

## Over 20% efficient CIGS-perovskite tandem solar cells

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Supplementary material

# Over 20% Efficient CIGS –Perovskite Tandem Solar Cells

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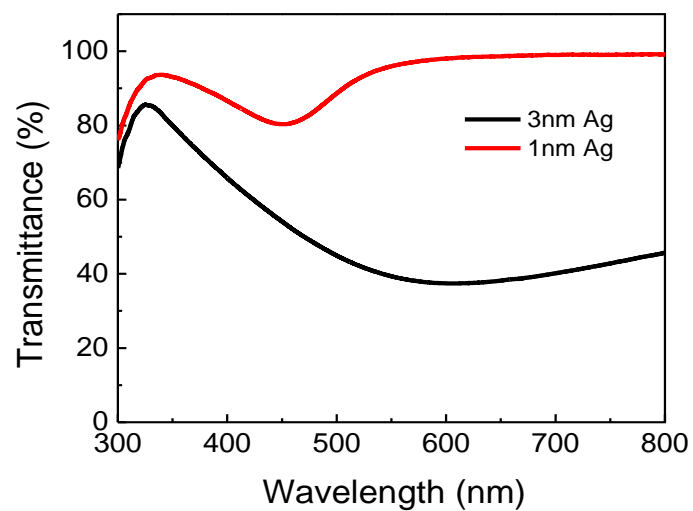
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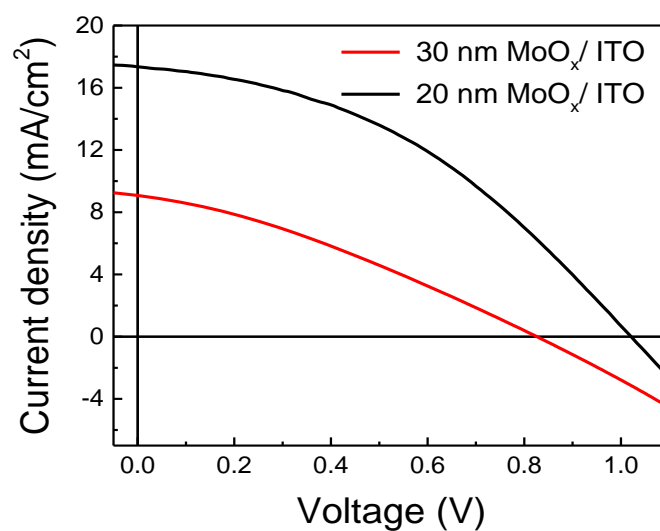
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## Author Contributions

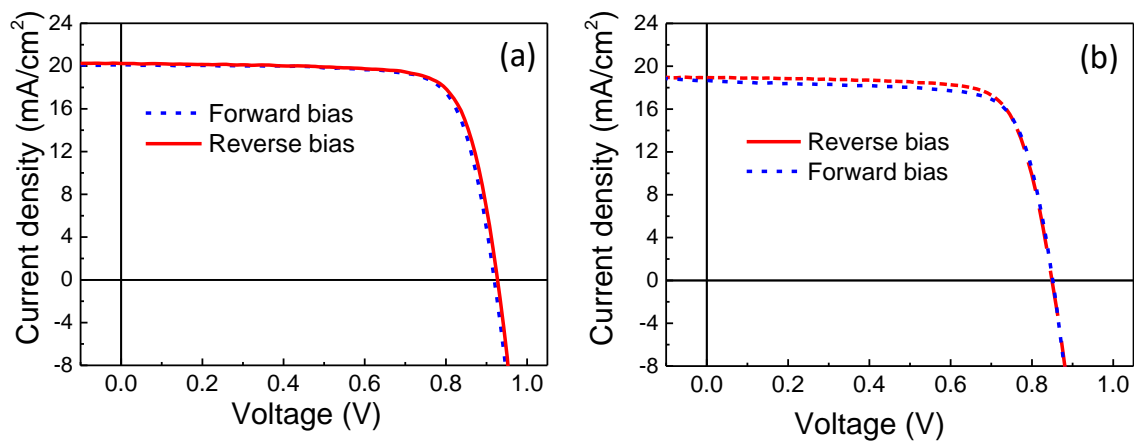
# These authors contributed equally to this work



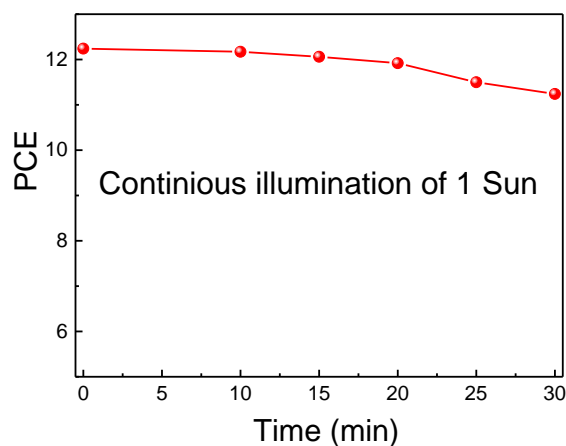
**Figure S1.** Transparency of the 1nm Ag and 3 nm Ag thin film on glass



**Figure S2.** J-V characteristics of the semi-transparent perovskite device with MoO<sub>x</sub> buffer layer



**Figure S3.** J-V characteristics under forward and reverse bias condition of a (a) as fabricated device semi-transparent device and (b) after storing >1month inside the glove box.



**Figure S4.** PCE values of a semi-transparent device under continuous illumination of 1 SUN light.

**Table S1.** J-V summary of as fabricated cell and after storing >1month inside glove box

Bias	$J_{sc}$ (mA/cm <sup>2</sup> )	$V_{oc}$ (mV)	FF (%)	PCE (%)
Forward	20.1	919	77.6	14.3
Reverse	20.2	927	77.3	14.5
<b>After &gt;1 month</b>				
Forward	18.7	851	75.3	12.0
Reverse	18.9	849	76.0	12.2