

Omni-direction PERC Solar Cells Harnessing Periodic Locally Focused Light Incident Through Patterned PDMS Encapsulation

Yeon Hyang Sim^{1,2}, Min Ju Yun¹, Dong Y. Lee¹ and Seung I. Cha^{*1,2},

1. Energy Conversion Research Center, Electrical Materials Research Division, Korea
Electrotechnology Research Institute

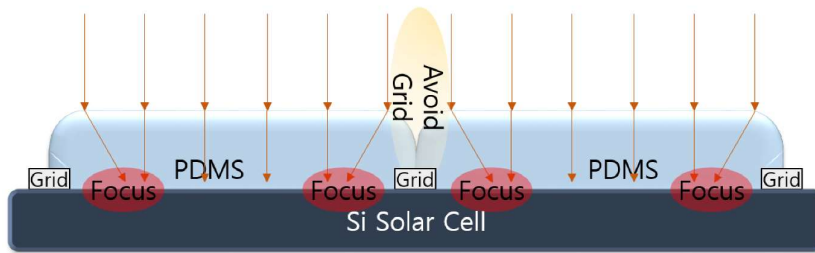
2. Department of Electro-functionality Materials Engineering, University of Science and
Technology

Supporting Information

Table S1. Performances of PERC solar cells with difference local focusing condition calculated by PC2D.

	uniform	center concentration	left concentration	by grid	two points
V_{mpp} (V)	0.55	0.548	0.55	0.554	0.551
V_{oc} (V)	0.654	0.654	0.655	0.657	0.656
J_{sc} (mA/cm ²)	39.6	40.5	40.6	40.6	40.5
FF	0.804	0.802	0.803	0.804	0.803
P_{max} (mW/cm ²)	20.8	21.2	21.4	21.4	21.3

One pattern between two grids



Two patterns between two grids

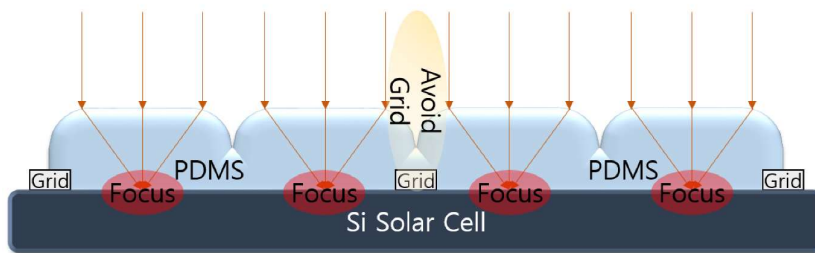


Figure S1. Schematic of the full devise with PDMS encapsulation.

