

3D-Polymer optical waveguide circuit devices

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Light-induced self-written (LISW) technology is a unique and simple method of forming low-loss 3-dimensional (3D) optical circuits in photopolymers using radiation from an optical fiber.¹⁾ Since this technology is applicable to almost all kinds of optical fiber and optical waveguide, many studies have been carried in a number of different organizations. This enables self-organization connection of optical elements, drastic cost reduction of resulting integrated modules can be expected.

We have been studying the WDM optical modules for POF and HPCF network system, as shown in Fig. 1 (a), (b)²⁻³⁾. These two types of module are now working toward practical use for automobile applications. Recently, some new fabrication process and concepts, e.g. singlemode (SM) LISW optical waveguides⁴⁾, cascade connection of EO-polymer-doped-waveguide⁵⁾ and forming of volume hologram⁶⁾, are developed. Fig. 1 (c) shows an example of our target “SM WDM 3D integrated transceiver chip” which embedded those SM-LISW components.

References:

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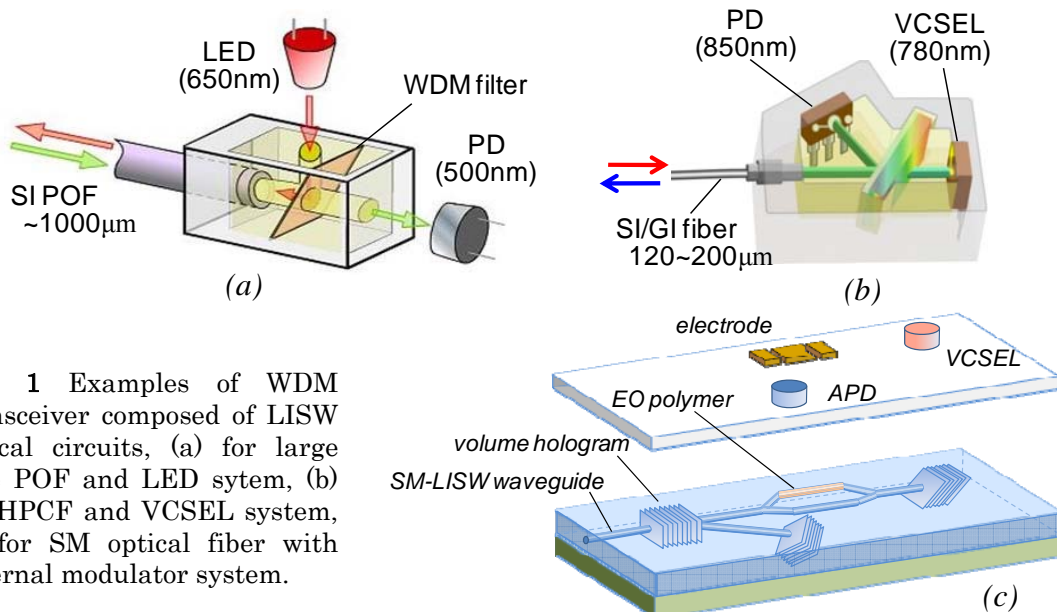


Fig. 1 Examples of WDM transceiver composed of LISW optical circuits, (a) for large core POF and LED system, (b) for HPCF and VCSEL system, (c) for SM optical fiber with external modulator system.