

Device Modeling Report

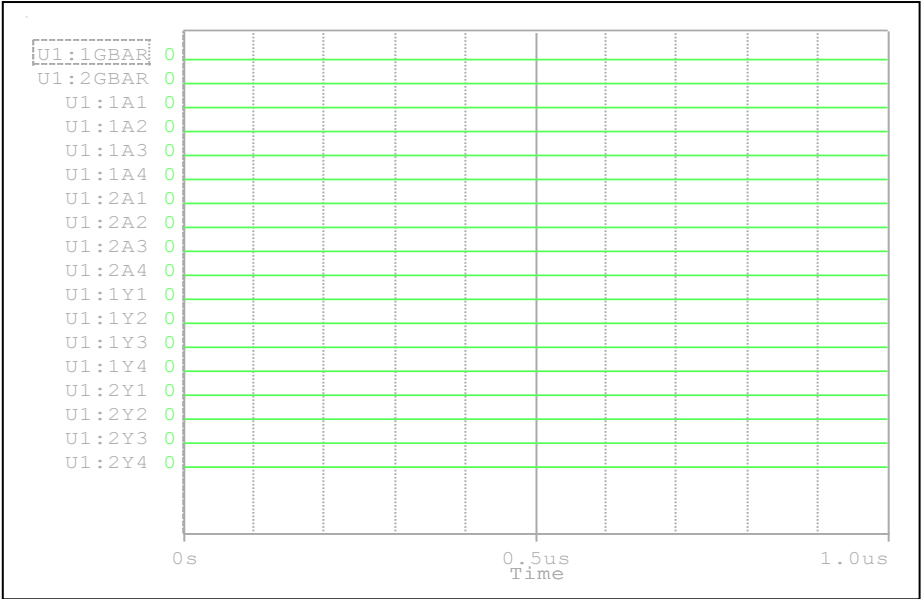
COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT
PART NUMBER : TC74AC244FW
MANUFACTURER : TOSHIBA



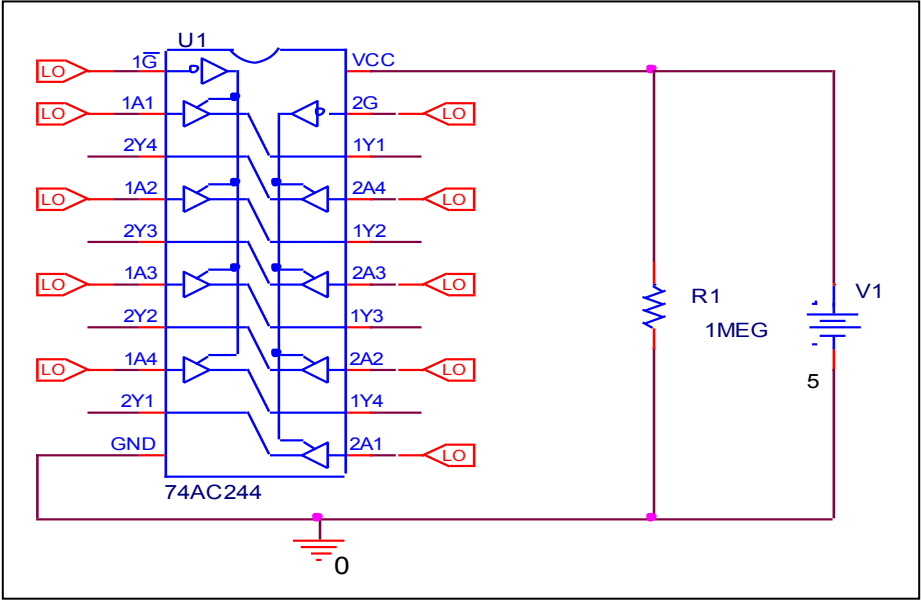
Bee Technologies Inc.

