CLAIMS

1. A device comprising:

a substrate; and

a photodetector coupled to the substrate,

wherein the substrate has a depth in a depth direction,

wherein the photodetector is arranged to detect light emitted from a light source that irradiates a top surface of the device,

wherein the depth of the substrate is at most 1 times a diffusion length of a minority carrier within the substrate so as to mitigate dark current arising from minority carriers photoexcited in the substrate based on the light emitted from the light source; and

an additional photodetector coupled to the substrate,

wherein the additional photodetector is arranged to detect light emitted from the light source that irradiates the top surface of the device and is electrically connected in series with the photodetector.

2. The device of claim 1, wherein the depth of the substrate is at most 0.1 times the diffusion length of the minority carrier within the substrate.

3. The device of claim 1, wherein the depth of the substrate is at most an optical absorption length of the substrate.

4. The device of claim 1, wherein the depth of the substrate defines a maximum absorption depth for the light emitted from the light source.

5. A device comprising:

a substrate; and

a photodetector coupled to the substrate,

wherein the substrate has a depth in a depth direction,

wherein the photodetector is arranged to detect light emitted from a light source that irradiates a top surface of the device, and

wherein the depth of the substrate is at most 1 times a diffusion length of a minority carrier within the substrate so as to mitigate dark current arising from minority carriers photoexcited in the substrate based on the light emitted from the light source.

6. The device of claim 5, further comprising an additional photodetector coupled to the substrate,

wherein the additional photodetector is arranged to detect light emitted from the light source that irradiates the top surface of the device and is electrically connected in series with the photodetector.

7. The device of claim 5, wherein the depth of the substrate is at most 0.1 times the diffusion length of the minority carrier within the substrate.

8. The device of claim 5, wherein the depth of the substrate is at most an optical absorption length of the substrate.

9. The device of claim 5, wherein the depth of the substrate defines a maximum absorption depth for the light emitted from the light source.