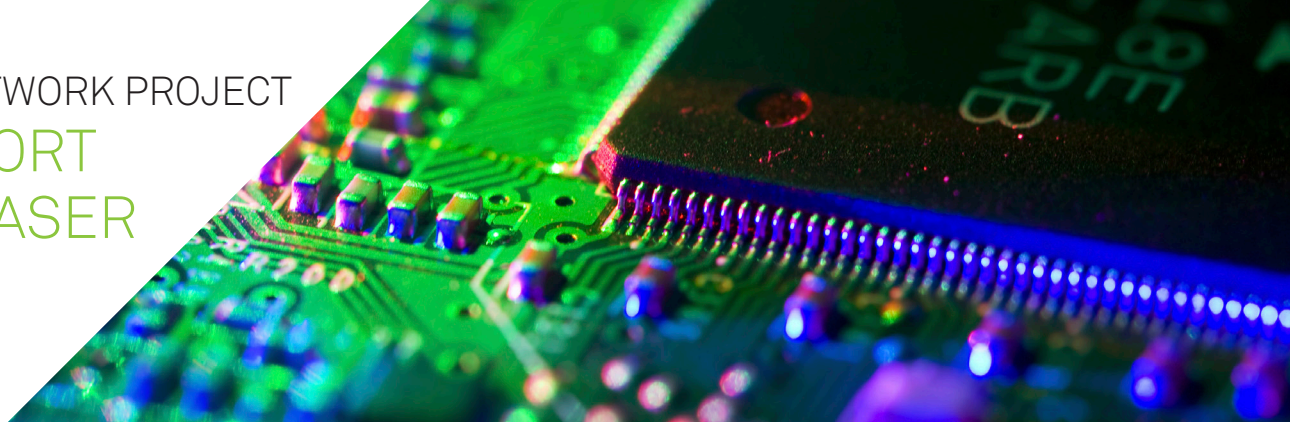


EUREKA NETWORK PROJECT 7162 SHORT PULSE LASER



GERMANY AND ISRAEL COLLABORATE ON LASER OF UNRIVALLED PRECISION

In an extraordinary example of long-distance collaboration, SMEs from Berlin and Kibbutz Einat have joined forces to develop new laser technology that will be used in the precision manufacture of next-generation electronic components including processors, screens and solar panels.

Everyone has heard of Moore's Law: the number of transistors on an integrated circuit doubles every year. It keeps the electronics industry moving at a fast pace, and has been interpreted and applied increasingly broadly since its first observation in 1965. Fewer people know Moore's Second Law, however: the cost of a plant for fabricating such semiconductor chips doubles every four years. Making parts for use in electronic products requires increasingly precise manufacturing methods, and the price keeps rising.

Whether it's the cutting of glass materials for displays, solar panels and smartphones or the scribing of processors, manufacturing relies on laser etching to achieve finer and finer work. Consequently, all over the world there are organisations searching for improved laser technologies – but many of them are prevented from working together because of the difficulties presented by national boundaries.

National funding plays a vital role in defraying the risk associated with such technically and commercially challenging ventures, and international partnerships are often neglected because of this. The EUREKA Network exists to facilitate funding across such boundaries, and one of its

recent success stories has involved bringing together Israeli laser product developer Optisiv Ltd. and Berlin-based laser diode manufacturer eagleyard Photonics GmbH. The German part of the project was funded by the Central Innovation Programme for SMEs (ZIM) of the German Federal Ministry for Economic Affairs and Energy (BMWi).

Focused like a laser

"The objective of the project was to develop a laser component which would deliver very short optical pulses with high optical power," explains Dipl. Ing. Jörg Muchametow, CEO of eagleyard Photonics. "And the challenge for us was to optimise the laser diode package to bring high-current pulses to the chip." When manufacturers use lasers for micromachining, they generally require excellent edge quality, absence of peeling, minimal heat-affected zones and smooth edges with no recast processing in the finished product. This needs depth control, high resolution and high speed in the micromachining laser, and in order to meet those requirements a laser has to have a pulse duration under 1nanosecond and a repetition rate greater than 100 kHz.

Because eagleyard Photonics already had products on the market for seeding fibre amplifiers before the project started, work on the project was largely geared towards optimising their offering to meet client needs. "The optical performance of the system is not only determined by the laser diode but also by the environment and driver electronics of the target system", Muchametow points out. The collaboration with Optisiv was therefore vital, because it was they who provided feedback on how the component improved performance in

the system. By correlating their results carefully, the two partners were able to redesign their package to enable much faster pulses.

The project was a great success. "We were able not only to add a new product to our portfolio, but also to establish a stable business relationship with our project partner which led to significant revenues", explains Muchametow. Today, eagleyard Photonics is operating worldwide, and has continued on a path of steady growth –



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and it also maintains several productive collaborations with partners in Israel "We are now at the leading edge of laser technology, and our customers have many ideas of what they will do in future with higher power and shorter pulses. We are looking forward to helping them to realise their ideas", Muchametow says.

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OTHER PARTNERS

Optisiv Ltd. (Israel)

TOTAL R&D INVESTMENT

€ 0.52 million

DURATION

February 2012 to January 2013

COUNTRIES INVOLVED



EUREKA is a European network for market-oriented R&D.

