[별첨4_CP 양식]

CONCEPT PAPER

for KIER International Cooperation project

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Title	Development of a carrier selective passivated contact for high efficiency, large area n-type Si solar cells			
Description	Carrier selective passivated contact has become an active area of investigation for next generation high-efficiency Si solar cells because it can bridge the efficiency gap between the current production cells and practically achievable Si cell efficiency by eliminating high recombination at the metal/Si contacts and in the heavily diffused region. Introduction of a thin passivating interlayer between the high recombination regions and the Si absorber mitigates their negative impact because they are not in direct contact with the absorber. This reduces total recombination or saturation current density (Jo), resulting in much higher Voc. Several research groups reported very high efficiency with carrier selective passivated contact technology in small cell size, but it is still very changeable to scale-up for commercial ready and large area Si solar cells. Our proposal to achieving a carrier selective contact involves chemically or thermally grown ultra-thin tunnel oxide capped with p+ or n+ poly silicon and screen printing contact on front and back side for bifacial large area Si solar cells. The p+ or n+ poly silicon can be grown by either PECVD or LPCVD tool followed by an anneal. The objective of this project is to develop and manufacture high power n-type (or p-type) bifacial Si solar cells with efficiencies ≥ 22.0% by applying carrier selective passivated contact on the back side of large area Si solar cells. In addition, bifacial structures will be fabricated to boost module power by 5-25%.			
Outcomes*	● Excellent saturation current density below 10 fA/cm2 from carrier selective passivated contact ● Development of simple cell process sequence for commercialization ● Screen printed, large area n-type bifacial cells with efficiency >22% ● ~2 papers per 1 year and ~2 patents			