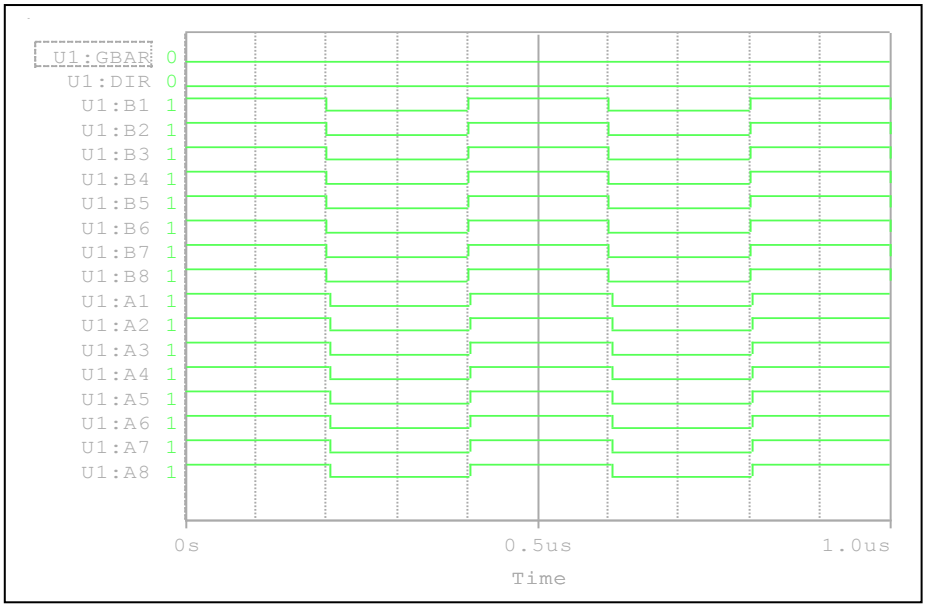
Device Modeling Report

COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT
PART NUMBER : TC74VHC245FW
MANUFACTURER : TOSHIBA

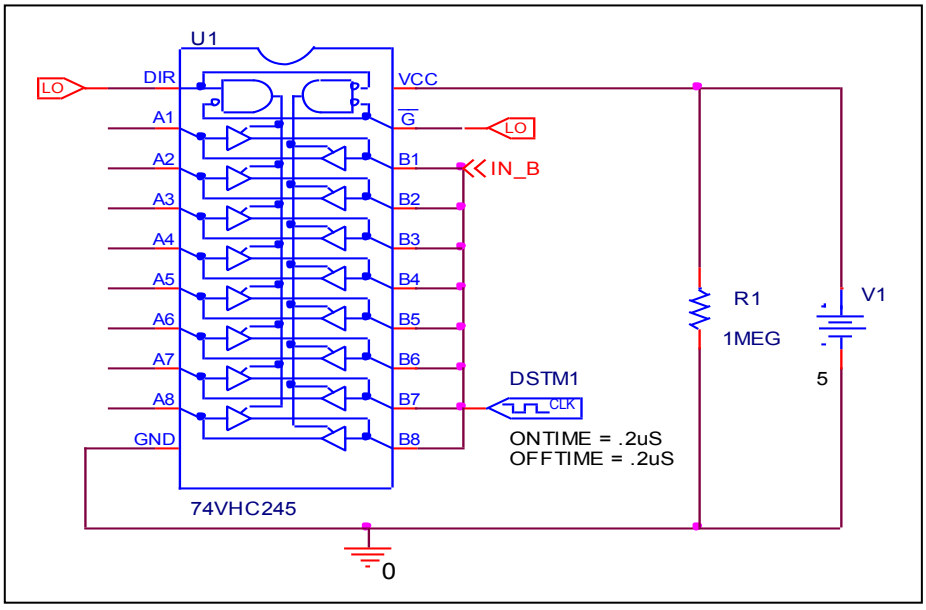
Bee Technologies Inc.

