

Device Modeling Report

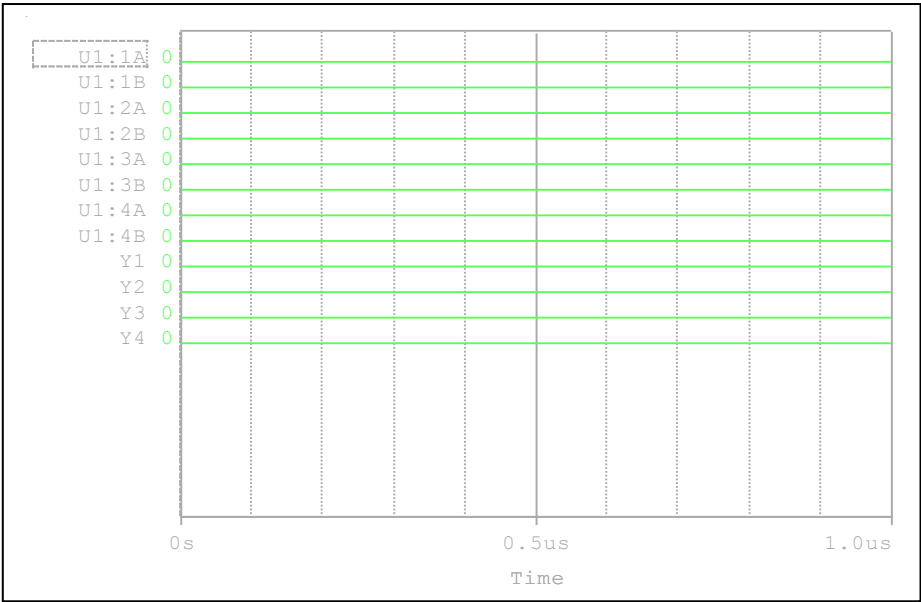
COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT
PART NUMBER : TC74LCX32FN
MANUFACTURER : TOSHIBA



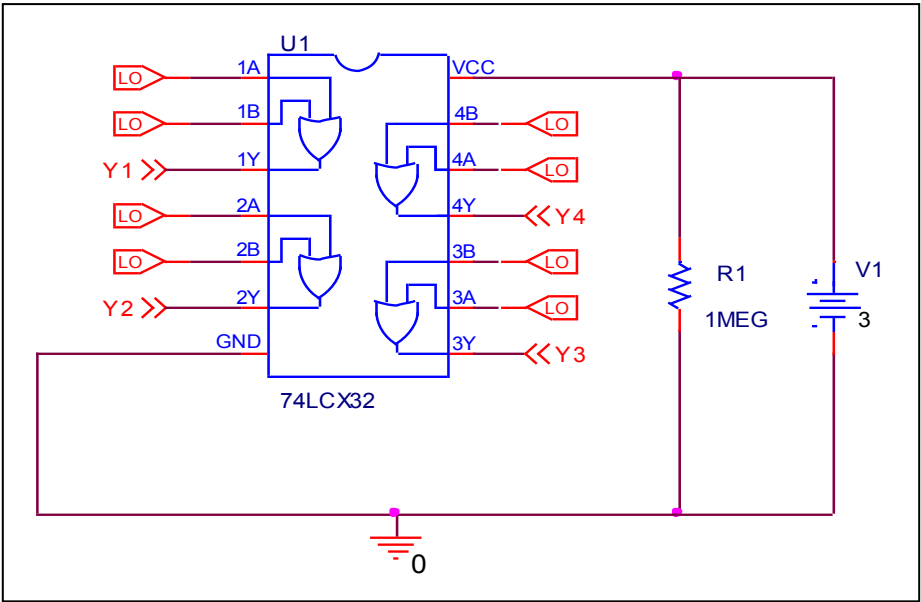
Bee Technologies Inc.

