



How to process a GaN-on-Diamond wafer

By The Management

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A) ABOUT OUR DIAMOND (1/2)

■ How thick is the Diamond substrate underneath the GaN Film?

Our diamond is about 25- μm thick. Per special request, we will grow thicker (or thinner) diamond for a customer. Our simulations and modeling results show that 25- μm of diamond provides most of the benefit that electronic and optical applications need.

■ Will Group4 Labs consider growing thicker Diamond substrates ?

Yes. We will consider such requests on a case-by-case basis. Our simulations and modeling results show that 25- μm of diamond provides most of the benefit that most electronic and optical applications need.

A) ABOUT OUR DIAMOND (2/2)

■ Can the GaN-on-Diamond substrate be free-standing ?

Yes. It is quite fragile. You may hold the wafer gently and with little force to prevent breakage. You may use a handheld pair of tweezers, or preferably vacuum tweezers to lift and handle the wafer.

B) ABOUT THE WAFER-BOW (1/2)

■ How much bow does the GaN-on-Diamond wafer have ?

The wafer (without mounting on a temporary Si SiO₂-encased graphite handle wafer) is bowed by about 100-microns peak-to-valley across a 10mmx10mm area.

■ Is the GaN-on-Diamond wafer flexible or elastic ?

Yes. The wafer will bounce up and down when normal force is applied to the surface of the wafer. The wafer is elastic.

■ Can Group4 Labs ship me wafers without the bow?

Yes. Just let us know at the time you place your order (*note the designation on the specification sheet*) and we will mount the wafer – flattened – on a temporary Si or SiO₂-encased graphite handle wafer. Unless otherwise stated by a customer, we will usually ship our GaN-on-Diamond wafers free-standing.

B) ABOUT THE WAFER-BOW (2/2)

■ Can Group4 Labs remove the wafer bow?

Yes. We remove the bow by mounting the GaN-on-Diamond wafer on a temporary thick (>450- μm) Si or SiO₂-encased graphite handle wafer. We use high-temperature glass as an adhesive in mounting the GaN-on-Diamond wafer. Only a few bond points are created between the two wafers to enable easy removal of the temporary Si handle wafer.

■ Can you ship the GaN-on-Diamond wafer free-standing ?

Yes. Just let us know at the time you place your order (note the designation on the specification sheet) and we will ship the free-standing GaN-on-Diamond wafers without mounting them on a temporary Si handle.

C) HANDLING OUR WAFERS (1/1)

■ How may I lift the free-standing GaN-on-Diamond wafers ?

You may lift and handle the wafer with a common pair of tweezers, or preferably with vacuum tweezers. The wafers are highly fragile and require the slightest handling force possible. We recommend that you clasp one of the angular edges of the wafer so that one tweezer arm rests on the wafer's surface, and the other arm carries the bottom of the wafer.

■ How may I lift the wafers when they're mounted on Si handles ?

You may lift and handle the Si edges of the handle as you would any normal Si wafer.

D) De-MOUNTING DIAMOND FROM Si handle (1/1)

■ How do I remove the temporary Si wafer from the GaN-on-Diamond ?

You may dip the wafer into a solution of BHF (buffered hydrofluoric acid). The BHF will demount the GaN-on-Diamond wafer from Silicon in 15-30-mins depending on the concentration of the BHF solution.

■ What does Group4 Labs use in mounting GaN-on-Diamond to Si ?

We use high-temperature glass to mount GaN-on-Diamond wafers to Si or SiO₂-encased graphite substrates.