

TM71

高磁导率功率材料
HIGH-PERMEABILITY POWER FERRITE

TM71 为高磁导率锰锌功率铁氧体，初始磁导率 (μ_i) 3800 为功率系列最高，饱和磁通密度 (B_s) 550 mT (25 °C) / 425 mT (100 °C)，居里温度高于 255 °C。矫顽力 (H_c) 仅 6 A/m (25 °C) / 2.5 A/m (100 °C)，100 kHz 相对损耗因子低于 4×10^{-6} ；高 μ_i 与低 H_c 让同一激磁电感的匝数最少、激磁电流最小，脉冲的顶降与回复都快。但损耗对温度敏感：100 kHz / 200 mT 由 25 °C 的 400 kW/m³ 升到 100 °C 的 1100 kW/m³，500 kHz / 50 mT 为 190 → 525 kW/m³，磁芯升温后不再是低损耗材料。典型应用为栅极驱动与脉冲变压器、信号隔离变压器、低磁通的储能与滤波电感。在 300 kHz 以下功率材中，TM71 以 μ_i 而非损耗取胜：磁芯长时间高温或大磁通摆幅的主变压器改用 TM80 / TM83。25 °C 条件下它的直流偏磁表现领先，到 100 °C 优势随损耗上升而消失，选用必须以实际磁芯温度为准。

TM71 is a high-permeability MnZn power ferrite with an initial permeability (μ_i) of 3800 — the highest in the power series — a saturation flux density (B_s) of 550 mT at 25 °C (425 mT at 100 °C) and a Curie temperature above 255 °C. Coercivity (H_c) is only 6 A/m at 25 °C (2.5 A/m at 100 °C) and the relative loss factor at 100 kHz below 4×10^{-6} : high μ_i and low H_c give the fewest turns and the smallest magnetising current for a given inductance, so pulse droop and recovery are fast. Loss, however, is temperature-sensitive: 100 kHz / 200 mT rises from 400 kW/m³ at 25 °C to 1100 kW/m³ at 100 °C and 500 kHz / 50 mT from 190 to 525 kW/m³ — once hot it is no longer a low-loss grade. Typical uses are gate-drive and pulse transformers, signal isolation transformers and low-flux storage and filter inductors. Among sub-300 kHz power grades TM71 wins on μ_i , not loss: main transformers that run hot or at large flux swing belong to TM80/TM83. Its DC-bias performance leads at 25 °C but the advantage disappears at 100 °C as loss climbs, so select on the actual core temperature.

Gate-Drive Transformer

Pulse Transformer

Signal Isolation Transformer

Low-Flux Storage Inductor

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	3800±25%		
增幅磁导率 Amplitude Permeability μ_a	25 kHz/400 mT	> 4000	> 3000	
饱和磁通密度 Saturation Flux Density B_s	1200 A/m 100 Hz	550	425	mT
残留磁通密度 Remanence B_r	1200 A/m 100 Hz	80	150	mT
矫顽力 Coercivity H_c	1200 A/m 100 Hz	6	2.5	A/m
相对损耗因子 Loss Factor	100 kHz & <0.2 mT	< 4		10^{-6}
居里温度 Curie Temperature T_c	100 kHz & <0.2 mT	> 255		°C
密度 Density D	阿基米德法 Archimedes method	4.9		g/cm ³
电阻率 Electrical Resistivity ρ	直流电流 DC Current	> 5		$\Omega \cdot m$

功率损耗 P_{cv} POWER LOSS · KW/M³

测试条件 Condition	25 °C	100 °C
100 kHz/200 mT	400	1100
300 kHz/50 mT	50	170
500 kHz/50 mT	190	525

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TM71

特性曲线

CHARACTERISTIC CURVES