Truth Table

Circuit simulation result



Evaluation circuit

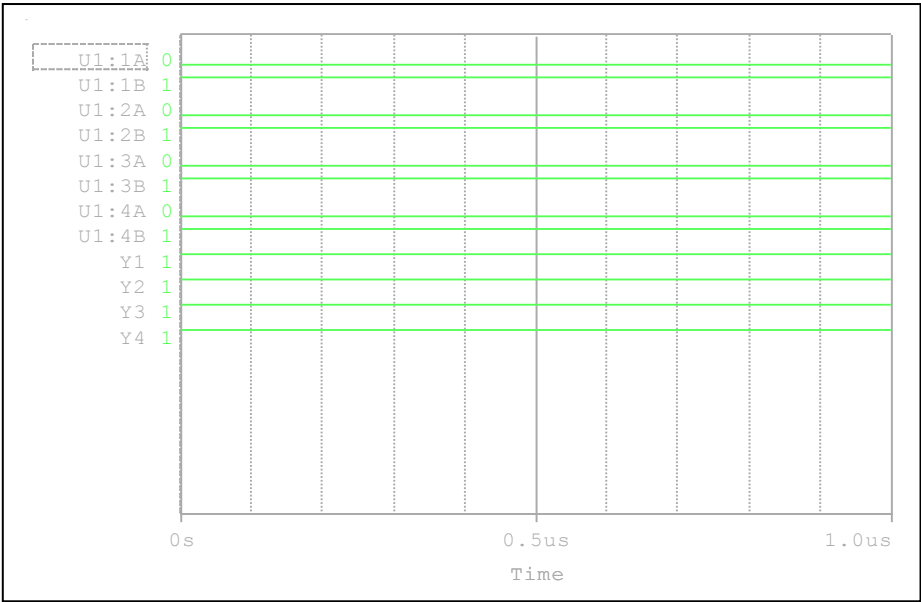


Comparison table

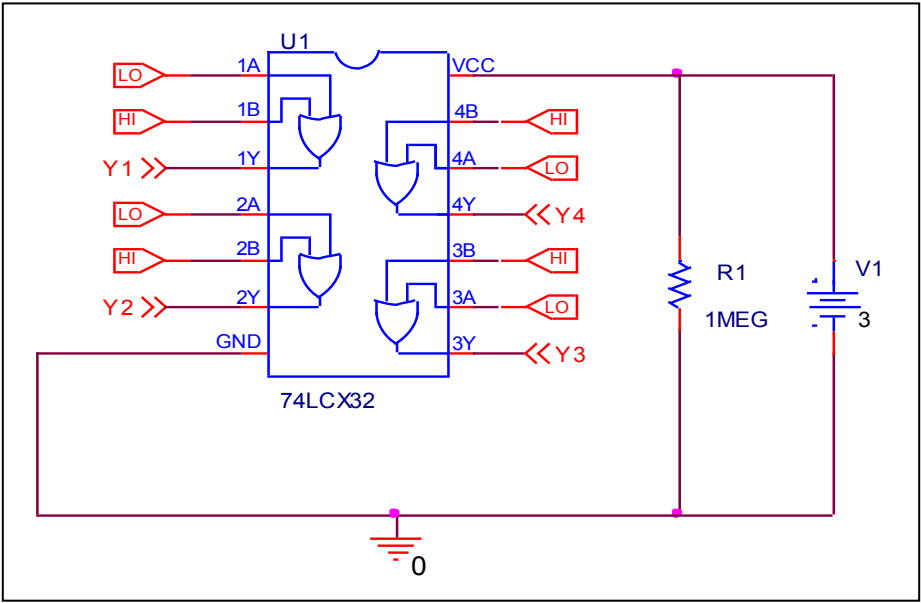
Input		Output		%Error
An	Bn	Yn (Measurement)	Yn (Simulation)	
L	L	L	L	0

