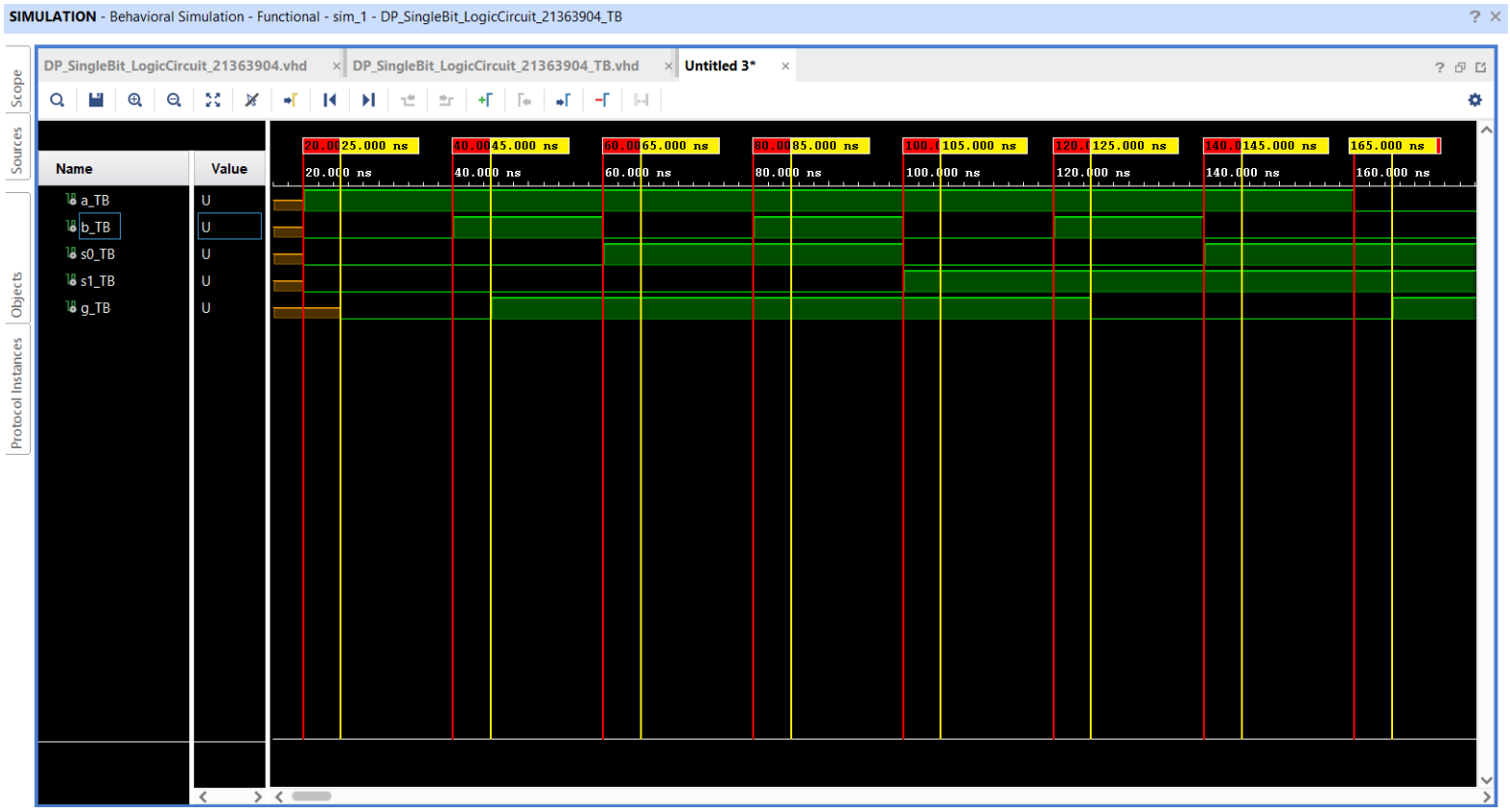
DP_SingleBit_LogicCircuit_21363904



The timing diagram for the Single Bit Logic Circuit is shown above. The red lines mark when the select inputs change and the yellow lines mark when the correct value appears at the output, after a propagation delay of 5ns. The waveform above demonstrates each of the four bitwise operations on two sets of inputs, A and B: the first three operations (AND, OR and XOR) are performed on 1 and 0 followed by 1 and 1, and the last operation (NOT) is performed on 1 followed by 0. When both selects are 0, we perform $A\ AND\ B$, when $s0$ is 1, we perform $A\ OR\ B$, when $s1$ is 1, we perform $A\ XOR\ B$, and when both selects are 1, we perform $NOT(A)$. We can see from the waveform that each operation yields the correct result: $1\ AND\ 0 = 0$, $1\ AND\ 1 = 1$, $1\ OR\ 0 = 1$, $1\ OR\ 1 = 1$, $1\ XOR\ 0 = 1$, $1\ XOR\ 1 = 0$, $NOT(1) = 0$, $NOT(0) = 1$.