

Device Modeling Report

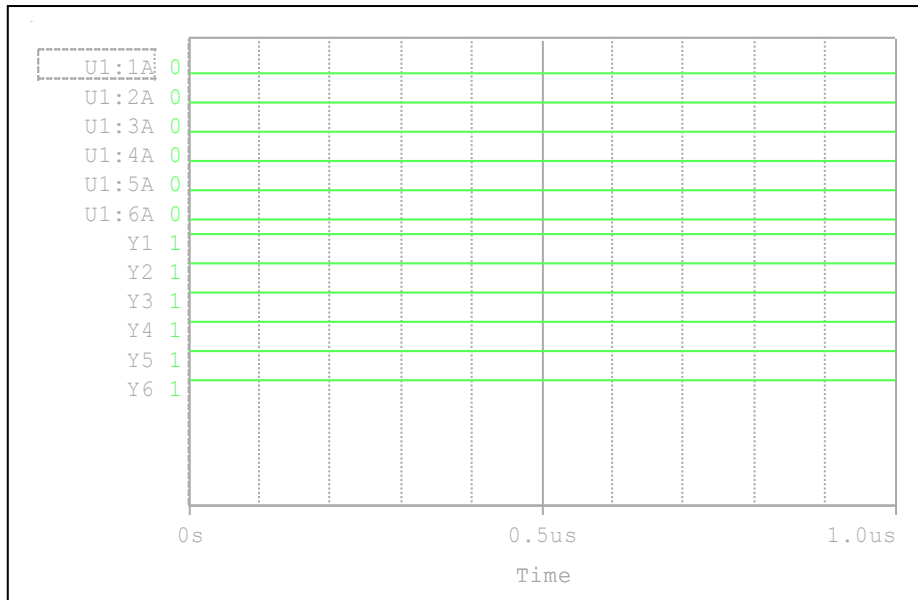
COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT
PART NUMBER : TC74HC04AP
MANUFACTURER : TOSHIBA



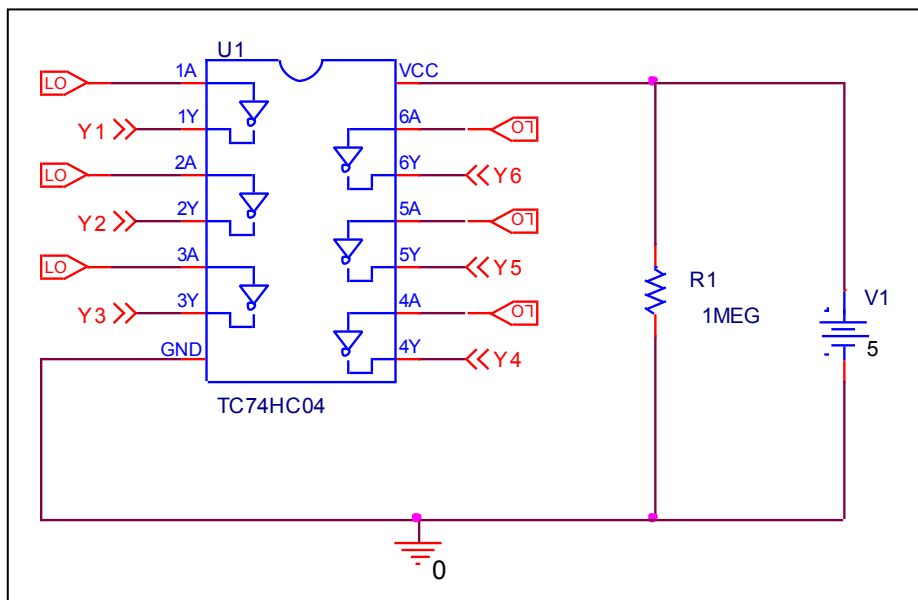
Bee Technologies Inc.

