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(54) **PHOTONIC CRYSTAL SEMICONDUCTOR DEVICE AND METHOD FOR MANUFACTURING SAME**

(57) To provide a photonic crystal semiconductor device which enables various kinds of optical devices having a photonic crystal structure which is readily formed using a semiconductor and a semiconductor manufacturing process, and a manufacturing method thereof. The object can be achieved by a photonic crystal structure, including a lower DBR layer 1, a core layer 2, an upper DBR layer 3, and a dielectric multilayer film 6 which are

sequentially laminated from an n-InP substrate 11 side, a plurality of holes 9 formed in the direction of a film thickness in the core layer 2 and the upper DBR layer 3, and a line defect portion 10 with none of the plurality of holes formed therein and disposed between the plurality of holes 9, wherein the line defect portion 10 serves as an optical waveguide.

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FIG.1

