Device Modeling Report

COMPONENTS : CMOS DIGITAL INTEGRATED CIRCUIT
PART NUMBER : TC74LCX245FT
MANUFACTURER : TOSHIBA

Bee Technologies Inc.

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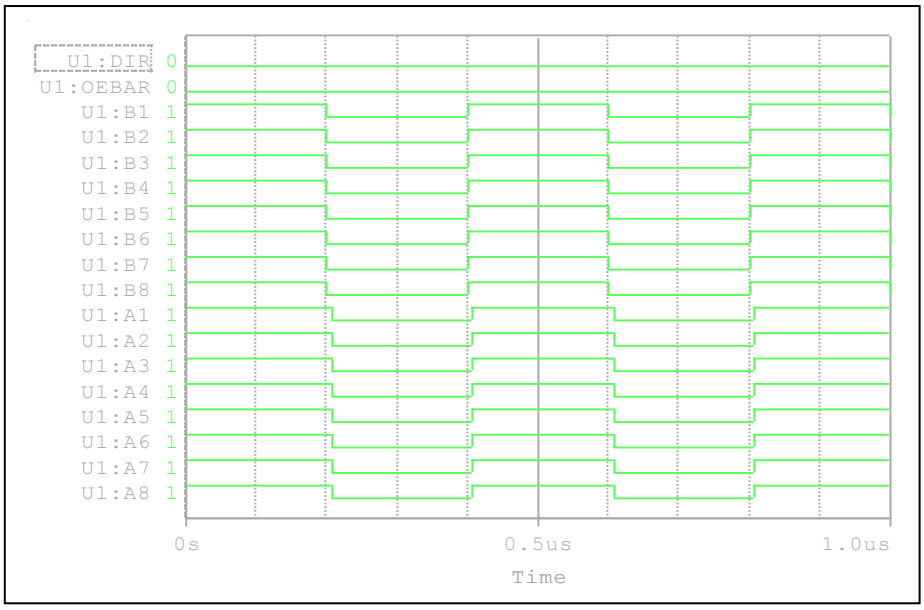
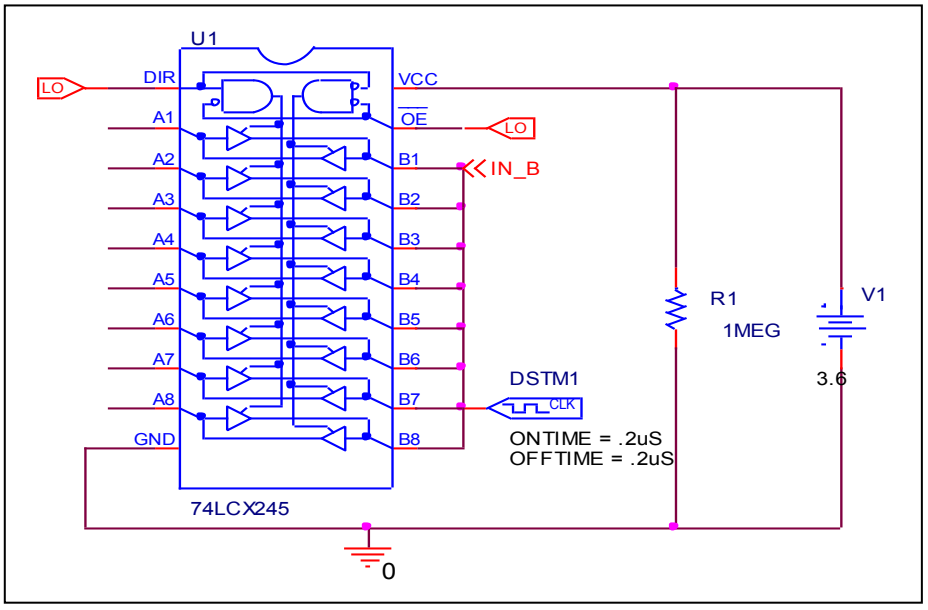
Truth Table

