DL6

高磁通耐热冲击材料
HIGH FLUX & THERMAL SHOCK RESISTANT FERRITE

鐵研 TAK

DL6 为镍锌铁氧体材料，初始磁导率（μi）约 300，饱和磁通密度（Bs）约 440 mT（25 ℃）/ 370 mT（100 ℃），居里温度高于 260 ℃。此材料以略低的磁导率换取全系列最高的磁通密度与温度上限——100 ℃ 仍保有 370 mT，Tc 高于 260 ℃，可承受极端温度循环（−40 ℃ 至 +200 ℃）与高温回流焊；低磁通下相对损耗因子 20×10^{-6}（0.1 MHz）/ 50×10^{-6}（2.0 MHz），中高频损耗仍低。典型应用为极端温度环境下的高功率电感与射频滤波器，以及航空航天、油井勘探等专用磁性元件，支持车规与军规电源系统的高电流、高磁通设计，亦适合高可靠性 SMD 元件。在 DL 系列中，DL6 是极限工况版：相较 DL5（Bs 约 420 mT、Tc >240 ℃）再往磁通与耐温推进一级，代价是标称磁导率略低、达到同样感量需要较多匝数；若温度与磁通需求未达极端等级，DL5 通常是更均衡的选择。

DL6 is a NiZn ferrite with an initial permeability (μi) of approx. 300, a saturation flux density (Bs) of approx. 440 mT at 25 °C (370 mT at 100 °C) and a Curie temperature above 260 °C. It trades a slightly lower permeability for the family's highest flux density and temperature ceiling — 370 mT still available at 100 °C and a Curie point above 260 °C — withstanding extreme temperature cycling (−40 °C to +200 °C) and high-temperature reflow; the relative loss factor stays low into the mid/high-frequency range (20×10^{-6} at 0.1 MHz / 50×10^{-6} at 2.0 MHz). Typical uses are high-power inductors and RF filters in extreme-temperature environments, dedicated magnetics for aerospace and downhole exploration, and high-current, high-flux designs in automotive- and military-grade power systems, as well as high-reliability SMD parts. Within the DL family, DL6 is the extreme-duty grade: over DL5 (Bs approx. 420 mT, Tc >240 °C) it pushes flux density and temperature one step further at the cost of a slightly lower nominal permeability — more turns for the same inductance; when conditions are less extreme, DL5 is usually the more balanced choice.

High-Power Inductor | RF Filter | Aerospace / Downhole Magnetics | Automotive / Military Power

电磁特性 MAGNETIC CHARACTERISTICS

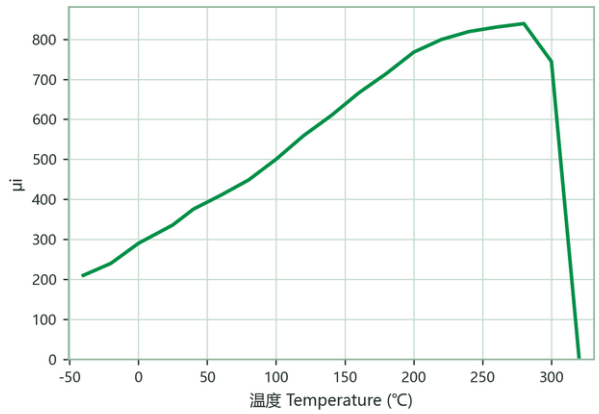
特性 Characteristic	条件 Condition	值 Value	单位 Unit
初始磁导率 μi Initial Permeability	100 kHz & <0.2 mT	300±25%	
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 25 ℃ 100 Hz	440	mT
饱和磁通密度 Bs Saturation Flux Density	3000 A/m · 100 ℃ 100 Hz	370	mT
残留磁通密度 Br Remanence	3000 A/m · 25 ℃ 100 Hz	300	mT
残留磁通密度 Br Remanence	3000 A/m · 100 ℃ 100 Hz	204	mT
矫顽力 Hc Coercivity	3000 A/m · 25 ℃ 100 Hz	57.7	A/m
矫顽力 Hc Coercivity	3000 A/m · 100 ℃ 100 Hz	44.3	A/m
αμr（温度系数） Temperature coefficient of permeability	20 ~ 60 ℃	25	$\times10^{-6}$/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	2.0 MHz & <0.2 mT	50	$\times10^{-6}$
居里温度 Tc Curie Temp.	100 kHz & <0.2 mT	>260	℃
密度 D Density	阿基米德法 Archimedes method	5.2	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	32 kHz / 125 mT · 25 ℃/100 ℃/120 ℃	390 / 278 / 254	kW/m³
功率损耗 Pcv Power Loss	64 kHz / 100 mT · 25 ℃/100 ℃/120 ℃	600 / 410 / 375	kW/m³
功率损耗 Pcv Power Loss	100 kHz/100 mT | 500 kHz/30 mT | 1 MHz/30 mT · 25 ℃	1063 | 451 | 1112	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。