Truth Table

Circuit simulation result



Evaluation circuit

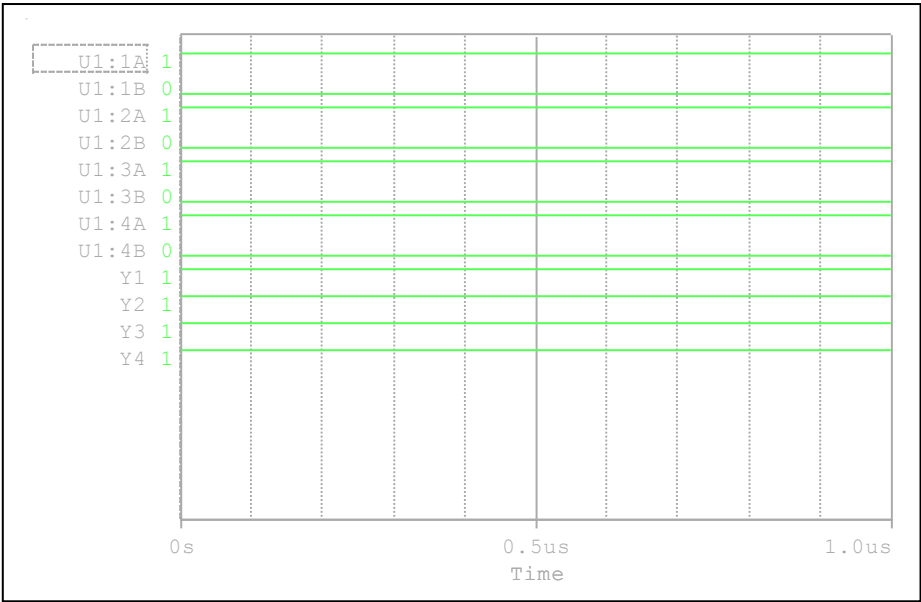


Comparison table

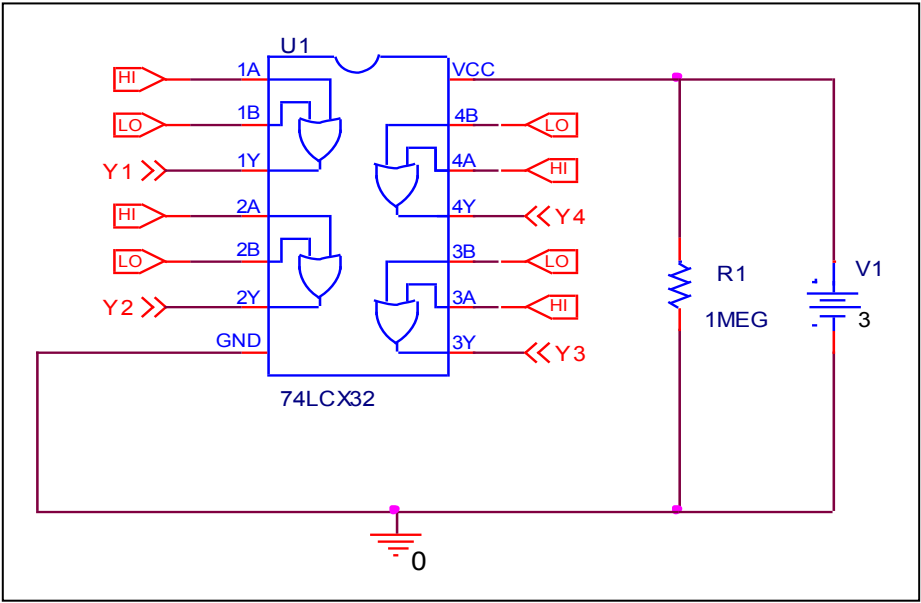
Input		Output		%Error
An	Bn	Yn (Measurement)	Yn (Simulation)	
L	H	H	H	0

