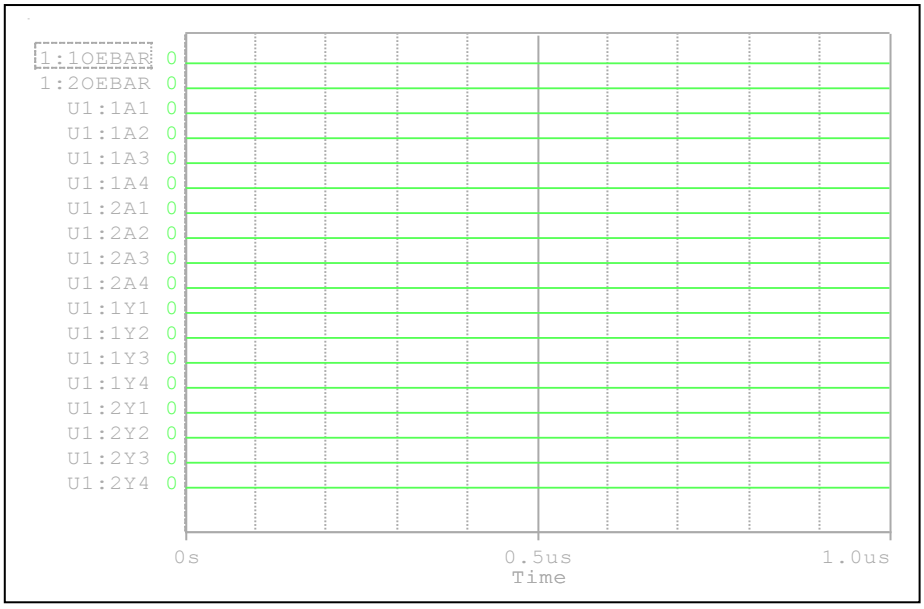
Device Modeling Report

COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT
PART NUMBER : TC74LCX244FW
MANUFACTURER : TOSHIBA

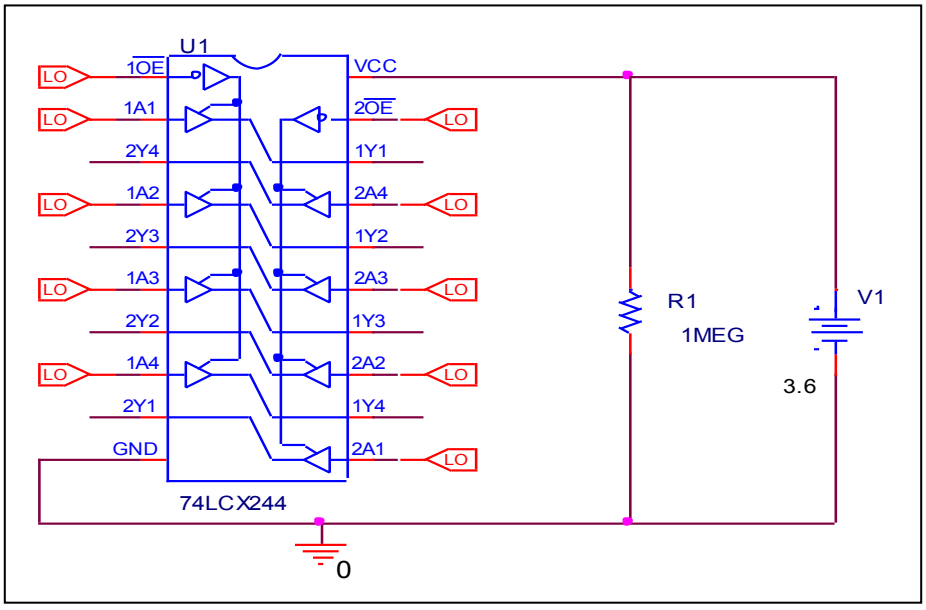
Bee Technologies Inc.