Truth Table

Circuit simulation result



Evaluation circuit

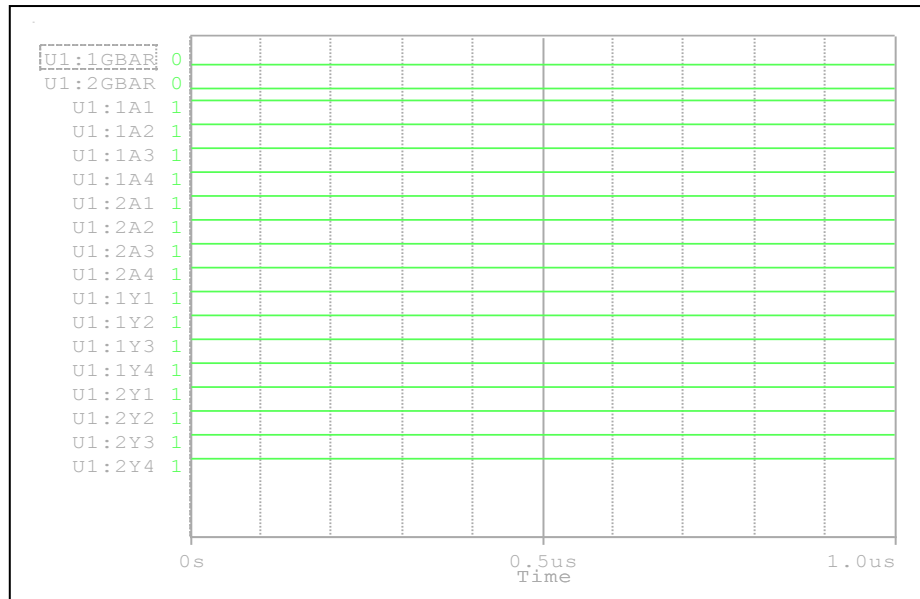


Comparison table

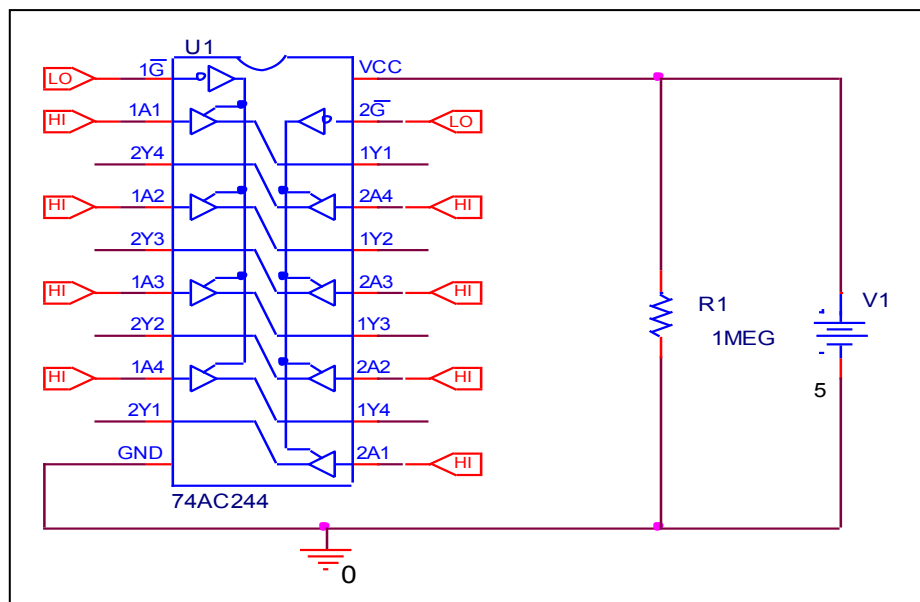
Input		Output		%Error
$\overline{G}$	An	Yn (Measurement)	Yn (Simulation)	
L	L	L	L	0

