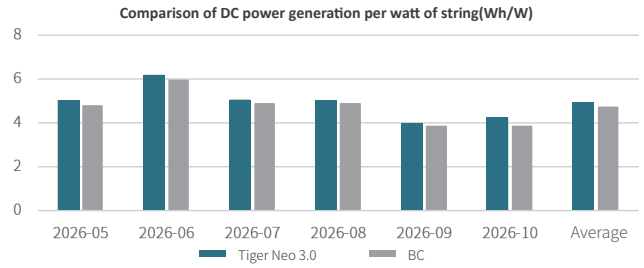
Building Your Trust in Solar

Yinchuan, Ningxia Vertical Installation Demonstration: Tiger Neo 3.0 Achieves a 4.26% Increase in Power Output per Watt Compared to N-Type BC Modules, Highlighting Its High Bifaciality Advantage

I. Key Conclusions

1. Leading Power Output per Watt

The field test project in Yinchuan, Ningxia, was conducted from May 6 to October 31, 2026, lasting six months. Measurement data shows that the average DC power output per watt for vertically installed Tiger Neo 3.0 string modules reached **4.89 Wh/W**, compared to **4.69 Wh/W** for N-type BC string modules of the same power rating, indicating that Tiger Neo 3.0 achieved a **4.26%** increase in power output per watt.

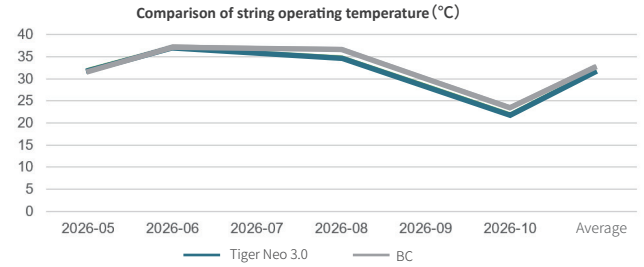


2. The advantage of high bifaciality is evident

Vertical installation allows both the front and back of the modules to receive sunlight simultaneously, making bifaciality a key parameter determining the power generation performance of vertically installed modules. The measured bifaciality of the test sample in this study was 82.20%, compared to 69.96% for an N-type BC module of the same power rating—a difference of 12.2 percentage points. Under vertical installation conditions, which rely heavily on rear-side irradiation, the advantage of bifaciality is fully magnified.

3. Lower Operating Temperature

Data from six months of monitoring shows that, under an average ambient temperature of 22.78 ° C, the Tiger Neo 3.0 string had an average operating temperature of 31.76° C—approximately 1° C lower than the 32.73° C recorded for the N-type BC string. This gap widened further during the hottest months, reaching approximately 1.9 ° C in August. A lower operating temperature translates to reduced power loss due to heat and improved long-term reliability.



II. Project Background

To verify the comprehensive power generation performance of the Tiger Neo 3.0 under vertical installation and bifacial exposure conditions, and to explore its application value in "PV+" integrated scenarios, JinkoSolar conducted a comparative field test of the Tiger Neo 3.0 and N-type BC modules under vertical installation at the Yinchuan Outdoor Demonstration Base of the National Solar Photovoltaic Product Quality Inspection and Testing Center (CPVT). The test data was compiled, analyzed, and reported by the Wuxi Institute of Inspection, Testing, and Certification.

Located in the heart of Northwest China, Yinchuan, Ningxia, features abundant sunshine, scarce precipitation, and significant diurnal temperature variations. With solar resources ranking among the highest in the country, it serves as a typical region for evaluating the outdoor power generation performance of modules. Vertical installation is the mainstream approach in composite scenarios such as "PV + desertification control," "PV + agriculture," and "PV + transportation," This enables three-dimensional land utilization: the module's two sides face east and west respectively, a light-receiving characteristic that flattens the power generation curve. The selection of Yinchuan as the site and the adoption of a vertical installation scheme aim to ensure that the results closely reflect the actual operating conditions in the Northwest region and in composite scenarios.