Truth Table

Circuit simulation result



Evaluation circuit

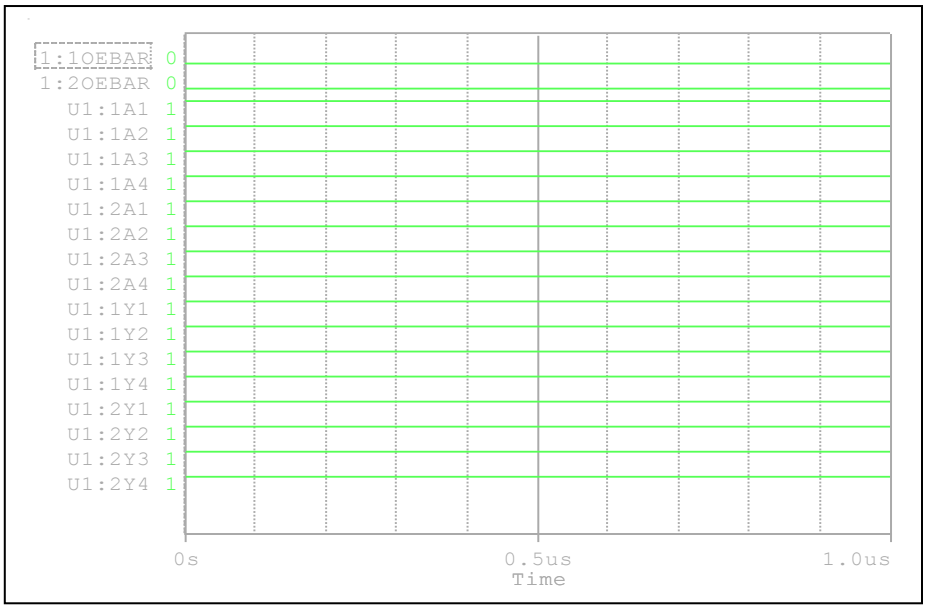


Comparison table

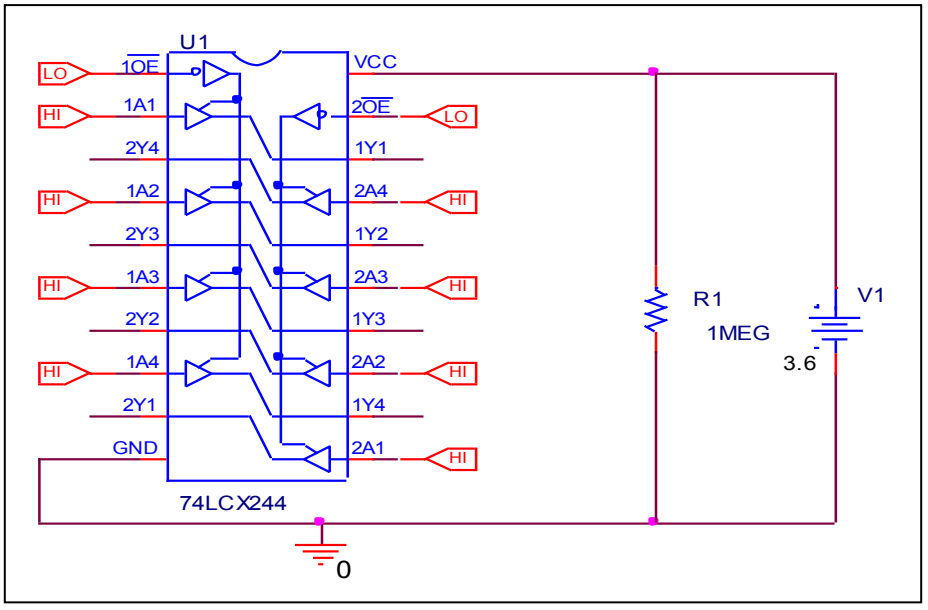
Input		Output		%Error
$\overline{G}$	An	Yn (Measurement)	Yn (Simulation)	
L	L	L	L	0

