

TP45 较高磁导率功率材料
HIGHER-PERMEABILITY LOW-LOSS POWER FERRITE

TP45 为较高磁导率锰锌功率铁氧体，初始磁导率 (μ) 2500，饱和磁通密度 (B_s) 500 mT (25 °C) / 400 mT (100 °C)，居里温度高于 210 °C。比 TP40 / TP44 高出 25 % 的 μ 让同一激磁电感所需匝数更少，反激与适配器变压器得以压低绕线层数与漏感；损耗并未因此牺牲：100 kHz / 200 mT 为 600 $\rightarrow$ 300 kW/m³，与 TP44 同级，300 kHz / 100 mT 为 620 $\rightarrow$ 420 kW/m³，500 kHz / 50 mT 仍有 270 $\rightarrow$ 200 kW/m³，频段上缘可延伸到 500 kHz 的低磁通工作点；100 °C 矫顽力 (H_c) 7 A/m、残留磁通密度 (B_r) 70 mT。典型应用为适配器与充电器的反激变压器、通信电源与 300 kHz 级半桥 / LLC 变压器。在 300 kHz 以下低损耗高 B_s 群中，TP45 以 μ 区隔：匝数与漏感是瓶颈时选它；沿用 μ 2000 的匝数设计又想降损耗选 TP44；大尺寸通用磁芯选 TP40。居里温度 210 °C 为三支中最低，热设计要多留裕度。

TP45 is a higher-permeability MnZn power ferrite with an initial permeability (μ) of 2500, a saturation flux density (B_s) of 500 mT at 25 °C (400 mT at 100 °C) and a Curie temperature above 210 °C. A μ 25 % above TP40/TP44 means fewer turns for the same magnetising inductance, so flyback and adapter transformers need fewer winding layers and carry less leakage — without giving up loss: 600 $\rightarrow$ 300 kW/m³ at 100 kHz / 200 mT, on a level with TP44, 620 $\rightarrow$ 420 kW/m³ at 300 kHz / 100 mT and still 270 $\rightarrow$ 200 kW/m³ at 500 kHz / 50 mT, so low-flux points around 500 kHz remain usable; at 100 °C coercivity (H_c) is 7 A/m and remanence (B_r) 70 mT. Typical uses are flyback transformers for adapters and chargers, telecom supplies and 300 kHz-class half-bridge/LLC transformers. Within the sub-300 kHz low-loss high- B_s group TP45 is set apart by μ : choose it when turns and leakage are the bottleneck, TP44 to cut loss while keeping a μ 2000 turns design, TP40 for large general-purpose cores. Its 210 °C Curie point is the lowest of the three, so leave extra thermal margin.

- Flyback Transformer
- Adapter / Charger
- Telecom Power
- Half-Bridge / LLC Transformer

电磁特性 MAGNETIC CHARACTERISTICS

特性 Characteristic	条件 Condition	25 °C	100 °C	单位 Unit
初始磁导率 Initial Permeability μ	100 kHz & <0.2 mT	2500 $\pm$ 25%		
增幅磁导率 Amplitude Permeability μ_a	25 kHz/400 mT	> 4000	> 3500	
饱和磁通密度 Saturation Flux Density B_s	1200 A/m 100 Hz	500	400	mT
残留磁通密度 Remanence B_r	1200 A/m 100 Hz	130	70	mT
矫顽力 Coercivity H_c	1200 A/m 100 Hz	10	7	A/m
相对损耗因子 Loss Factor	100 kHz & <0.2 mT	<10		10 ⁻⁶
居里温度 Curie Temperature T_c	100 kHz & <0.2 mT	>210		°C
密度 Density D	阿基米德法 Archimedes method	4.8		g/cm ³
电阻率 Electrical Resistivity ρ	直流电流 DC Current	>6		$\Omega\cdot m$

功率损耗 P_{cv} POWER LOSS · KW/M³

测试条件 Condition	25 °C	100 °C
100 kHz/200 mT	600	300
300 kHz/100 mT	620	420
500 kHz/50 mT	270	200

