

Optimasi Ketebalan Lapisan Ganda Anti-Reflection Coating untuk Devais Opto-Elektronika

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Abstrak

in this research, thickness of two layers anti-reflection coating (MRC) with refractive index n_a , of the end facet of weakly-guiding semiconductor (compound III-V), has been optimised to single Transverse Electro-Magnetic (TEM) mode: in order that reflectance had less than 0,0001. Reflection at the boundary is exactly analogous to transmission-line models, with the result that continuity relation using dyadic admittance Y and impedance Z operators at transverse plane, also by replacing the waveguide with homogeneous medium of equivalent refractive index n_{eq} is equal to core refractive index n_c where wide of the wave guide can be represented of active layer width w . Through the differential operator, backward electric field can be formed by matrix elements R , of reflection of interface, in such a way that reflectance at the plane $z=0$ is obtained. Double layers response frequencies at wavelength $\lambda = 1,55 \mu\text{m}$ operating, produced the thickness $d = \lambda/4$ with $n_1=1,46$ (SiO₂) or $n_2=2,5870$ (Si₃N₄ ZnSe). Difference of both refractive indexes ($n_1, n_2; n_1=1, n_2=1$), minimum reflectance is 0,58 .10⁻⁴ (practically is zero) with optimum thickness $d/3 = 0,1938 \mu\text{m}$.