Circuit simulation result



Evaluation circuit



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

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

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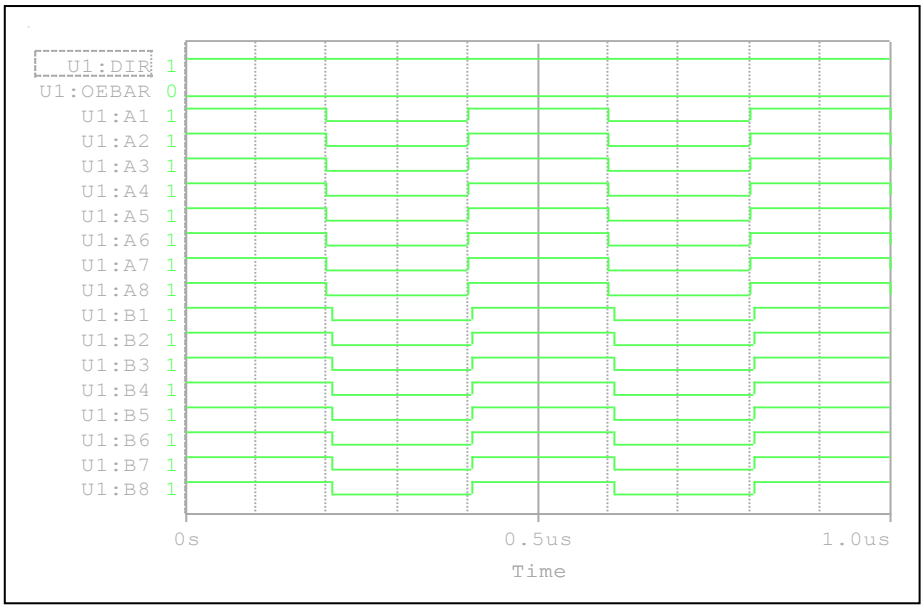
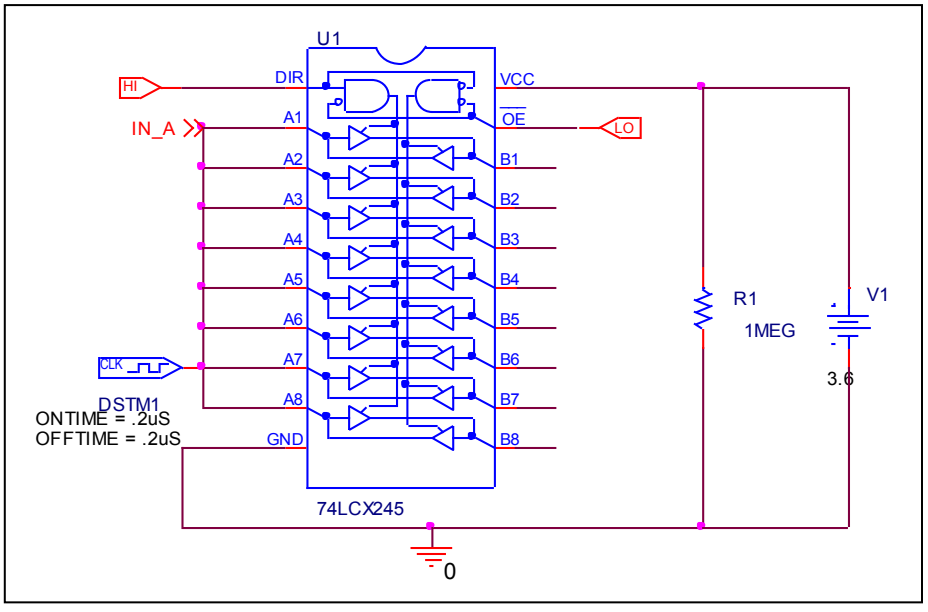
Truth Table

