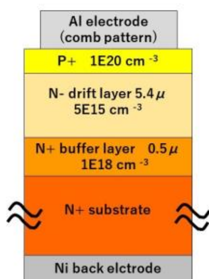
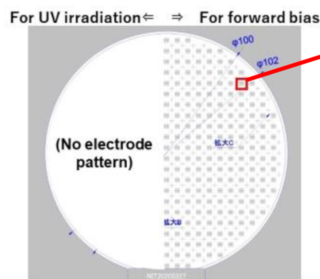
ITES

Quantification of correlation between forward bias expansion and UV expansion

Sample Preparation

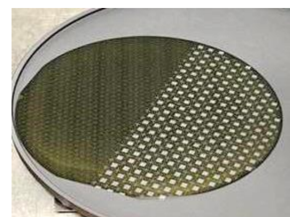


PiN diode X-section

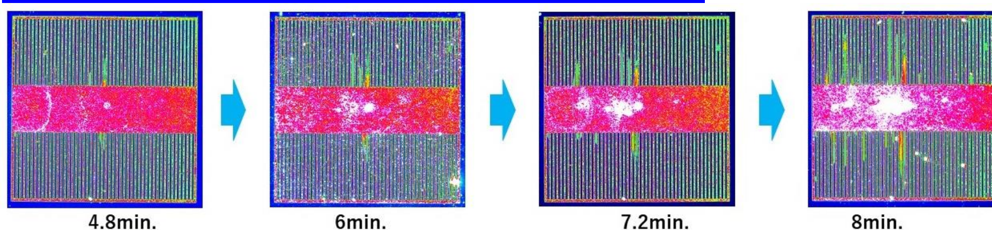


4inch SiC wafer Si-face 4° off

1chip enlarged(comb pattern) (PiN diode, 2mm sq.)



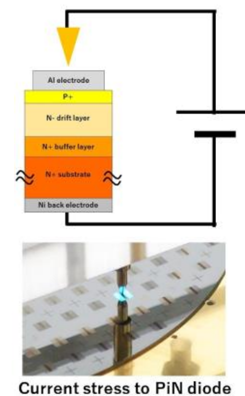
Forward Bias (Current Pulse) Stress Test



4.8min. 6min. 7.2min. 8min.

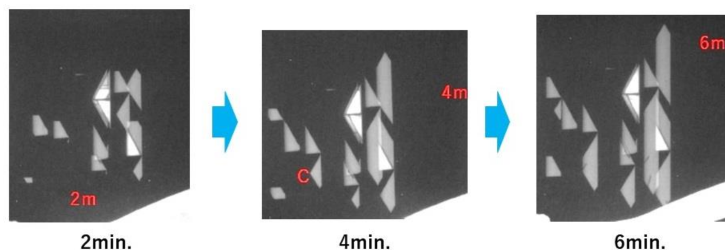
An example of bar-shaped SSF expansion by constant current pulse stress(400A/cm²)

Most bar shaped SSFs originate from the contact area of the probe. Therefore, they seem to extend from the chip surface by the stress concentration caused by the contact.



Current stress to PiN diode

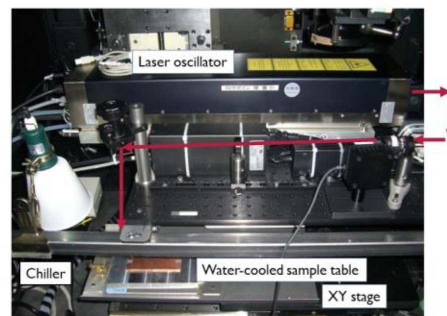
UV Irradiation Test



2min. 4min. 6min.

An example of bar-shaped SSF expansion by UV irradiation(186W/cm²)

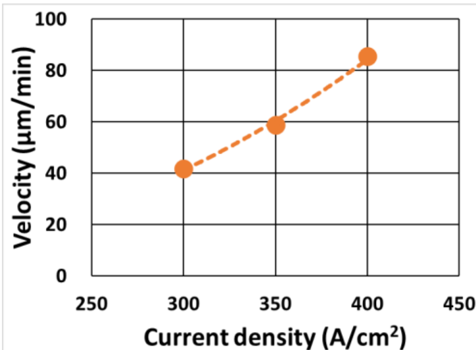
Bar shaped SSFs are randomly generated on the chip.

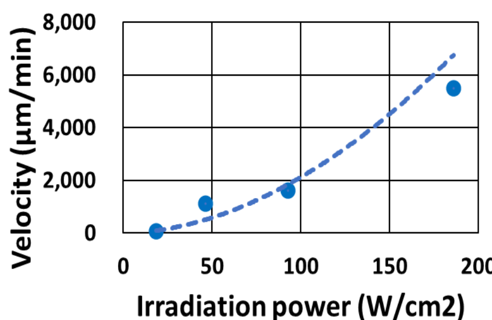


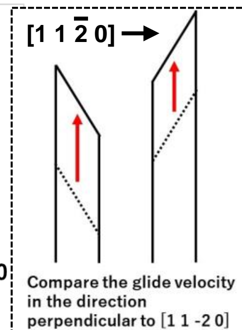
UV-LASER SYSTEM

The third harmonic 355nm of Nd-YAG laser is used.

Correlation Between Forward Bias and UV







In our experiments, SSFs extend from the Epi surface mostly in the forward bias(FB) test, and from the Epi/sub interface (Epi bottom) in the UV irradiation. Therefore, when calculating the correlation between FB and UV, we compare the speed of extension in the direction perpendicular to [11-2 0] after the SSF reaches the bottom from the surface, or the surface from the bottom.

Simultaneously with the experiments, simulations of hole concentration at the Epi/Sub interface in FB tests and UV irradiation are in progress to validate experimental results.

Contact: SiC@ites.co.jp