

Device Modeling Report

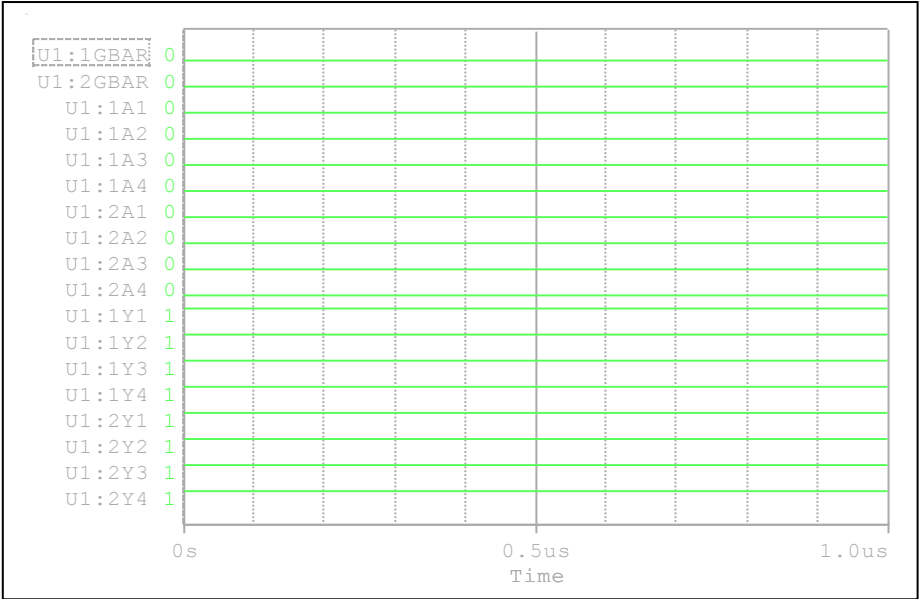
COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT
PART NUMBER : TC74VHCT240AF
MANUFACTURER : TOSHIBA



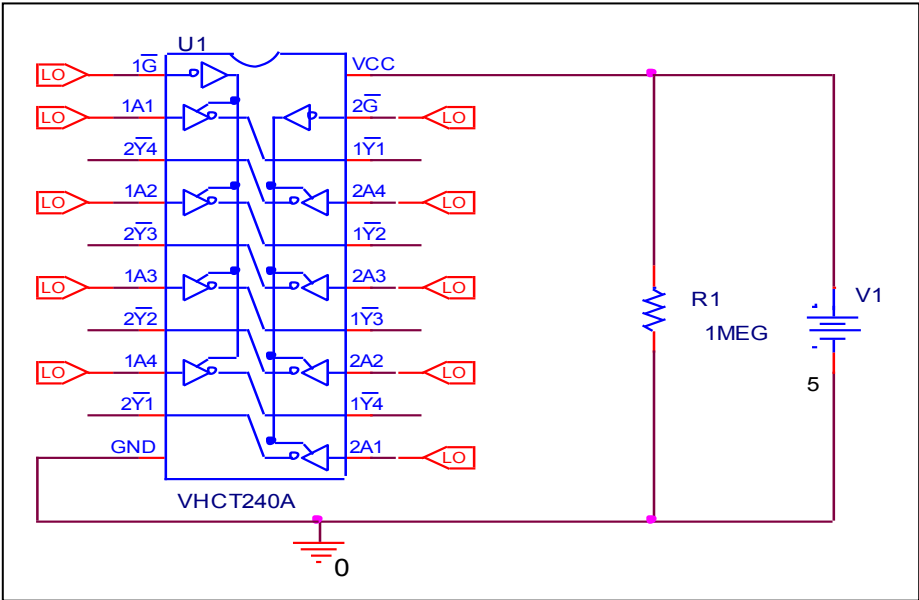
Bee Technologies Inc.