Truth Table

Circuit simulation result



Evaluation circuit

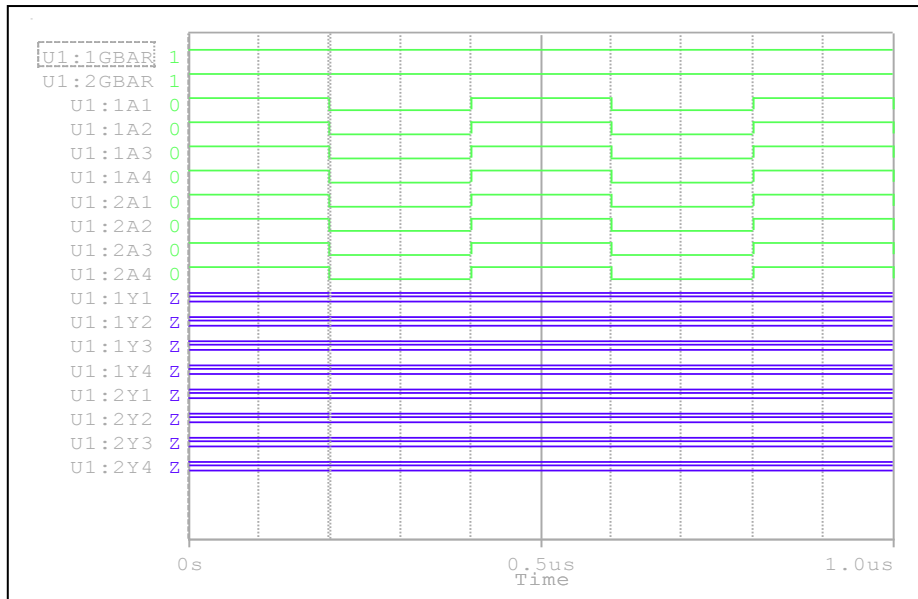


Comparison table

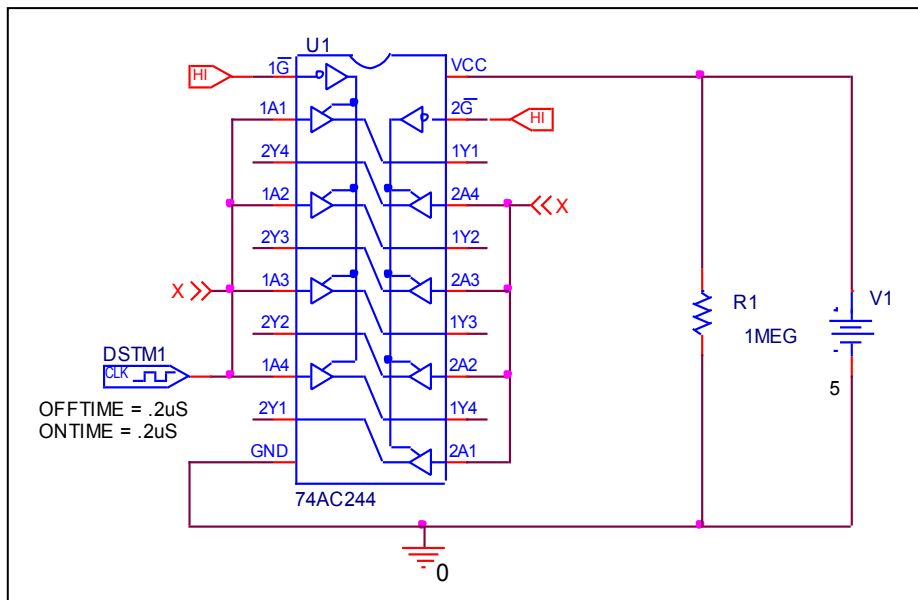
Input		Output		%Error
$\bar{G}$	A_n	Y_n (Measurement)	Y_n (Simulation)	
L	H	H	H	0

