Noureldeen Allama

900202115


Project 2 Microelectronics

Introduction

XOR gate is a type of digital logic gate that provides a high output only when the number of logical inputs differs between true and false states. In order to implement this circuit, CMOS (Complementary Metal-Oxide-Semiconductor) technology is often utilized. This technology uses both PMOS (P-type Metal-Oxide-Semiconductor) and NMOS (N-type Metal-Oxide-Semiconductor) transistors to provide a balanced electrical load and minimize power consumption. XOR CMOS gates are commonly used in various digital circuits, and their design and implementation are essential for digital electronics engineering.
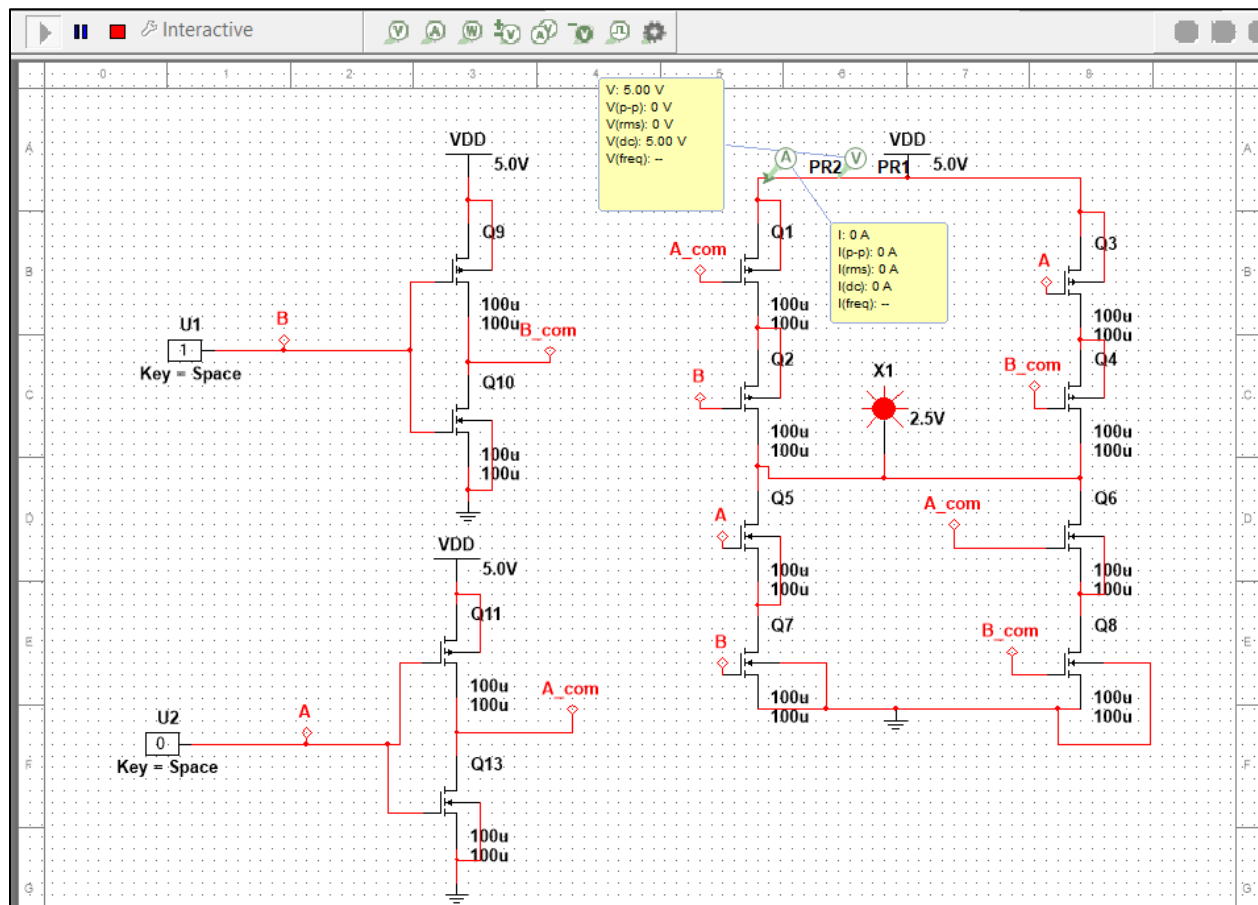
Testing

