

TM50A 为高频高磁导率锰锌功率铁氧体，初始磁导率 (μ_i) 2500 为高频群最高，饱和磁通密度 (B_s) 550 mT (25 °C) / 450 mT (100 °C)，居里温度高于 240 °C。高 μ_i 与 450 mT 的热态 B_s 让它在 300–500 kHz 能承受较大的磁通摆幅，25 kHz / 400 mT 的增幅磁导率 (μ_a) 在 100 °C 仍大于 3500：500 kHz / 100 mT 为 800 → 700 kW/m³，500 kHz / 50 mT 为 120 → 100 kW/m³，300 kHz / 100 mT 在 25 °C 仅 150 kW/m³；100 °C 矫顽力 (H_c) 8 A/m、残留磁通密度 (B_r) 70 mT。1 MHz / 30 mT 为 210 → 150 kW/m³，只适合低磁通工作点，有效覆盖频率以 500 kHz 为界。典型应用为 300–500 kHz 的 LLC 谐振变压器与谐振电感、通信与伺服器电源、中高频半桥变压器。在高频群中，TM50A 与 TM59 成对：需要高 μ_i 减少匝数、或磁通摆幅偏大时选 TM50A；500 kHz 以上或追求热态最低损耗 (500 kHz / 50 mT 100 °C 50 kW/m³) 与最低 B_r 选 TM59。300 kHz / 100 mT 由 25 °C 的 150 升到 100 °C 的 280 kW/m³，热设计要按热态值估。

TM50A is a high-frequency high-permeability MnZn power ferrite with an initial permeability (μ_i) of 2500, the highest in the high-frequency group, a saturation flux density (B_s) of 550 mT at 25 °C (450 mT at 100 °C) and a Curie temperature above 240 °C. High μ_i , 450 mT of hot-state B_s and an amplitude permeability (μ_a) above 3500 at 100 °C let it carry larger flux swings at 300–500 kHz: 800 → 700 kW/m³ at 500 kHz / 100 mT, 120 → 100 kW/m³ at 500 kHz / 50 mT and only 150 kW/m³ at 25 °C for 300 kHz / 100 mT; at 100 °C coercivity (H_c) is 8 A/m and remanence (B_r) 70 mT. 1 MHz / 30 mT reads 210 → 150 kW/m³ — low-flux use only, so effective coverage ends around 500 kHz. Typical uses are 300–500 kHz LLC resonant transformers and inductors, telecom and server supplies and half-bridge transformers. Within the high-frequency group TM50A pairs with TM59: choose TM50A for higher μ_i or larger flux swing, TM59 above 500 kHz or for the lowest hot-state loss (50 kW/m³ at 500 kHz / 50 mT, 100 °C) and lowest B_r . As 300 kHz / 100 mT rises from 150 to 280 kW/m³ at 100 °C, size the thermal design on the hot value.

- LLC Resonant Transformer
- Resonant Inductor
- Telecom / Server Power
- Medium-High-Frequency 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_i	100 kHz & <0.2 mT	2500±25%		
增幅磁导率 Amplitude Permeability μ_a	25 kHz/400 mT	> 3500	> 3500	
饱和磁通密度 Saturation Flux Density B_s	1200 A/m 100 Hz	550	450	mT
残留磁通密度 Remanence B_r	1200 A/m 100 Hz	90	70	mT
矫顽力 Coercivity H_c	1200 A/m 100 Hz	18	8	A/m
相对损耗因子 Loss Factor	100 kHz & <0.2 mT	<5		10 ⁻⁶
居里温度 Curie Temperature T_c	100 kHz & <0.2 mT	>240		°C
密度 Density D	阿基米德法 Archimedes method	>4.85		g/cm ³
电阻率 Electrical Resistivity ρ	直流电流 DC Current	>10		Ω·m

功率损耗 P_{cv}

POWER LOSS · KW/M³

测试条件 Condition	25 °C	100 °C	测试条件 Condition	25 °C	100 °C
300 kHz/100 mT	150	280	500 kHz/100 mT	800	700
500 kHz/50 mT	120	100	1000 kHz/30 mT	210	150

Steinmetz 系数

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

频段 Range	K	α	β
100 ≤500	1.16E-07	1.4754	2.89164
100 ≤1000	2.31E-06	1.51745	2.20134

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TM50A

特性曲线

CHARACTERISTIC CURVES

