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X-Mode™ DBRs Enable Extended Tuning Range

The Photodigm family of high-power edge-emitting Distributed Bragg Reflector (DBR) laser diodes is based on Photodigm's proprietary single epitaxial DBR laser architecture. The Photodigm DBR laser architecture consists of an electrically pumped gain region and a separate passive DBR grating region, monolithically fabricated over a continuous ridge waveguide. This design has resulted in the world's highest power commercially available, single-frequency, and monolithic laser diodes with performance specifications that rival benchtop research lasers. Over the years, Photodigm DBR lasers have proven themselves to be ideally suited for applications requiring high power single-frequency performance within a well-defined operating range. Photodigm has worked with its customers to develop a family of laser products unmatched in the industry. Optimized for stability, reliability, and power, these devices have opened up opportunities for an emerging class of cost-effective precision mobile instruments for applications in spectroscopy, atomic physics, non-linear optics, and quantum information.

The DBR laser is often compared to the distributed feedback, or DFB, laser. Both DBR and DFB lasers are single frequency, diffraction limited, narrow bandwidth laser diodes. Most users will recognize the DFB as having an extended continuous tuning range, typically 2 nm within a continuous current and temperature tuning range. They will also associate the DBR with a similar tuning range, but one which is subject to periodic mode hops as the current or temperature are adjusted. Mode hops in a conventional DBR will typically occur with a free spectral range of approximately 0.15 nm as the device is tuned by current only with a slope of 0.002-0.003 nm/mA. While this free spectral range is acceptable for most applications, certain applications require a continuous wavelength range of as much as 2 nm. Photodigm has recently introduced a new product, the X-Mode™ DBR, which combines the best attributes of a DBR laser with the tuning characteristics of a DFB. This breakthrough is a result of Photodigm's extensive experience in the design and operation of laser diodes. By careful design and thermal management of the device, Photodigm's X-Mode DBR will operate with a continuous wavelength range of 2 nm when tuned by temperature or current.

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