鐵研 TAK

Q1C1 高频稳定材料 HIGH FREQUENCY STABLE MATERIALS

Q1C1 为镍锌铁氧体材料，初始磁导率（μi）约 250，饱和磁通密度（Bs）约 335 mT（25 ℃）/ 240 mT（100 ℃），居里温度高于 140 ℃。本材料是高频族的高磁导端点：损耗因子仅 35×10⁻⁶（0.5 MHz）/ 45×10⁻⁶（2.5 MHz），在此磁导率档位属于相当低的水平，单位匝数感量高，有利于元件小型化。作为 EMI 抑制材料，其标准化阻抗以 RH5×1.5×10 磁珠实测（曲线见次页）。典型应用为低频 EMI 滤波器、RF 调谐元件与追求小型化的电源模块电感。与 M63（μi 约 180、Tc >300 ℃）相比，Q1C1 感量密度更高，但居里温度明显较低（>140 ℃）——温度环境严苛时回选 M63 / M61，常温小型化设计则 Q1C1 是本族首选。

Q1C1 is a NiZn ferrite with an initial permeability (μi) of approx. 250, a saturation flux density (Bs) of approx. 335 mT at 25 °C (240 mT at 100 °C) and a Curie temperature above 140 °C. It is the high-permeability end of the high-frequency family: a loss factor of only 35×10^{-6} at 0.5 MHz / 45×10^{-6} at 2.5 MHz is remarkably low for this permeability step, and the high inductance per turn favours miniaturisation. As an EMI-suppression material its normalized impedance is measured on an RH5×1.5×10 bead (curve on the next page). Typical uses are low-frequency EMI filters, RF tuning elements and compact power-module inductors. Against M63 (μi approx. 180, Tc >300 °C), Q1C1 offers higher inductance density at a clearly lower Curie temperature (>140 °C) — fall back to M63/M61 in harsh thermal environments; for compact room-temperature designs Q1C1 is the family's first choice.

Low-Frequency EMI Filter | RF Tuning Element | Compact Power-Module Inductor | EMI Suppression Bead

电磁特性 MAGNETIC CHARACTERISTICS

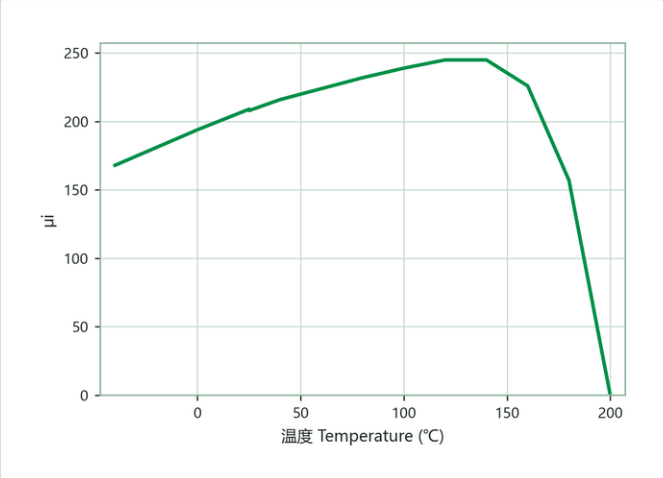
特性 Characteristic	条件 Condition	值 Value	单位 Unit
初始磁导率 μi Initial Permeability	100 kHz & <0.2 mT	250±25%	
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 25 ℃ 100 Hz	335	mT
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 100 ℃ 100 Hz	240	mT
残留磁通密度 Br Remanence	3000 A/m · 25 ℃ 100 Hz	200	mT
残留磁通密度 Br Remanence	3000 A/m · 100 ℃ 100 Hz	130	mT
矫顽力 Hc Coercivity	3000 A/m · 25 ℃ 100 Hz	140	A/m
矫顽力 Hc Coercivity	3000 A/m · 100 ℃ 100 Hz	140	A/m
αμr（温度系数）Temperature coefficient of permeability	20 ~ 60 ℃	10	$\times10^{-6}$/K
相对损耗因子 tanδ/μi Relative Loss Factor	0.5 MHz & <0.2 mT	35	$\times10^{-6}$
相对损耗因子 tanδ/μi Relative Loss Factor	2.5 MHz & <0.2 mT	45	$\times10^{-6}$
居里温度 Tc Curie Temp.	100 kHz & <0.2 mT	>140	℃
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。

