Today, many group presented high efficiency Si solar cells over 25% in efficiency. One of the promising structures is the TOPCon cell presented by Fraunhofer ISE in Germany. Recently, a 25.1% tunnel oxide passivated contact (TOPCon) cell based on n-type Si was reported. The highlight of this cell is the excellent interface passivation quality achieved by applying a thin (<2 nm) oxide layer. The oxide layer was located between the doped poly-Si and the Si substrate. In this study, we fabricated TOPCon cell by depositing phosphorus doped a-Si and polysilicon each. They act as carrier-selective contacts and, thereby, lead to a significant reduction of the cell’s recombination current. We analyzed these layers by various methods and could get good results on the phosphorus doped Si contact in TOPCon solar cell.

![Diagram](image)

Figure 1: Annealing effect of TOPCon rear structure.