MATERIAL DATASHEET | GALLIUM OXIDE SUBSTRATES AND EPI-LAYERS

Gallium oxide (GaO) substrates and epi-layers

Over the past decade, beta-gallium oxide (β-Ga_2O_3) has emerged as a promising material for next-generation power electronics. Due to its wide band-gap properties, ease of n-type doping corresponding to a widely tunable conductivity, and high breakdown strength, devices made from β-Ga_2O_3 are ideal for power conversion applications, RF technology / wireless communication, and space applications.

We made significant advancements in epitaxy technologies for growing device-level β-Ga_2O_3 layer with low defect density, high mobility, and high surface quality via MOVPE (Metal Organic Vapor Phase Epitaxy). High-quality epi-layers are available with wide-range thickness and doping concentration as specified. Our epitaxy process is compatible with the β-Ga^2O^3 crystalline orientations (100) 4°off and (010) and has the potential for heteroepitaxy on foreign substrates, including Si, SiC, GaN... etc.

ADVANTAGES

- Wide bandgap (4.5-4.9 eV)
- High critical field strength (8 MV/cm)
- Low-cost native substrate availability
- High thermal stability

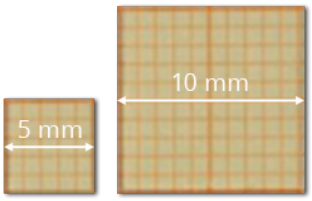
APPLICATIONS | TECHNOLOGIES

- Detectors and Sensors
- High-power radio frequency (RF) devices
- High-power devices
- Vertical devices
- Lateral devices

PATENTS

- Ta-Shun Chou, Saud Bin Anooz, Andreas Popp, Walter Haeckl: Method for growing a gallium oxide layer on a substrate and semiconductor wafer; EP22194558

more information at:
www.ikz-berlin.de/en/offer/gallium-oxide



SPECIFICATIONS

General bulk properties	
Density	5.95 [g/cm³].
Bandgap Width	4.5 - 4.8 [eV]
Thermal Conductivity	0.1 - 0.3 [W/cmK]
Resistivity	Doping-dependent
Dielectric Constant	10
Breakdown Field Strength	8 [MV/cm]

Substrate properties	
Dopant	Mg (semi-insulating)
Doping Level	-
Orientation	(100)-Cz
Misorientation	4°
Thickness	0.5 mm
Size	5x5 mm², 10x10 mm²

Epi-layer properties	
Dopant	Si (n-type)
Doping Level	$5x10^{16}$ - $2x10^{19}$ cm^{-3}
Thickness	4 nm - 4 µm

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