



Application Note

DWDM “Color” Bands for CATV Industry

Keywords

Application, CATV, DWDM, Fiber-optics

Summary

For fiber-optic, Cable-TV purposes, the “C-band” is divided into three color “bands:” Blue, Purple and Red. Basically, the lower half, of the C-Band, includes the blue channels. The upper half includes the Red channels. The narrow section, which divides the Red and the Blue, includes the Purple channels.

Scenario

A Cable TV provider asks for DWDM module. The channels are specified using the colors: Blue, Purple and Red.

Question

Which DWDM channels are represented by which color “band?”

Notes/Answer

Fiber-optic wavelengths are divided into several “bands.” For example, the C-Band (or Conventional-Band) is centered at 1550-nm. The C-band, for Dense Wavelength Division Multiplexing (DWDM), is defined by the International Telecommunication Union (ITU) “Grid,” as 1520.25-nm to 1577.03-nm. Bands are convenient ways for describing a group of wavelengths, which are used in various fiber-optic applications, like Cable Television (CATV).

According to the ITU's DWDM Grid, the C-Band includes channels 1 through 72. However, the CATV industry typically uses only channels 19 through 59. Within the Cable TV industry, these C-Band channels are grouped into three “color” bands: Blue, Purple and Red. The following table shows how the DWDM channels (and wavelengths) are divided among these three, CATV, color bands.

<i>Channel Numbers</i>	<i>Wavelengths (nm)</i>	<i>CATV Color Band</i>
59 to 45	1530.33 to 1541.35	Blue
43 to 37	1542.94 to 1547.72	Purple
35 to 19	1549.32 to 1562.23	Red

Or, graphically



Note: some of Fiberdyne's DWDM products use a “Red/Blue” filter. This filter divides the ITU Grid channels, into the above Red and Blue groups. In some applications, like the Red/Blue filter, the Purple band is used as a “guard band.” A guard band is a relatively large separation, which ensures that one band does not overlap another band.