Truth Table

Circuit simulation result



Evaluation circuit

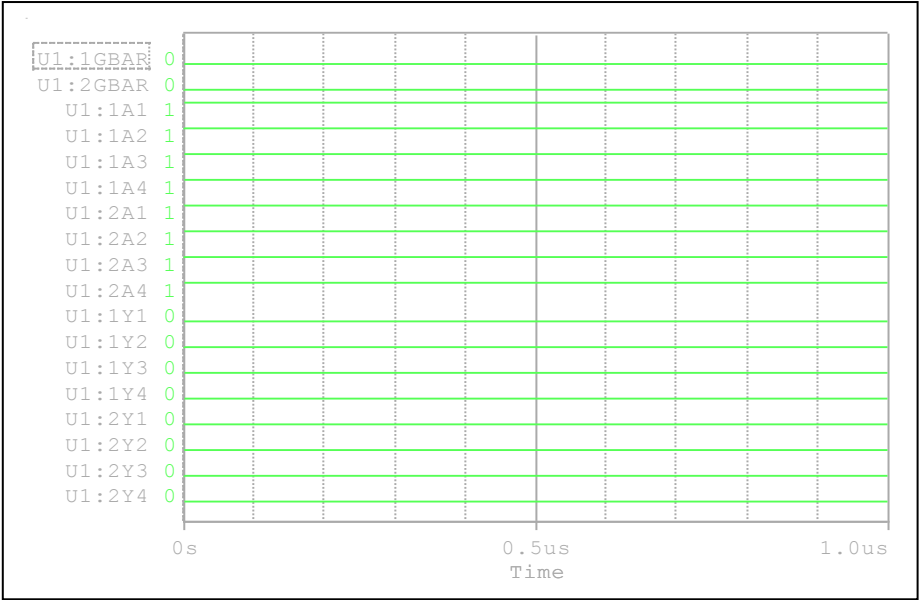


Comparison table

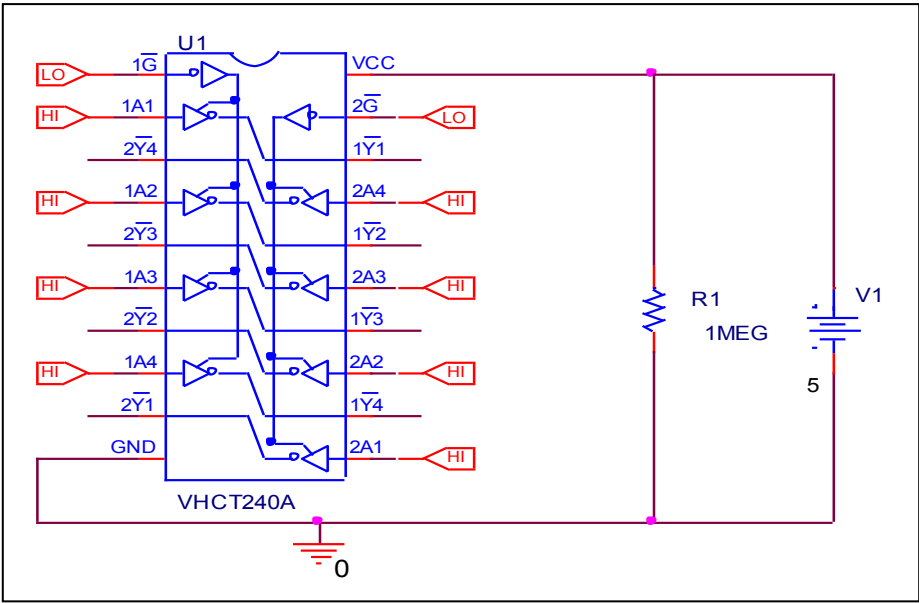
Input		Output		%Error
$\bar{G}$	An	$\bar{Y}_n$ (Measurement)	$\bar{Y}_n$ (Simulation)	
L	L	H	H	0