Truth Table

Circuit simulation result



Evaluation circuit

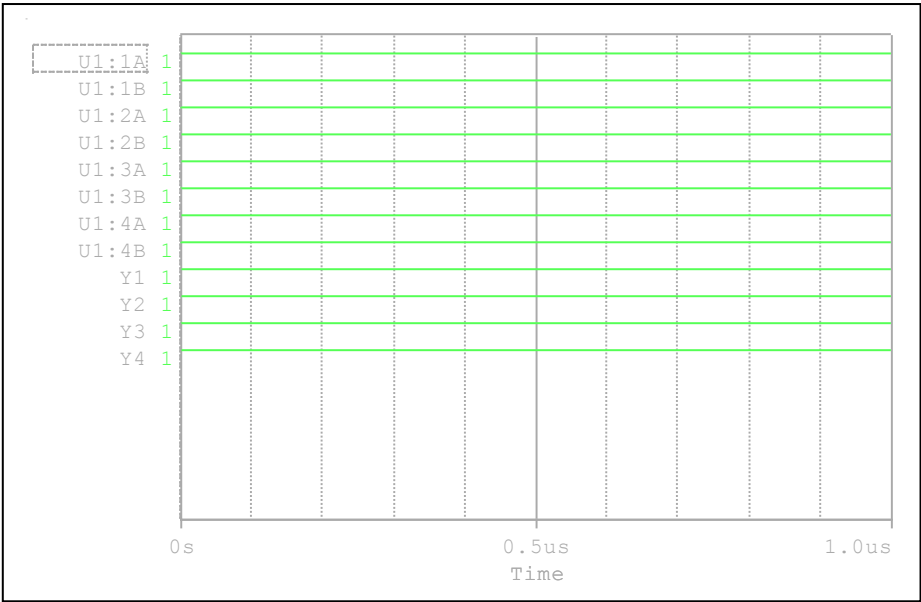


Comparison table

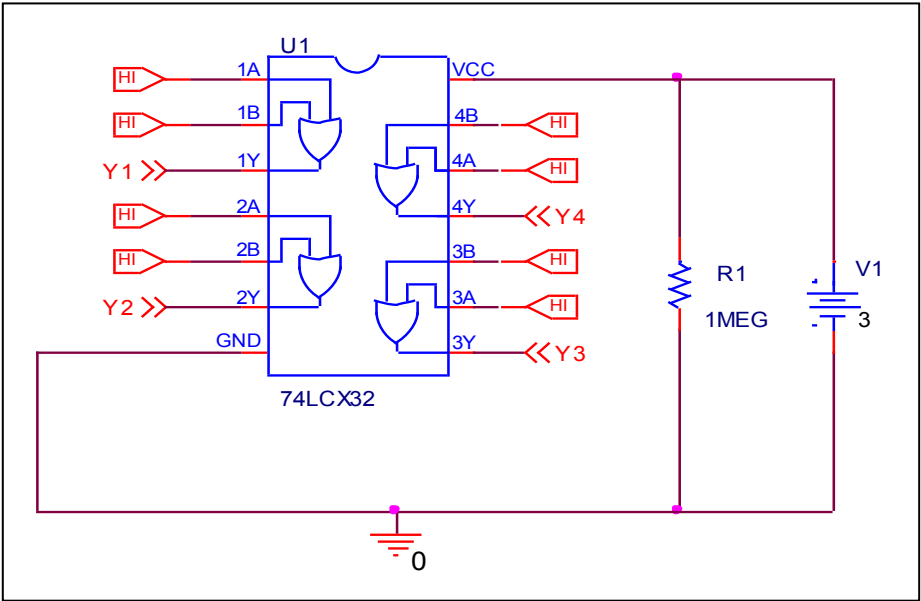
Input		Output		%Error
An	Bn	Yn (Measurement)	Yn (Simulation)	
H	L	H	H	0

