

Title (en)

ULTRAVIOLET LASER ABLATIVE PATTERNING OF MICROSTRUCTURES IN SEMICONDUCTORS

Title (de)

HERSTELLUNG VON MUSTERN VON MIKROSTRUKTUREN IN HALBLEITERN MIT UV-LASER

Title (fr)

REALISATION DES MOTIFS DE MICROSTRUCTURES DE SEMICONDUCTEURSPAR ABLATION AU LASER ULTRAVIOLET

Publication

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Application

EP 02707453 A 20020110

Priority

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Abstract (en)

[origin: WO02060636A1] Patterns with feature sizes of less than 50 microns are rapidly formed directly in semiconductors, particularly silicon, using ultraviolet laser ablation. These patterns include very high aspect ratio cylindrical through-hole openings for integrated circuit connections; singulation of processed die contained on semiconductor wafers; and microtab cutting to separate microcircuit workpieces from a parent semiconductor wafer. Laser output pulses (32) from a diode-pumped, Q-switched frequency-tripled Nd:YAG, Nd:YVO₄, or Nd:YLF is directed to the workpiece (12) with high speed precision using a compound beam positioner. The optical system produces a Gaussian spot size, or top hat beam profile, of about 10 microns. The pulse energy used for high-speed ablative processing of silicon using this focused spot size is greater than 200 μJ per pulse at PRFs greater than 5 kHz and preferably above 15 kHz. The laser pulsewidth measured at the full width half-maximum points is preferably less than 80 ns.

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