

TWO-DIMENSIONAL ELECTRON GAS IN GaAs

FACT SHEET

Units:	Carrier Density	N_s	10^{11} cm^{-2}
	Mobility	μ	$10^6 \text{ cm}^2 / \text{Vs}$
	Magnetic Field	B	Tesla, T
	Energy		Kelvin, K or meV
Effective Mass:	$m^* = 0.067 m_0$		
g-factor:	$g = -0.44$		
Fermi Wavevector:	$k_F = 7.9 \times 10^5 \times N_s^{1/2} \text{ (cm}^{-1}\text{)}$		
Fermi Energy:	$E_F = 3.6 \times N_s \text{ (meV)}$		
Mobility Lifetime:	$\tau = 40 \times \mu \text{ (psec)}$		
Mean Free Path:	$\lambda = 5.4 \times \mu \times N_s^{1/2} \text{ (\mu m)}$		
Magnetic Length:	$l_0 = 25.7 \times B^{-1/2} \text{ (nm)}$		
Landau Level Degeneracy:	$D = eB/h = 2.42 \times 10^{10} \times B \text{ cm}^{-2}$		
Cyclotron Energy:	$\hbar\omega_c = 20 \times B \text{ (K)}$		
Spin Splitting:	$g\mu_B B = 0.29 \times B \text{ (K)}$		
Coulomb Energy Scale:	$e^2 / 4\pi\epsilon l_0 = 50 \times B^{1/2} \text{ (K)}$		