Truth Table

Circuit simulation result



Evaluation circuit

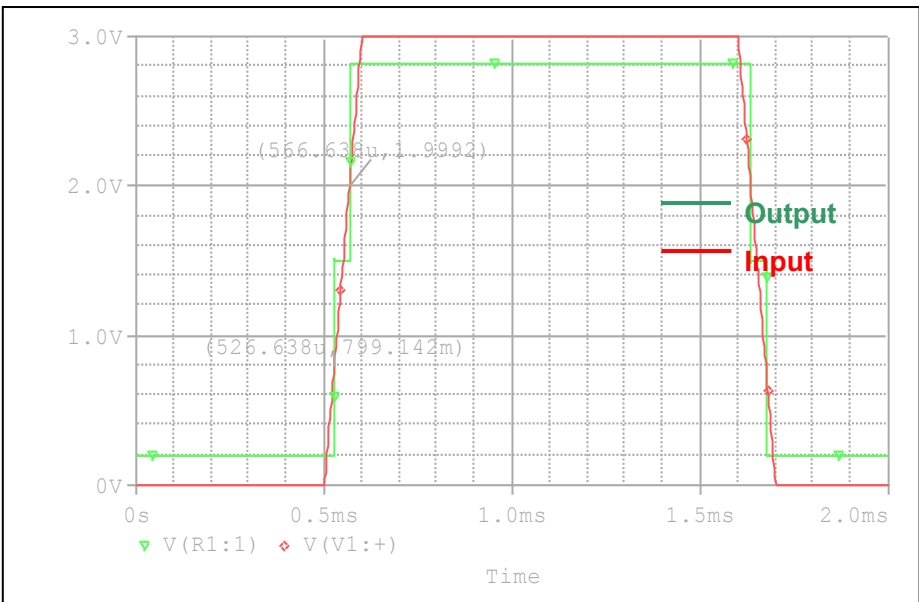


Comparison table

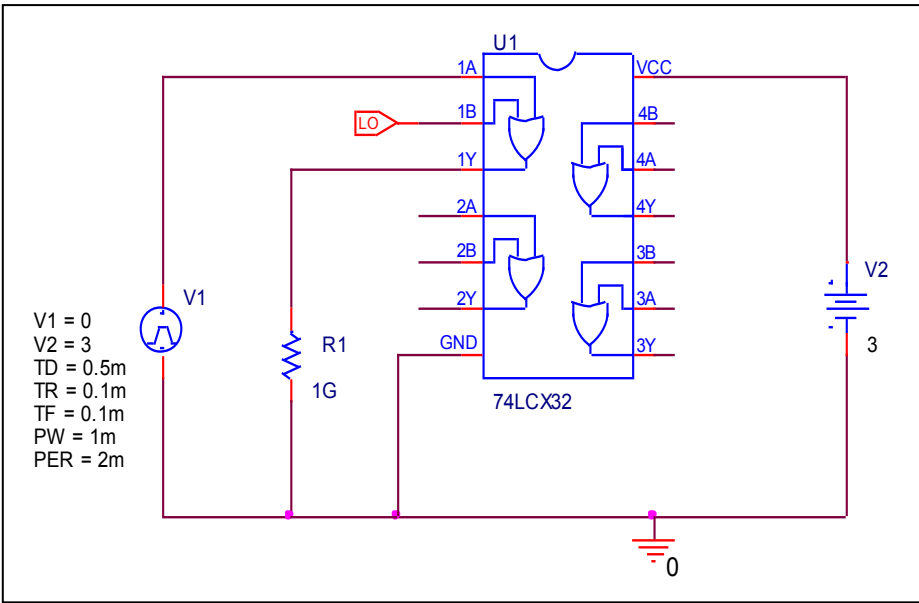
Input		Output		%Error
An	Bn	Yn (Measurement)	Yn (Simulation)	
H	H	H	H	0

