3.58% Yield Gain of Tiger Neo 3.0 vs. N-Type BC in Rooftop Field Test in Guangdong

Key Findings

1. The field test project for C&I rooftop power stations in Jiangmen, Guangdong, was conducted from February 1, 2026, to February 27, 2026. The measured data shows that during the test period, the cumulative power generation per watt for Tiger Neo 3.0 modules reached **76.17 kWh/kW**, while the N-type BC modules of the same power generation achieved **73.53 kWh/kW**. Tiger Neo 3. 0 demonstrated a stable power gain of **3.58%** per watt.

2. Time-segmented performance analysis indicates that Tiger Neo 3.0 modules demonstrate particularly prominent advantages during low-irradiance periods. Taking the typical overcast-to-cloudy weather on February 23 as an example.

Before 8:00 AM, the per-watt gain of Tiger Neo 3.0 reached **4.02%** over BC panels,representing that Tiger Neo 3.0 modules enter effective power output earlier.

After 3 PM, the per-watt gain reached **7.70%**, effectively extending evening generation duration.

Throughout the day (9:00–15:00), gains remained within the **3.51%–4.12%** range, demonstrating all-day, all-period performance stability.

3. From a technical attribution perspective, the Tiger Neo 3.0 module leverages the low leakage current characteristics of its TOPCon cell structure, maintaining higher current collection efficiency in low-light conditions. N-type BC modules, due to their complex interdigitated back contact structure and dense leakage pathways, exhibit significant leakage current losses under low irradiance conditions, resulting in persistently constrained power generation capacity throughout the day.

Project Information

The comparison test was performed in Jiangmen, Guangdong, located along the coastal region of South China, which features a subtropical maritime monsoon climate. While winter solar radiation levels are generally adequate, frequent

Project Design

This project employs a string-level parallel comparison approach, strictly controlling variables to ensure data validity.

1. Test Samples: Eight pieces of Tiger Neo 3.0 module (rated power 650W) were selected, along with eight N-type BC modules (rated power 650W).

2. Installation Conditions: Both sets of modules were installed flat at a 0 ° tilt angle on a color-coated steel tile roof with no shading and consistent orientation, ensuring identical irradiation reception conditions.

3. Electrical Configuration: Two strings connected to the same model string inverter, utilizing independent MPPT channels to synchronously data collection.

4. Monitoring Period: February 1, 2026, to February 27, 2026, covering a nearly one-month operational cycle.

5. Typical Day Analysis: February 23, 2026 (overcast conditions, southeast wind at level 2, temperature 20–27 ° C) as a time-slice analysis sample, focusing on monitoring low-irradiance periods in the morning and evening, as well as hourly generation performance throughout the day.

6. Key Monitoring Metrics: Cumulative power generation per watt (Wh/W), hourly power generation per watt (Wh/W), and Relative Power Gain (%). Data collection was conducted without interruption throughout the process to ensure the integrity and credibility of empirical conclusions.

Conclusion

The Jiangmen, Guangdong field test project fully validated the power generation advantages of Tiger Neo 3.0 modules in rooftop applications. During the testing period, the Tiger Neo 3.0 modules achieved an average 3.58% power gain over N-type BC and the power gain further amplified to 7.70% during low-light conditions in the evening.

This test project featured unique installation conditions: **modules were laid flat at a 0 ° tilt on a color-coated steel tile roof with minimal clearance from the ground, virtually eliminating access to ground reflection and atmospheric scattering light. Even in typical rooftop scenarios where bifacial effects are negligible, the Tiger Neo 3.0 modules still achieved significant power generation gains. This fully demonstrates that the gain stems entirely from its superior front-side low-light performance rather than bifaciality.** This conclusion precisely attributes the performance difference between Tiger Neo 3.0 and BC modules precisely to low-light response capability itself, eliminating interference from other variables.

From a technical perspective, the TOPCon cell structure used in Tiger 3 modules features positive and negative electrodes distributed on both sides, confining leakage pathways to a minimal area at the cell edges. This design significantly enhances leakage current control compared to N-type BC modules. In contrast, the complex interdigitated electrode structure and multiple patterning steps in BC modules result in densely distributed leakage points. Under low-irradiance conditions, resulting in persistent power generation losses throughout the day. The Tiger Neo 3.0 module with its optimized interconnection resistance design and ultra-thin tunnel oxide layer structure, maintain higher current collection efficiency and fill factor in low-light environments, achieving all-weather performance that "keeps pace in strong light and excels in weak light."

In summary, Tiger Neo 3.0 modules demonstrate all-weather performance characterized by "strong light without lag, weak light with greater lead" in rooftop scenarios, thanks to their superior low-light response advantages.For distributed PV projects with high cloud coverage, significant early morning/late afternoon low-light periods, and flat mounting configurations where bifacial effects are limited, The Tiger Neo 3.0 module effectively harnesses non-peak sunlight resources and extends effective power generation duration, delivering quantifiable long-term yield improvements for end users.