Truth Table

Circuit simulation result



Evaluation circuit

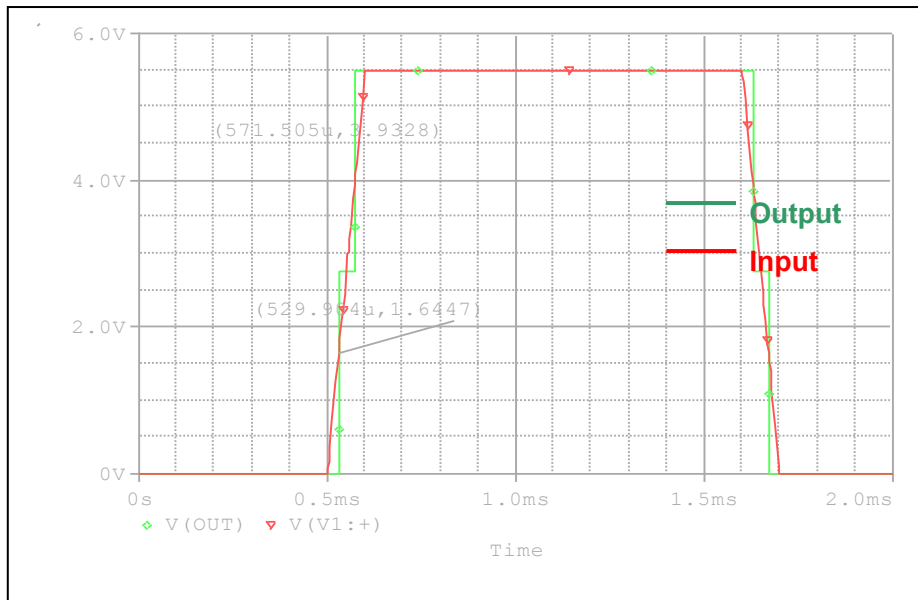


Comparison table

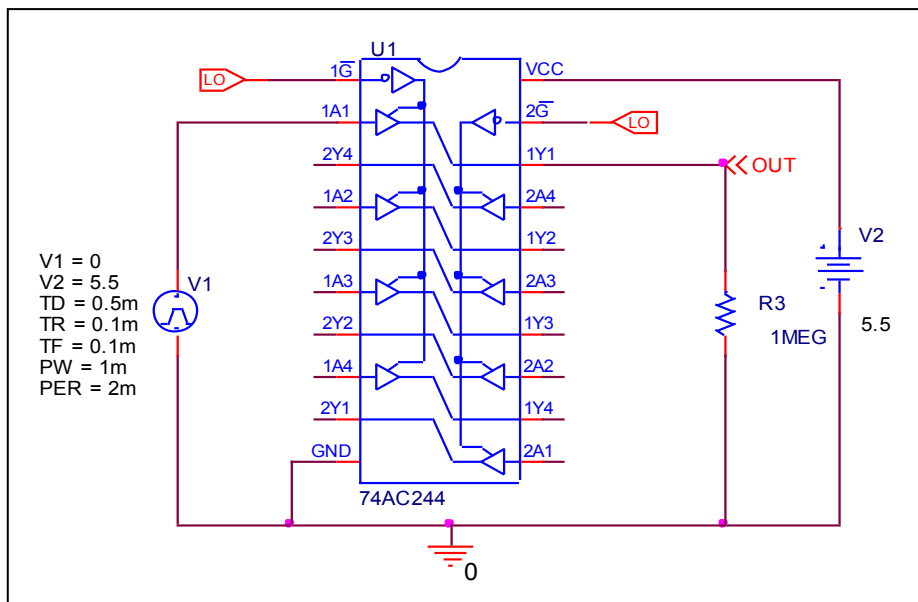
Input		Output		%Error
$\overline{G}$	A_n	Y_n (Measurement)	Y_n (Simulation)	
H	X	Z	Z	0