Truth Table

Circuit simulation result



Evaluation circuit

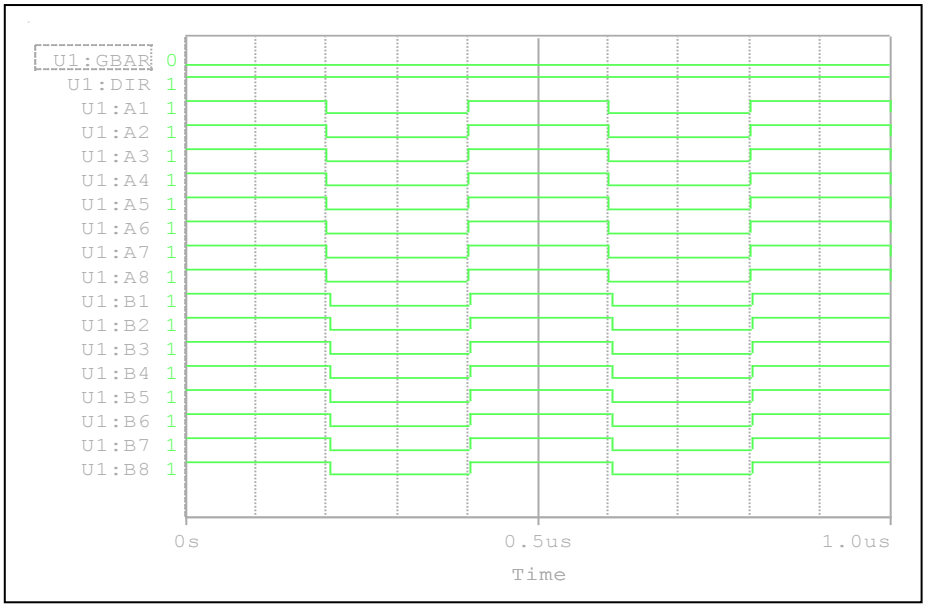


Comparison table **Function : A BUS = OUTPUT, B BUS = INPUT**

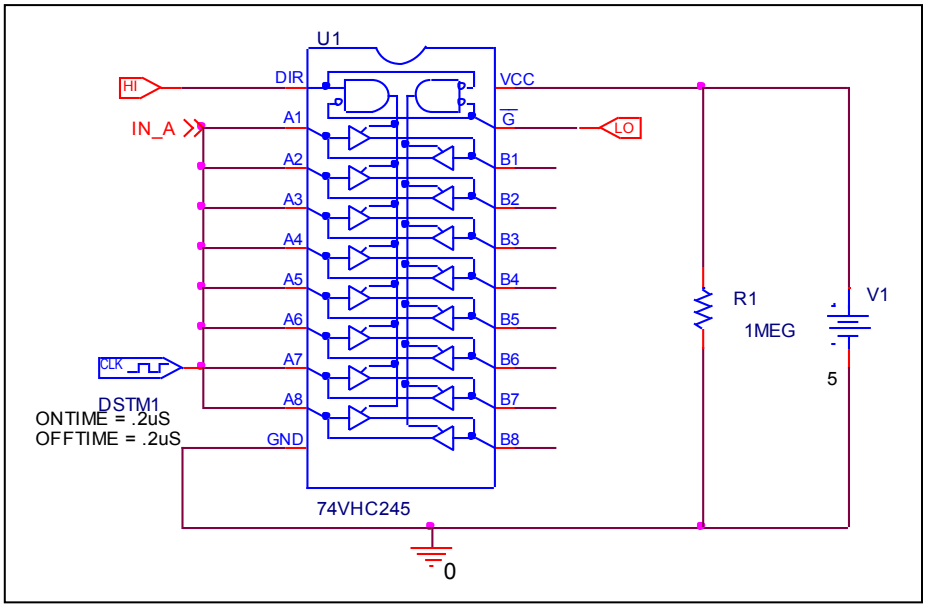
Input		Output		%Error
$\overline{G}$	DIR	Measurement	Simulation	
L	L	A=B	A=B	0

