# XOR Logic Gate Using 2N2222 Transistors



VCC
5V

R3
220Ω
Output

R4
1kΩ

R6
1kΩ

InputA

A

R1
10kΩ

Q1
2N2222A

B

R2
10kΩ

Q2
2N2222A

InputB

Key = A

Key = B

R5
10kΩ

Q3
2N2222A

A

R7
10kΩ

Q4
2N2222A

B

R8
10kΩ

Q5
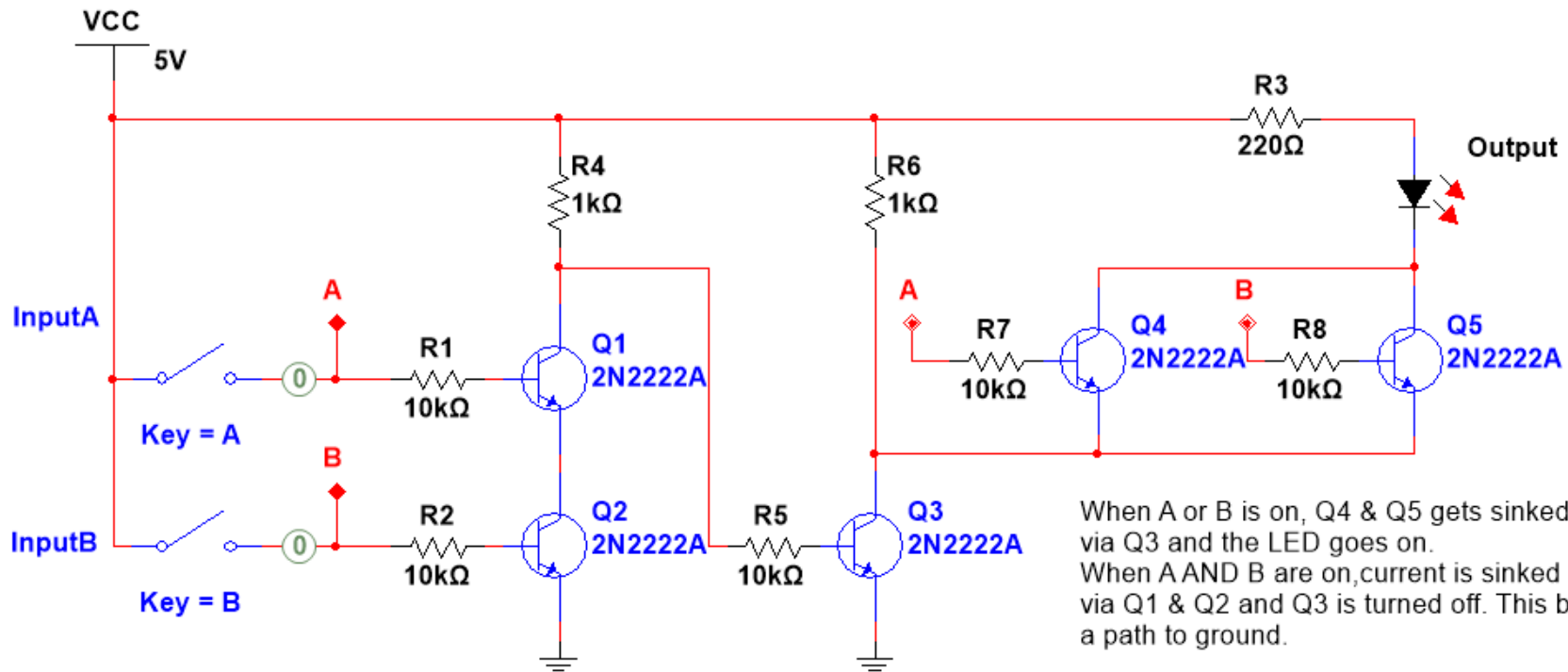2N2222A

When A or B is on, Q4 & Q5 gets sinked
via Q3 and the LED goes on.
When A AND B are on, current is sinked
via Q1 & Q2 and Q3 is turned off. This blocks
a path to ground.

Q1 & Q2 function as a NAND gate
Q4 & Q5 function as a OR gate.
Q3 provides a way to sink Q4 & Q5

R3 = 5V - 1.7v/.015A = 220ohms

| Inputs | | Outputs |
|---|---|---|
| X | Y | Z |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

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| Title: Digital Logic | Desc.: XOR Gate Using 2N2222 Transistors (NAND + OR) | |
|---|---|---|
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