

For immediate release

## **WAVELABS defines requirements and solutions for the characterization of PST solar cells**

- Efficiency boost from perovskite silicon tandem (PST) cells offers hope for faster energy transition
- Scaling PST cell production requires adjustments to test procedures and flasher technology
- New white paper defines requirements and solutions for accurate characterization of PST cells

**Leipzig, Germany, November 8, 2022** – WAVELABS, the world's leading developer and supplier of state-of-the-art LED cell flasher solutions, has published a white paper discussing the promising PST cell technology and the requirements for cell test systems. Also known as perovskite silicon tandem, PST photovoltaic cells achieved an efficiency record of over 31.25% for the first time in 2022<sup>3</sup>. PST cells are therefore seen as a beacon of hope that will enable the even faster roll-out of renewable energies in the fight against the climate crisis. Their special design consisting of two sub-cells (silicon and perovskite) enables efficiencies of potentially up to 45%. By comparison, the currently widely used pure silicon solar cells have a physical efficiency barrier of around 29%. At a recent webcast, Dr. Kaining Ding, Head of "Silicon Heterojunction Solar Cells and Modules" at the IEK5-Photovoltaics Forschungszentrum Jülich, stated that with PST cells, »with the reduction of the levelized cost of electricity by another 30%, PST cells will be automatically cheaper than any other form of electricity generation available on earth. «<sup>4</sup> This is due to the relatively inexpensive raw materials and extensive reuse of production processes already known from thin-film manufacturing. PST cells are therefore among the few highly efficient cell designs that make it possible to make the leap from special applications in space to large-scale use.

### **LED flasher provides foundation for scalable cell testing of PST cells**

However, PST cells also pose some challenges compared to classical c-Si, especially in cell measurement and characterization. These include different saturation behavior, different properties of the individual sub-cells, and more demanding current matching. In the case of 3- and 4-terminal designs, where the sub-cells are connected in parallel and independently, respectively, the PST cells should also be flashed both front and back.

*»Overall, PST cells require a flexible, spectrally and temporally variable light source, though this cannot be easily implemented with the conventional widely used xenon-based flasher technology,«* explains Britta Mette, Product & Service Engineer at WAVELABS.

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<sup>3</sup> <https://www.csem.ch/page.aspx?pid=172296>

<sup>4</sup> <https://wavelabs.de/how-the-perovskite-solar-cells-will-shape-our-world/>

In the new whitepaper »*Measurement Challenges for Perovskite / Silicon Tandem (PST) Solar Cells – How to scale PST cell production and characterization in R&D and commercial manufacturing*«, WAVELABS explains the challenges of PST design to cell measurement in production lines and presents recommended solutions. In the white paper, the German company presents arguments why LED-based cell flasher are crucial for accurate and scalable cell measurement in industrial production of PST cells. »*Cell flasher for the characterization of PST cells must offer the possibility to take into account the specifics of different cell designs as well as to implement measurement on an industrial scale,*« adds Dr. Patrick Mergell, WAVELABS COO/CTO. »*Currently, only LED-based cell flasher technology meets the necessary measurement requirements of PST solar cells in a form that is simple, accurate and efficient.*«

Leading PST cell research and manufacturing companies such as Hanwha QCells and Fraunhofer ISE are already using WAVELABS' LED flasher solutions to benefit from the combination of advanced technological capabilities and scalable implementation. WAVELABS has been developing and marketing LED-based cell flasher for over ten years and currently holds around 30% market share for cell measurement systems worldwide.

The whitepaper is available for download at the following link:

[https://wavelabs.de/wp-content/uploads/WAVELABS\\_White-Paper\\_Perovskite.pdf](https://wavelabs.de/wp-content/uploads/WAVELABS_White-Paper_Perovskite.pdf)

#### **Caption**

- (1) Britta Mette, WAVELABS Product & Service Engineer
- (2) Dr. Patrick Mergell, WAVELABS COO/CTO
- (3) Roadmap: PST technology will boost the PV market, © Dr. Bernd Stannowski, HZB / WAVELABS

#### **About WAVELABS**

WAVELABS Solar Metrology Systems GmbH was founded in September 2011 by Jörn Suthues, Dr. Thankmar Wagner and Dr. Torsten Brammer. Over the next decade, WAVELABS went from start-up to global leader for LED solar simulators — now with customers in more than 30 countries and a market share of around 30 percent. With a staff of 90 employees, the company posted € 29 million in earnings for 2021.

Every day, major PV manufacturers, influential research institutions, and universities around the globe trust their production and research to innovative metrology systems from WAVELABS for analyzing solar cells and modules. The company's vision is to make the world a better place by helping to achieve a 100 percent renewable energy supply. LED's copy the sun!

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