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sp3 Sees Bright Future for Diamond in Laser and LED Markets

DiaTherm maintains device reliability, enables higher powered lasers and brighter LEDs

SANTA CLARA, Calif. — January 24, 2006 — sp3 Diamond Technologies, Inc., a leading supplier of diamond film products, equipment and services, announced that testing has demonstrated the feasibility of its DiaTherm™ Diamond Heat Spreaders for laser packages and LED devices. The decrease in device junction temperature achieved by the increased thermal conductivity of DiaTherm allows manufacturers to design improved device reliability margin or longer lifetime with increasing laser and LED optical power by up to 300 percent.

DiaTherm offers thermal conductivity three times that of copper, a common heat sink, and five times greater than aluminum nitride (AlN) or beryllium oxide (BeO), common heat spreaders. These values equate to higher brightness, closer spacing and longer lifetimes for LED devices and higher laser power with the same device reliability.

“We have seen significant performance increases when DiaTherm is used as a device's heat spreader,” stated Dwain Aidala, president and COO of sp3 Diamond Technologies, Inc. “Whether the designer uses this thermal benefit for longer life, higher brightness, higher output power or a combination, the end result is a cost effective material that

provides differentiating capability to the end product. This is a key message to both the design and marketing communities."

Replacement of copper heat-spreaders used in bright LED devices with DiaTherm enables an increase in LED optical power output of over 200 percent at the same junction temperature. DiaTherm fits directly in LED device assembly processing with solder attachment to the LED die and PCB or heat sink. Cost increase for replacement of copper heat-spreaders with DiaTherm is relatively small as the CVD diamond heat-spreaders have an unmetallized price of about $1.5 per cubic millimeter.

"These results demonstrate how cost effective diamond can be as a heat spreading technology. A diamond heat spreader represents only one to two percent of the total bill-of-materials for laser packages, but its performance offers benefits that far outweigh the cost. DiaTherm enables these devices to operate at 300 percent greater optical power with the same reliability than devices using traditional AlN or BeO heat-spreaders," continued Aidala.

Available as bare, freestanding diamond segments or in metallized form, sp3's DiaTherm heat spreaders are laser cut from sheets of pure diamond formed by chemical vapor deposition in DC torch reactors. DiaTherm is 100 percent polycrystalline diamond with a density of 3.5 g/cubic cm. The material achieves a thermal conductivity of up to 1400 W/m-k. In addition to its heat conductivity, electrical insulating properties and ability to be machined to tight tolerances, diamond is a passive heat spreader consuming no power.

For further information on pricing and delivery times, please call 877-773-9940 or email.

About sp3 Diamond Technologies, Inc.

Diamond is hard, durable, stiff, thermally conductive and electrically insulating. These are just some of the many qualities that diamond offers making it ideal for a wide variety of applications, from cutting tools to advanced semiconductor manufacturing. sp3 Diamond Technologies makes CVD (chemical vapor deposition) diamond for a broad

range of applications where current materials have reached their limit. Our ability to make and deposit diamond is a direct result of our proprietary chemical vapor deposition diamond reactor technology and our coating services capability. It is this technology that allows us to deposit uniform thin-film diamond and do it cost-effectively. Consistent and cost-effective manufacture of CVD diamond is in turn broadening the material's appeal throughout multiple industries where diamond could be considered the material of choice.

Based in Santa Clara, California, USA, the company provides diamond products for advanced thermal applications, diamond coating and material services, hot filament CVD reactors, and deposition consulting services. sp3 Diamond Technologies is a subsidiary of sp3 Inc., a full service provider of products and services relating to thin-film and freestanding diamond deposition and other diamond materials. For more information about the company and its products and services please visit www.sp3inc.com.

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