Circuit simulation result



Evaluation circuit



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

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

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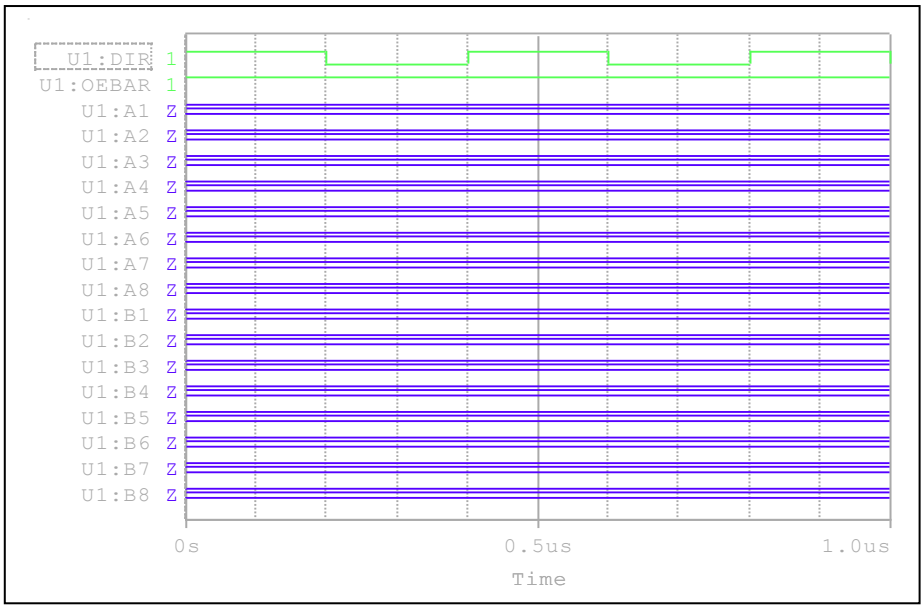
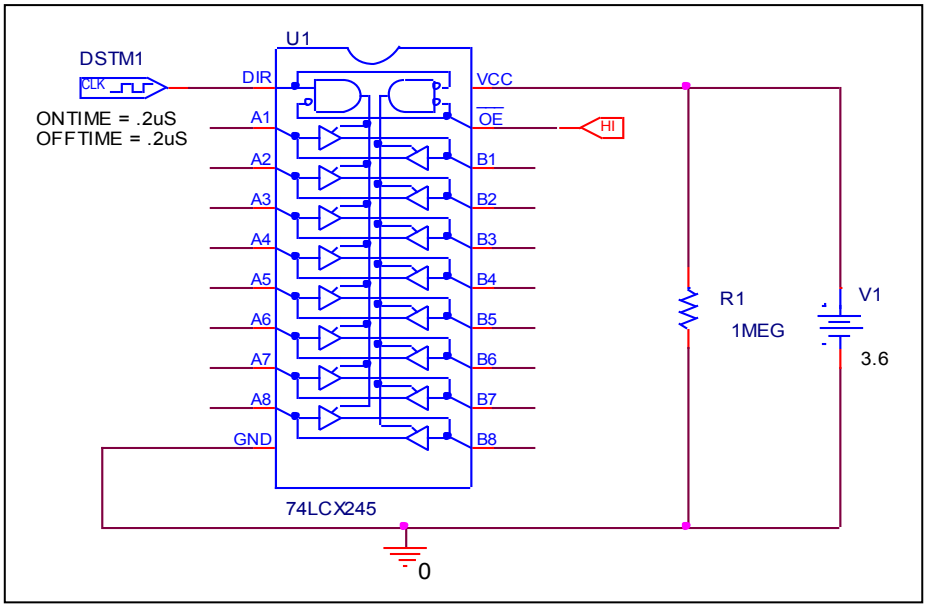
Truth Table