Truth Table

Circuit simulation result



Evaluation circuit

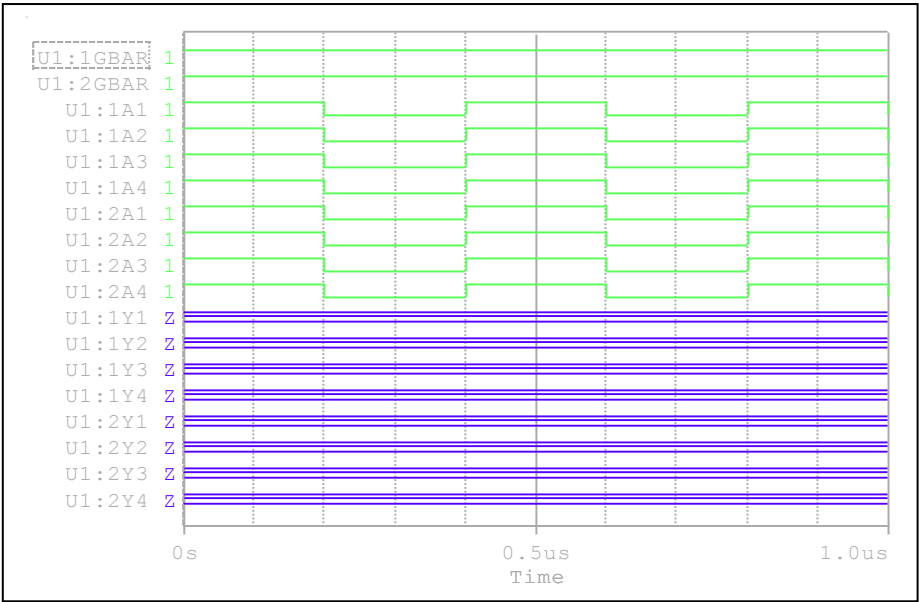


Comparison table

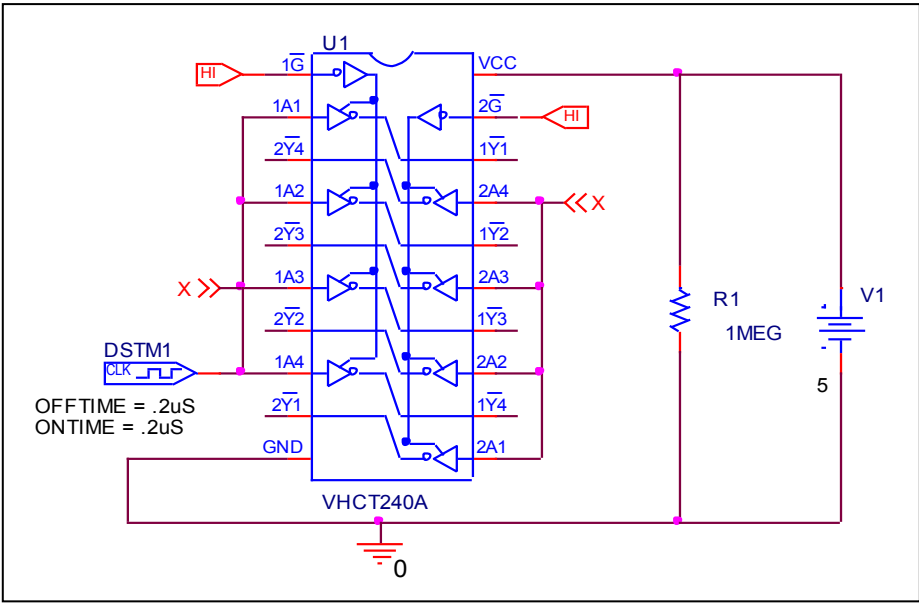
Input		Output		%Error
$\overline{G}$	An	$\overline{Y}_n$ (Measurement)	$\overline{Y}_n$ (Simulation)	
L	H	L	L	0