Truth Table

Circuit simulation result



Evaluation circuit

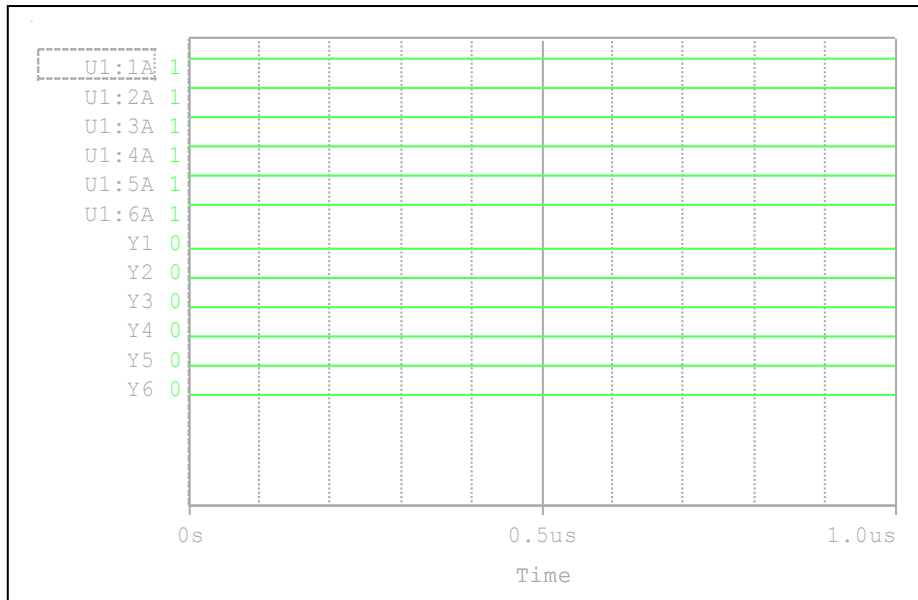


Comparison table

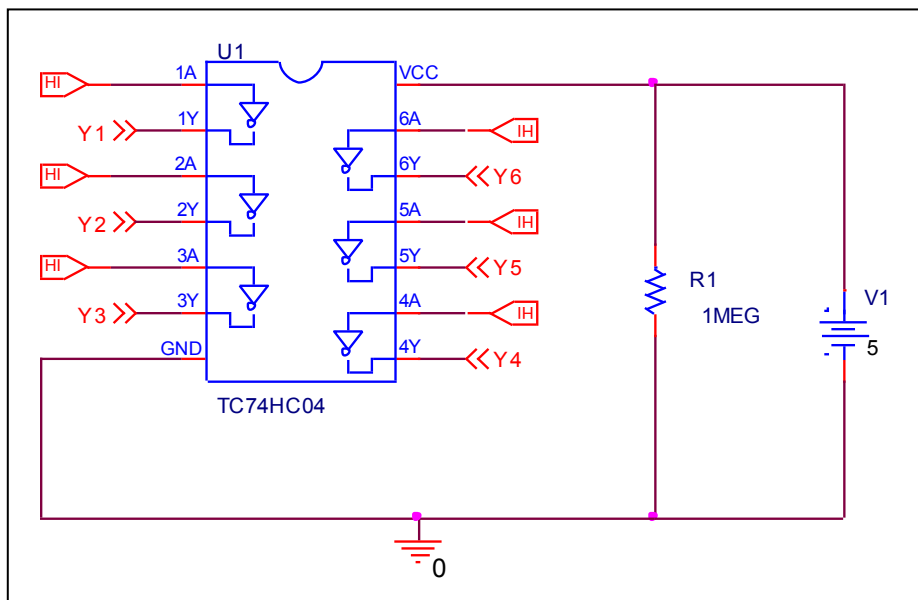
Input	Output		%Error
	Yn (Measurement)	Yn (Simulation)	
L	H	H	0

