鐵研 TAK

G5B

高磁导高磁通EMI材料

HIGH PERM. & HIGH FLUX & EMI MATERIALS

G5B 为镍锌铁氧体材料，初始磁导率（μi）约 1000，饱和磁通密度（Bs）约 390 mT（25 ℃）/ 300 mT（100 ℃），居里温度高于 180 ℃。本材料在保持 G5 家族高饱和磁通的前提下，把标称磁导率再提高两成五：共模滤波可用更少匝数取得同等阻抗，功率电感的储能与感量密度亦更高；矫顽力仅 25 A/m，磁滞损低，损耗因子 15×10^{-6}（0.1 MHz）/ 45×10^{-6}（1.0 MHz）。典型应用为电源模块、电流补偿电感、共模与差模滤波器，车用领域同样适用于 ADAS 与电机驱动的 EMC 防护。与 G5A（μi 约 800、Bs 约 400 mT、Tc >190 ℃）的取舍：两者 Bs 与耐温同级，G5B 的优势在阻抗与感量密度，G5A 在 1 MHz 端的损耗略低（30 对 45×10^{-6}）——高频端占比高的设计选 G5A，其余多数共模 / 功率场合 G5B 通用性更高。

G5B is a NiZn ferrite with an initial permeability (μi) of approx. 1000, a saturation flux density (Bs) of approx. 390 mT at 25 °C (300 mT at 100 °C) and a Curie temperature above 180 °C. It raises the G5 family's nominal permeability by a further 25 % while keeping the high saturation flux: common-mode filters reach the same impedance with fewer turns, and power inductors gain energy-storage and inductance density; with a coercivity of only 25 A/m the hysteresis loss stays low, and the loss factor is 15×10^{-6} at 0.1 MHz / 45×10^{-6} at 1.0 MHz. Typical uses are power modules, current-compensated inductors and common-/differential-mode filters, including ADAS and motor-drive EMC protection in automotive. Against G5A (μi approx. 800, Bs approx. 400 mT, Tc >190 °C): Bs and temperature rating are on the same level; G5B leads in impedance and inductance density while G5A is slightly lower-loss at the 1 MHz end (30 vs 45×10^{-6}) — pick G5A when the upper band dominates the design, G5B for most other common-mode and power duties.

Common-Mode Choke | Current-Compensated Inductor | Power Inductor | EMI Filter | ADAS / Motor-Drive EMC

电磁特性 MAGNETIC CHARACTERISTICS

特性 Characteristic	条件 Condition	值 Value	单位 Unit
初始磁导率 μi Initial Permeability	100 kHz & <0.2 mT	1000±25%	
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 25 ℃ 100 Hz	390	mT
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 100 ℃ 100 Hz	300	mT
残留磁通密度 Br Remanence	3000 A/m · 25 ℃ 100 Hz	235	mT
残留磁通密度 Br Remanence	3000 A/m · 100 ℃ 100 Hz	150	mT
矫顽力 Hc Coercivity	3000 A/m · 25 ℃ 100 Hz	25	A/m
矫顽力 Hc Coercivity	3000 A/m · 100 ℃ 100 Hz	20	A/m
αμr（温度系数）Temperature coefficient of permeability	20～60 ℃	8	$\times10^{-6}$/K
相对损耗因子 tanδ/μi Relative Loss Factor	0.1 MHz & <0.2 mT	15	$\times10^{-6}$
相对损耗因子 tanδ/μi Relative Loss Factor	1.0 MHz & <0.2 mT	45	$\times10^{-6}$
居里温度 Tc Curie Temp.	100 kHz & <0.2 mT	>180	℃
密度 D Density	阿基米德法 Archimedes method	5.1	g/cm³
电阻率 ρ Volume Resistivity	直流电流 DC Current	10^7	Ω·m
功率损耗 Pcv Power Loss	100 kHz/100 mT | 500 kHz/30 mT | 1 MHz/30 mT · 25 °C	460 | 264 | 832	kW/m³

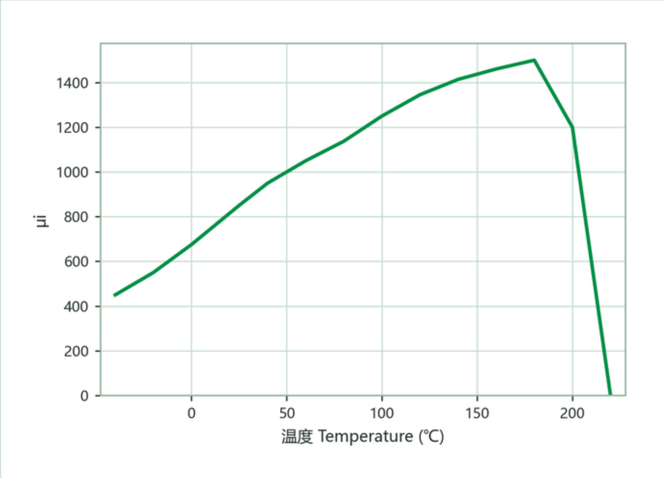
备注：各项数值均为环形磁芯T31×19×8测得的典型数值，由于几何形状和尺寸的影响，产品规格将与这些数据有所差异。25 ℃ 之功率损耗 Pcv 为 T31×19×8 环形磁芯绕线 3 匝实测。

Note: all values are typical data measured on a T31×19×8 toroidal core; actual product specifications will vary with geometry and size. Pcv values at 25 °C are measured on a T31×19×8 toroid wound with 3 turns.

