

EMERALD™ 160/160i SERIES UV LASER DRILLING



EMERALD™ 160/160i SERIES

Drill More.

Emerald™ 160 series delivers a new level of advanced UV drilling performance for today's most challenging IC substrate and assembly applications. Powered by Orbotech's innovative Multi-Path Technology™, this unique series of UV Laser Drilling solutions provides best-in-class, high-speed precision drilling. Emerald™ 160 series consistently meets the demands of increasingly complex designs to ensure maximum performance and cost savings. Emerald™ 160 was designed for fcCSP/fcBGA substrates and LTCC with 10µm accuracy and 18µm spot size, while Emerald™ 160i - with improved beam quality and superior accuracy down to 6µm and 15µm spot size - was optimized to support advanced packaging applications like organic interposers/2.1D and embedded die.

Benefits

Greater Speed with Multi-Path Technology™

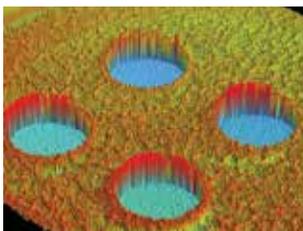
- Ultra-fast drilling and precision with patented Multi-Path Technology™
- 100% laser pulse utilization

Exceptional Quality

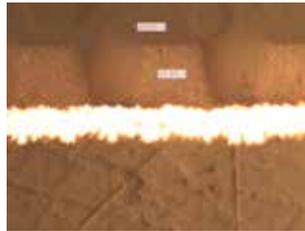
- Registration accuracy down to 6µm (160i)
- Minimal spot size of 15µm (160i)
- Automatic built-in measurement and calibration tools for highest drilling quality
- Supports both drilling through holes and blind vias for:
 - IC substrate for FC-CSP and FC- BGA
 - LTCC, Ceramics
 - Organic interposer / 2.1D
 - Panel level embedded die

Advanced Modularity for a Full Range of Applications

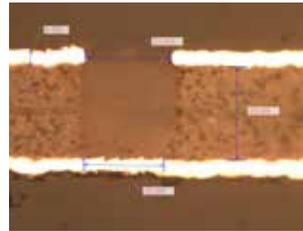
- Versatile enough to drill through a variety of materials, including:
 - BT/PP; ABF; PI / PBO; mold; ceramic; solder resist and metals
- Multi-step drilling protocol automatically adapts to changing conditions
- Full software control for various drilling modes and beam shapes



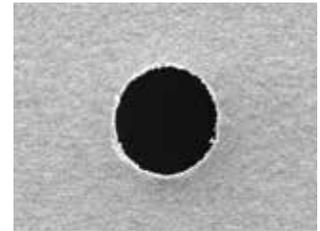
Blind Via on PI for Embedded Die



Blind Via on ABF for 2.1D and Organic Interposer



30µm via in PrePreg



Via formation on Ceramic



Greater Speed with Multi-Path Technology™

Drilling throughput is fully optimized by the system's unique ability to simultaneously drill 8 areas of the panel at a time. Featuring advanced Multi-Path Technology™, a higher power UV laser operates at a higher frequency rate with 8 fast galvanic scanners for 100% utilization of the laser pulses.



Top drilling speed – 2 beams, 8 scanners operating in parallel

Exceptional Quality

Achieving registration accuracy down to 6µm (160i), Emerald™ 160 series can drill small vias through ABF, polyimide, ceramic, resin, mold compounds, metal and solder resist with no residue or damage to the bottom of the via and no undercut. To ensure consistently superior performance under varying conditions, the system conducts automatic optical tests and calibrations through built-in measurement tools including drill power, navigation accuracy and multiple beam shapes and sizes to accommodate the drilling of highly warped rigid and flex panel.

Advanced Modularity for a Full Range of Applications

Emerald™ 160 series offers the flexibility to support a large variety of drilling profiles for different materials, shapes and sizes. The system is designed to achieve advanced precision for small vias and through holes across a range of materials (polyimide, ABF and PrePreg) including embedded components and ceramic applications. Multiple laser beam sizes with Top Hat and Gaussian beam shapes are supported. Setup and switching between drilling modes and materials is fast and easy.