



# 2019 SiC 반도체 컨퍼런스

O-05

## Modified hot-zone design for large diameter 4H-SiC single crystal growth

최정오<sup>1</sup>, 김정규<sup>1</sup>, 장병규<sup>1</sup>, 고상기<sup>1</sup>, 견명옥<sup>1</sup>, 서정두<sup>1</sup>, 구갑열<sup>1a</sup>, 장연숙<sup>1</sup>, 이원재<sup>2</sup>

Jung-Woo Choi<sup>1</sup>, Jung-Gyu Kim<sup>1</sup>, Byung-Kyu Jang<sup>1</sup>, Sang-Ki Ko<sup>1</sup>, Myung-Ok Kyun<sup>1</sup>, Jung-Doo Seo<sup>1</sup>, Kap-Ryeol Ku<sup>1a</sup>, Yeon-Suk Jang<sup>1</sup>, Won-Jae Lee<sup>2</sup>

<sup>1</sup>SKC

<sup>2</sup>동의대학교

### Abstract:

Silicon carbide is one of the most attractive and promising wide band-gap semiconductor materials with high breakdown voltage, high thermal conductivity, and high electron mobility. Commercial available SiC-power-devices of MOSFETs and SBDs are recently fabricated with SiC epitaxial layer grown on n-type 4H-SiC substrates with 4, 6-inch in diameter. For growing large diameter SiC crystal with over 6 inch, the diameter of crucible must be increased significantly. However, the temperature gradient in radial direction at growth temperature is getting bigger in the crystal grown using large sized crucible. This big temperature difference between center and edge region could produce too convex shape in crystal boule by non-uniform growth rate and the quality degradation in edge region of grown crystal. Therefore, the careful control of temperature gradient in the front of growing crystal is crucial on large-sized SiC crystal growth.

### Keywords

6 inch, 4H-SiC, Crystal growth

### a. 교신저자 이메일

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