Truth Table

Circuit simulation result



Evaluation circuit

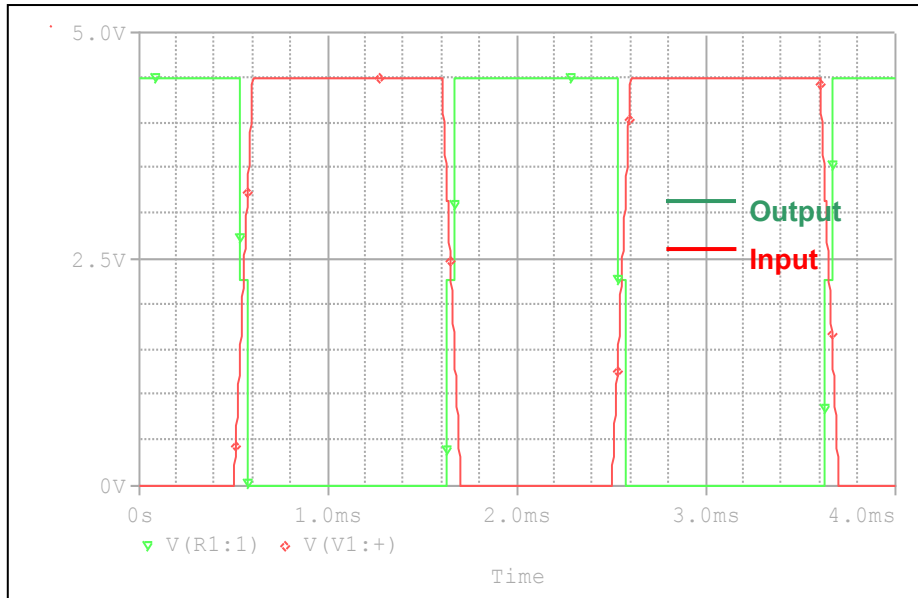


Comparison table

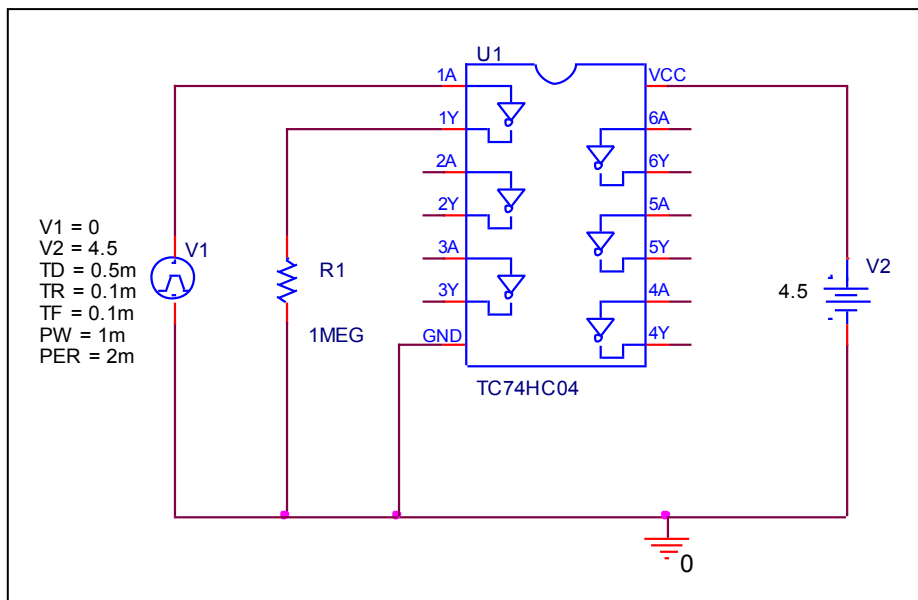
Input	Output		%Error
	Yn (Measurement)	Yn (Simulation)	
H	L	L	0

