MF3

镍镁锌材料
NI-MG-ZN MATERIALS

鐵研 TAK

MF3 为镍镁锌铁氧体材料，初始磁导率（μi）约 350，饱和磁通密度（Bs）约 330 mT（25 ℃）/ 230 mT（100 ℃），居里温度高于 160 ℃。本材料是本组的信号级：温度系数约 10×10⁻⁶/K、损耗因子 20×10⁻⁶（0.1 MHz）/ 25×10⁻⁶（1.0 MHz），温度漂移与损耗之低在本组配方中相当突出，可在频率与温度变动下维持稳定的感量与 Q 值。典型应用为 RFID 线圈、低频与高频射频滤波器，以及宽频 EMI 抑制磁环。在 MF 系中，MF3 损耗最低、特性最均衡（MF1 为低 μi 高频支、MF2 为高 μi 低频支）；若需要更高的温度等级，可对照纯镍锌之 DL3 / MGB1（同 μi 350 档）。

MF3 is a Ni-Mg-Zn ferrite with an initial permeability (μi) of approx. 350, a saturation flux density (Bs) of approx. 330 mT at 25 °C (230 mT at 100 °C) and a Curie temperature above 160 °C. It is the signal-grade member of this group: a temperature coefficient of about 10×10⁻⁶/K and a loss factor of 20×10⁻⁶ at 0.1 MHz / 25×10⁻⁶ at 1.0 MHz — remarkably low drift and loss for this composition class — keep inductance and Q stable against frequency and temperature. Typical uses are RFID coils, LF/HF RF filters and broadband EMI suppression rings. Within the MF line, MF3 has the lowest loss and the most balanced characteristics (MF1 is the low-μi high-frequency branch, MF2 the high-μi low-frequency branch); for a higher temperature class, see the NiZn grades DL3/MGB1 at the same μi ≈ 350 step.

RFID Coil | RF Filter | Broadband Suppression Ring

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	350±25%	
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 25 ℃ 100 Hz	330	mT
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 100 ℃ 100 Hz	230	mT
残留磁通密度 Br Remanence	3000 A/m · 25 ℃ 100 Hz	160	mT
残留磁通密度 Br Remanence	3000 A/m · 100 ℃ 100 Hz	120	mT
矫顽力 Hc Coercivity	3000 A/m · 25 ℃ 100 Hz	55	A/m
矫顽力 Hc Coercivity	3000 A/m · 100 ℃ 100 Hz	40	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	0.1 MHz & <0.2 mT	20	$\times10^{-6}$
相对损耗因子 tanδ/μi Relative Loss Factor	1.0 MHz & <0.2 mT	25	$\times10^{-6}$
居里温度 Tc Curie Temp.	100 kHz & <0.2 mT	>160	℃
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

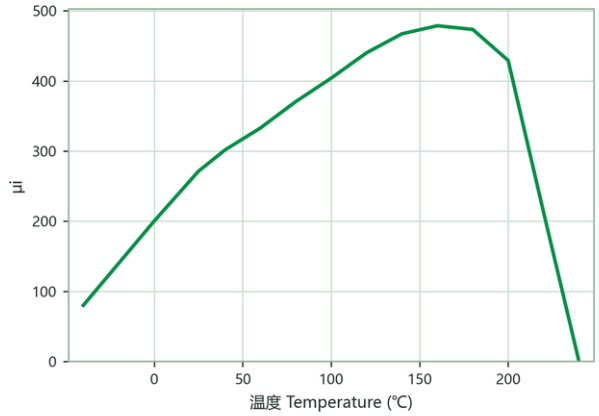
备注：各项数值均为环形磁芯T31×19×8测得的典型数值，由于几何形状和尺寸的影响，产品规格将与这些数据有所差异。

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

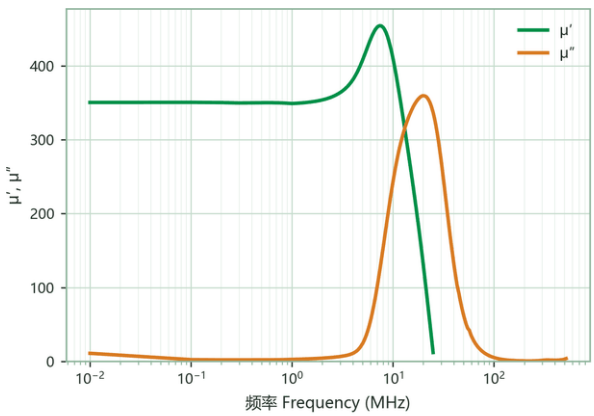
特性曲线详见次页 CHARACTERISTIC CURVES — SEE NEXT PAGE

MF3

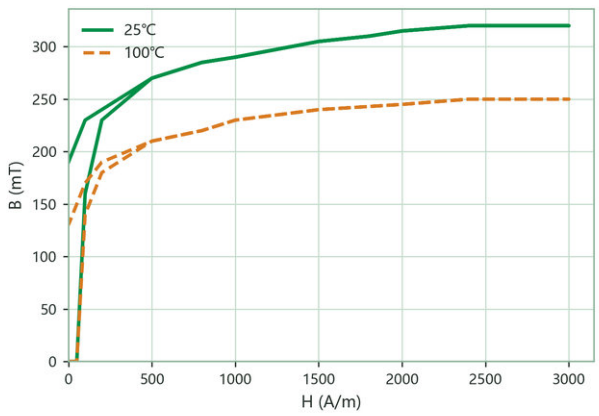
特性曲线
CHARACTERISTIC CURVES



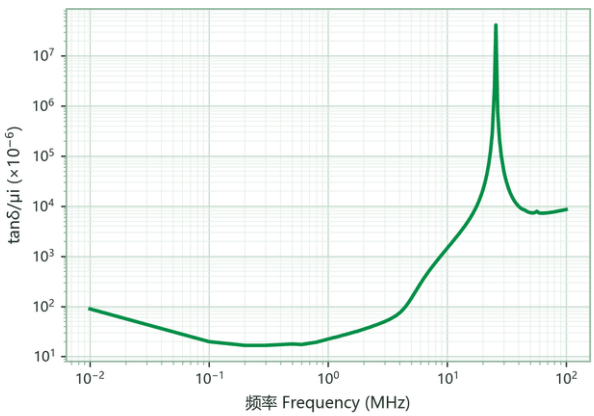
初始磁导率—温度特性
Initial Permeability vs. Temperature



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