Truth Table

Circuit simulation result



Evaluation circuit

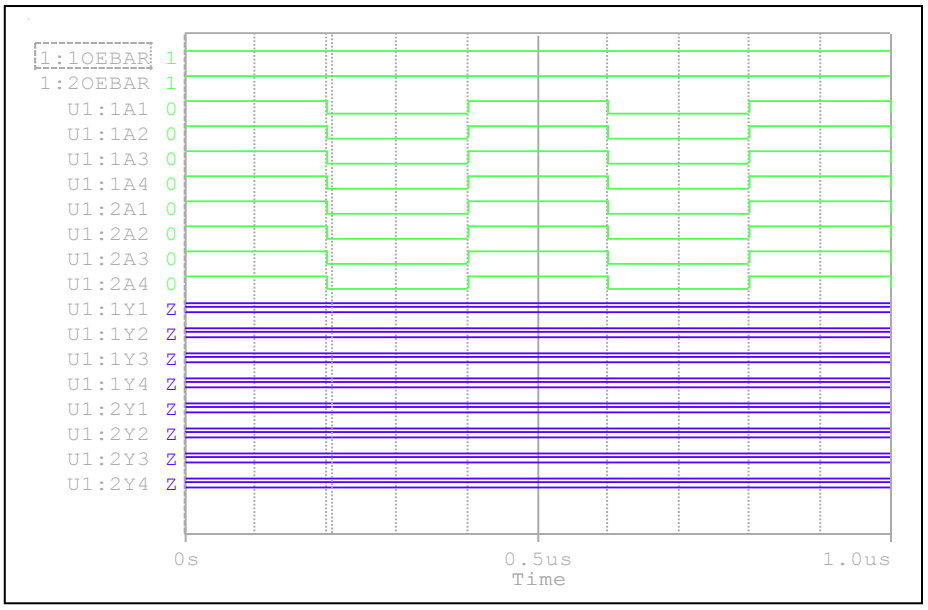


Comparison table

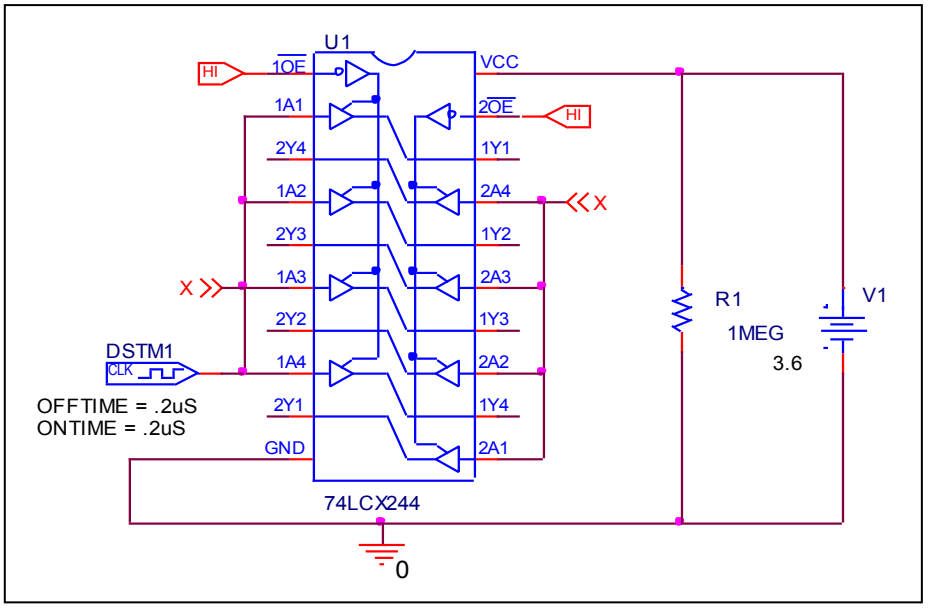
Input		Output		%Error
$\overline{G}$	An	Yn (Measurement)	Yn (Simulation)	
L	**H**	H	H	0

