

# FIBRESYSTEMS

COMPONENTS

## Pump lasers line up in metro and access

Irish start-up Eblana Photonics has a simple plan: to commercialize a family of source and pump lasers for emerging metro and access optical applications. What's more, like an increasing number of new players in the fibre-optic components sector, the Dublin-based venture has opted to outsource its manufacturing. The aim is clear: to add value during the product design and development cycle – which is where start-ups can really set themselves apart from the pack.

"I'm a great believer in looking at how the silicon industry evolved and using that as a roadmap for the photonics industry," said chief executive officer James O'Gorman. "In the future, there's going to be a high level of contract manufacturing involved in optics in the same way as it is in electronics."

The traditional method for manufacturing high-performance laser diodes is via a complex series of growth, regrowth and etching phases. "Our technology platform allows us to remove materials regrowth from the whole process," O'Gorman explained. "Because all the device processing we do is post-growth, we have a much simpler procedure for achieving high-quality, high-reliability fabricated wafers for our lasers. Furthermore, the platform is amenable to contract manufacturing"

Eblana is pioneering an approach known as photon mode engineering to impose de-



**Contract out: Eblana plans to outsource device manufacturing, freeing up resources to focus on structure and design, and test and measurement of its high-performance laser-diode components.**

vice characteristics. The technique involves etching geometrically precise microstructures into the semiconductor wafers used to fabricate the lasers (with the etching taking place following initial growth of the laser's epitaxial layers). The microstructures "pattern" the refractive index seen by an optical field propagating through the device, which in turn creates a band structure that can be manipulated to control the allowable optical modes in the laser.

"We just etch a different topology into the structure for a different wavelength or type of characteristic that we need to achieve,"

said O'Gorman. One application is the formation of highly singlemode lasers. "Our laser has a side-mode suppression ratio of 55 dB," he claimed. "That's as good as it gets, and we're accomplishing this without having to make regrown diffraction gratings as is done for distributed-feedback lasers."

O'Gorman reckons the ability to use a uniform technology platform to create a range of different components is key to Eblana's success. "We're in a situation where if we want to implement high performance in a particular laser, then it's essentially the same type of process that you apply whether it's 1500, 1300 or 980 nm."

Right now, O'Gorman and his colleagues are concentrating their efforts on two key components: a 980 nm pump laser (200 mW output power) for mini-amplifier applications, and a source laser with ultrahigh spectral purity (offering a minimum output power of 4 mW at data rates up to 2.5 Gbit/s).

Both devices are now sampling. "After that we're going to begin rolling out newer products like pump-laser arrays," O'Gorman explained. In the long term, tunable lasers may be on the agenda, depending on how that market develops, and O'Gorman reckons Eblana's core technology is intrinsically compatible with photonic integration.

"At the moment, we see most of the action for the type of product we're making in the area of Gigabit Ethernet, 2.5 Gbit/s-type products," he continued. "But we do see an interest and a desire for higher-speed components up to 10 Gbit/s. These products are under development at the moment." ●

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