

IMPLEMENTATION OF MMI STRUCTURE FOR OPTICAL DEVICE USING
POLYMER MATERIAL

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*To all my loving family members,
especially to my beloved PARENTS....*

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In the name of Allah, the Most Beneficent and Most Merciful.

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ABSTRACT

Multimode interference (MMI) devices have been extensively studied and are of considerable interest as key optical components in photonic integrated circuit (PIC). The principle of the MMI devices is based on destructive/constructive interferences occurring in the MMI area with a large number of multimodes. Because of its unique properties, such as low insertion loss, large optical bandwidth, compactness, low crosstalk and excellent fabrication tolerances, the MMI devices has many potential applications such as couplers, splitters, combiners, filters and routers. Compared with silica, recently, polymeric material has lately attracted considerable attention for various waveguide devices, such as optical switches and variable optical attenuators, especially for its simple fabrication process.

ABSTRAK

Peralatan Gangguan Pelbagai Mod (MMI) telah dipelajari secara meluas dan dianggap sebagai komponen kunci/penting kepada litar fotonik (PIC). Pada umumnya, peralatan MMI adalah berdasarkan pada gangguan pemusnah/pembina yang berlaku di dalam kawasan MMI dengan jumlah nombor gangguan yang banyak. Disebabkan ciri-ciri unik seperti kehilangan penyelitan yang rendah, jalur optik yang besar, kepadatan, dan toleran pembuatan yang amat tinggi, peralatan MMI adalah berpotensi dalam aplikasi seperti pasangan, penggabung, penapis dan juga pembahagi. Berbanding dengan silika, sejak akhir-akhir ini, bahan polimer telah menarik minat ramai untuk digunakan dalam pelbagai peralatan waveguide, seperti suis optik dan atenuator optic boleh laras, terutama sekali kerana proses pembuatannya yang mudah.