

# **Abstract**

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## **Innovative Architecture of Switching Device for Expanding the Applications in Fiber to the Home (FTTH)**

A new device, optical cross add multiplexer (OXADM), is proposed and analyzed. It uses the combination concept of optical add multiplexer (OADM) and optical cross connect (OXC). It enables a wavelength switch while implementing add and functions simultaneously. So, it expands the applications in fiber to the home (FTTH) and optical core networks. A very high isolation crosstalk level (~ 60 dB) is achieved. Also, a bidirectional OXADM and N×N OXADM are proposed. Finally, a multistage OXADM is presented making some sort of wavelength buffering. To make these devices operate more efficient, tunable fiber Bragg gratings (TFBGs) switches are used to control the operation mechanism.