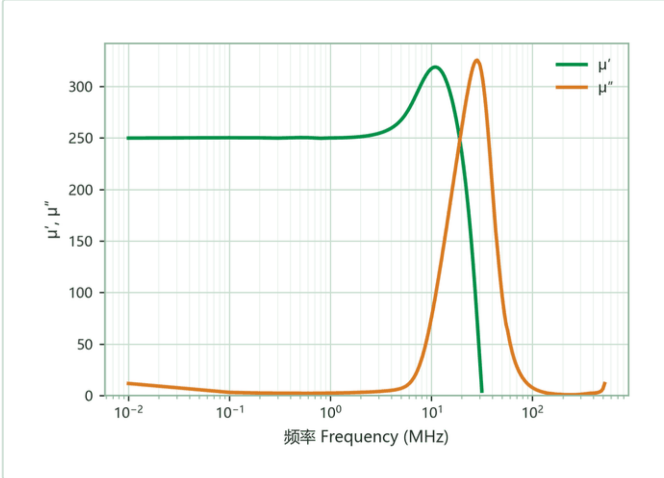
Note: all values are typical data measured on a T31×19×8 toroidal core; actual product specifications will vary with geometry and size.

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

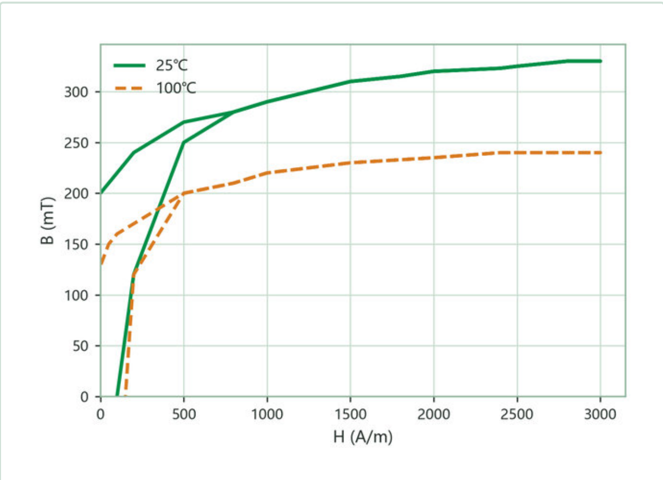
Q1C1 特性曲线 CHARACTERISTIC CURVES



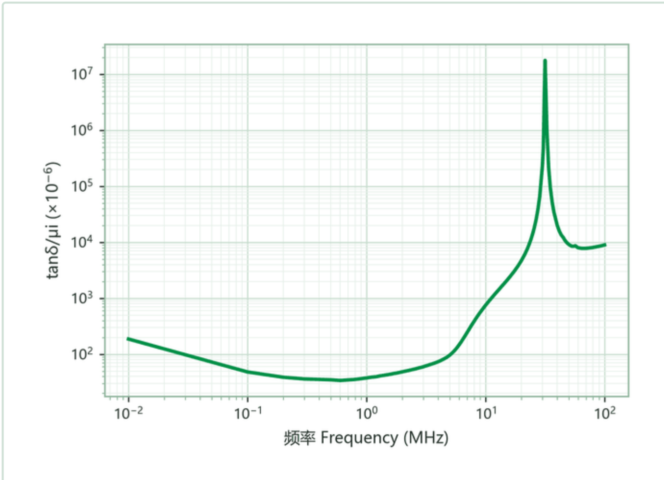
初始磁导率—温度特性
Initial Permeability vs. Temperature



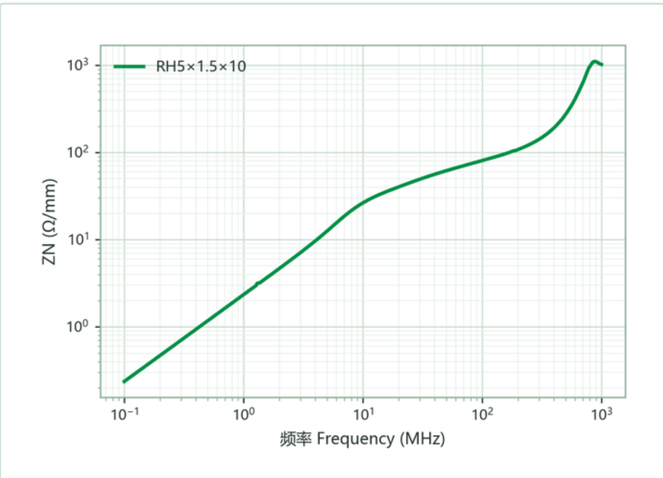
复数磁导率—频率特性
Complex Permeability (μ′, μ″) vs. Frequency



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)