Abstract

Effect of Boundary Layers on Transmittance of Defect Mode in One-Dimensional Photonic Band Structures

Il-Sug CHUNG¶[1], Yong Tak LEE[1], Young-Kyoung CHOI[2], Jae-Eun KIM[2], and Hae-Yong PARK[2]

[1]Department of Information and Communications
Kwangju Institute of Science and Technology
Kwangju, 500-712
Korea

[2]Department of Physics
Korea Advanced Institute of Science and Technology
Daejeon, 305-701
Korea

ischung@kjist.ac.kr

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We study the effect of the outermost boundary layers on the transmittance of a defect mode in a one-dimensional (1D) photonic band structure (PBS). The structure consists of a single defect layer sandwiched by the two identical 1D PBS's. The calculation shows that the transmittance of the defect mode is 1.0 when the two outermost layers of film have the same value of refractive indices. This fact is unaffected by the change in the frequency of the defect mode, i.e., the variation of the thickness and/or the refractive index of the defect layer. With two outermost layers of different refractive indices, the transmittance of the defect mode becomes less than one, being minimum at the center of the band gap and maximum near the band edges.

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