

ABSTRACT

The disclosure discloses an optical filter (5) including a substrate (51) and a first set of films (52) disposed on a first surface of the substrate, wherein the first set of films (52) includes a high refractive index film layer, a low refractive index film layer, and a matching film layer. A material of the matching film layer includes a nitrogen-doped silicon germanium mixture having a chemical formula $\text{Si}_x\text{Ge}_{1-x}\text{N}_y$, where $0 \leq x \leq 1$, and $0 < y \leq 0.1$. In a wavelength range of 780nm to 3000nm, a refractive index of the high refractive index film layer is greater than a refractive index of the low refractive index film layer, and a refractive index of the matching film layer is not equal to a refractive index of its adjacent film layer.

FIG. 1