High Level and Low Level Input Voltage

Circuit simulation result



Evaluation circuit

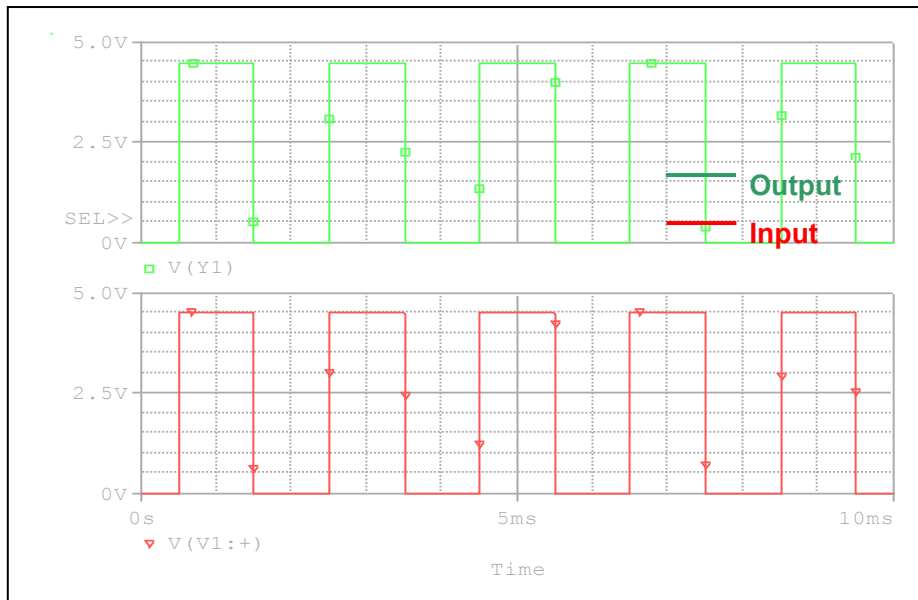


Comparison table

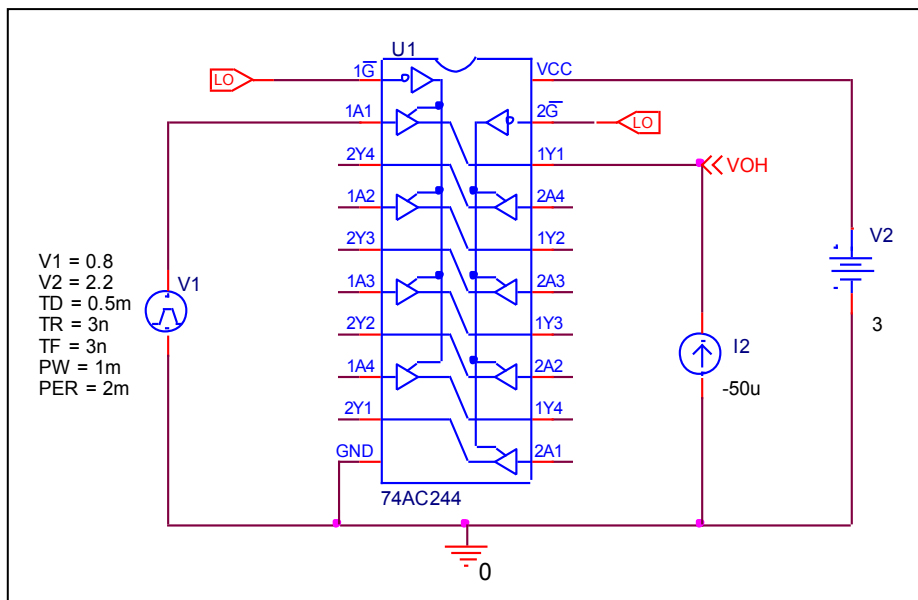
$V_{CC} = 5.5V$	Measurement	Simulation	%Error
$V_{IH} (V)$	3.85	3.9328	2.151
$V_{IL} (V)$	1.65	1.6447	-0.321