III. Project Design

To ensure the objectivity and validity of the comparison results, this project employs a string-level parallel comparison approach, strictly controlling variables to guarantee data validity.

1. Test Samples: Ten Tiger Neo 3.0 modules and ten N-type BC modules of the same power rating, each arranged in vertically mounted comparison strings of equal size;

2. Installation Method: Both sets of modules were installed using vertical mounting brackets, the two sides of the module face east and west respectively, with the lower edge of the modules 1.0 meters above the ground and a spacing of 10 meters between the front and rear of the arrays. There were no obstructions in the surrounding area to ensure that the irradiance conditions for both sets were essentially the same;

3. Purpose of Comparison: Vertical installation reflects typical operating conditions in "PV+" hybrid scenarios, with a focus on examining the comprehensive power generation performance and operating temperature differences between the two types of modules;

4. Monitoring Period: May 6, 2026, to October 31, 2026;

5. Data Assurance: All statistical data for the project is sourced from the Yinchuan Outdoor Demonstration Base of the National Solar Photovoltaic Product Quality Inspection and Testing Center (CPVT) and was compiled, analyzed, and reported by the Wuxi Institute of Inspection, Testing, and Certification to ensure the objectivity and impartiality of the test data;

6. Key Monitoring Indicators: String DC power generation per watt (Wh/W), front/back irradiance (kWh/m²), operating temperature (° C), and ambient temperature (°C).



IV. Data Insights

During the 6-month testing period, the Tiger Neo 3.0 achieved a power output gain of 4.26% per watt, with its advantages primarily evident in two areas.

1. Higher bifaciality translates to superior power generation: In vertical installations, the rear-side irradiance accounts for a significant portion of total irradiance; the higher the bifaciality, the more electricity can be generated from the same amount of rear-side irradiance. The Tiger Neo 3.0' s bifaciality is 12.2 percentage points higher than that of N-type BC modules with the same power rating, which is a key factor behind the difference in power output per watt between the two modules—**4.89 Wh/W** versus **4.69 Wh/W**.

2. Stable Full-Cycle Gain: From May to October, the monthly power generation gain per watt ranged from **2.66%** to **9.09%**. The gain remained positive every month for six consecutive months, peaking at 9.09% in October. There was no decline in gain due to harsh outdoor conditions, demonstrating stable and reliable power generation performance.

V. Analysis of Principles

From a technical perspective, the comprehensive advantages of the Tiger Neo 3.0 stem from the combined effects of a high bifaciality ratio and superior thermal characteristics. N-type TOPCon cells inherently possess a high bifaciality ratio; building on this, the Tiger Neo 3.0 incorporates MAX-patterned enhancement technology, which reduces rear-side irradiation losses through the selective layout of the rear poly layer, achieving a bifaciality ratio of up to **85% ± 5%**. Vertical installation ensures that the front and back of the module receive nearly equal amounts of light, allowing the back to additionally capture sky-scattered and ground-reflected irradiance; the higher the bifaciality ratio, the greater the actual power generation that can be converted from this irradiance.

In terms of temperature performance, the Tiger Neo 3.0 features an excellent power temperature coefficient, resulting in minimal power derating at high temperatures; its lower operating temperature, as verified by field tests, enables it to maintain stable power output under the high-irradiance conditions of Yinchuan.

In contrast, in N-type BC cells, both the positive and negative busbars are located on the rear side, resulting in greater shading losses caused by the metal electrodes and the patterning process; the bifaciality ratio is typically only around 70%. In scenarios such as vertical installation—where power generation is driven by both the front and rear sides—the disadvantage of a lower bifaciality ratio is further amplified. Combined with higher operating temperatures, power temperature losses consequently increase. This finding is corroborated by the results from field tests, which showed that the Tiger Neo 3.0 achieved a power gain of **4.26%** per watt and an average operating temperature approximately 1 ° C lower. Overall, the combination of a high bifaciality ratio and lower operating temperature accounts for the Tiger Neo 3.0' s power generation advantage under vertical installation conditions in Yinchuan.