Truth Table

Circuit simulation result



Evaluation circuit

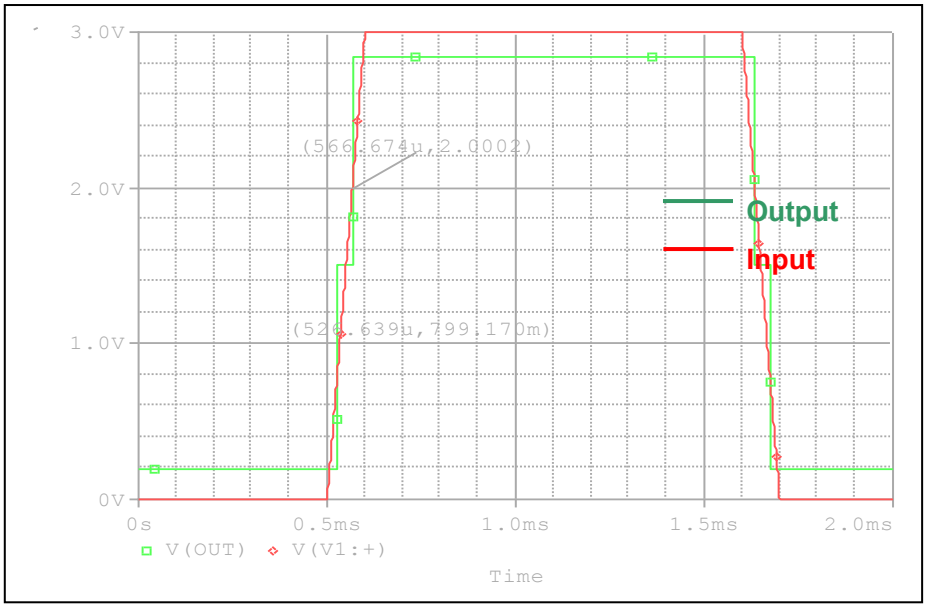


Comparison table

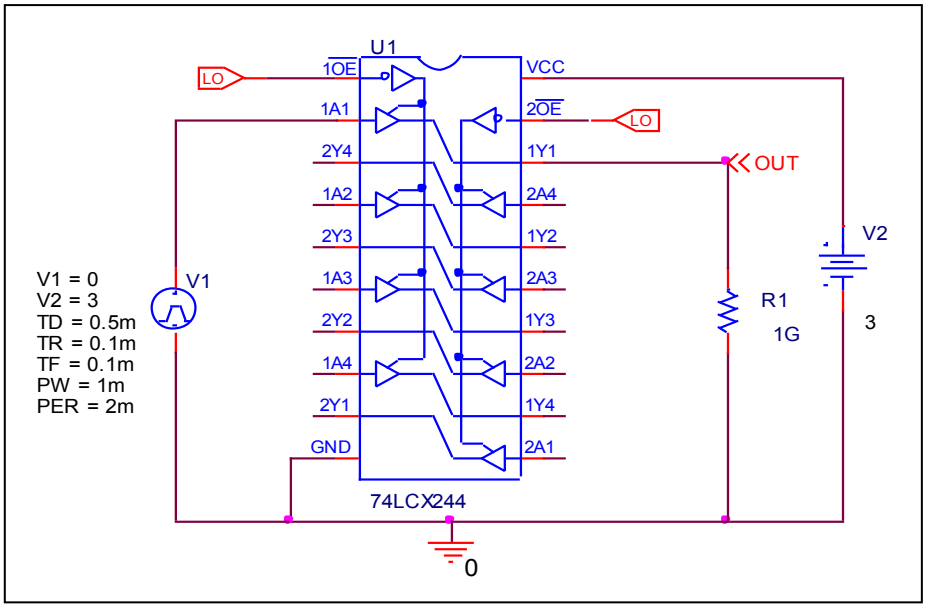
Input		Output		%Error
$\overline{G}$	An	Yn (Measurement)	Yn (Simulation)	
H	X	Z	Z	0