High Level and Low Level Output Voltage

Circuit simulation result



Evaluation circuit

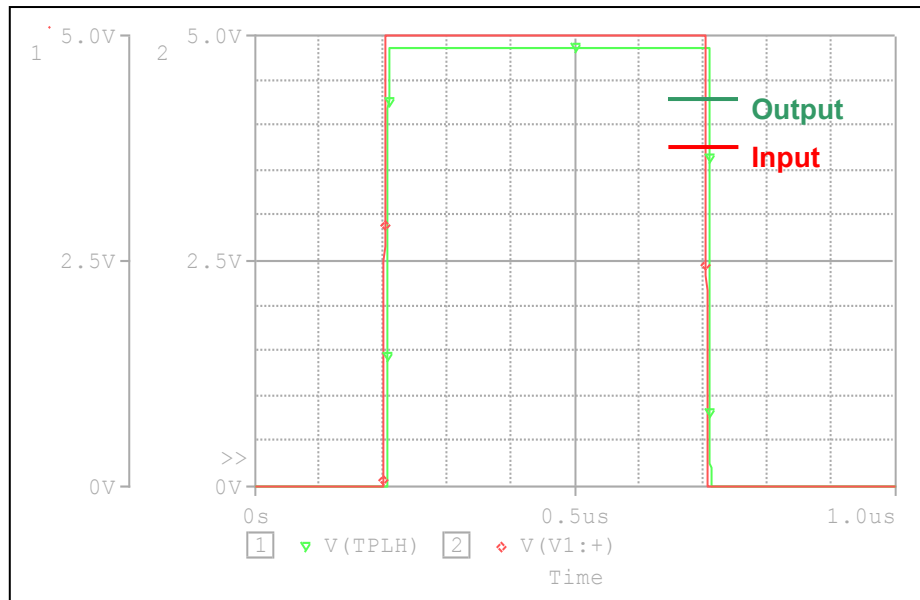


Comparison table

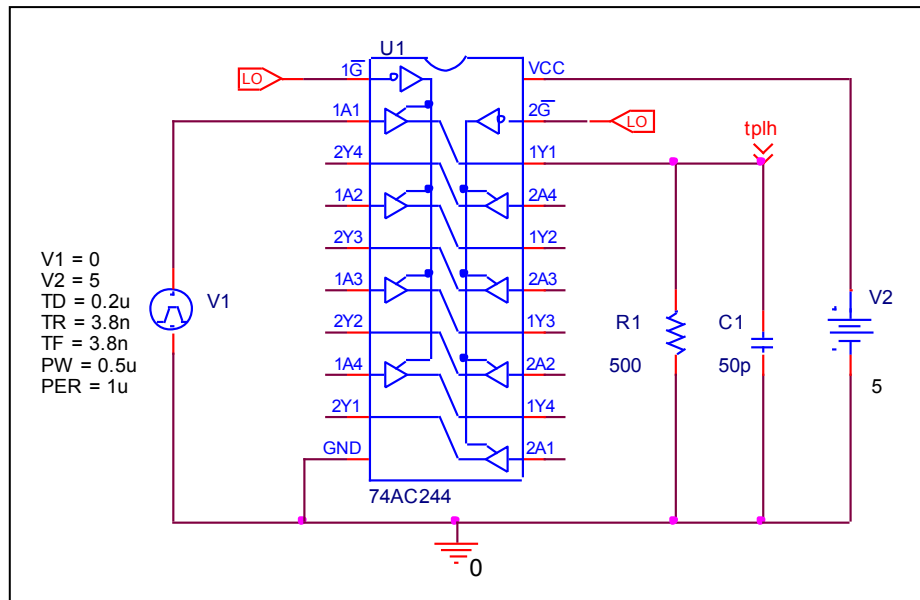
$V_{CC} = 4.5V$	Measurement	Simulation	%Error
$V_{OH} (V)$	4.5	4.4988	-0.027
$V_{OL} (V)$	0	0	0

