

パワーHEMT用GaN on Si基板

GaN Epitaxial Film on Si Substrate for Power HEMT Device

Si基板の上にバッファ層を設け、GaN 単結晶をヘテロエピ成長することにより、大口径 GaN 基板を比較的安価で提供することを可能にします。

Covalent Materials has developed a GaN substrate composed of GaN epitaxial films on Si substrates (GaN on Si) by using buffer layers, which makes it possible to provide GaN substrate in large diameters at a reasonable price.

特長 Features

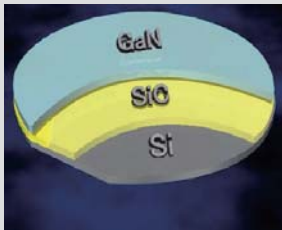
- ・ワイドバンドギャップ半導体材料GaN単結晶成長
Single crystal growth GaN of wide bandgap semiconductor material
- ・3C-SiCバッファ層を設けたSi基板へのヘテロエピタキシャル成長
Hetero-epitaxial growth GaN on Si substrate using 3C-SiC buffer layer

用途 Usage

- ・パワーデバイス作製用GaN HEMT基板
GaN HEMT substrate for power device fabrication
- ・高周波・高出力デバイス作製用GaN HEMT基板
GaN HEMT substrate for high radio frequency and high power device fabrication

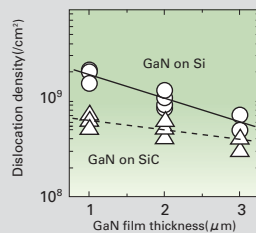
コンセプト Concept

■Hetero-epitaxial growth using buffer layers

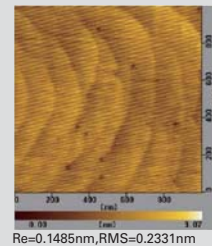


データ Typical data

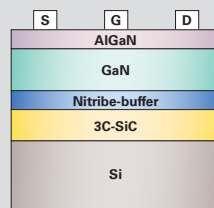
■Dislocation density of the GaN



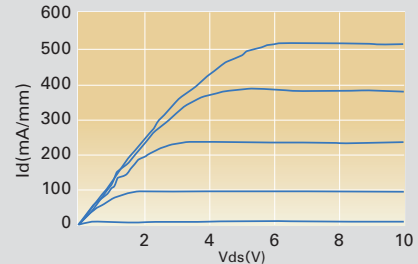
■Surface morphology of the GaN



■Schematic illustration of GaN on Si substrates for HEMT devices



■Transistor action of the fabricated devices

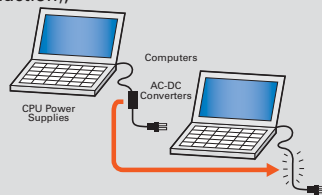


未来予想図 Future impact of GaN on Si

■Output Power Density Increasing Trend

Output power density will increase tenfold every 15 years;
for example: Current 1W/cc(Y2000)⇒10W/cc(Y2015)
→key for further trends(volume reduction);

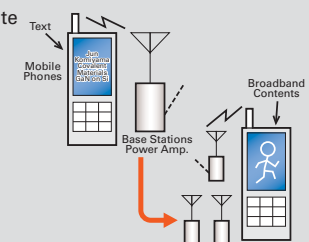
- Low power loss(= low resistance)
→Compact heat sinks / cooling components(power loss generates heat)
- Reasonable price
→GaN on Si based devices



■Higher Efficiency Amplifiers for Wireless Communication

Increase in data transfer rate – key device performance

- Higher frequency passive
- Higher output power
- Higher efficiency
- Reasonable prices
→GaN on Si based devices



COVALENT

コバレントマテリアル株式会社

事業開発本部 新事業推進部

神奈川県秦野市曾屋30 〒257-8566

Tel:0463-84-6613 Fax:0463-81-0485

E-mail:cat_j324@covalent.co.jp

www.covalent.co.jp