Application Note

DWDM Channel Spacing

Keywords

DWDM, Fiber optics, Specifications, WDM

Summary

When working with DWDM devices, one must know the spacing. Either ask the customer for the requirements or be able to suggest the appropriate spacing.

Scenario

Customer orders a DWDM module.

Question

Which filters should be used?

Notes/Answer

Actually, there are two parts to that question. What ITU channels does the customer want, and what spacing is required? The customer should know the channel numbers. However, some flexibility exists in the spacing.

Spacing describes the separation between the centers, of the ITU grid channels. Each channel is defined by its center wavelength (or frequency) and its bandwidth (or bandpass). Bandwidth describes the range of wavelengths within the "band" (or channel).

200 GHz filters have a wider bandwidth than 100 GHz filters (see diagrams 1 & 2). The bandwidth for 200 GHz filters is 1.6 nm. The bandwidth for 100 GHz filters is 0.8 nm. Therefore, center wavelengths, of 200 GHz filters, are spaced further apart. When ordering 200 GHz filters, you use every other channel number (i.e. either odd or even numbered channels).

Note: for greater channel isolation, or for future expansion, customers may request 100 GHz filters *at 200 GHz spacing*. (see diagram 3)
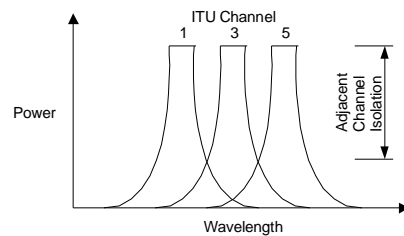

Diagram 1:
Power vs. Wavelength
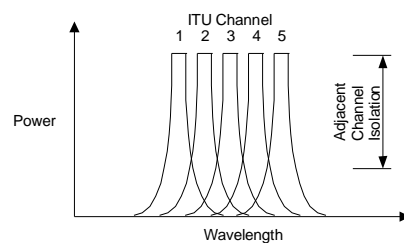200 GHz filters

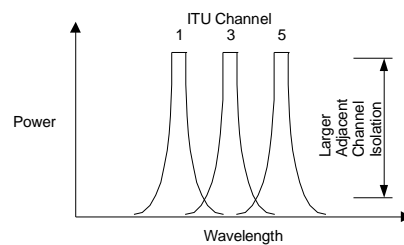Diagram 2:
Power vs. Wavelength
100 GHz filters

Diagram 3:
Power vs. Wavelength
100 GHz Filters
@ 200 GHz Spacing