



Application Note

Dense Wavelength Division Multiplexing (DWDM) -- an introduction

Keywords

DWDM, Fiber optics, WDM

Summary

DWDM is a technique for combining multiple "channels" onto a single fiber. DWDM also refers to the filter device, which is used for multiplexing different channels, onto a single fiber.

Scenario

DWDM Modules are still new to many customers.

Question

What are DWDMs (Dense Wavelength Division Multiplexers) and how are they used?

Notes/Answer

DWDMs are also known as *Add/Drop Filters*. They add a channel in the multiplexer role, or they drop a channel in the demultiplexer role. The length is 30 mm, and the diameter is 4 mm. They have three fibers, which are labeled: **Common**, **Reflected** and **Pass**.

The figure shows a DWDM in a typical "demultiplexer" role. A broadband signal is applied to the *Common* fiber. A single, *ITU Channel* goes to the *Pass* fiber. And, all other channels go to the *Reflected* fiber. In the multiplexer role, the signals are reversed, and a channel is added to those, on the Reflected fiber.

The ITU Channel is a narrow wavelength band, which is defined by the **ITU Grid**. The ITU Grid is a table, which shows Channel Number, Wavelength and Frequency. (*Note: see our DWDM web page, which includes an ITU Grid.*)

DWDMs are also described by their *spacing*. Spacing is measured in GHz (Gigahertz). It relates to bandwidth of the pass band. For 200-GHz spacing, the pass band is 1.6 nm wide. For 100-GHz spacing, the pass band is 0.8 nm wide. On our web site, the ITU Grid shows 72 channels at 100-GHz spacing. If a customer only needs 200-GHz spacing, then they use even or odd number channels.