Truth Table

Circuit simulation result



Evaluation circuit

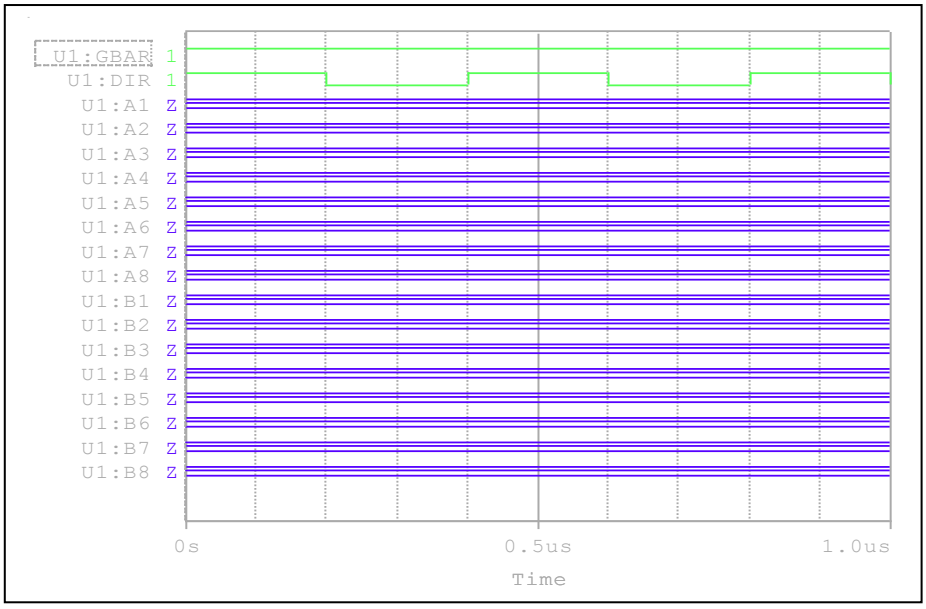


Comparison table **Function : A BUS = INPUT, B BUS = OUTPUT**

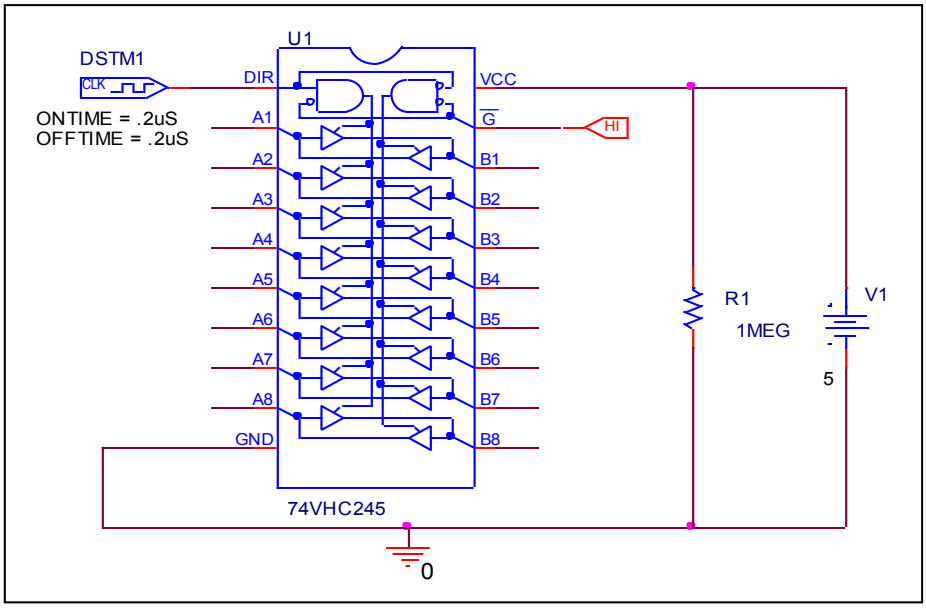
Input		Output		%Error
$\overline{G}$	DIR	Measurement	Simulation	
L	H	B=A	B=A	0