Propagation Delay Time

Circuit simulation result



Evaluation circuit

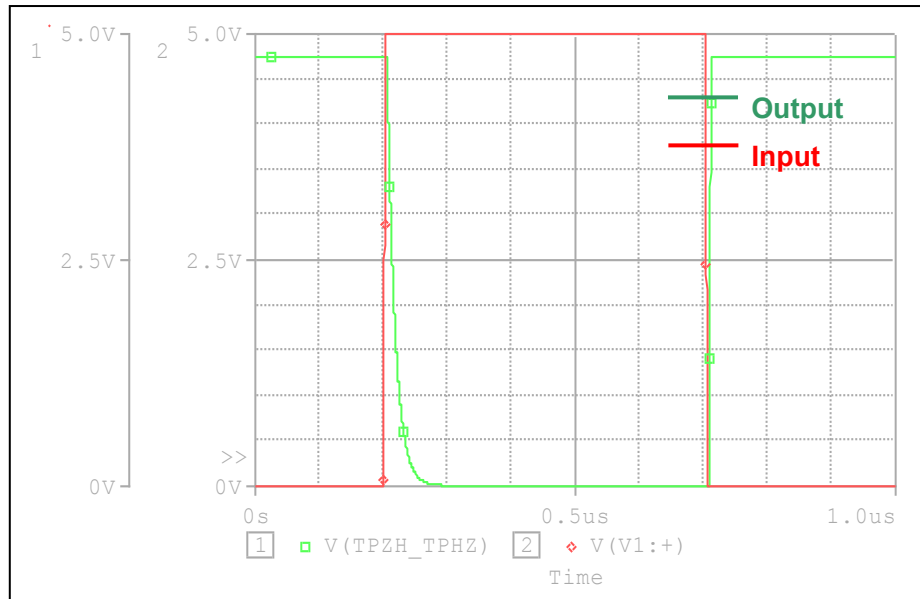


Comparison table $C_L = 50 \text{ pF}$, $R_L = 500 \Omega$

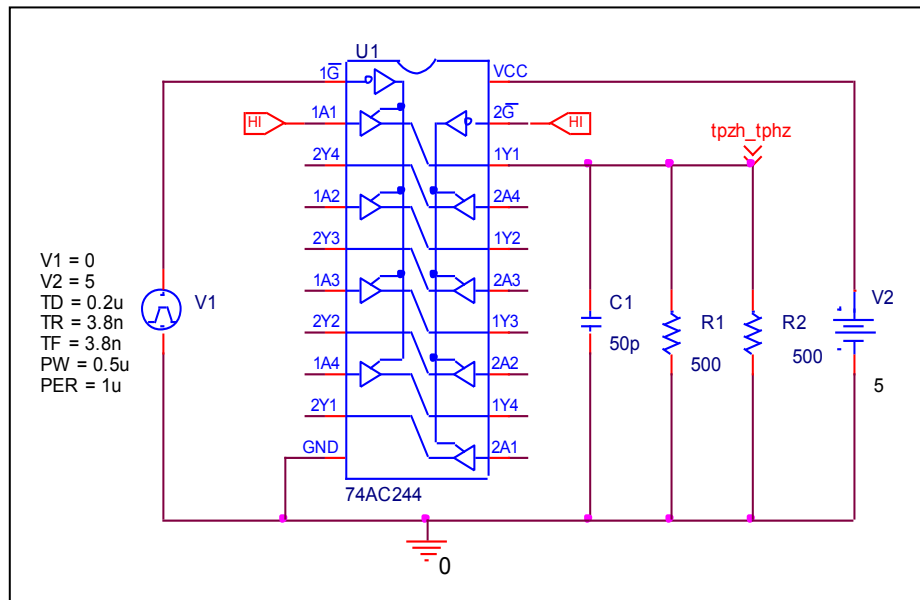
$V_{CC} = 5 \text{ V}$, $t_r = t_f = 3 \text{ ns}$	Measurement	Simulation	%Error
$t_{PLH} \text{ (ns)}$	5.2	5.3997	3.840
$t_{PHL} \text{ (ns)}$	5.2	5.3093	2.102

