ABSTRACT

The present application relates to the field of solar cells, and in particular to a main-gate-free and high-efficiency back-contact solar cell module, assembly, and a preparation process thereof. The main-gate-free and high-efficiency back-contact solar cell module comprises solar cells and an electrical connection layer, a backlight side of the solar cells having P-electrodes connected to a P-type doping layer and N-electrodes connected to an N-type doping layer, wherein the electrical connection layer comprises a number of small conductive gate lines, part of which are connected to the P-electrodes on the backlight side of the solar cells while the other part of which are connected to the N-electrodes on the backlight side of the solar cells; and, the small conductive gate lines are of a multi-section structure. The present application has the following beneficial effects: the usage of silver paste is decreased, and the cost is reduced; moreover. The arrangement of small conductive gate lines in a multi-section structure reduces the series resistance and the transmission distance of a filling factor, so that the efficiency is improved and the stress on the cells from the small conductive gate lines can be effectively reduced.