Truth Table

Circuit simulation result



Evaluation circuit

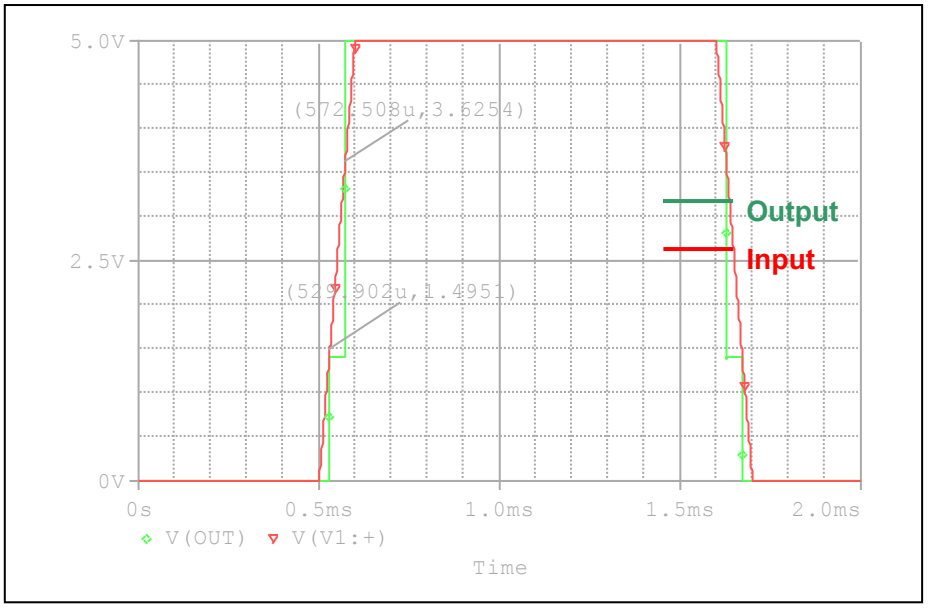


Comparison table **Function : A BUS and B BUS = HIGH IMPEDANCE**

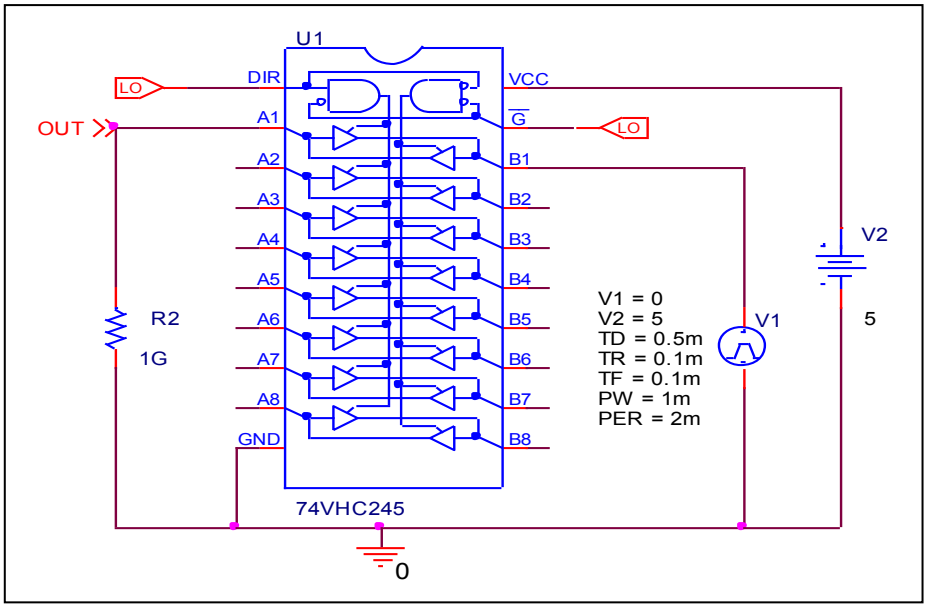
Input		Output		%Error
$\overline{G}$	DIR	Measurement	Simulation	
H	X	Z	Z	0