High Level and Low Level Input Voltage

Circuit simulation result



Evaluation circuit

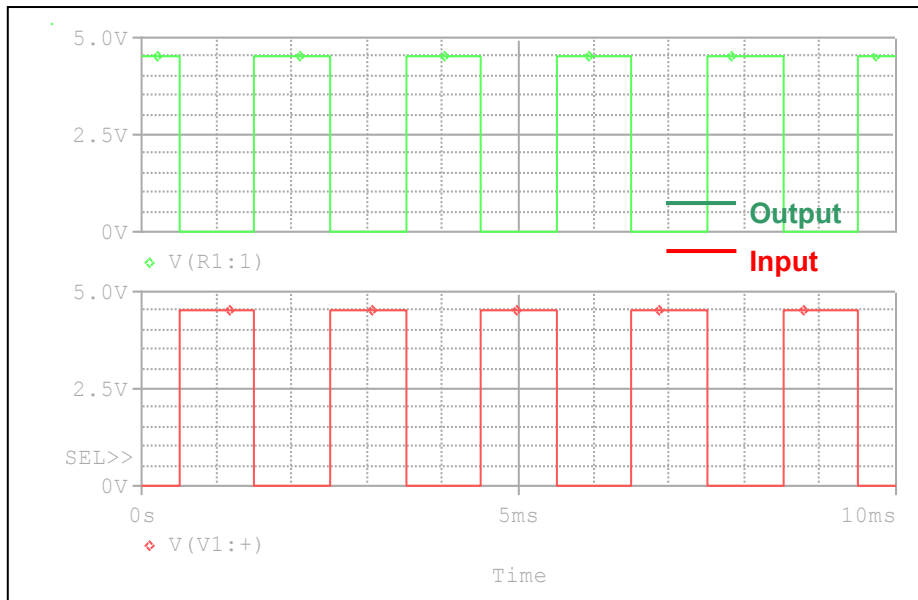


Comparison table

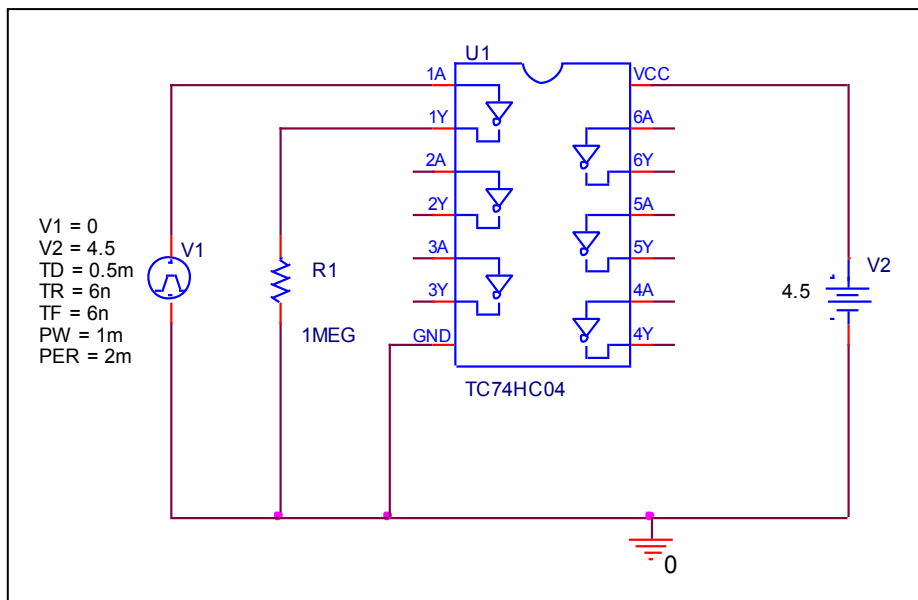
$V_{CC} = 4.5V$	Measurement	Simulation	%Error
$V_{IH} (V)$	3.15	3.1506	0.019
$V_{IL} (V)$	1.35	1.3455	-0.333

