	
	LS366A, 368A				21			

Note 1: Not more than one output should be shorted at a time, nor for more than 1 second.

AC CHARACTERISTICS (T_A = 25°C, V_{CC} = 5.0 V)

Symbol	Parameter	LS365A/LS367A			LS366A/LS368A			Unit	Test Conditions
		Min	Typ	Max	Min	Typ	Max		
t_{PLH} t_{PHL}	Propagation Delay		10 9.0	16 22		7.0 12	15 18	ns	C_L = 45 pF, R_L = 667 Ω
t_{PZH} t_{PZL}	Output Enable Time		19 24	35 40		18 28	35 45	ns	
t_{PHZ} t_{PLZ}	Output Disable Time			30 35			32 35	ns	C_L = 5.0 pF

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