DIMENSIONS AND UNITS

To get the value of a quantity in Gaussian units, multiply the value expressed in SI units by the conversion factor. Multiples of 3 in the conversion factors result from approximating the speed of light $c = 2.9979 \times 10^{10}$ cm/sec $\approx 3 \times 10^{10}$ cm/sec.

Physical Quantity	Symbol	Dimensions		SI Units	Conversion Factor	Gaussian Units
		SI	Gaussian			
Capacitance	C	$\frac{t^2q^2}{ml^2}$	l	farad	9×10^{11}	cm
Charge	q	q	$\frac{m^{1/2}l^{3/2}}{t}$	coulomb	3×10^9	statcoulomb
Charge density	ρ	$\frac{q}{l^3}$	$\frac{m^{1/2}}{l^{3/2}t}$	coulomb /m^3	3×10^3	statcoulomb /cm^3
Conductance		$\frac{tq^2}{ml^2}$	$\frac{l}{t}$	siemens	9×10^{11}	cm/sec
Conductivity	σ	$\frac{tq^2}{ml^3}$	$\frac{1}{t}$	siemens /m	9×10^9	sec^{-1}
Current	I, i	$\frac{q}{t}$	$\frac{m^{1/2}l^{3/2}}{t^2}$	ampere	3×10^9	statampere
Current density	$\mathbf{J}, \mathbf{j}$	$\frac{q}{l^2t}$	$\frac{m^{1/2}}{l^{1/2}t^2}$	ampere /m^2	3×10^5	statampere /cm^2
Density	ρ	$\frac{m}{l^3}$	$\frac{m}{l^3}$	kg/m^3	10^{-3}	g/cm^3
Displacement	$\mathbf{D}$	$\frac{q}{l^2}$	$\frac{m^{1/2}}{l^{1/2}t}$	coulomb /m^2	$12\pi \times 10^5$	statcoulomb /cm^2
Electric field	$\mathbf{E}$	$\frac{ml}{t^2q}$	$\frac{m^{1/2}}{l^{1/2}t}$	volt/m	$\frac{1}{3} \times 10^{-4}$	statvolt/cm
Electromotance	$\mathcal{E}$, Emf	$\frac{ml^2}{t^2q}$	$\frac{m^{1/2}l^{1/2}}{t}$	volt	$\frac{1}{3} \times 10^{-2}$	statvolt
Energy	U, W	$\frac{ml^2}{t^2}$	$\frac{ml^2}{t^2}$	joule	10^7	erg
Energy density	w, ϵ	$\frac{m}{lt^2}$	$\frac{m}{lt^2}$	joule/m^3	10	erg/cm^3

Physical Quantity	Symbol	Dimensions SI	Dimensions Gaussian	SI Units	Conversion Factor	Gaussian Units
Force	$\mathbf{F}$	$\frac{ml}{t^2}$	$\frac{ml}{t^2}$	newton	10^5	dyne
Frequency	f, ν	$\frac{1}{t}$	$\frac{1}{t}$	hertz	1	hertz
Impedance	Z	$\frac{ml^2}{tq^2}$	$\frac{t}{l}$	ohm	$\frac{1}{9} \times 10^{-11}$	sec/cm
Inductance	L	$\frac{ml^2}{q^2}$	$\frac{t^2}{l}$	henry	$\frac{1}{9} \times 10^{-11}$	sec^2/cm
Length	l	l	l	meter (m)	10^2	centimeter (cm)
Magnetic intensity	$\mathbf{H}$	$\frac{q}{lt}$	$\frac{m^{1/2}}{l^{1/2}t}$	ampere–turn/m	$4\pi \times 10^{-3}$	oersted
Magnetic flux	Φ	$\frac{ml^2}{tq}$	$\frac{m^{1/2}l^{3/2}}{t}$	weber	10^8	maxwell
Magnetic induction	$\mathbf{B}$	$\frac{m}{tq}$	$\frac{m^{1/2}}{l^{1/2}t}$	tesla	10^4	gauss
Magnetic moment	m, μ	$\frac{l^2q}{t}$	$\frac{m^{1/2}l^{5/2}}{t}$	ampere–m^2	10^3	oersted–cm^3
Magnetization	$\mathbf{M}$	$\frac{q}{lt}$	$\frac{m^{1/2}}{l^{1/2}t}$	ampere–turn/m	$4\pi \times 10^{-3}$	oersted
Magnetomotance	$\mathcal{M}$, Mmf	$\frac{q}{t}$	$\frac{m^{1/2}l^{1/2}}{t^2}$	ampere–turn	$\frac{4\pi}{10}$	gilbert
Mass	m, M	m	m	kilogram (kg)	10^3	gram (g)
Momentum	$\mathbf{p}, \mathbf{P}$	$\frac{ml}{t}$	$\frac{ml}{t}$	kg–m/s	10^5	g–cm/sec
Momentum density		$\frac{m}{l^2t}$	$\frac{m}{l^2t}$	kg/m^2–s	10^{-1}	g/cm^2–sec
Permeability	μ	$\frac{ml}{q^2}$	1	henry/m	$\frac{1}{4\pi} \times 10^7$	—

Physical Quantity	Symbol	Dimensions SI	Dimensions Gaussian	SI Units	Conversion Factor	Gaussian Units
Permittivity	ϵ	$\frac{t^2q^2}{ml^3}$	1	farad/m	$36\pi \times 10^9$	—
Polarization	$\mathbf{P}$	$\frac{q}{l^2}$	$\frac{m^{1/2}}{l^{1/2}t}$	coulomb/m^2	3×10^5	statcoulomb /cm^2
Potential	V, ϕ	$\frac{ml^2}{t^2q}$	$\frac{m^{1/2}l^{1/2}}{t}$	volt	$\frac{1}{3} \times 10^{-2}$	statvolt
Power	P	$\frac{ml^2}{t^3}$	$\frac{ml^2}{t^3}$	watt	10^7	erg/sec
Power density		$\frac{m}{lt^3}$	$\frac{m}{lt^3}$	watt/m^3	10	erg/cm^3–sec
Pressure	p, P	$\frac{m}{lt^2}$	$\frac{m}{lt^2}$	pascal	10	dyne/cm^2
Reluctance	$\mathcal{R}$	$\frac{q^2}{ml^2}$	$\frac{1}{l}$	ampere–turn /weber	$4\pi \times 10^{-9}$	cm^{-1}
Resistance	R	$\frac{ml^2}{tq^2}$	$\frac{t}{l}$	ohm	$\frac{1}{9} \times 10^{-11}$	sec/cm
Resistivity	η, ρ	$\frac{ml^3}{tq^2}$	t	ohm–m	$\frac{1}{9} \times 10^{-9}$	sec
Thermal conductivity	κ, k	$\frac{ml}{t^3}$	$\frac{ml}{t^3}$	watt/m–deg (K)	10^5	erg/cm–sec–deg (K)
Time	t	t	t	second (s)	1	second (sec)
Vector potential	$\mathbf{A}$	$\frac{ml}{tq}$	$\frac{m^{1/2}l^{1/2}}{t}$	weber/m	10^6	gauss–cm
Velocity	$\mathbf{v}$	$\frac{l}{t}$	$\frac{l}{t}$	m/s	10^2	cm/sec
Viscosity	η, μ	$\frac{m}{lt}$	$\frac{m}{lt}$	kg/m–s	10	poise
Vorticity	ζ	$\frac{1}{t}$	$\frac{1}{t}$	s^{-1}	1	sec^{-1}
Work	W	$\frac{ml^2}{t^2}$	$\frac{ml^2}{t^2}$	joule	10^7	erg