High Level and Low Level Input Voltage

Circuit simulation result



Evaluation circuit

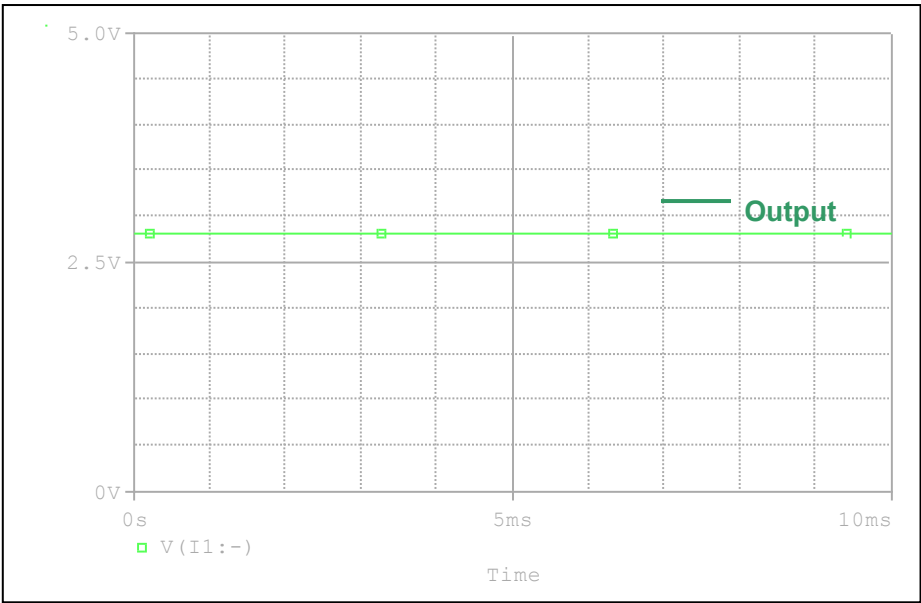


Comparison table

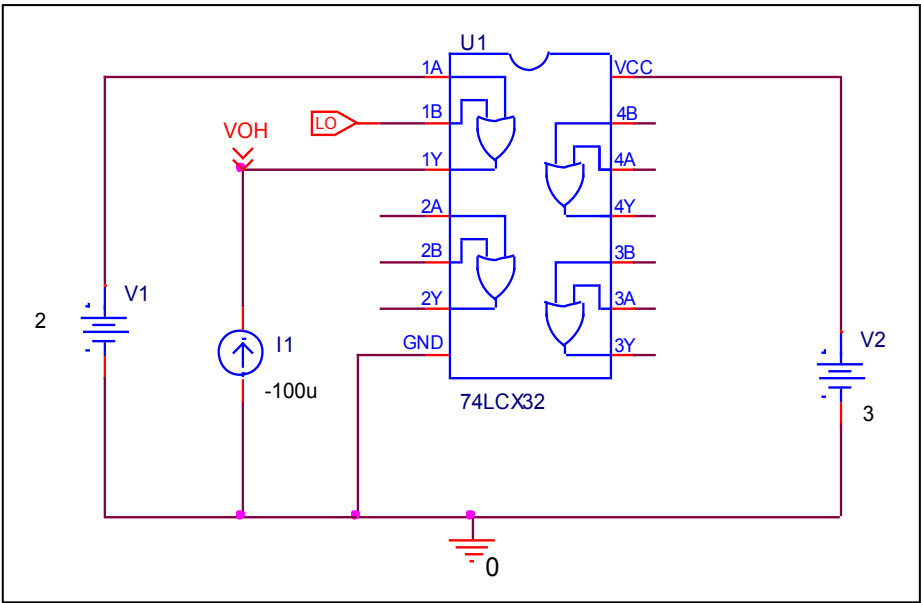
$V_{CC} = 3V$	Measurement	Simulation	%Error
$V_{IH} (V)$	2	1.9992	-0.040
$V_{IL} (V)$	0.8	0.799142	-0.107

