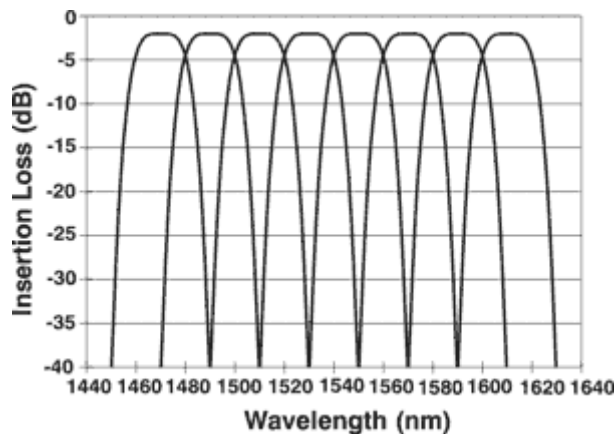


## Coarse Wavelength-division Multiplexing

The development of CWDM (coarse wavelength-division multiplexing), an intermediate technology, responded to the growing fiber network demand. With a capacity greater than WDM and smaller than DWDM, CWDM allows a modest number of channels, typically eight or less, to be stacked in the 1550 nm region of the fiber called the C-Band. To dramatically reduce cost, CWDMs use uncooled lasers with a relaxed tolerance of  $\pm 3$  nm. Whereas DWDM systems use channel spacing as close to 0.4 nm, CWDM uses a spacing of 20 nm. The wide spacing accommodates the uncooled laser wavelength drifts that occurs as the ambient temperature varies. The uncooled laser drifts about  $\pm 0.06$  nm/°C. CWDM transmission may occur at one of eight wavelengths: typically 1470 nm, 1490nm, 1510 nm, 1530 nm, 1550 nm, 1570 nm, 1590 nm, 1610 nm. Figure 1 illustrates the CWDM passband for an eight channel device.

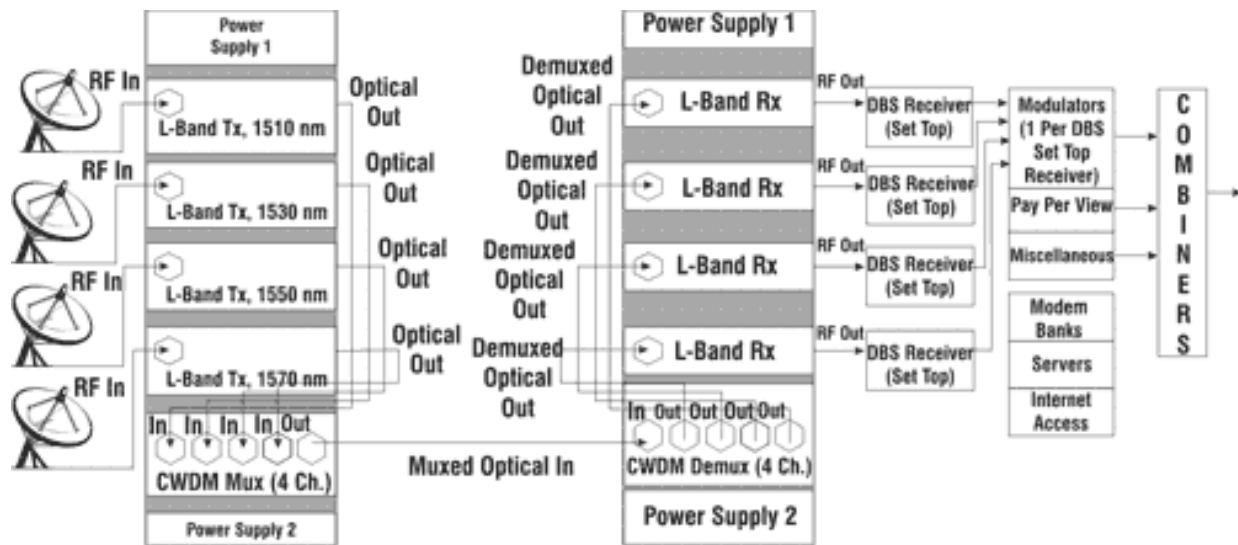
**Figure 1 - CWDM Passband for an Eight Channel Device**



## Unidirectional Applications

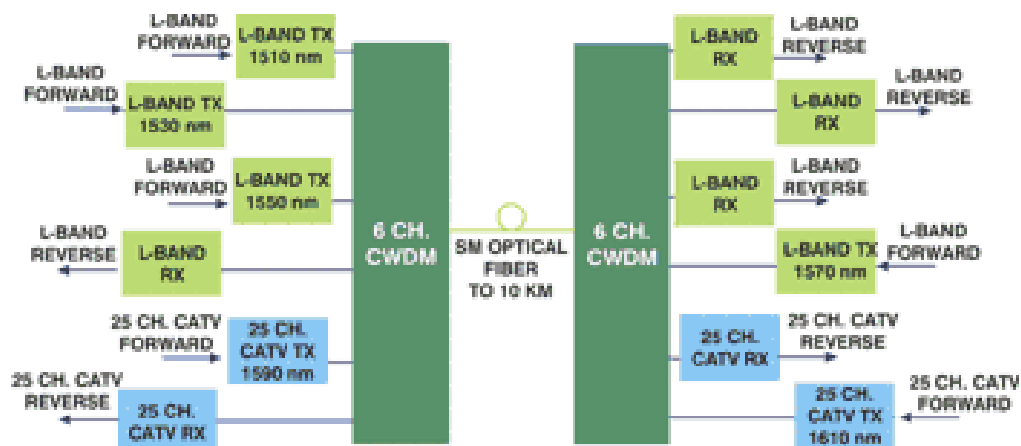
Insertion loss for an eight channel device is about 2 dB per end. The passband is around 13 nm wide at the -0.5 dB loss point. CWDM demultiplexers typically have higher insertion loss and significantly better isolation loss. The multiplexer have a lower insertion loss and a poorer isolation loss. Isolation does not matter in a unidirectional application because the multiplexer combines several transmitter outputs. Figure 2 illustrates a unidirectional CWDM application.

**Figure 2 - Unidirectional CWDM Application**



In a bidirectional application, illustrated in Figure 3, any input on either end of the fiber can be an input or an output, requiring the higher isolation of demultiplexers to guarantee that the system will work without interference between channels.

**Figure 3 - Bidirectional CWDM Application**



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