High Level and Low Level Input Voltage

Circuit simulation result



Evaluation circuit

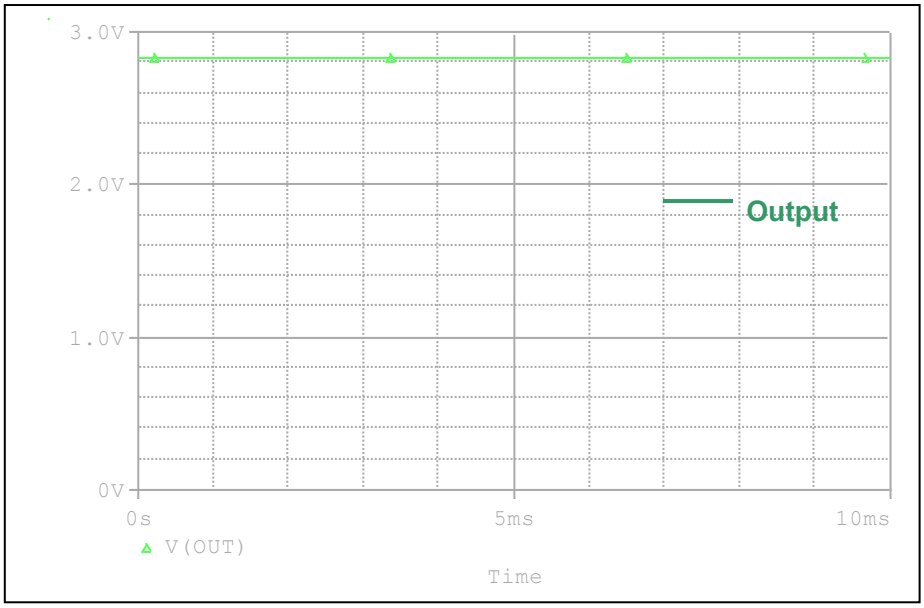


Comparison table

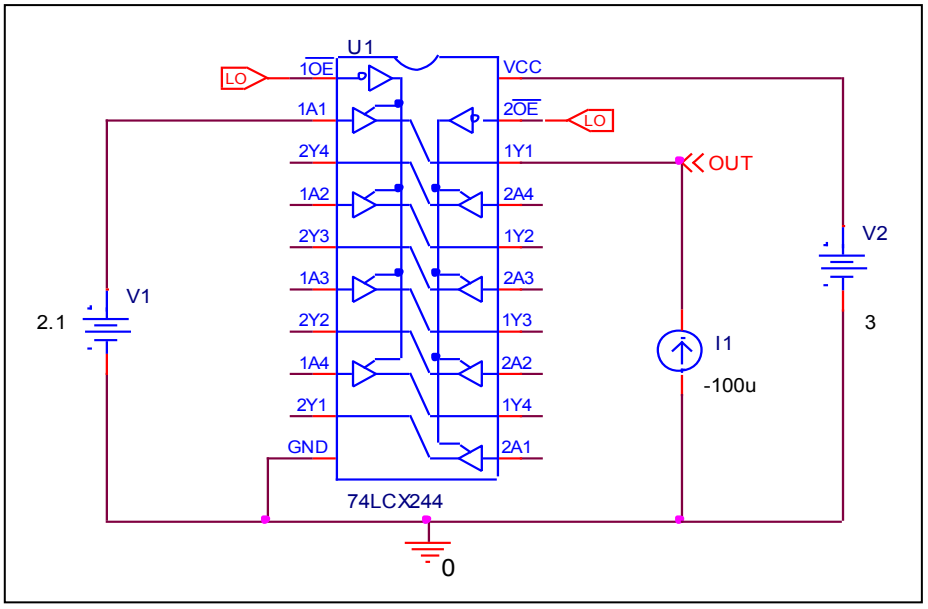
V_{CC} = 5V	Measurement	Simulation	%Error
V_{IH} (V)	2	2	0
V_{IL} (V)	0.8	0.799170	-0.104