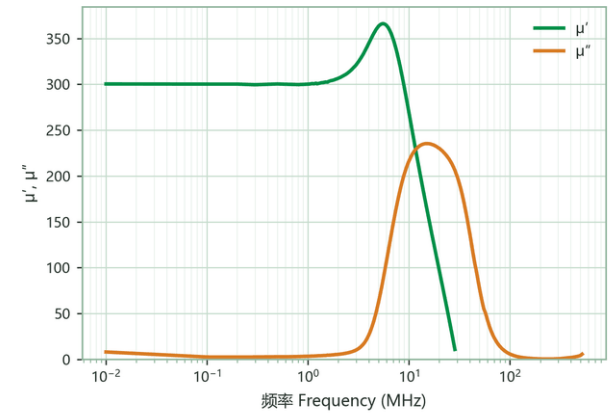
Note: all values are typical data measured on a T31×19×8 toroidal core; actual product specifications will vary with geometry and size. Pcv values at 25 °C are measured on a T31×19×8 toroid wound with 3 turns.

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

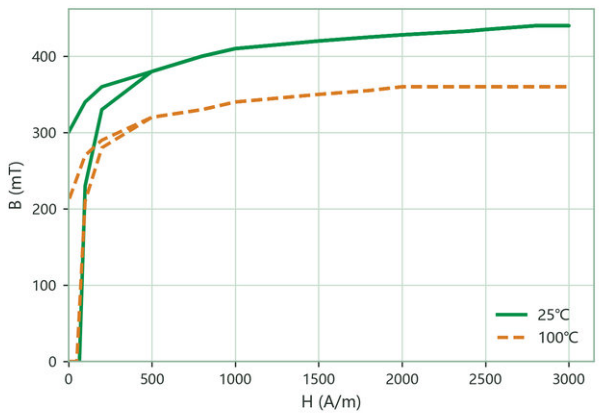
DL6 特性曲线
CHARACTERISTIC CURVES



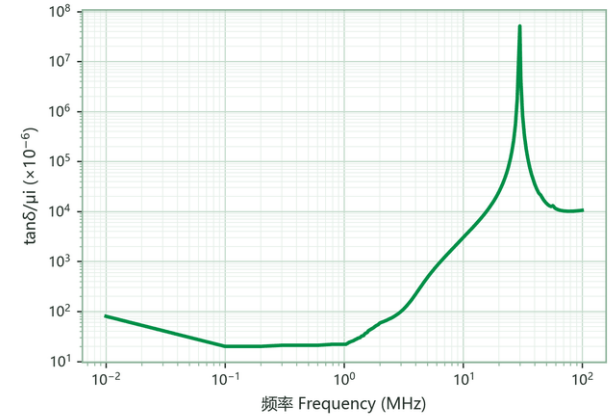
初始磁导率—温度特性
Initial Permeability vs. Temperature



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