Abstract

In this study the Light Beam Induced Current (LBIC) imaging technique was used to characterise InGaP/InGaAs/Ge triple junction solar cells. The study focused on the use of monochromatic and solar light as beam probes to obtain photocurrent response maps from which the presence of any current reducing features on the solar cell were identified. Point illuminated current voltage (*I–V*) curves were obtained simultaneously while LBIC scanning measurements were being made. Curve fitting using an interval division algorithm based on the single diode model was performed to extract basic point device and performance parameters to give a rough indication of the functioning of the triple junction device. Using red and blue lasers as beam probes, reverse voltage breakdown was observed on the *I–V* curves which could be attributed to the Ge bottom subcell not being fully activated. The extracted parameters obtained when using monochromatic and solar light beam probes showed a large variation, indicating the dependence of *I–V* parameters on the spectral content of the beam probe.