Circuit simulation result



Evaluation circuit



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

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

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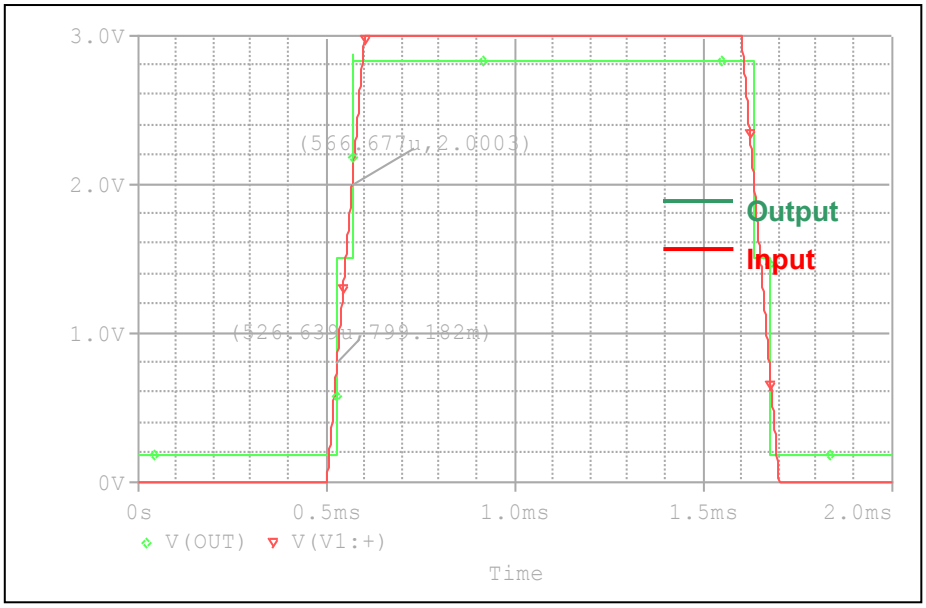
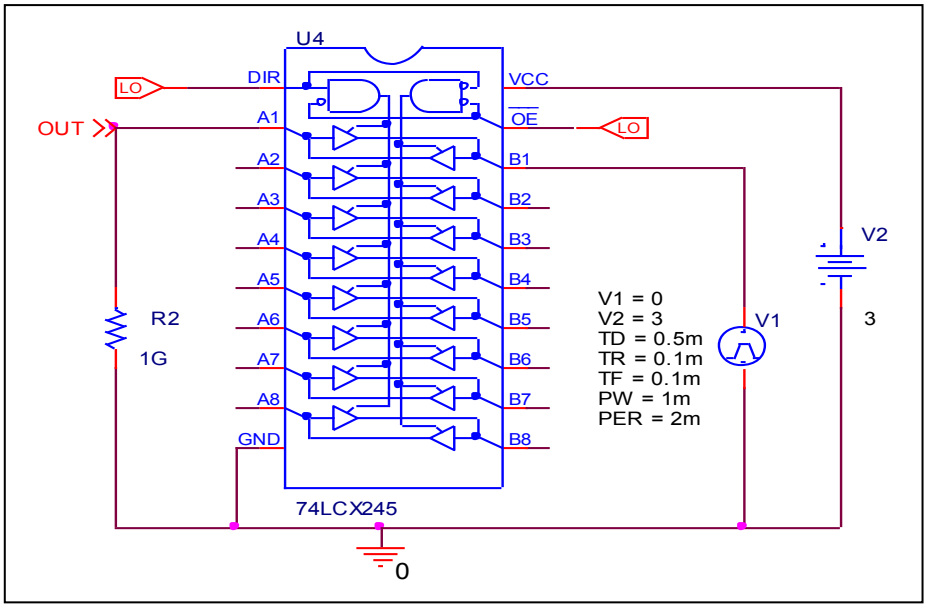
High Level and Low Level Input Voltage

Circuit simulation result



Evaluation circuit



Comparison table

V_{CC} =3.3 V	Measurement	Simulation	%Error
V_{IH} (V)	2	2	0
V_{IL} (V)	0.8	0.799182	-0.102

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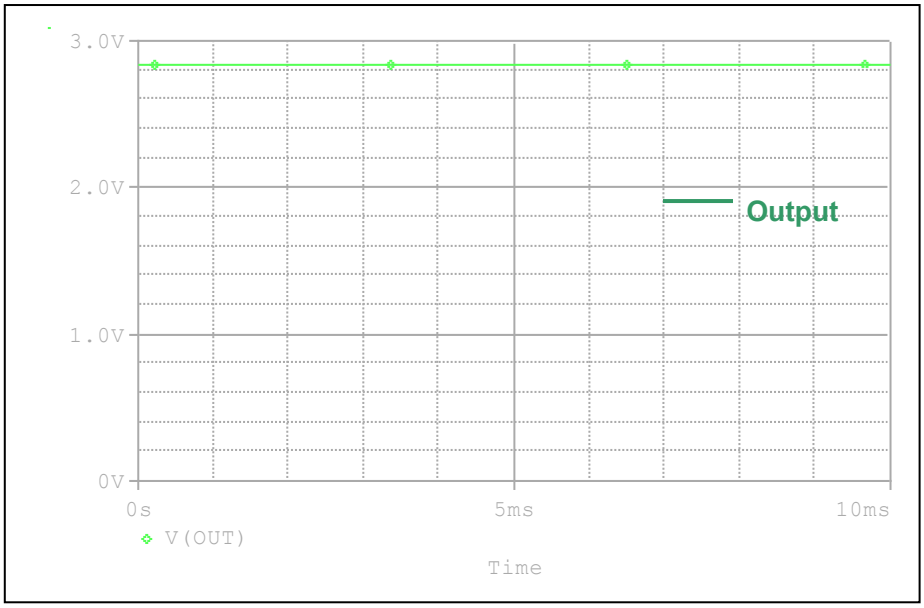
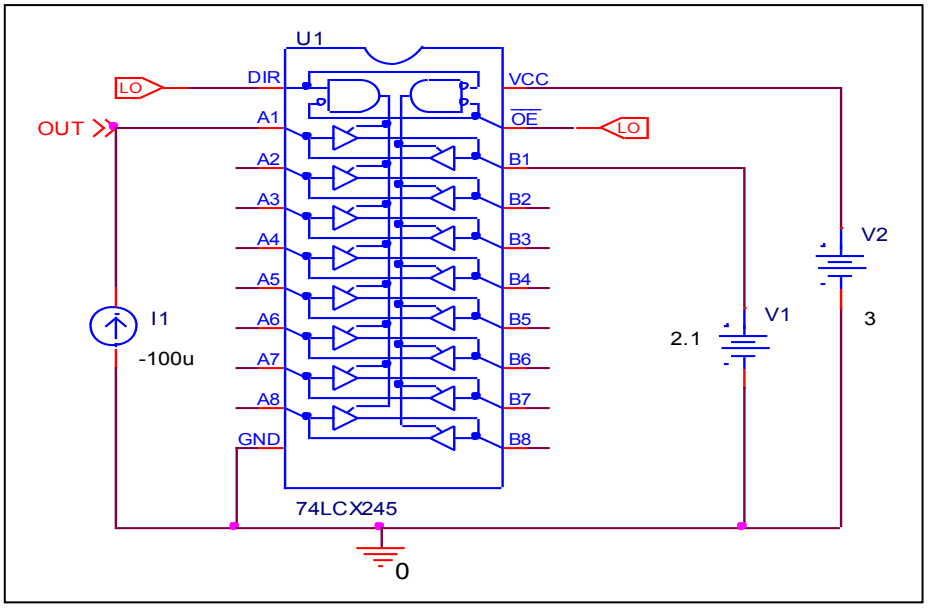
High Level Output Voltage

