

## Tailored high power picosecond laser beam stealth dicing of silicon

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Silicon stealth dicing was demonstrated using an axicon lens generated Bessel beam, based on a picosecond laser with 1064 nm wavelength at a 404 kHz repetition rate. To avoid the dust and debris generation on the top surface, the shifting distance of Bessel beam towards to the bottom surface was investigated. Since the laser beam transmission under 1064 nm wavelength for the 1 mm thickness silicon is around 10%, multiple layer processing strategy was adopted from bottom to top surface. After the laser scanning, the film expansion and the mechanical expansion was compared to obtain high quality stealth dicing cross profiles.