High Level Output Voltage

Circuit simulation result



Evaluation circuit

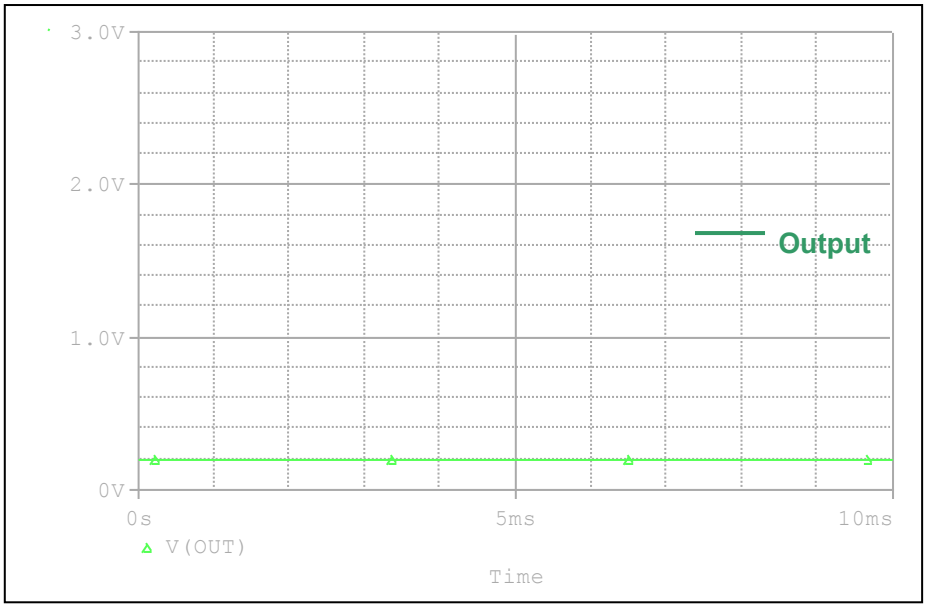


Comparison table

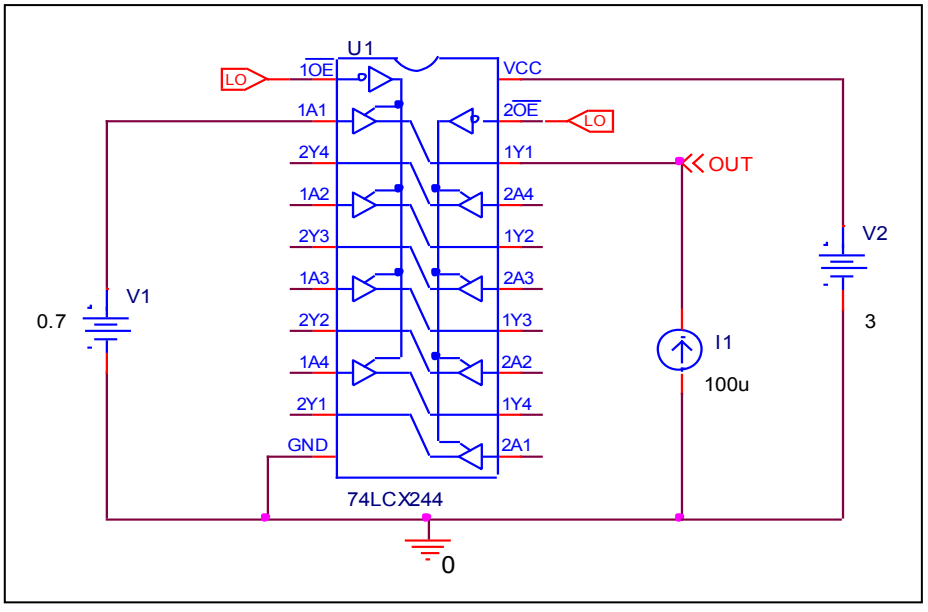
$V_{IN} = V_{IH}$, V_{CC} = 3 V	Measurement	Simulation	%Error
Min V_{OH} = (V_{CC} - 0.2) V	2.8	2.8340	1.214

Low Level Output Voltage

Circuit simulation result



Evaluation circuit

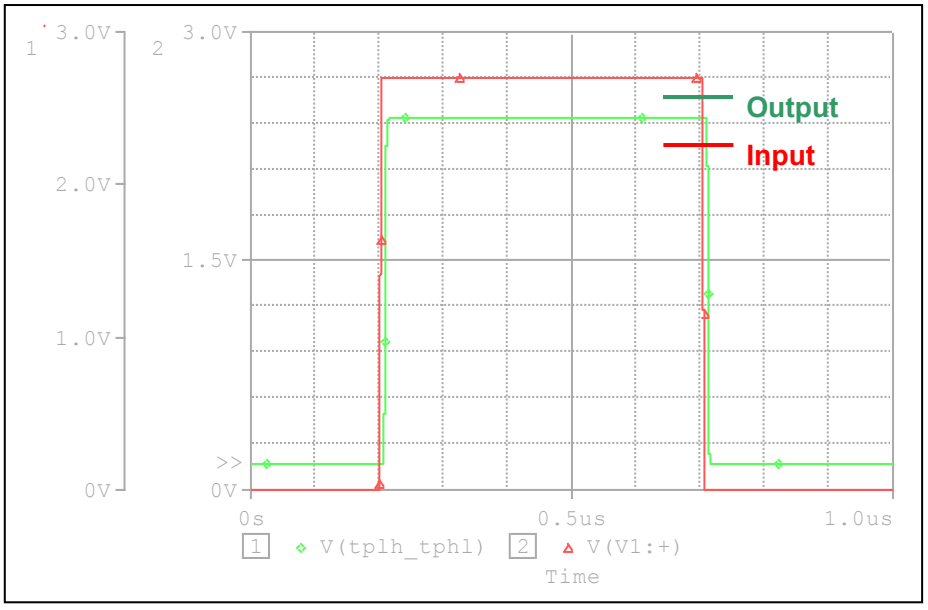


Comparison table

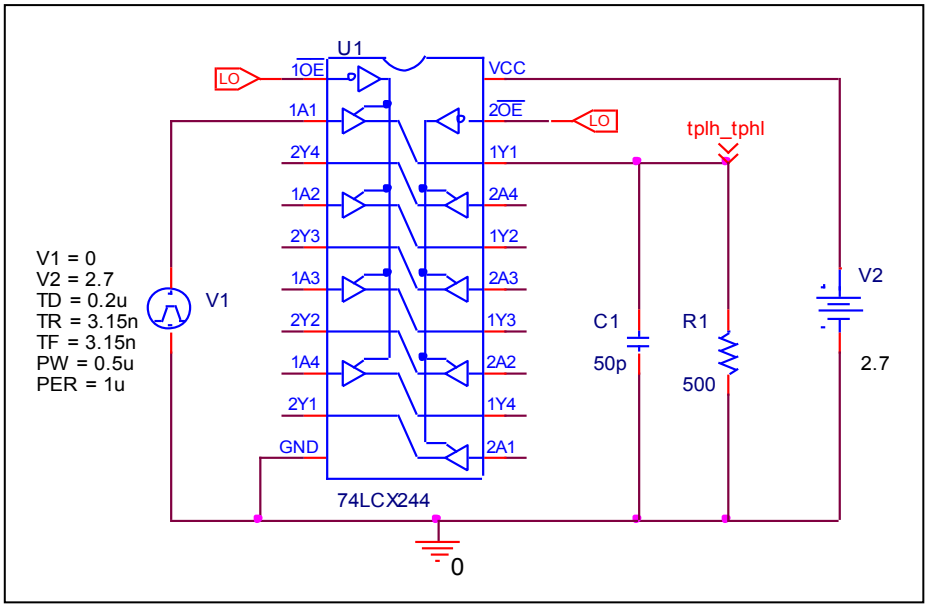
$V_{IN} = V_{IL}$, V_{CC} = 3 V	Measurement	Simulation	%Error
V_{OL} (V)	0.2	0.191208	-4.396

