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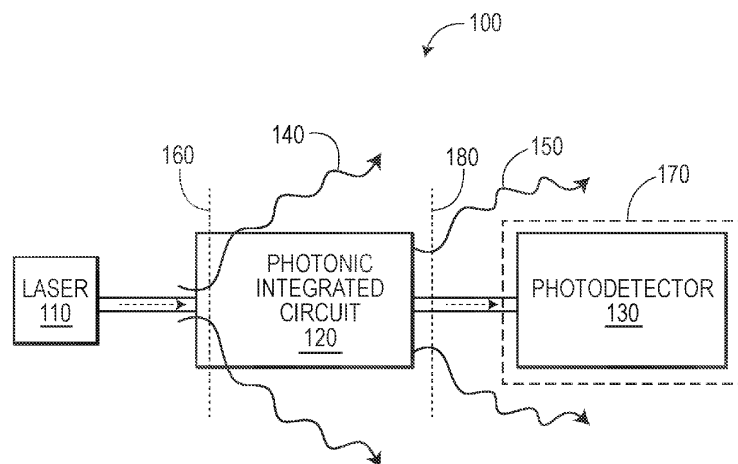


FIG. 1

(57) Abstract: A device including a substrate, a dielectric layer on the substrate, a waveguide within the dielectric layer, and a photodetector optically coupled to the waveguide. The photodetector is disposed above the waveguide layer and is monolithically integrated with the substrate. The photodetector is configured to operate at low temperatures, such as below about 50 K or about 20 K. In some embodiments, the monolithic photonic device includes thermal isolation structures and optical isolation structures. Techniques for manufacturing the monolithic photonic device, including the thermal isolation structures and optical isolation structures, are also described.

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