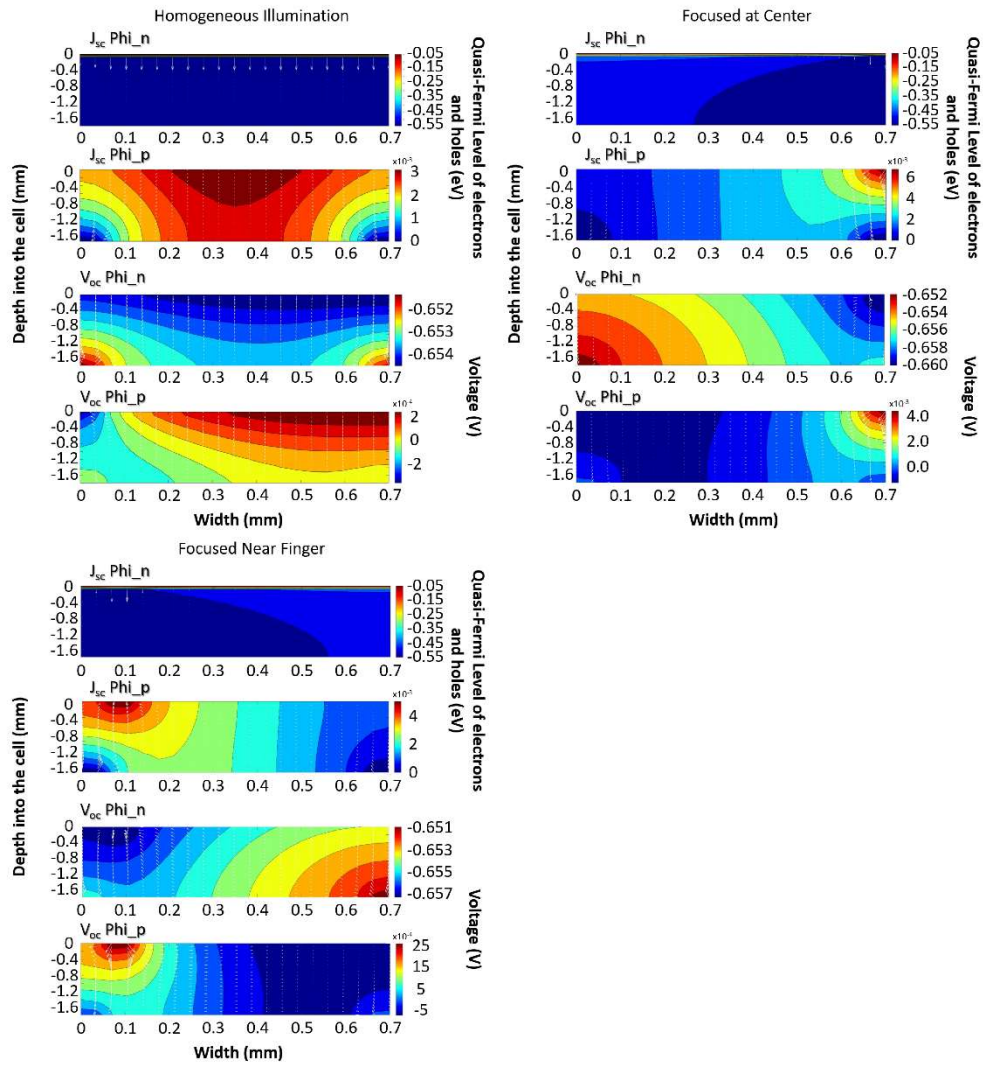


Figure S2. PC3D simulated results for quasi-Fermi level of electrons and holes under various local focusing condition at short circuit condition and open voltage condition.

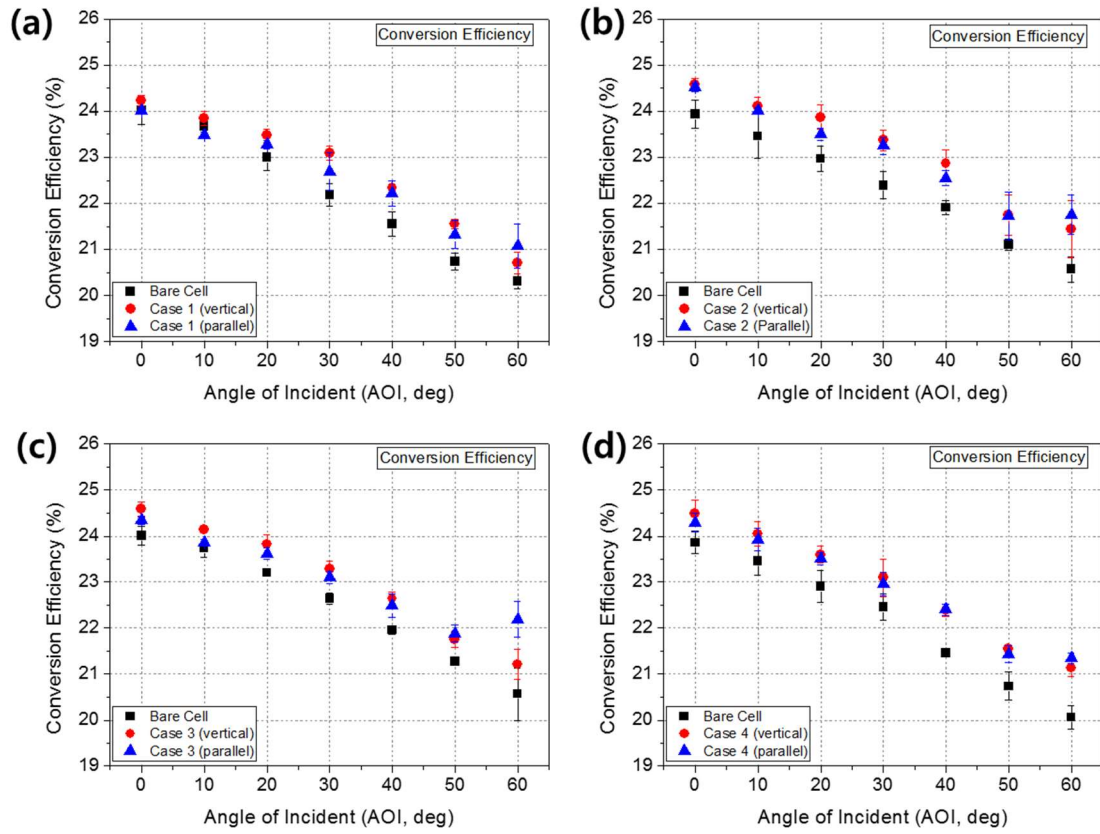


Figure S3. The variation of energy conversion efficiency according to AOI for (a) Case 1, (b) Case 2, (c) Case 3 and (d) Case 4 geometry introduced PDMS encapsulated PERC solar cells.