Steinmetz 系数 $P_{cv} = K \cdot f^\alpha \cdot B^\beta$

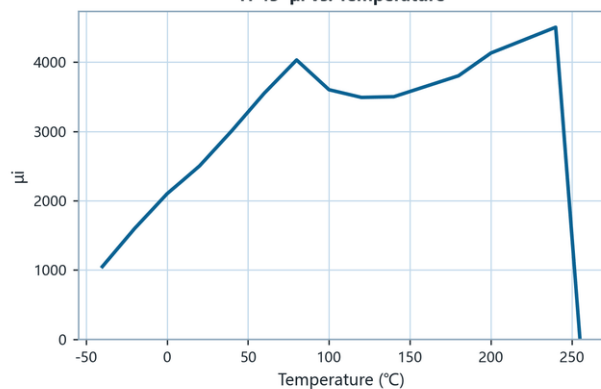
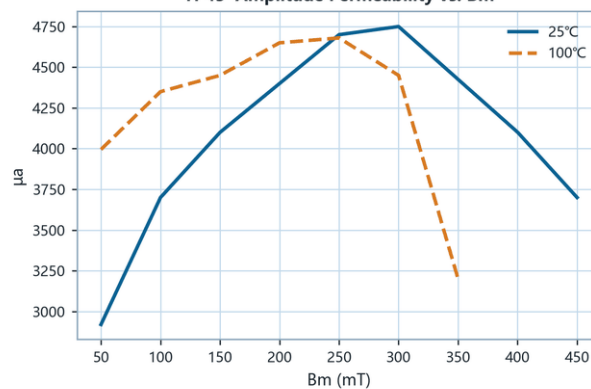
频段 Range	K	α	β
80 $\leq$ 500	7.85E-08	1.87237	2.54868
100 $\leq$ 500	4.75E-07	1.7414	2.35204

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

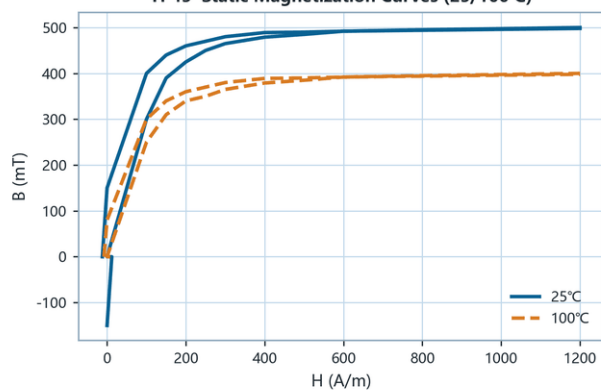
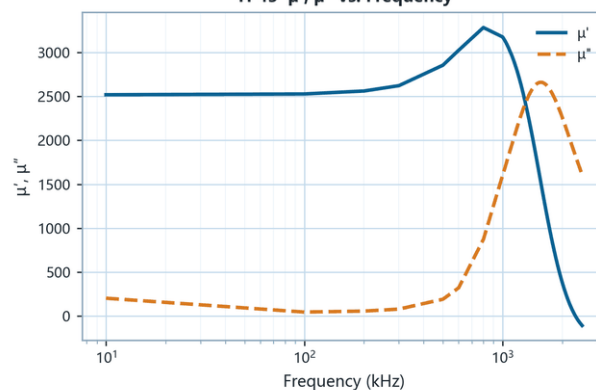
TP45

特性曲线

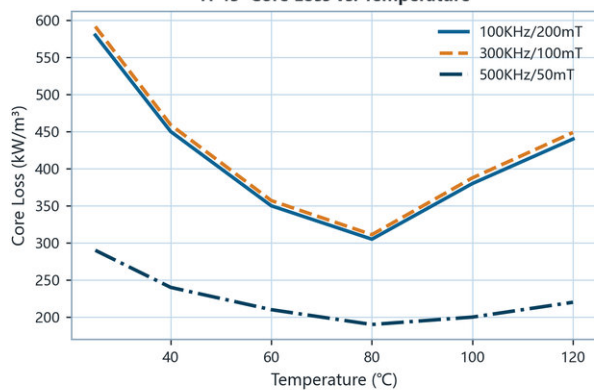
CHARACTERISTIC CURVES

TP45 μ_i vs. TemperatureTP45 Amplitude Permeability vs. B_m 

TP45 Static Magnetization Curves (25/100°C)

TP45 μ' , μ'' vs. Frequency

TP45 Core Loss vs. Temperature



TP45 Core Loss vs. Flux Density