High Level and Low Level Input Voltage

Circuit simulation result



Evaluation circuit

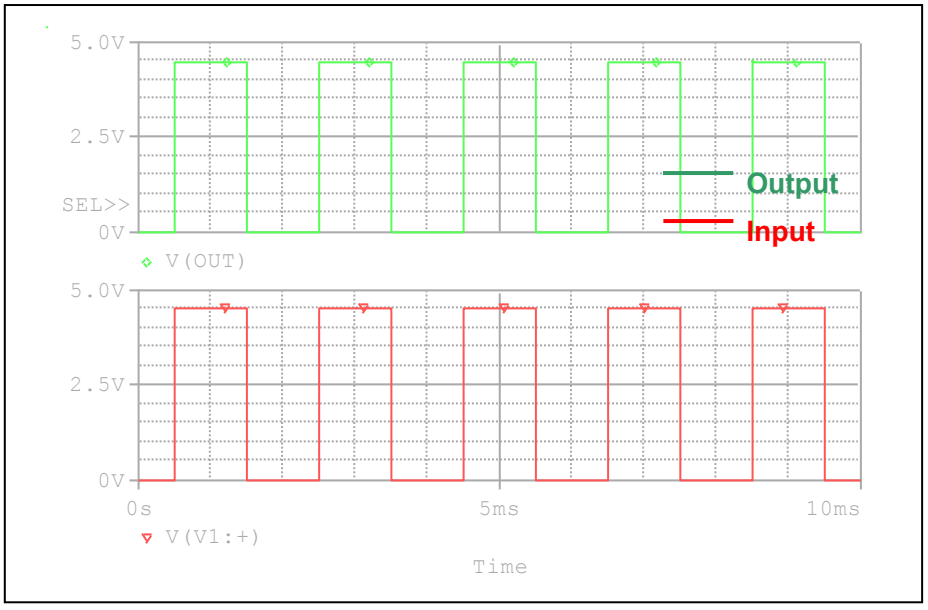


Comparison table

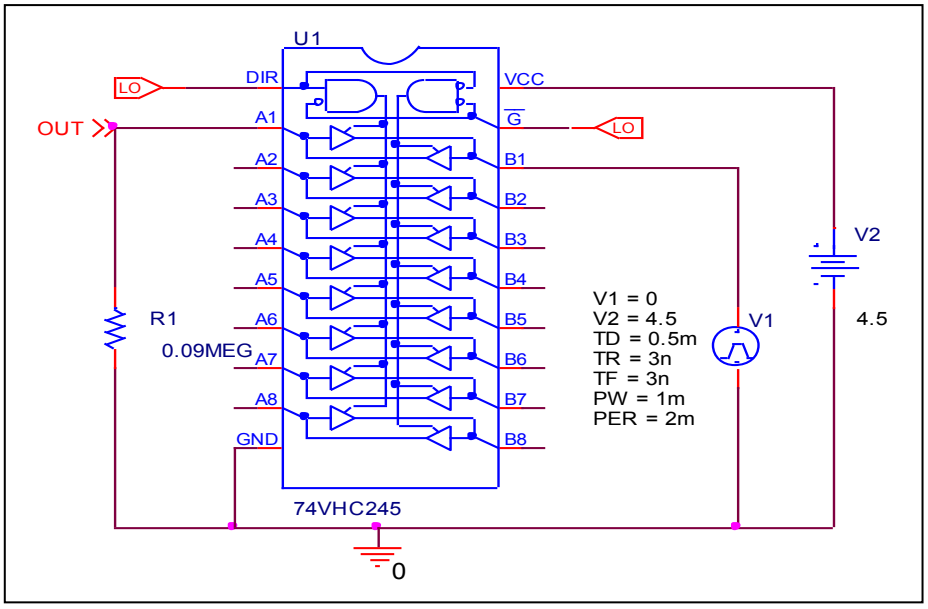
V_{CC} = 5 V	Measurement	Simulation	%Error
Min V_{IH} = (V_{CC}*0.7) V	3.5	3.6254	3.583
Min V_{IL} = (V_{CC}*0.3) V	1.5	1.4951	-0.327