The four various input combinations are summarized in following table

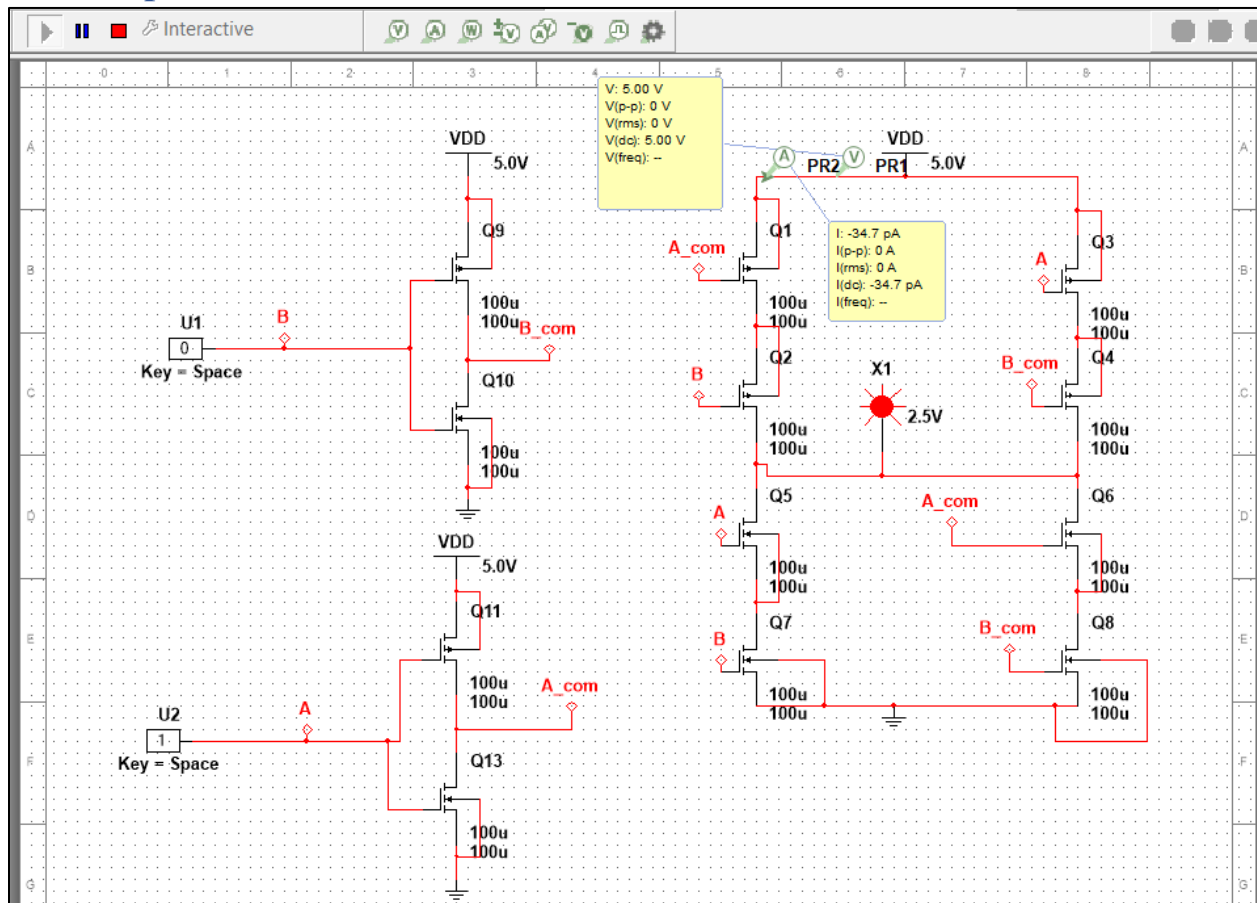