Propagation Delay Time

Circuit simulation result



Evaluation circuit

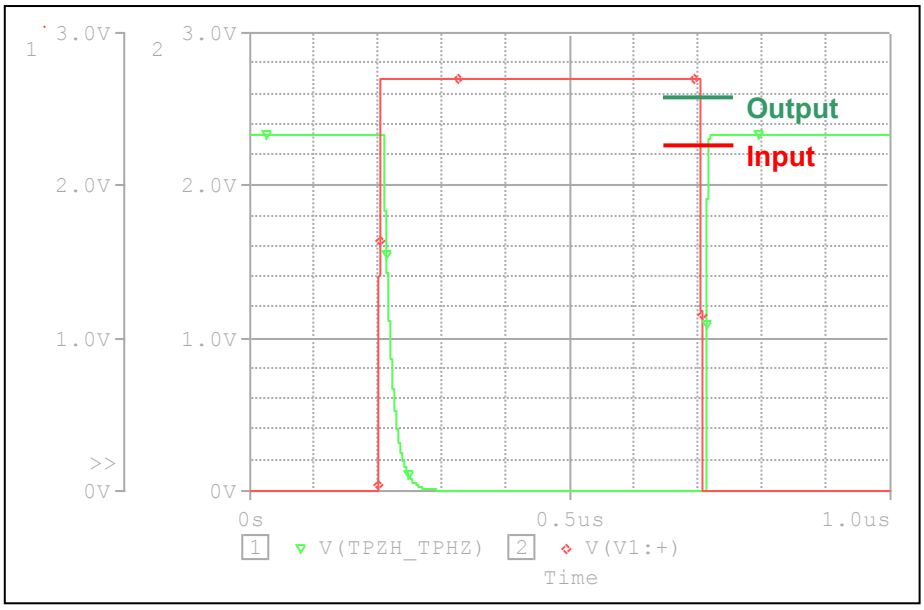


Comparison table C_L = 50 pF, R_L = 500 Ω

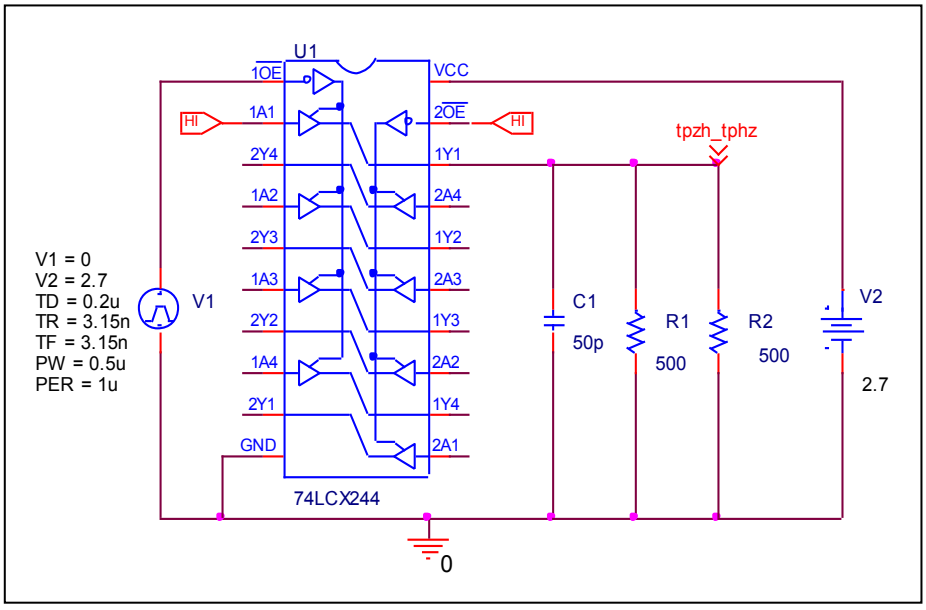
V_{CC} = 2.7 V, t_r=t_f= 2.5 ns	Measurement	Simulation	%Error
t_{PLH} (ns)	7.5	7.4214	-1.048
t_{PHL} (ns)	7.5	7.4696	-0.405