High Level and Low Level Output Voltage

Circuit simulation result



Evaluation circuit

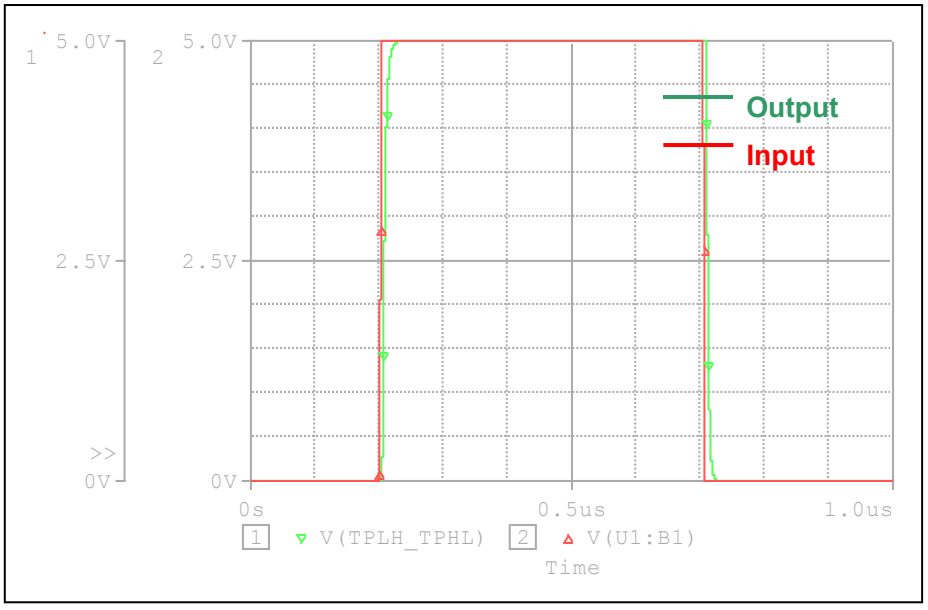


Comparison table

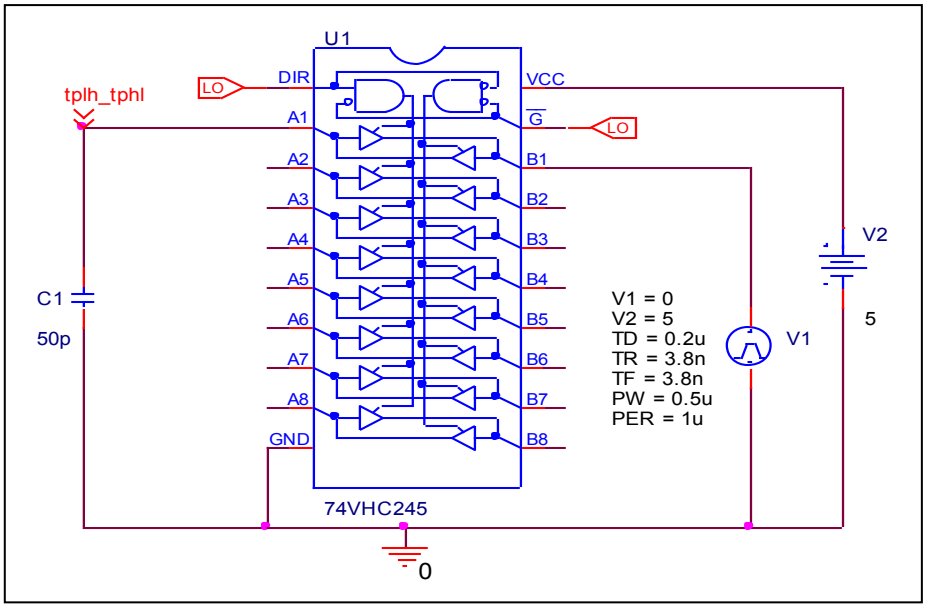
V_{CC} = 4.5V	Measurement	Simulation	%Error
V_{OH} (V)	4.5	4.4968	-0.071
V_{OL} (V)	0	0	0

