

T10

极高磁导率低残磁材料

VERY-HIGH PERMEABILITY LOW-REMANENCE FERRITE

T10 为极高磁导率低残磁锰锌铁氧体，初始磁导率 (μ_i) 10000，饱和磁通密度 (B_s) 420 mT (25 °C) / 240 mT (100 °C)，居里温度高于 140 °C。残留磁通密度 (B_r) 70 mT (25 °C) / 60 mT (100 °C) 为族内最低，矫顽力 (H_c) 8 → 6 A/m；直流暂态或开关浪涌过后磁芯几乎不留残磁，电流互感器的比差与相位差不会因此偏移；100 kHz 相对损耗因子低于 15×10^{-6} ，磁滞常数 ηB 0.4×10^{-6} /mT，共模扼流圈在同体积下取得接近 T12 的阻抗。与 T12 相比，居里温度由 110 °C 提高到 140 °C，100 °C 的 B_s 由 210 mT 提高到 240 mT，工作温度上限更宽。典型应用为精密电流互感器与漏电保护互感器、电源输入端共模扼流圈、宽频信号变压器。在高磁导率族中，T10 是 T12 的耐温低残磁版： μ_i 上限优先且环境温和时选 T12 (μ_i 12000)；温度特性优先选 T07；需要热态 B_s 选 T05。 μ_i 公差 $\pm 30\%$ ，感量精度要求高时以匝数或气隙微调。

T10 is a very-high-permeability low-remanence MnZn ferrite with an initial permeability (μ_i) of 10000, a saturation flux density (B_s) of 420 mT at 25 °C (240 mT at 100 °C) and a Curie temperature above 140 °C. Its remanence (B_r) of 70 mT at 25 °C (60 mT at 100 °C) is the lowest in the family and its coercivity (H_c) 8 → 6 A/m: the core retains almost no flux after a DC transient, so a current transformer's ratio and phase error do not shift; a relative loss factor below 15×10^{-6} at 100 kHz and a hysteresis constant ηB of 0.4×10^{-6} /mT give common-mode chokes an impedance close to T12's in the same volume. Against T12 the Curie point rises from 110 °C to 140 °C and B_s at 100 °C from 210 mT to 240 mT. Typical uses are precision and residual-current transformers, common-mode chokes and wideband signal transformers. Within the high-permeability family T10 is the higher-temperature, low-remanence version of T12: choose T12 (μ_i 12000) when maximum μ_i matters and the environment is mild, T07 for temperature stability, T05 for hot-state B_s . The μ_i tolerance is $\pm 30\%$, so trim inductance by turns or gap where precision is critical.

Precision Current Transformer

Residual-Current Transformer

Common-Mode Choke

Wideband Signal Transformer

电磁特性 MAGNETIC CHARACTERISTICS

特性 Characteristic	条件 Condition	25 °C	100 °C	单位 Unit
初始磁导率 Initial Permeability μ_i	100 kHz & <0.2 mT	10000 $\pm$ 30%		
饱和磁通密度 Saturation Flux Density B_s	1200 A/m 50 Hz	420	240	mT
残留磁通密度 Remanence B_r	1200 A/m 50 Hz	70	60	mT
矫顽力 Coercivity H_c	1200 A/m 50 Hz	8	6	A/m
相对损耗因子 Loss Factor	100 kHz	<15		10^{-6}
磁滞常数 Hysteresis Constant ηB	100 kHz 1.5-3.0 mT	0.4		10^{-6} /mT
温度系数 Temperature Factor α_f	100kHz <0.2 mT	1~2		10^{-6}
居里温度 Curie Temperature T_c	100 kHz & <0.2 mT	>140		°C
密度 Density D	阿基米德法 Archimedes method	5.0		g/cm ³
电阻率 Electrical Resistivity ρ	直流电流 DC Current	0.2		$\Omega \cdot m$

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T10

特性曲线

CHARACTERISTIC CURVES

