M9A

高频稳定材料
HIGH FREQUENCY STABLE MATERIALS

鐵研 TAK

M9A 为镍锌铁氧体材料，初始磁导率（μi）约 50，饱和磁通密度（Bs）约 340 mT（25 ℃）/ 300 mT（100 ℃），居里温度高于 300 ℃。本材料在 5～50 MHz 频段展现优异 Q 值（损耗因子 100×10⁻⁶ @5 MHz / 120×10⁻⁶ @20 MHz），且 Bs 达 340 mT、100 ℃ 仍有 300 mT——在高频族中属于少数兼顾“高 Q”与“磁通承载”的档位，适合需要承受功率的射频磁性元件。典型应用为短波与中频 RF 滤波器、功率级射频扼流圈与调谐电感。阶梯位置在 V2F1（μi 约 30）与 M61（约 100）之间：频率上限较 V2F1 低、较 M61 高，功率承载与 Q 的均衡使其成为 HF 频段功率射频的主力档。

M9A is a NiZn ferrite with an initial permeability (μi) of approx. 50, a saturation flux density (Bs) of approx. 340 mT at 25 °C (300 mT at 100 °C) and a Curie temperature above 300 °C. It shows excellent Q across 5–50 MHz (loss factor 100×10⁻⁶ at 5 MHz / 120×10⁻⁶ at 20 MHz) while keeping Bs at 340 mT with 300 mT still available at 100 °C — one of the few high-frequency grades combining high Q with real flux capability, suited to RF magnetics that must carry power. Typical uses are shortwave/mid-frequency RF filters, power-stage RF chokes and tuning inductors. In the ladder it sits between V2F1 (μi approx. 30) and M61 (approx. 100): a lower ceiling than V2F1 but higher than M61, and its balance of power handling and Q makes it the workhorse for HF power RF.

Shortwave RF Filter | RF Power Choke | Tuning Inductor

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	50±25%	
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 25 ℃ 100 Hz	340	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	230	mT
残留磁通密度 Br Remanence	3000 A/m · 100 ℃ 100 Hz	190	mT
矫顽力 Hc Coercivity	3000 A/m · 25 ℃ 100 Hz	590	A/m
矫顽力 Hc Coercivity	3000 A/m · 100 ℃ 100 Hz	580	A/m
αμr（温度系数） Temperature coefficient of permeability	20～60 ℃	60	×10⁻⁶/K
相对损耗因子 tanδ/μi Relative Loss Factor	5.0 MHz & <0.2 mT	100	×10⁻⁶
相对损耗因子 tanδ/μi Relative Loss Factor	20 MHz & <0.2 mT	120	×10⁻⁶
居里温度 Tc Curie Temp.	100 kHz & <0.2 mT	>300	℃
密度 D Density	阿基米德法 Archimedes method	4.9	g/cm³
电阻率 ρ Volume Resistivity	直流电流 DC Current	10^7	Ω·m

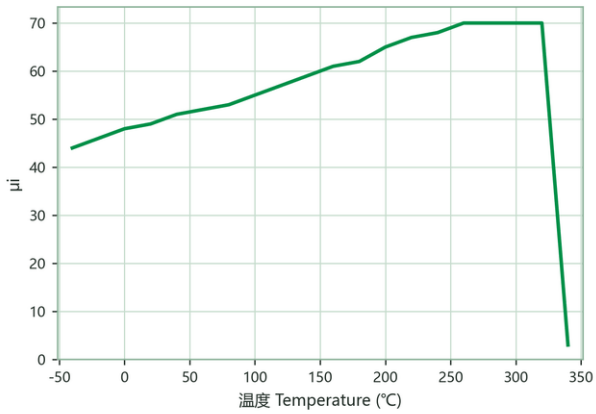
备注：各项数值均为环形磁芯T31×19×8测得的典型数值，由于几何形状和尺寸的影响，产品规格将与这些数据有所差异。

Note: all values are typical data measured on a T31×19×8 toroidal core; actual product specifications will vary with geometry and size.

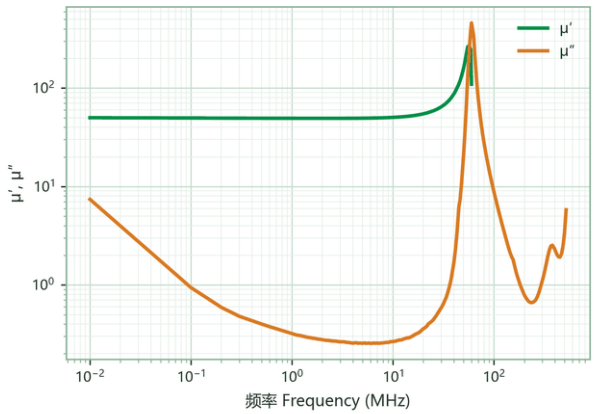
特性曲线详见次页 CHARACTERISTIC CURVES — SEE NEXT PAGE

M9A

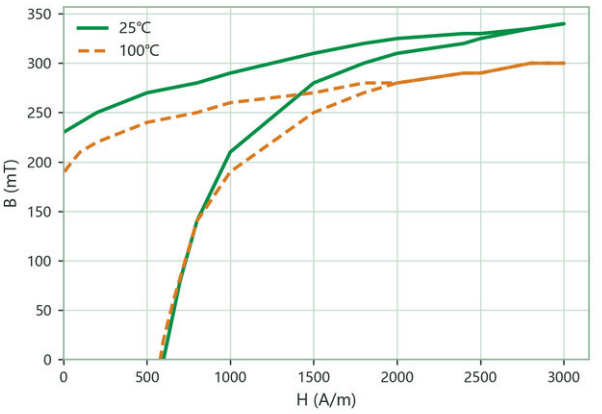
特性曲线
CHARACTERISTIC CURVES



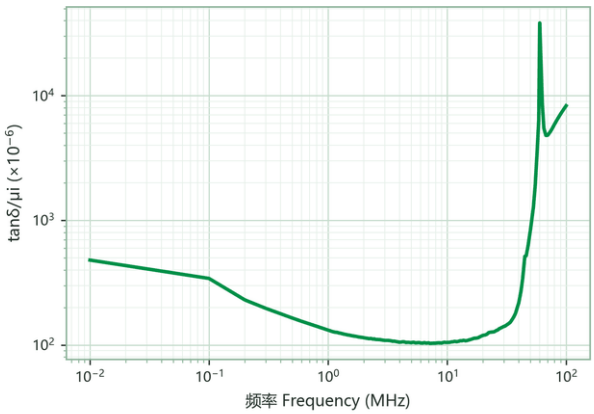
初始磁导率—温度特性
Initial Permeability vs. Temperature



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