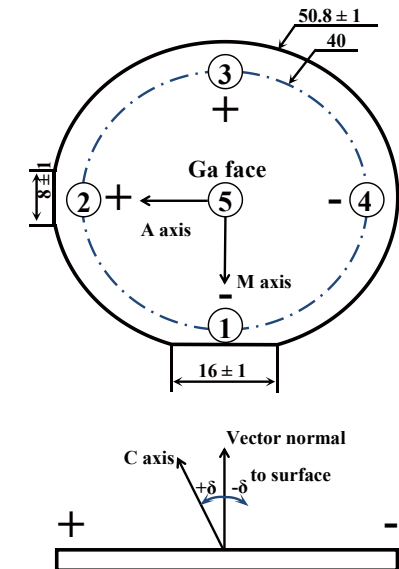


# GaN 2" Free-standing Si-dope Wafer

| 2-inch Free-standing SI-GaN Substrates                         |                                                                                 |                                        |                                          |                                        |                                        |                 |  |  |
|----------------------------------------------------------------|---------------------------------------------------------------------------------|----------------------------------------|------------------------------------------|----------------------------------------|----------------------------------------|-----------------|--|--|
|                                                                | Excellent level (S)                                                             |                                        | Production level (A)                     |                                        | Research level (B)                     | Dummy level (C) |  |  |
|                                                                | S-1                                                                             | S-2                                    | A-1                                      | A-2                                    |                                        |                 |  |  |
| Dimension                                                      | 50.8 ± 1 mm                                                                     |                                        |                                          |                                        |                                        |                 |  |  |
| Thickness                                                      | 350 ± 25 μm                                                                     |                                        |                                          |                                        |                                        |                 |  |  |
| Orientation flat                                               | (1-100) ± 0.5°, 16 ± 1 mm                                                       |                                        |                                          |                                        |                                        |                 |  |  |
| Secondary orientation flat                                     | (11-20) ± 3°, 8 ± 1 mm                                                          |                                        |                                          |                                        |                                        |                 |  |  |
| Resistivity (300K)                                             | > 1 × 10 <sup>6</sup> Ω·cm for Semi-insulating (Fe-doped; GaN-FS-C-SI-C50)      |                                        |                                          |                                        |                                        |                 |  |  |
| TTV                                                            | ≤ 15 μm                                                                         |                                        |                                          |                                        |                                        |                 |  |  |
| BOW                                                            | ≤ 20 μm                                                                         |                                        |                                          |                                        |                                        | ≤ 40 μm         |  |  |
| Ga face surface roughness                                      | < 0.2 nm (polished)<br>or < 0.3 nm (polished and surface treatment for epitaxy) |                                        |                                          |                                        |                                        |                 |  |  |
| N face surface roughness                                       | 0.5 ~ 1.5 μm<br>option: 1~3 nm (fine ground); < 0.2 nm (polished)               |                                        |                                          |                                        |                                        |                 |  |  |
| Package                                                        | Packaged in a cleanroom in single wafer container                               |                                        |                                          |                                        |                                        |                 |  |  |
| Useable area                                                   | > 90%                                                                           |                                        |                                          |                                        | > 80%                                  | > 70%           |  |  |
| Dislocation density                                            | < 9.9 × 10 <sup>5</sup> cm <sup>-2</sup>                                        | < 3 × 10 <sup>6</sup> cm <sup>-2</sup> | < 9.9 × 10 <sup>5</sup> cm <sup>-2</sup> | < 3 × 10 <sup>6</sup> cm <sup>-2</sup> | < 3 × 10 <sup>6</sup> cm <sup>-2</sup> |                 |  |  |
| Orientation: C plane (0001) off angle toward M-axis (3 points) | 0.35 ± 0.15°                                                                    |                                        | 0.35 ± 0.15°                             |                                        | 0.35 ± 0.15°                           |                 |  |  |
| Macro defect density (hole)                                    | 0 cm <sup>-2</sup>                                                              |                                        | < 0.3 cm <sup>-2</sup>                   |                                        | < 1 cm <sup>-2</sup>                   |                 |  |  |
| Max size of macro defects                                      |                                                                                 |                                        | < 700 μm                                 |                                        | < 2000 μm                              | < 4000 μm       |  |  |



Note:  
 (1) Useable area: edge and macro defects exclusion  
 (2) 3 points: the miscut angles of positions (2, 4, 5) are 0.35 ± 0.15°

その他の形状もご相談ください