

182-N-Type 16BB Mono TOPCon Bifacial Solar Cell

How efficient are Topcon bifacial cells?

After optimizing the passivation process, the industrial-grade TOPCon bifacial cells reached an efficiency (Eff), Voc, Jsc, and FF values as high as 25.4%, 721 mV, 42.2 mA/cm², and 83.5%, respectively.

How efficient are Topcon solar cells?

Due to the potential for high theoretical limit efficiency as high as 28.7% and low cost, TOPCon solar cells have become one of the prospective technologies in the photovoltaic (PV) market. At present, the highest efficiency for n-TOPCon has achieved 26.4% on an area of 330.15 cm² at JinkoSolar.

How efficient are N-Topcon solar cells?

Cells with $J_0, n^+ = 5 \text{ fA/cm}^2$ (50 nm) and $J_0, \text{metal}, n^{++} = 73.8 \text{ fA/cm}^2$ (110 nm) exhibited the efficiency gain of 0.12%. A pilot efficiency > 25.4% of cells treated with optimized passivation process. Improving the conversion efficiency of n-TOPCon solar cell is still a hot topic.

What is the SiO_x/n⁺-poly-Si process of N-Topcon solar cells?

Therefore, this study focuses on the SiO_x/n⁺-poly-Si process of n-TOPCon solar cells, which consisted of screen-printed metallic contacts on both sides fabricated from 182 mm × 182 mm × 0.14 mm Cz-Si wafers through an industrial-type process with the fixed Ag/Al and Ag pastes.

Is GPOCl₃ suitable for the rear of a solar cell?

On the contrary, it is suitable for the rear of solar cell. The R increased by decreasing GPOCl₃ from 2400 to 1200 sccm, which has a high free carrier absorption (FCA) loss probably due to high doping, it is consistent with ECV profiles (Fig. 7 a).

What is the Topcon structure?

The TOPCon structure consists of an ultrathin silicon oxide (SiO_x) film and an n⁺ doped polysilicon (poly-Si) layer, which uses the concept of tunnel selectivity engineering. By employing thin SiO_x layer, it was possible to obtain the tunneling selectivity which allows electron transmission from Si to n⁺-poly-Si layer while holes are repelled.

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