Soft Ferrite Terminology

Air Core Inductance L_o (H) – The inductance that would be measured if the core had unity permeability and the flux distribution remained unaltered.

Amplitude Permeability μ_a – The quotient of the peak value of flux density and peak value of applied field strength at a stated amplitude of either, with no static field present.

Coercive Force H_c (oersted) – The magnetizing field strength required to bring the magnetic flux density of a magnetized material to zero.

Curie Temperature T_c (°C) – The transition temperature above which a ferrite loses its ferromagnetic properties.

Disaccommodation D – The proportional decrease of permeability after a disturbance of a magnetic material, measured at constant temperature, over a given time interval.

Disaccommodation Factor D.F. – The Disaccommodation after magnetic conditioning divided by the permeability of the first measurement times Log_{10} of the ratio of time intervals.

Effective Dimensions of a Magnetic Circuit Area A_e (cm^2), Path Length l_e (cm), and Volume V_e (cm^3) - For a magnetic core of given geometry, the magnetic path length, the cross sectional area and the volume that a hypothetical toroidal core of the same material properties should posses to be the magnetic equivalent to the given core.

Effective Permeability μ_e – For a magnetic circuit constructed with an air gap or air gaps, the permeability of a hypothetical homogeneous material which would provide the same reluctance.

Field Strength H (oersted) – The parameter characterizing the amplitude of alternating field strength.

Flux Density B (gauss) – The corresponding parameter for the induced magnetic field in an area perpendicular to the flux path.

Inductance Factor A_L (nH) – Inductance of a coil on a specified core divided by the square of the number of turns. (Unless otherwise specified the inductance test conditions for inductance factor are at a flux density < 10 gauss).

Initial Permeability μ_i – The permeability obtained from the ratio of the flux density, kept at < 10 gauss, and the required applied field strength. Material initially in a specified neutralized state.

Loss Factor $\tan \delta/\mu_i$ – The phase displacement between the fundamental components of the flux density and the field strength divided by the initial permeability.

Magnetic Hysteresis – In a magnetic material, the irreversible variation of the flux density of magnetization which is associated with the change of magnetic field strength and is independent of the rate of change.

Power Loss Density P(mW/cm^3) – The power absorbed by a body of ferromagnetic material and dissipated as heat, when the body is subjected to an alternating field which results in a measurable temperature rise. The total loss is divided by the volume of the body.

Remanence B_r (gauss) – The flux density remaining in a magnetic material when the applied magnetic field strength is reduced to zero.

Saturation Flux Density B_s (gauss) – The maximum intrinsic induction possible in a material.

Temperature Coefficient T.C. The relative change of the quantity considered, divided by the difference in temperatures producing it.

Temperature Factor T.F. – The fractional change in initial permeability over a temperature range, divided by the initial permeability.

Volume Resistivity ρ (ohm cm) – The resistance measured by means of direct voltage of a body of ferromagnetic material having a constant cross sectional area.

Hard / Soft Ferrites – Term relates to the coercive force to demagnetize the material from remanence to zero. Hard ferrites are generally permanent magnets and can require up to 2000 oersted to demagnetize from Remanence to zero, where Soft ferrites require small amounts of coercive force, typically from .05 to 4 oersted.

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