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

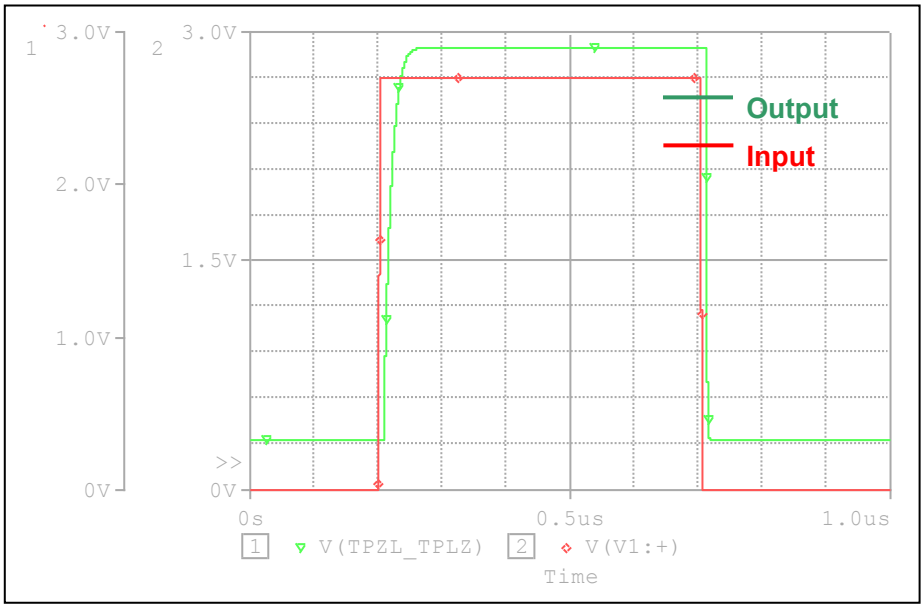


Comparison table C_L = 50 pF, R_L = 500 Ω

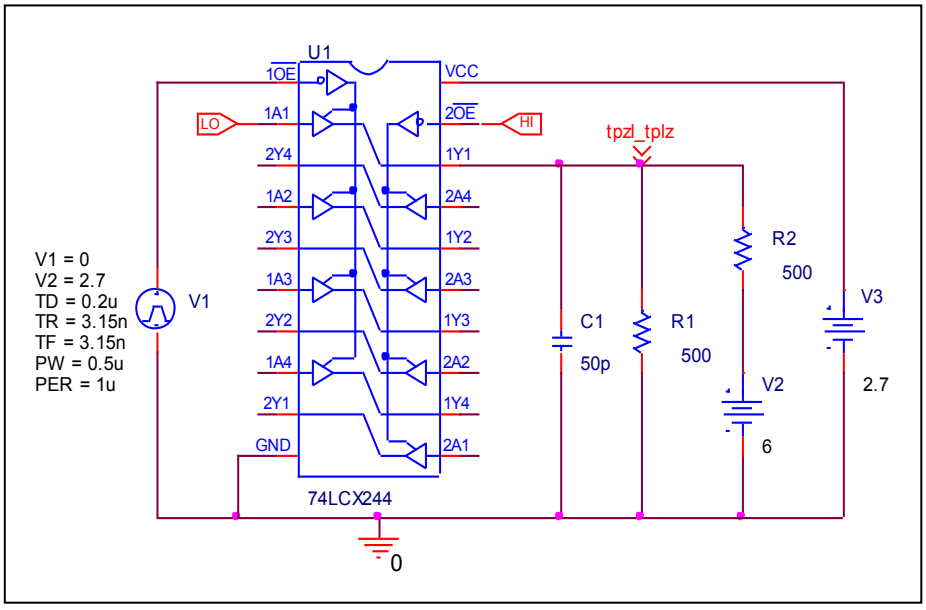
V_{CC} = 2.7 V, t_r=t_f= 2.5 ns	Measurement	Simulation	%Error
t_{PZH} (ns)	9	8.9765	-0.261
t_{PHZ} (ns)	8	7.9671	-0.411

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 = 500 Ω

V_{CC} = 2.7 V, t_r = t_f = 2.5 ns	Measurement	Simulation	%Error
t_{PZL} (ns)	9	8.8887	-1.237
t_{PLZ} (ns)	8	7.9379	-0.776