Propagation Delay Time

Circuit simulation result



Evaluation circuit

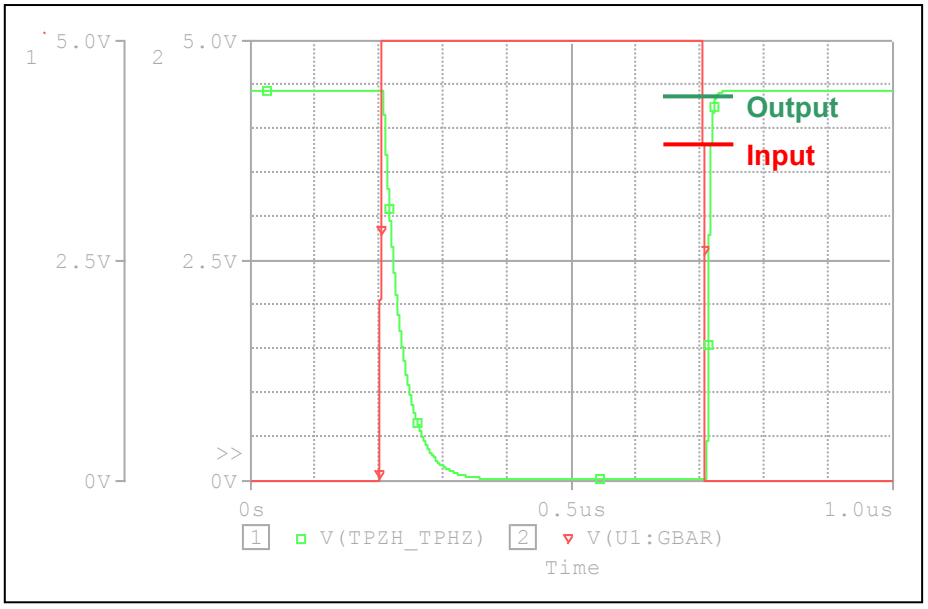


Comparison table **C_L = 50 pF**

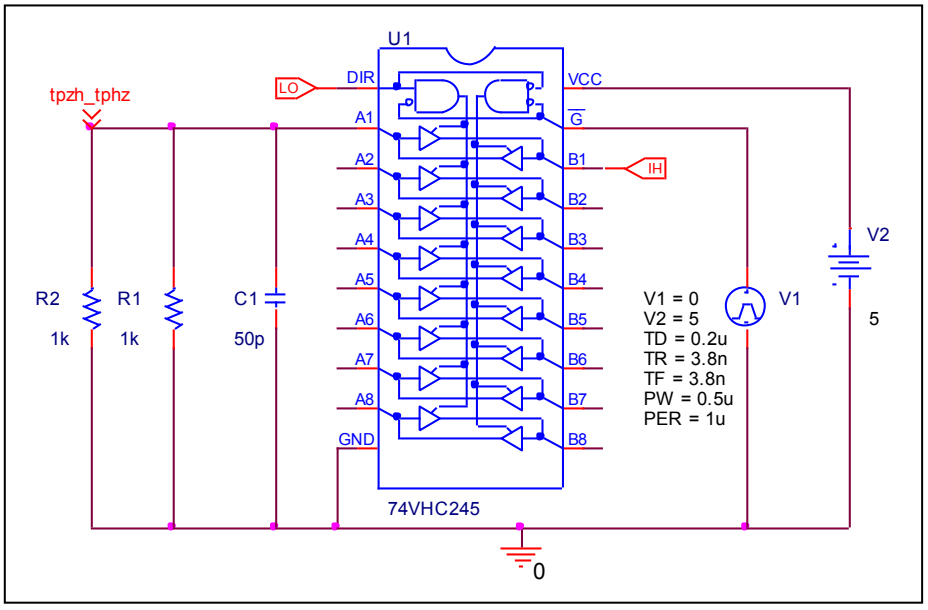
V_{CC} = 5 V, t_r=t_f= 3 ns	Measurement	Simulation	%Error
t_{PLH} (ns)	5.5	5.5414	0.753
t_{PHL} (ns)	5.5	5.5186	0.338

Output enable time, high impedance (off) to high output (t_{PZH})
Output disable time, high to high impedance (off) output (t_{PHZ})