High Level and Low Level Output Voltage

Circuit simulation result



Evaluation circuit

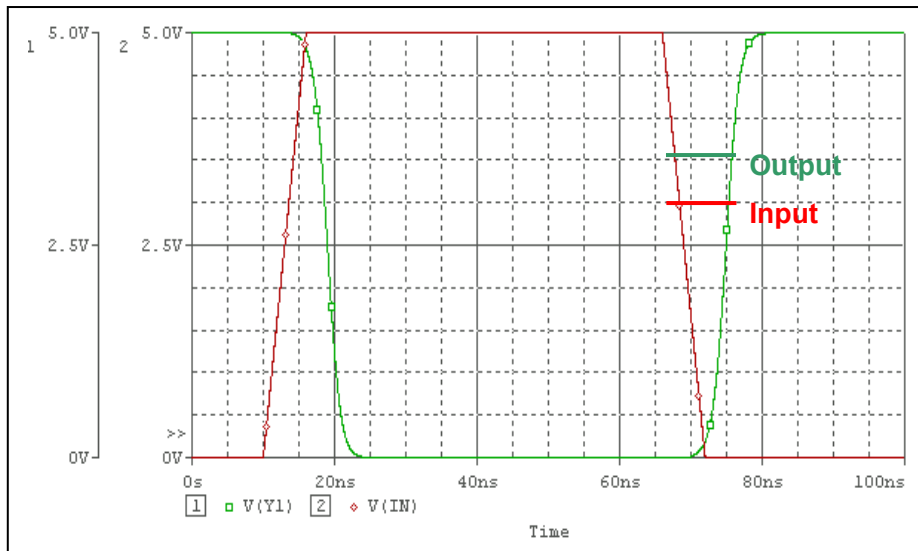


Comparison table

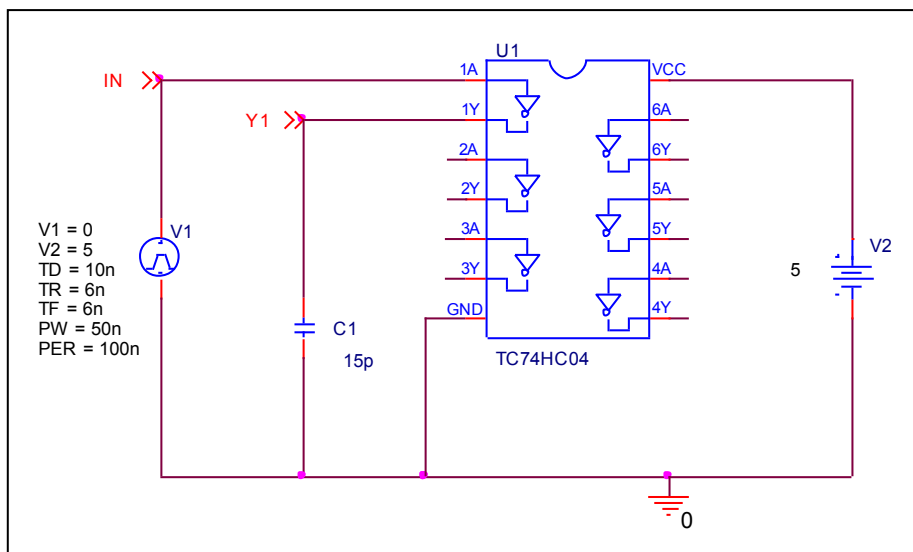
$V_{CC} = 4.5V$	Measurement	Simulation	%Error
$V_{OH} (V)$	4.5	4.4975	-0.056
$V_{OL} (V)$	0	0	0

Propagation Delay Time

Circuit simulation result



Evaluation circuit



Comparison table

C_L=15pF,V_{CC} = 5V,tr=tf=6ns	Measurement	Simulation	%Error
t_{TLH} (ns)	4	4	0
t_{THL} (ns)	4	4.0025	0.063
T_{pLH} (ns)	6	6.0457	0.762
T_{pHL} (ns)	6	6.0268	0.447