Truth Table

Circuit simulation result



Evaluation circuit

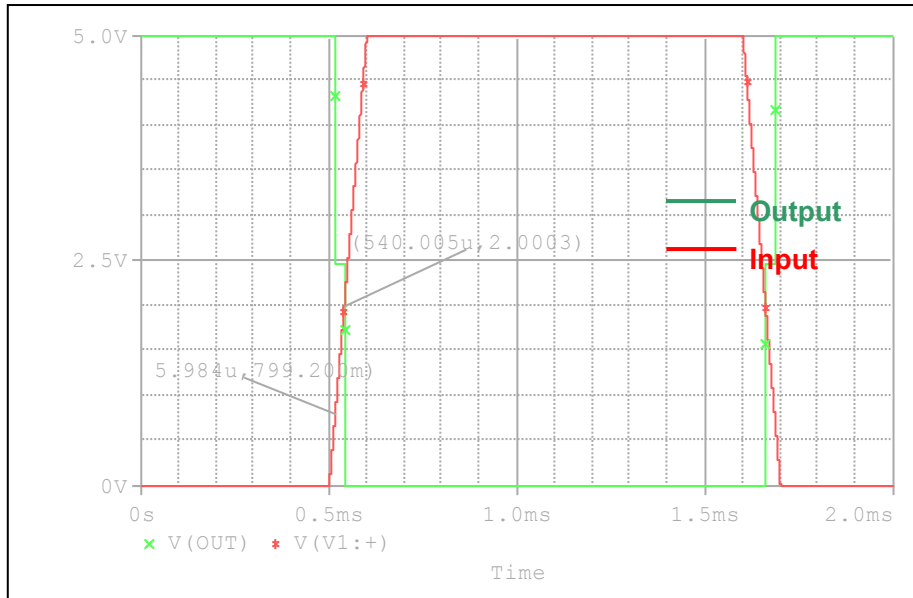


Comparison table

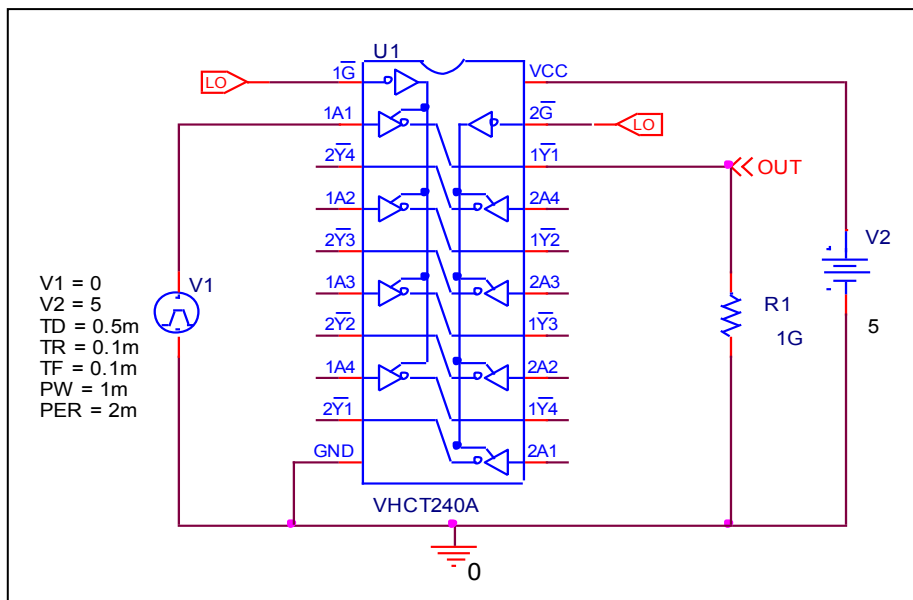
Input		Output		%Error
$\bar{G}$	An	$\bar{Y}_n$ (Measurement)	$\bar{Y}_n$ (Simulation)	
H	X	Z	Z	0

