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### Multiband Optical Filters Are Telecom Networks' Multitaskers

Dual- and multiband optical filters are helping to enhance the complexity, footprint, performance, and cost of fiber network components.

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WDM SPECTRAL TECHNOLOGIES

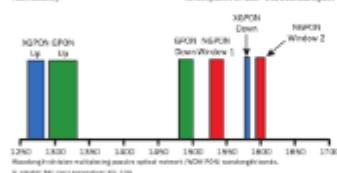
Multiband optical filters have long been used in applications such as fluorescence spectroscopy, astronomy, and 3D cinema, to name a few. The ability to combine more than one spectral band into a single optical filter can enable flexibility of system design and reduce the number of components and the costs needed to achieve a desired functionality.

Optical filters have always played a key role in fiber optic network systems. They provide the wavelength selectivity needed for optical add-drop nodes in DWDM and wavelength division multiplexing (WDM) architectures, and as bandpass filters to enable gain-flattening filters (GFFs) to reduce amplified fiber amplifiers (EDFAs) nonlinearities.

Recent advances in multiband and multifunction optical filters have expanded the benefits to network components. Such filters not only supported the development of dual- and multibandpass

filters for use in the backbone WDM architectures associated with wireless networks, they also enabled hybrid GFFs that couple gain-flattening functionality with laser pump blocking. These components advancements leverage the power of multiband filters to improve performance and save module build costs.

**Don't WDM with that?** WDM technology has been around since the late 1970s, when it emerged from and enabled the massive growth in demand for greater information rates to be achieved to support the "Global Village." By using dual-fiber fibers, modulators and optical isolators to split optical signals into individual channels on a single fiber, Coarse WDM (CWDM) with 20 nm band spacing was followed by dense WDM (DWDM), which allowed sub-nanometer band spacing to transport multiple signal bands simultaneously along the fiber optic highway. The dual-fiber fibers at the low cost of a single-band WDM channels that consisted of reflected a single-signal channel, or sometimes a group of channels using an X-dipole (XDM) chip filter.



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### Multiband Optical Filters Are Telecom Networks' Multitaskers

The ability to combine more than one spectral band into a single optical filter can enable flexibility of system design and reduce the number of components and the costs needed to achieve a desired functionality in fiber optic telecom components. Recent advances in multiband and multifunction filters support the development of dual- and multi-bandpass filters for use in the backbone WDM architectures for wireless networks, and enable hybrid GFFs that couple gain-flattening functionality with laser pump blocking to improve performance and save module build costs.

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