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	2.8331	1.182

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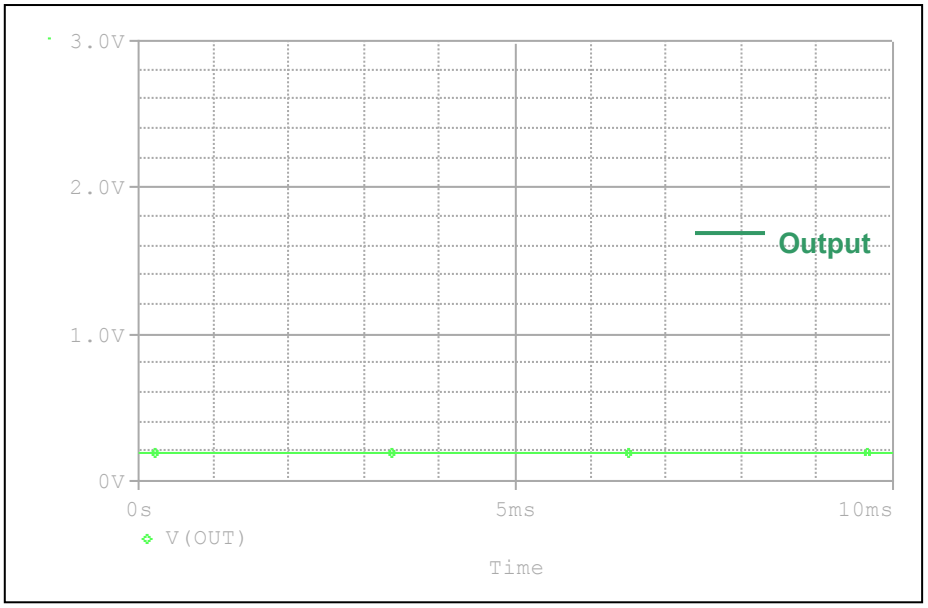
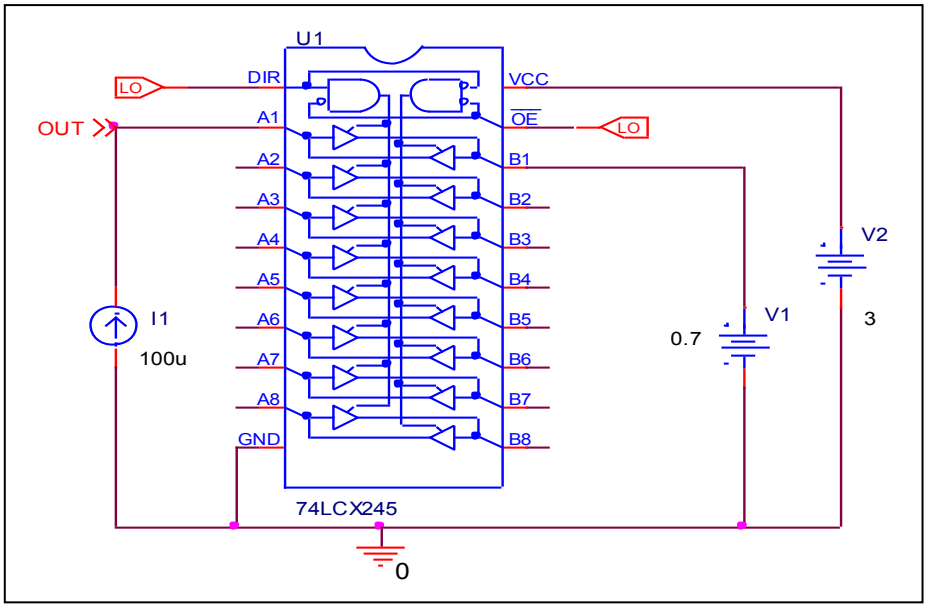
Low Level Output Voltage