High Level and Low Level Input Voltage

Circuit simulation result



Evaluation circuit

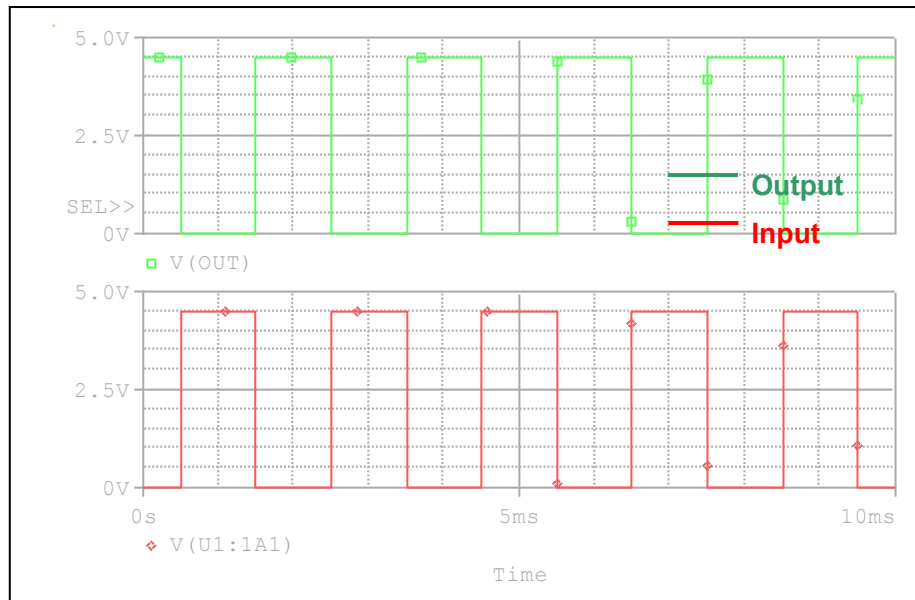


Comparison table

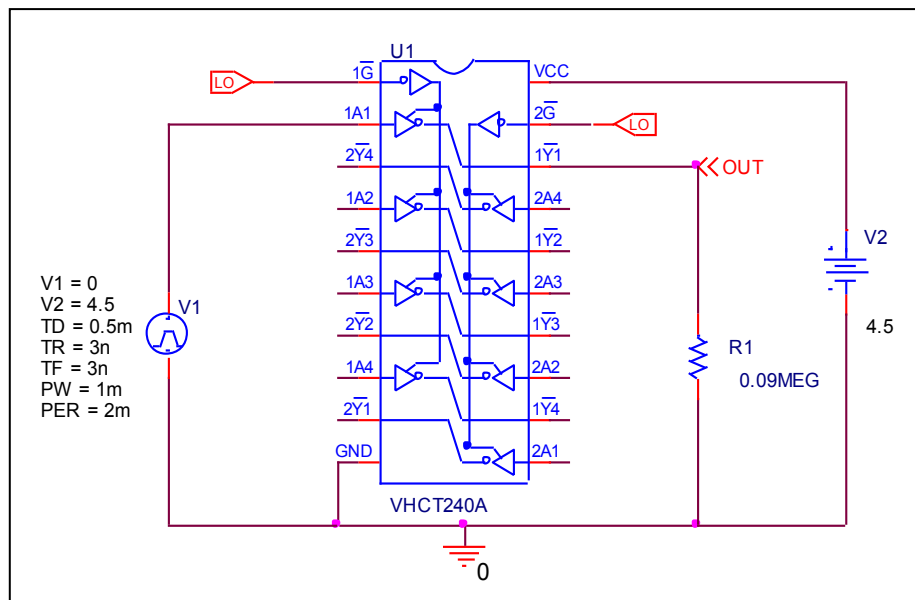
V _{CC} = 5V	Measurement	Simulation	%Error
V _{IH} (V)	2	2.0003	0.015
V _{IL} (V)	0.8	0.7992	-0.100

