The effect of interconnecting ribbons in external resistance of crystalline silicon photovoltaic modules

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**Abstract**. The interconnecting ribbons in commercial crystalline silicon photovoltaic modules significantly contributes to the external resistance of the modules [1]. This external resistance plays a major role in resistive losses in the modules and thus measures should be taken in minimization of such resistances [2]. In addition, the selection of wrong ribbon configuration essentially leads to breakage in fingers which further enhances resistive losses in the modules [3]. In this paper, a resistive network model using analytical approach have been proposed which effectively describes the effect of ribbon dimension on external resistance of the modules. The model has also taken care of measures for effective minimization of finger breakages under field operations. PSPICE simulation tool has been used to understand the resistive effect and the effective power loss in a quantitative manner [4]. The results show that the busbar width plays a significant role in choosing the right ribbon dimension. The proposed model is useful to understand the optimum ribbon configuration for newly manufactured crystalline silicon photovoltaic modules.

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