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

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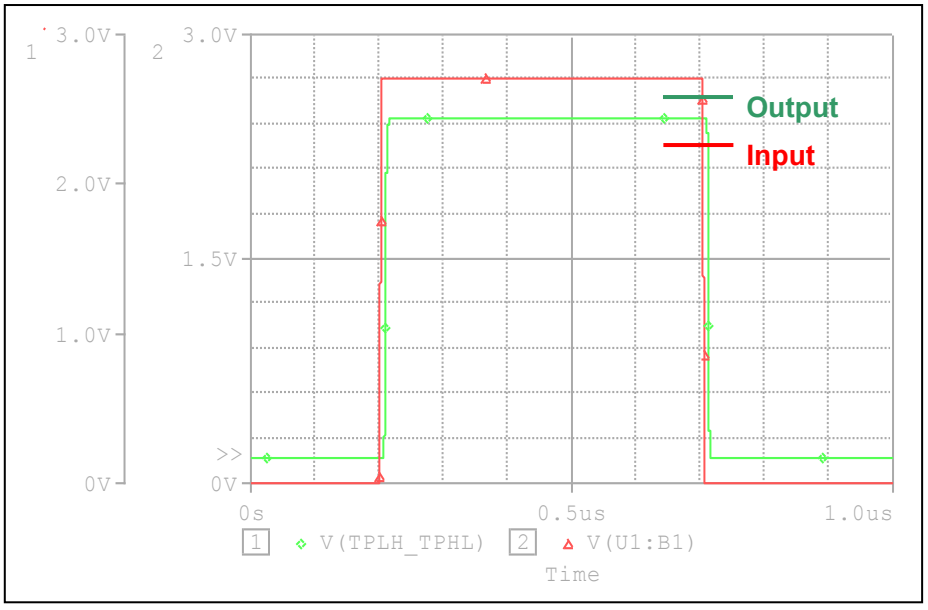
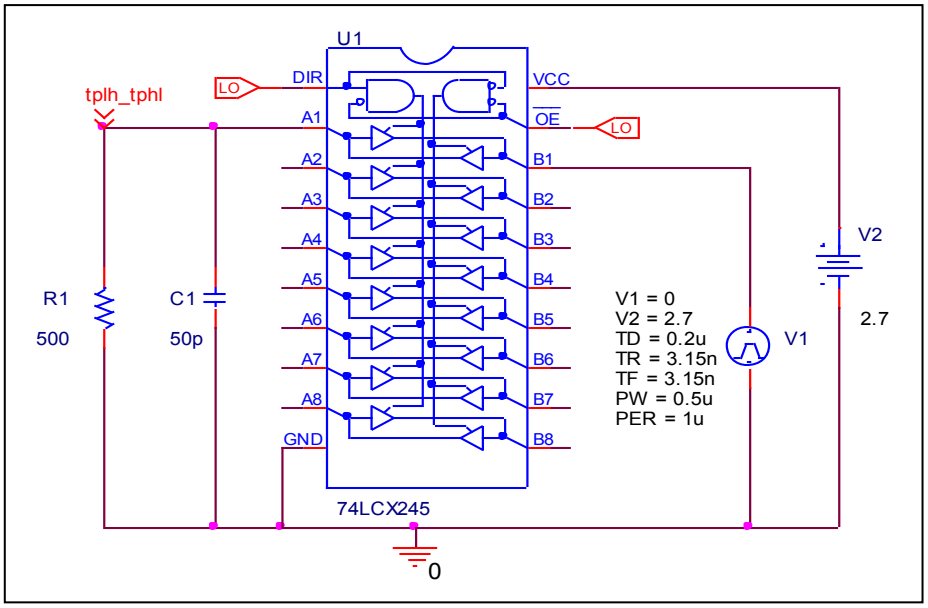
Propagation Delay Time