High Level and Low Level Output Voltage

Circuit simulation result



Evaluation circuit

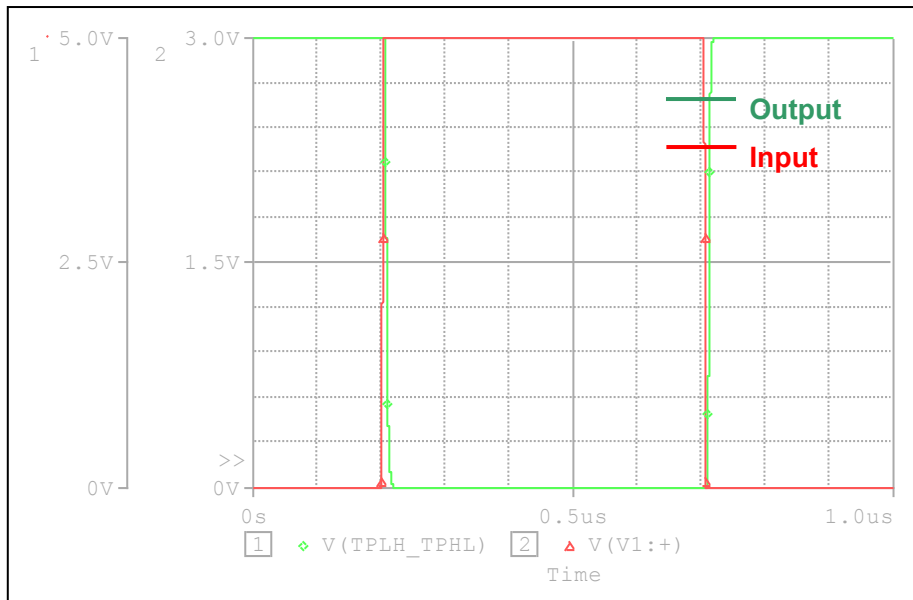


Comparison table

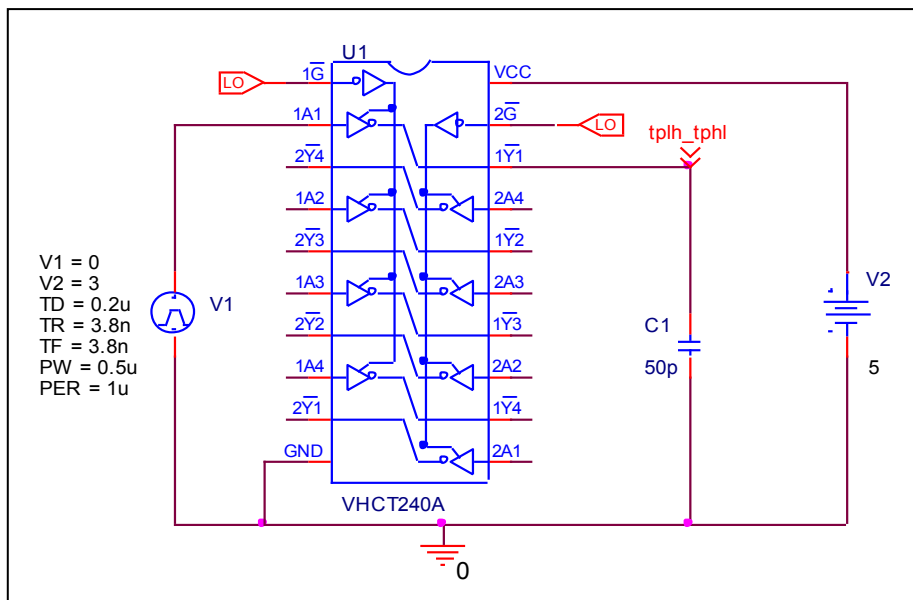
$V_{CC} = 4.5V$	Measurement	Simulation	%Error
$V_{OH} (V)$	4.5	4.4986	-0.031
$V_{OL} (V)$	0	0	0