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

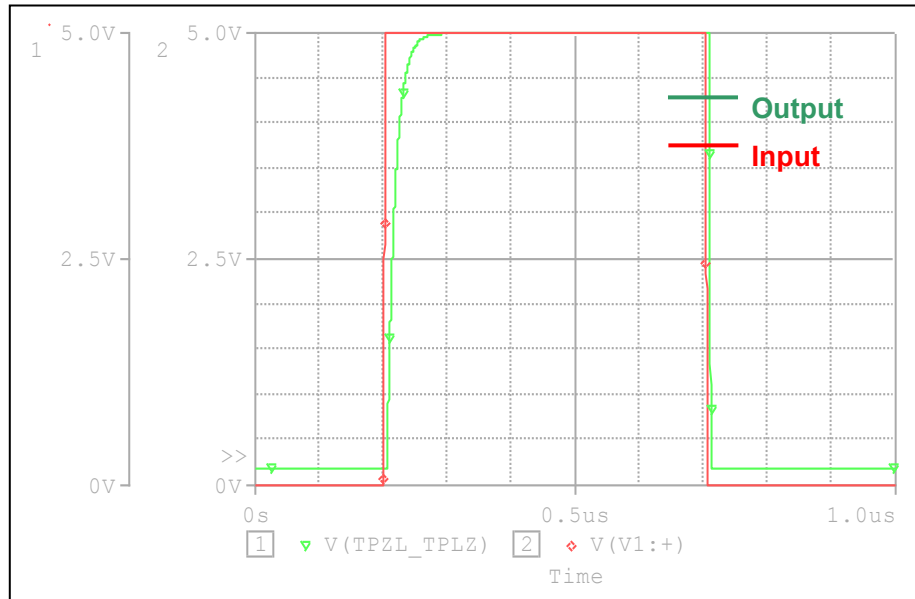


Comparison table $C_L = 50 \text{ pF}$, $R_L = 500 \Omega$

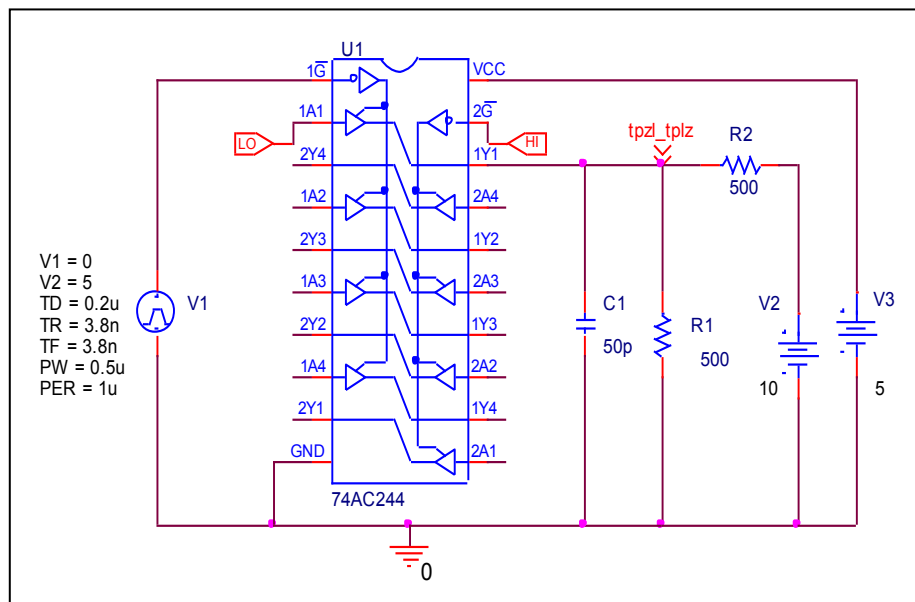
$V_{CC} = 5 \text{ V}$, $t_r = t_f = 3 \text{ ns}$	Measurement	Simulation	%Error
$t_{PZH} \text{ (ns)}$	5.9	5.9927	1.571
$t_{PHZ} \text{ (ns)}$	5.5	5.5810	1.473

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

$V_{CC} = 5 \text{ V}$, $t_r = t_f = 3 \text{ ns}$	Measurement	Simulation	%Error
$t_{PZL} \text{ (ns)}$	5.9	5.9775	1.314
$t_{PLZ} \text{ (ns)}$	5.5	5.5675	1.227