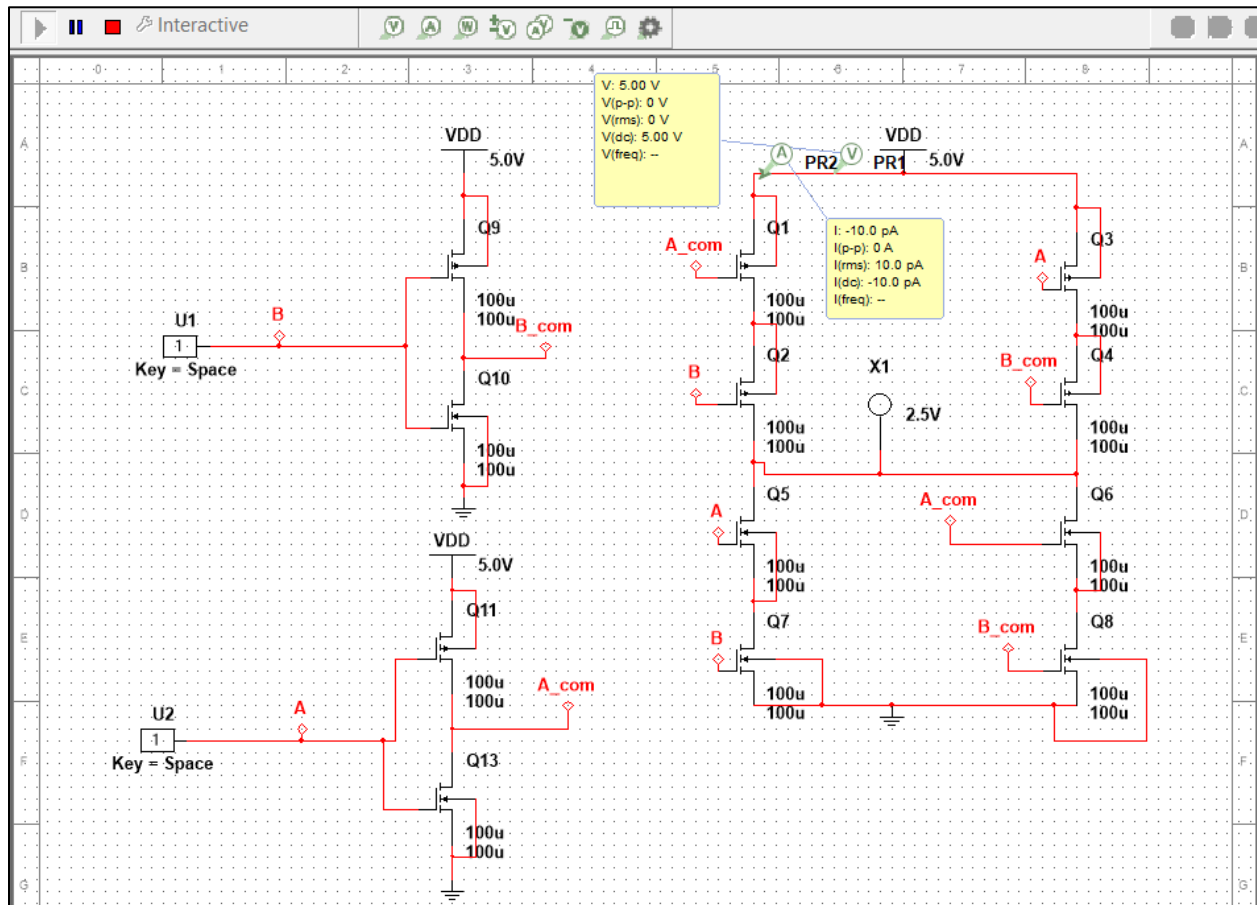| A	B	X
0	0	0
0	1	1
1	0	1
1	1	0