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)	8	7.9710	-0.362
t_{PHL} (ns)	8	7.8270	-2.163

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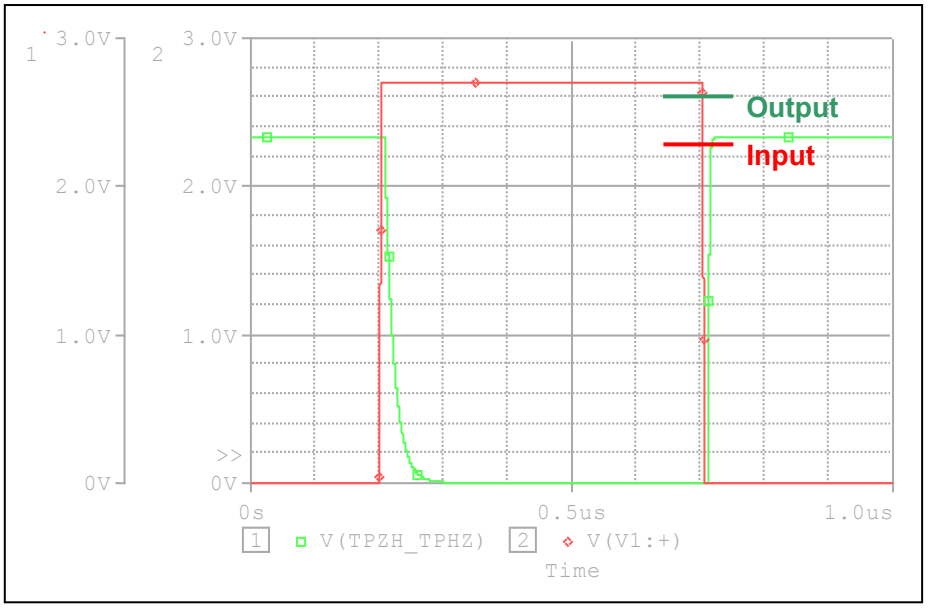
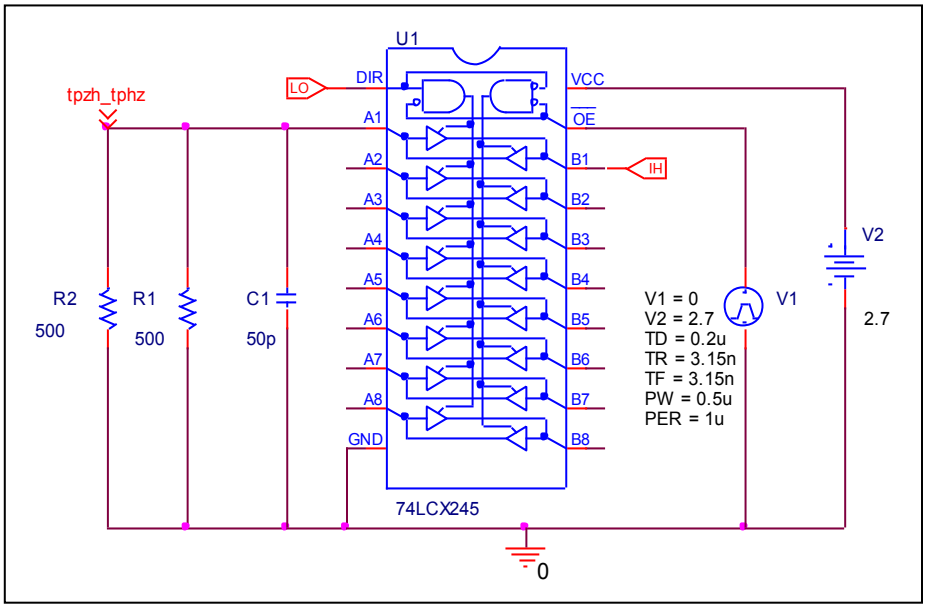
Output enable time, high impedance (off) to high output (t_{PZH})
Output disable time, high to high impedance (off) output (t_{PHZ})

