# GaN - Gallium Nitride

## Electrical properties

### Basic Parameters

*Basic Parameters for Zinc Blende crystal structure*
*Basic Parameters for Wurtzite crystal structure*

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### Basic Parameters for Zinc Blende (cubic) crystal structure

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|---|---|---|
| Breakdown field | ~5 x $10^6$ V $cm^{-1}$ | 300 K |
| Mobility electrons | =< 1000 $cm^2$ $V^{-1}$ $s^{-1}$ | 300 K |
| Mobility holes | =< 350 $cm^2$ $V^{-1}$ $s^{-1}$ | 300 K |
| Diffusion coefficient electrons | 25 $cm^2$ $s^{-1}$ | 300 K |
| Diffusion coefficient holes | 9 $cm^2$ $s^{-1}$ | 300 K |
| Diffusion coefficient holes | 3.2 x $10^5$ m $s^{-1}$ | 300 K |
| Diffusion coefficient holes | 9.5 x $10^4$ m $s^{-1}$ | 300 K |

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### Basic Parameters for Wurtzite crystal structure

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|---|---|---|
| Breakdown field | ~5 x $10^6$ V $cm^{-1}$ | 300 K |
| Mobility electrons | =< 1000 $cm^2$ $V^{-1}$ $s^{-1}$ | 300 K |
| Mobility holes | =< 200 $cm^2$ $V^{-1}$ $s^{-1}$ | 300 K |
| Diffusion coefficient electrons | 25 $cm^2$ $s^{-1}$ | 300 K |
| Diffusion coefficient holes | 5 $cm^2$ $s^{-1}$ | 300 K |
| Diffusion coefficient holes | 2.6 x $10^5$ m $s^{-1}$ | 300 K |
| Diffusion coefficient holes | 9.4 x $10^4$ m $s^{-1}$ | 300 K |

*Chow & Ghezzo (1996)*

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|---|---|---|---|
| Breakdown field | 3.3 x $10^6$ V $cm^{-1}$ | 300 K | *Chow & Ghezzo (1996)* |
| Conductivity σ | 6÷12 $\Omega^{-1}$ $cm^{-1}$ | 300 K ; $n$ ~= $10^{17}$ $cm^{-3}$, undoped layers grown by vaporphase technique on sapphire | *Ilegems (1972)*; *Ilegems & Dingle (1973)*; *Crouch et al. (1978)* |
| Mobility electrons $\mu_n$ | =< 440 $cm^2$ $V^{-1}$ $s^{-1}$ | 300 K ; purest material, $n$ ~= $10^{17}$ $cm^{-3}$ | *Ilegems (1972)*; *Ilegems & Dingle (1973)*; *Crouch et al. (1978)* |