

Perovskite photovoltaic module with eight percent conversion efficiency

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Nano-electronics research center imec announced today at Intersolar



Europe, a thin-film perovskite photovoltaic (PV) module of a power conversion efficiency of eight percent measured over an aperture area of 16cm². The remarkable geometrical fill factor of more than 95 percent for this size of module, demonstrates the potential of scaling up this novel thin-film PV technology from cell to module level. The achievement is an important breakthrough in realizing a marketable thin-film solution for applications such as building integrated photovoltaics (BIPV).

Organometal halide perovskites are considered an excellent material for thin-film solar cells as they have shown high conversion efficiencies at cell level. While the power conversion efficiency of this new class of thin film solar cells has increased rapidly in the last few years, further improvements are still needed to make thin-film photovoltaics an attractive technology for industrial production. Larger area processing and narrow interconnections are prerequisites for processing efficient thin-film modules. Imec's results demonstrate the achievement of both factors of perovskite-based solar cells.

"Not only is imec improving the perovskite material, but it is also adjusting the cell and module structure to enhance the conversion efficiency of <u>perovskite solar cells</u> and modules by more than 20 percent," said Tom Aernouts, R&D manager for thin-film photovoltaics at imec. "The rapid progress that we are making is based on our strong background and track record in traditional organic photovoltaics."

Imec develops a platform for glass-based perovskite modules and collaborates with the Dutch joint thin-film PV research initiative Solliance to develop foil-based processes. Thanks to its high <u>power</u> <u>conversion efficiency</u> and stand-alone integration in building elements, both glass-based and thin-film perovskite PV technology are widely considered as important technologies for the BIPV market. Imec is working to further increase the <u>conversion efficiency</u> of silicon <u>solar</u>



<u>cells</u> by creating a stack with a perovskite cell on top of a silicon solar cell. The <u>perovskite</u> cell will capture the light which is not absorbed by silicon, as such enabling conversion efficiencies of more than 30 percent.

Provided by IMEC

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