High Level Output Voltage

Circuit simulation result



Evaluation circuit

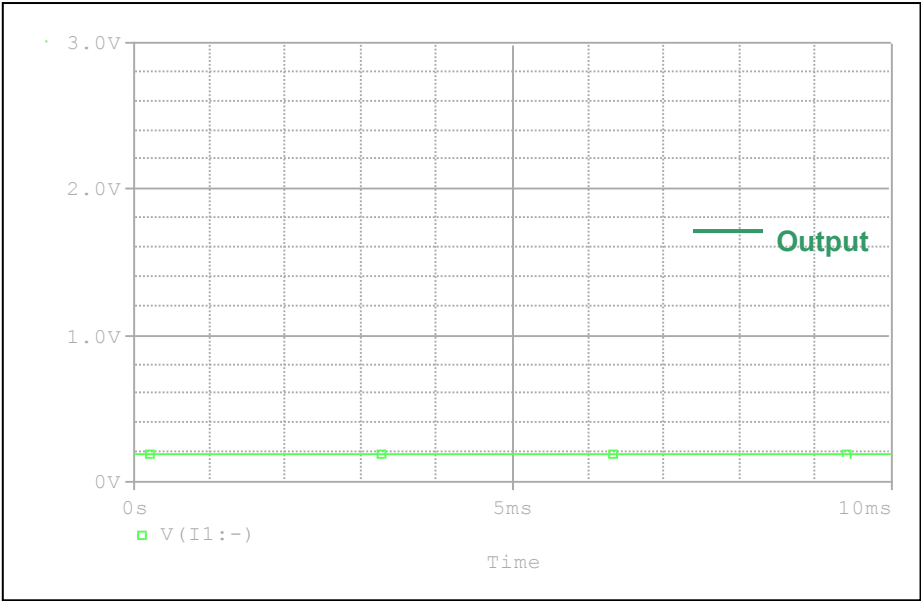


Comparison table

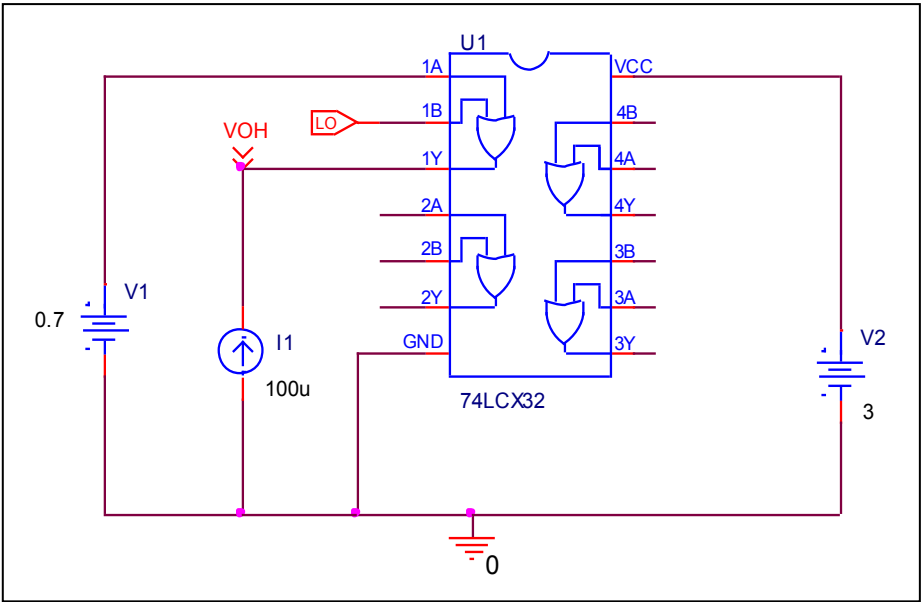
$V_{IN} = V_{IH}, V_{CC} = 3\text{ V}$	Measurement	Simulation	%Error
Min $V_{OH} = (V_{CC} - 0.2)\text{ V}$	2.8	2.8205	0.732