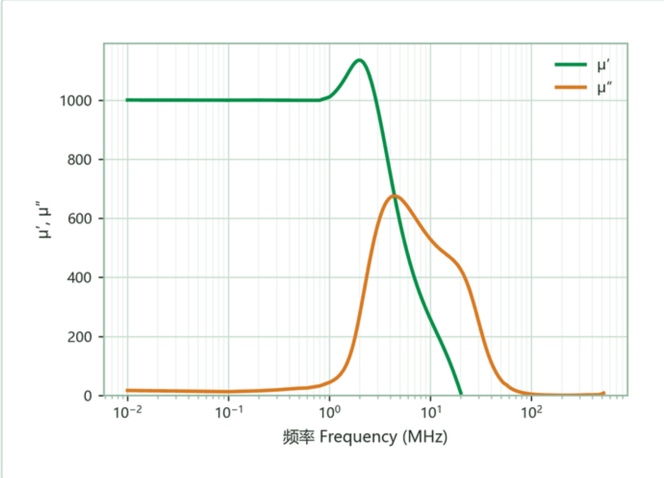
特性曲线详见次页 CHARACTERISTIC CURVES — SEE NEXT PAGE

G5B 特性曲线

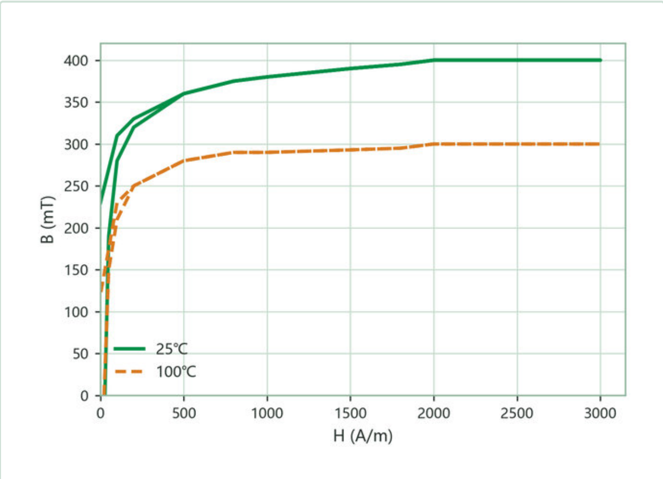
CHARACTERISTIC CURVES



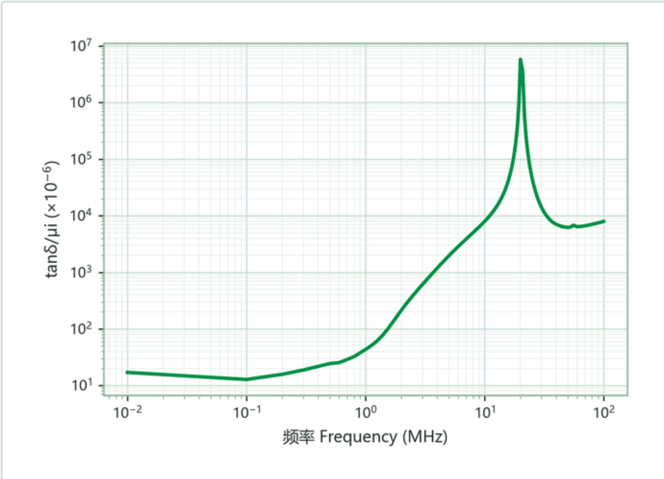
初始磁导率—温度特性
Initial Permeability vs. Temperature



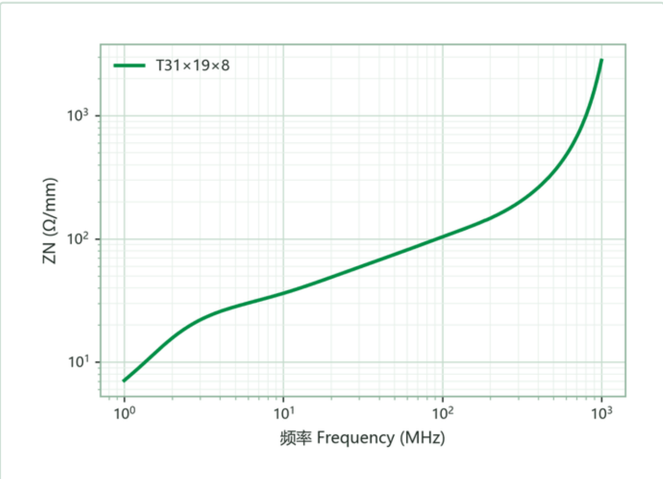
复数磁导率—频率特性
Complex Permeability (μ′, μ″) vs. Frequency



静态磁化曲线
Static Magnetization Curves (B–H)



相对损耗因子—频率特性
Relative Loss Factor (tanδ/μi) vs. Frequency



标准化阻抗—频率特性（Φ0.5 mm 漆包线 100 mm · 单圈测量）
Normalized Impedance ZN vs. Frequency (single turn of Φ0.5 mm wire, 100 mm long)