Propagation Delay Time

Circuit simulation result



Evaluation circuit

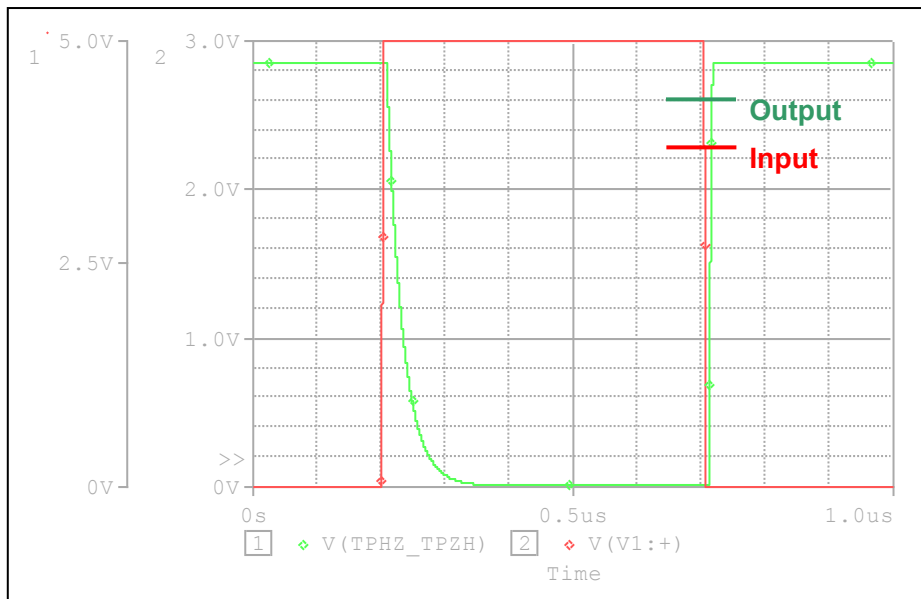


Comparison table $C_L = 50 \text{ pF}$

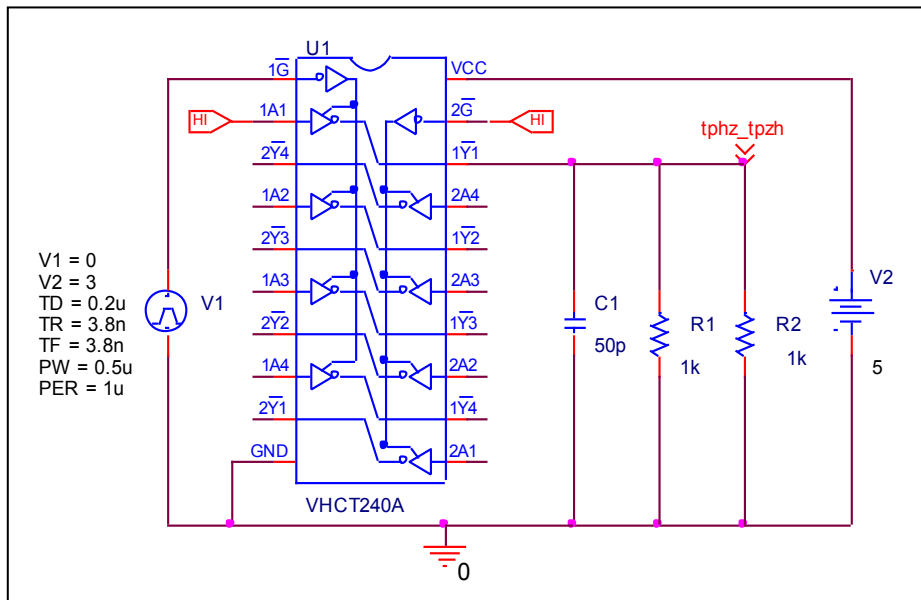
$t_r = t_f = 3 \text{ ns}$	Measurement	Simulation	%Error
$t_{PLH} \text{ (ns)}$	6.1	6.1741	1.215
$t_{PHL} \text{ (ns)}$	6.1	6.1436	0.715