Low Level Output Voltage

Circuit simulation result



Evaluation circuit

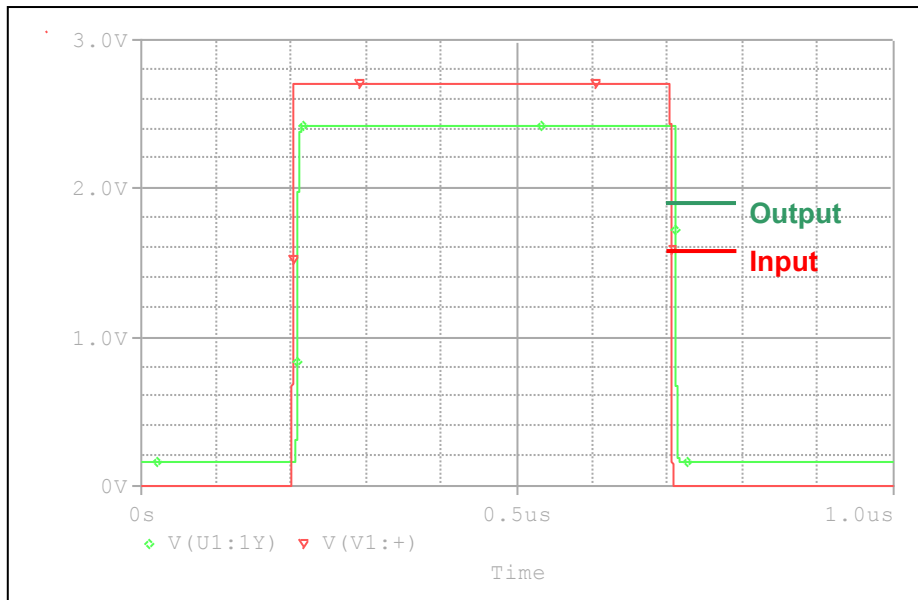


Comparison table

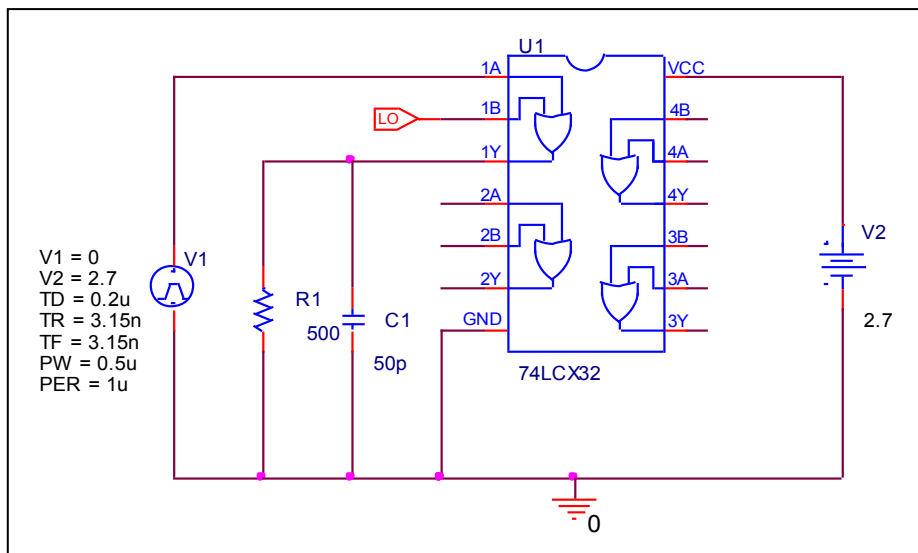
$V_{IN} = V_{IL}, V_{CC} = 3\text{ V}$	Measurement	Simulation	%Error
$V_{OL}\text{ (V)}$	0.2	0.191174	-4.413

Propagation Delay Time

Circuit simulation result



Evaluation circuit



Comparison table $C_L = 50 \text{ pF}$, $R_L = 500 \Omega$

$V_{CC} = 2.7 \text{ V}$, $t_r = t_f = 2.5 \text{ ns}$	Measurement	Simulation	%Error
$t_{pLH} \text{ (ns)}$	6.2	6.2026	0.042
$t_{pHL} \text{ (ns)}$	6.2	6.1245	-1.218