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)	9.5	9.4468	-0.560
t_{PHZ} (ns)	8.5	8.4095	-1.065

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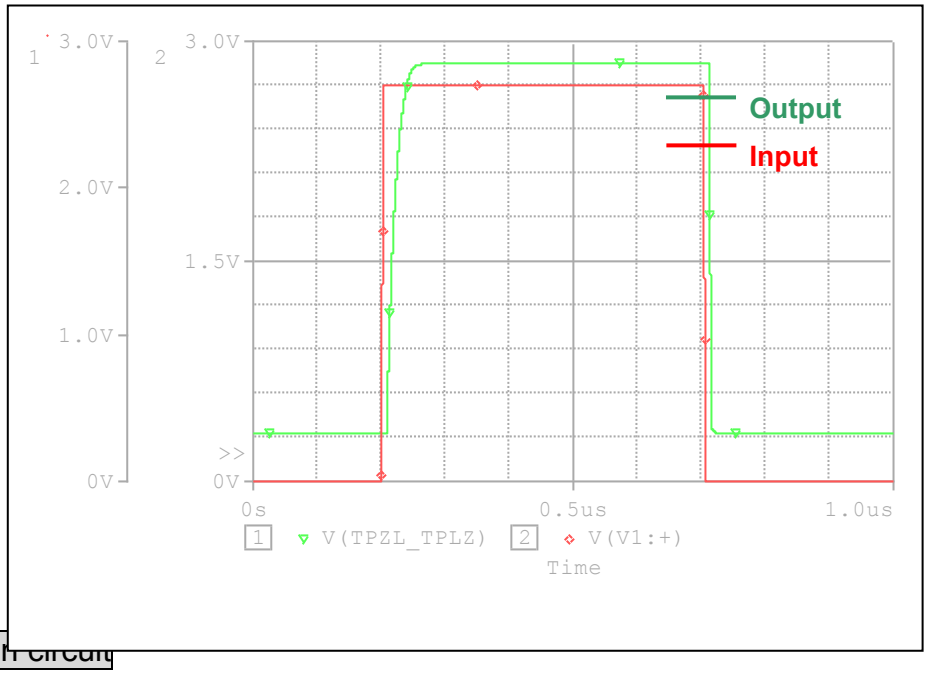
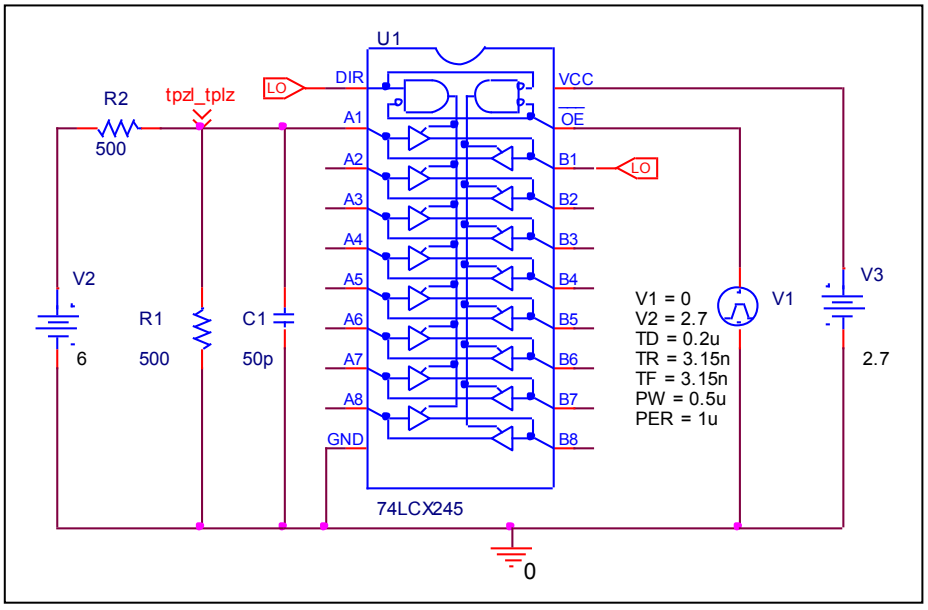
Output enable time, high impedance (off) to low output (t_{PZL})
Output disable time, low to high impedance (off) output (t_{PLZ})

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)	9.5	9.4525	-0.500
t_{PLZ} (ns)	8.5	8.4464	-0.631

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