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D.C. Marvin ; S.L. Froedge **All Authors**

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The silicon interdigitated back contact (IBC) solar cell, a relatively new design that has been demonstrated to have greater than 25% efficiency at 100 suns, air mass 1.5, is discussed. The design cells for space use have been investigated using 2-D computer simulations. Near-optimal designs have been presented for missions using either planar or 100-sun concentration arrays, under high or negligible radiation fluences. In the low-radiation environment the minority and majority carrier collection regions should be of comparable width, with thicknesses of 0.9 mu m and 3.0 mu m, respectively. In a high-radiation environment, a different design is used to maximize the end-of-life performance. The overall conclusion of this study is that properly designed IBC cells can yield performance which is comparable with (or superior to) competing silicon and gallium arsenide technologies.< >

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