Supporting information for:

Insights into the role of the interface defects density and the bandgap of back surface field for efficient p-type silicon heterojunction solar cells

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As shown in Fig. S1, it can be observed that the V_{oc} and *FF* are decreased as the increasing thickness of c-Si wafer. J_{sc} is improved as the increasing thickness of the c-Si wafer. This mainly due to the fact that thicker c-Si wafer will promote the light absorption and series resistance of the devices (as exhibited in Fig S2), which increasing the J_{sc} and declining the *FF* of the device. In addition, for a constant condition, thicker c-Si indicates that the photo-generated carriers need to diffuse longer path to be collected. This will decrease the built-in field of the p-type SHJ solar cells, which always seriously determining the V_{oc} of the device. As a result, in order to balance the optical and electrical properties, it demonstrates that the c-Si substrates with a thickness of 150-200 μm could be a preferred criterion to p-type SHJ solar cells.

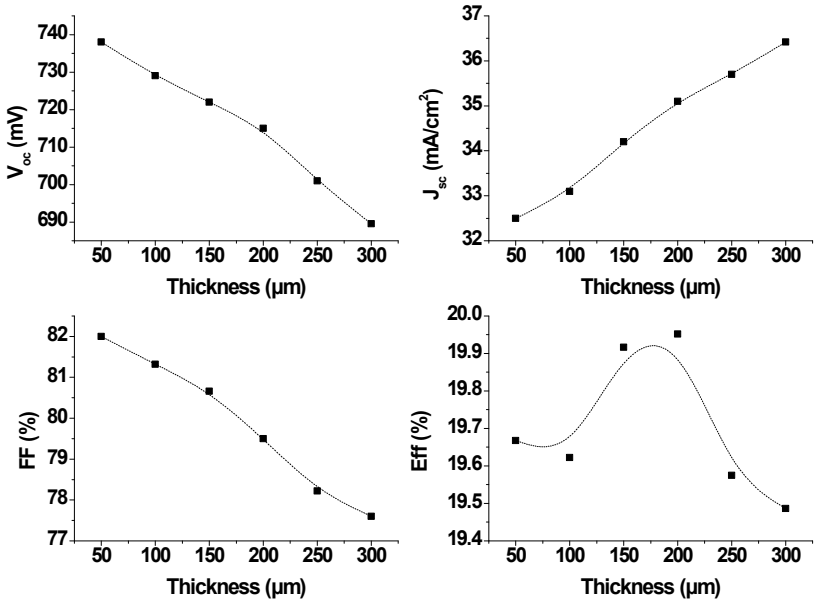

Fig. S1 The performance of p-type SHJ solar cells as a function of the c-Si thickness

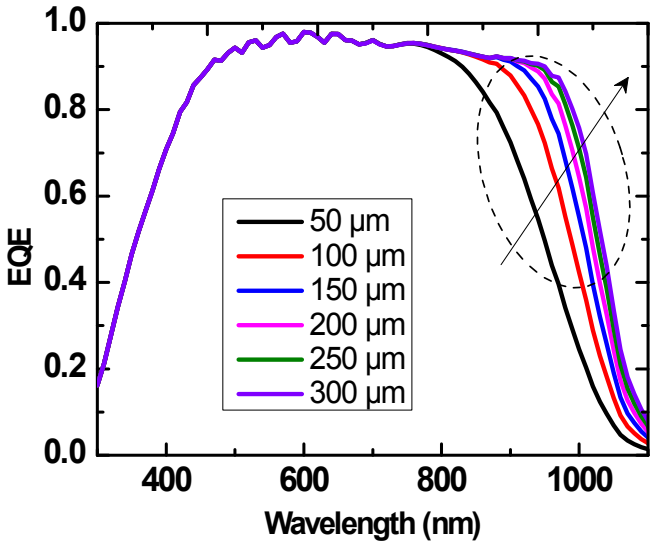

Fig. S2 The EQE curves of the p-type SHJ solar cells with various c-Si thickness