

# WAVELENGTH DIVISION MULTIPLEXER/DEMULTIPLEXER, PHOTONIC INTEGRATED CHIP, AND OPTICAL MODULE

## ABSTRACT

5 Disclosed are a wavelength division multiplexer/demultiplexer, a photonic integrated chip, and an optical module. The wavelength division multiplexer/demultiplexer comprises a substrate, a bus waveguide provided on the substrate, and at least two wavelength division multiplexing/demultiplexing units provided on the bus waveguide; each of the wavelength division  
10 multiplexing/demultiplexing units comprises a mode multiplexer and an asymmetric Bragg grating, wherein the mode multiplexer comprises a first port, a second port, and a third port, the third port is connected to the asymmetric Bragg grating so as to input light in a TE<sub>1</sub> mode or a higher-order mode to the asymmetric Bragg grating, and the asymmetric Bragg grating transmits light of  
15 other wavelengths except a wavelength  $\lambda_i$ , wherein the grating period of the asymmetric Bragg grating and the wavelength  $\lambda_i$  satisfy a resonance condition. The wavelength division multiplexer/demultiplexer of the present application has no requirement on an effective refractive index difference between TE<sub>0</sub> and TE<sub>1</sub>, so that wavelength division multiplexers/demultiplexers on waveguide structures  
20 of various materials can all satisfy the requirements of CWDM4, and a wider range of applications is achieved.

Figure 1 accompanies.