First combination (A=0, B=0)
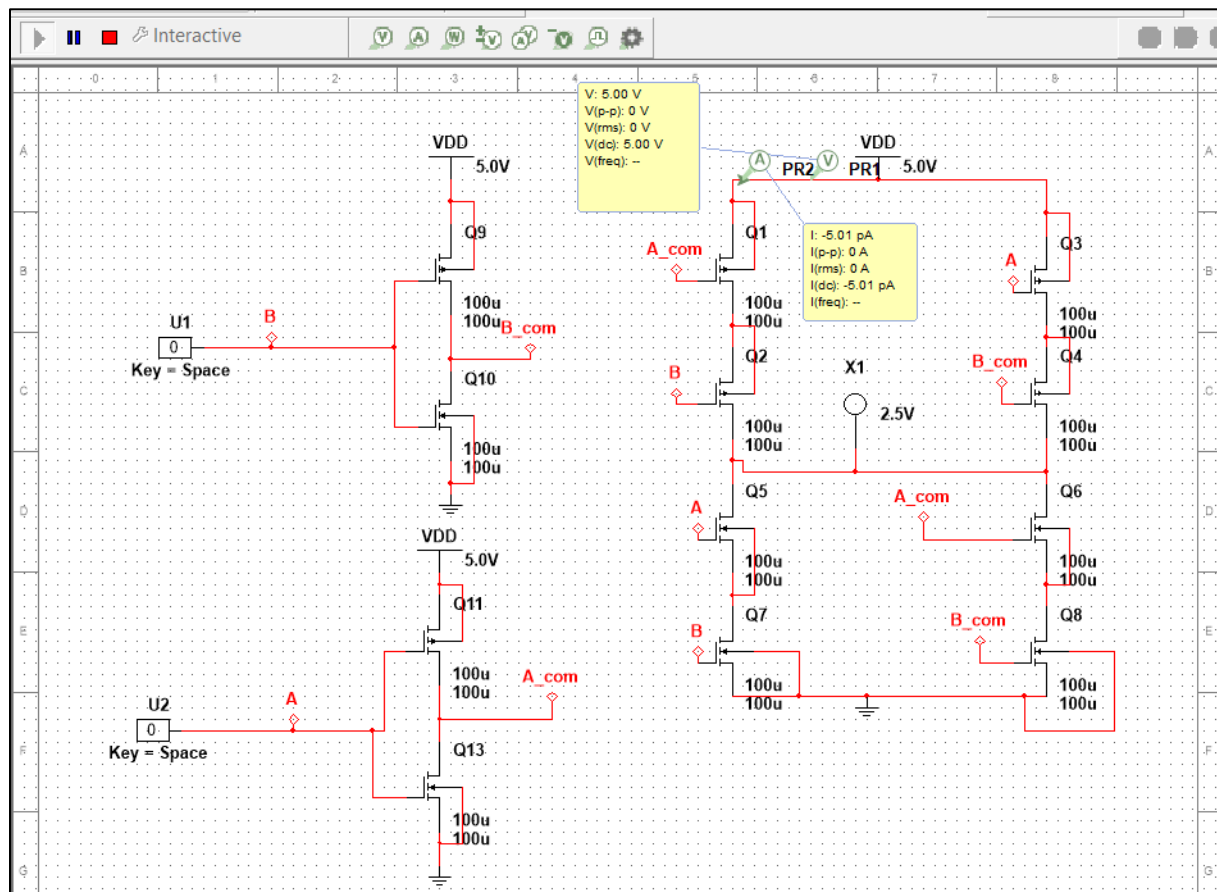
Second input combination (A=0, B=1)

Third input combination

Forth input combination

Results

The simulations shows that the circuit functionality is correct. The led is on only when the two inputs are different. The static power ($P=V_{dd}*I_{dd}$) is also zero in all cases.