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

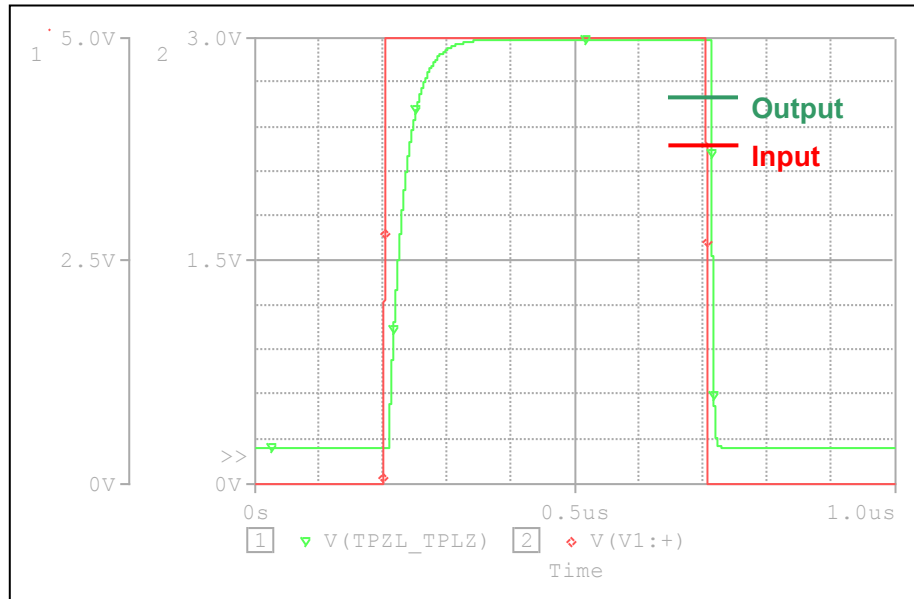


Comparison table $C_L = 50 \text{ pF}$, $R_L = 1 \text{ K}\Omega$

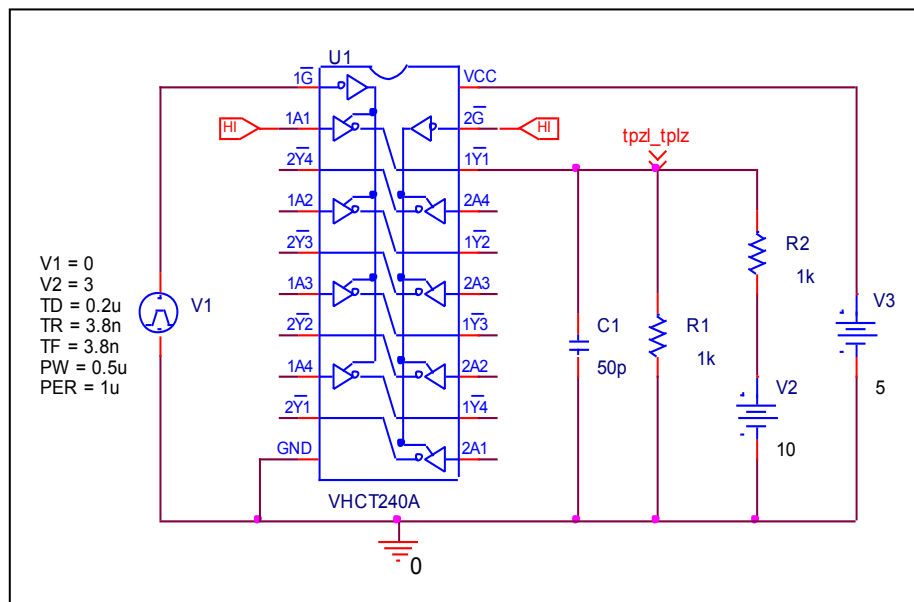
$t_r = t_f = 3 \text{ ns}$	Measurement	Simulation	%Error
$t_{PZH} \text{ (ns)}$	8.2	8.2419	0.511
$t_{PHZ} \text{ (ns)}$	8.8	8.9224	1.391

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 $C_L = 50 \text{ pF}$, $R_L = 1 \text{ K}\Omega$

$t_r = t_f = 3 \text{ ns}$	Measurement	Simulation	%Error
$t_{PZL} \text{ (ns)}$	8.2	8.2238	0.290
$t_{PLZ} \text{ (ns)}$	8.8	8.8277	0.315