Circuit simulation result



Evaluation circuit

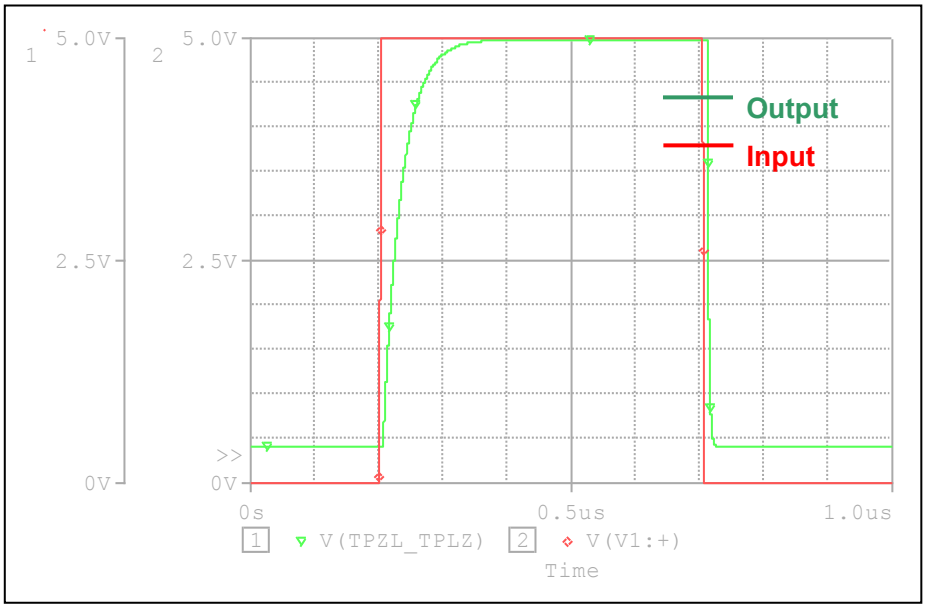


Comparison table C_L = 50 pF, R_L = 1 kΩ

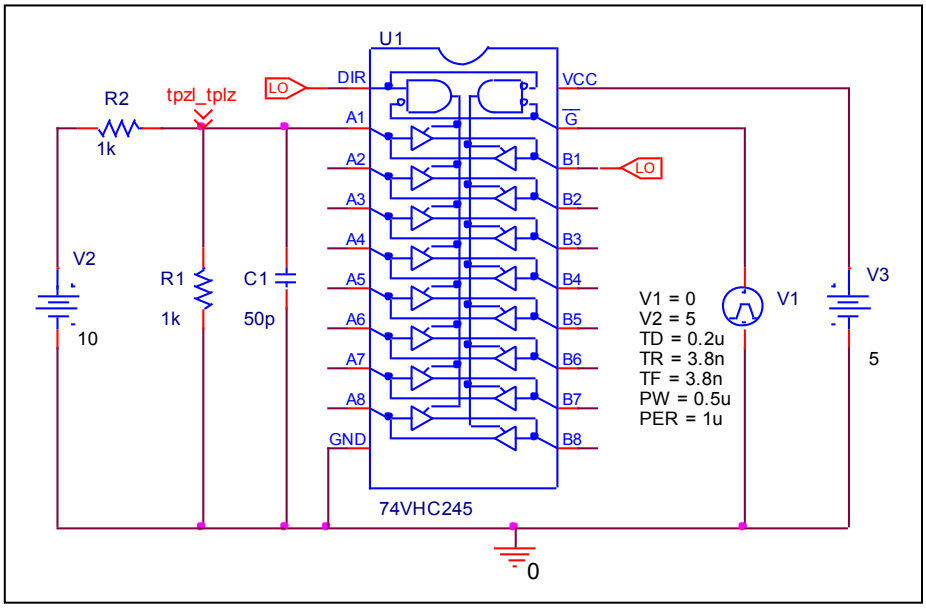
V_{CC} = 5 V, t_r=t_f= 3 ns	Measurement	Simulation	%Error
t_{PZH} (ns)	7.3	7.3971	1.330
t_{PHZ} (ns)	7	7.0539	0.770

Output enable time, high impedance (off) to low output (t_{PZL})
Output disable time, low to high impedance (off) output (t_{PLZ})

Circuit simulation result



Evaluation circuit



Comparison table C_L = 50 pF, R_L = 1 kΩ

V_{CC} = 5 V, t_r=t_f= 3 ns	Measurement	Simulation	%Error
t_{PZL} (ns)	7.3	7.272	-0.384
t_{PLZ} (ns)	7	7.0956	1.366