

TM65

高频电感功率材料
HIGH-FREQUENCY INDUCTOR POWER FERRITE

TM65 为高频电感用锰锌功率铁氧体，初始磁导率 (μ_i) 1300 为 700 kHz 以上群组最高，饱和磁通密度 (B_s) 540 mT (25 °C) / 440 mT (100 °C)，居里温度高于 240 °C。损耗谷底在热态：1 MHz / 50 mT 由 25 °C 的 250 kW/m³ 降到 100 °C 的 180 kW/m³，800 kHz / 60 mT 为 300 → 220 kW/m³，1 MHz / 30 mT 仅 70 → 50 kW/m³；100 °C 残留磁通密度 (B_r) 50 mT 把磁滞损压低。在同一颗 UD 磁芯的八材质直流偏磁实测中，220 nH 档 100 °C I@90 % 达 47.3 A，与 TM59 同级而高频损耗更低，这正是单匝、大电流、MHz 级电感所要的组合。典型应用为 CPU / GPU 供电的 VRM 与 TLVR 电感、POL 高频电感、1 MHz 级 DC-DC 电感与变压器。在 700 kHz–5 MHz 群中，TM65 以 μ_i 与偏磁能力区隔：1 MHz 以上的变压器、高频损耗优先时选 TM61；2 MHz 以上选 TM63。500 kHz / 100 mT 为 600 → 630 kW/m³，700 kHz 以下大磁通的工作点仍以 TM59 为主。

TM65 is a high-frequency inductor MnZn power ferrite with an initial permeability (μ_i) of 1300, the highest in the above-700 kHz group, a saturation flux density (B_s) of 540 mT at 25 °C (440 mT at 100 °C) and a Curie temperature above 240 °C. Its loss minimum lies at operating temperature: 1 MHz / 50 mT falls from 250 kW/m³ at 25 °C to 180 kW/m³ at 100 °C, 800 kHz / 60 mT from 300 to 220 kW/m³, and 1 MHz / 30 mT is only 70 → 50 kW/m³; a remanence (B_r) of 50 mT at 100 °C keeps hysteresis loss low. In the eight-grade DC-bias test on one UD core it reaches I@90 % = 47.3 A at 100 °C (220 nH band), on a par with TM59 but with lower high-frequency loss — what a single-turn, high-current MHz inductor needs. Typical uses are VRM/TLVR inductors, POL high-frequency inductors and 1 MHz-class DC-DC magnetics. Within the 700 kHz–5 MHz group TM65 is set apart by μ_i and bias capability: choose TM61 for transformers above 1 MHz where loss comes first, TM63 above 2 MHz. At 500 kHz / 100 mT it reads 600 → 630 kW/m³, so large-flux points below 700 kHz still belong to TM59.

- VRM / TLVR Inductor
- POL High-Frequency Inductor
- MHz DC-DC Inductor
- 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	1300±25%		
增幅磁导率 Amplitude Permeability μ_a	25 kHz/400 mT	> 2400	> 2400	
饱和磁通密度 Saturation Flux Density B_s	1200 A/m 100 Hz	540	440	mT
残留磁通密度 Remanence B_r	1200 A/m 100 Hz	70	50	mT
矫顽力 Coercivity H_c	1200 A/m 100 Hz	15	20	A/m
相对损耗因子 Loss Factor	100 kHz & <0.2 mT	<15		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
500 kHz/50 mT	70	50	800 kHz/80 mT	650	600
500 kHz/100 mT	600	630	1 MHz/30 mT	70	50
800 kHz/60 mT	300	220	1 MHz/50 mT	250	180

Steinmetz 系数

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

频段 Range	K	α	β
100 ≤500	5.064E-09	1.3197	3.7683
100 ≤1000	1.313E-10	1.7771	3.9893
100 ≤3000	2.212E-13	2.7658	3.8768

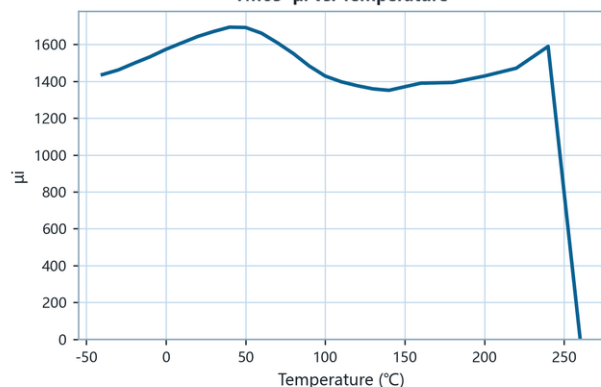
特性曲线详见次页

CHARACTERISTIC CURVES — SEE NEXT PAGE

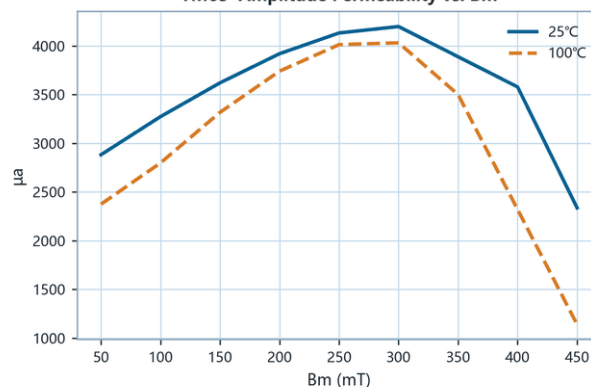
TM65

特性曲线

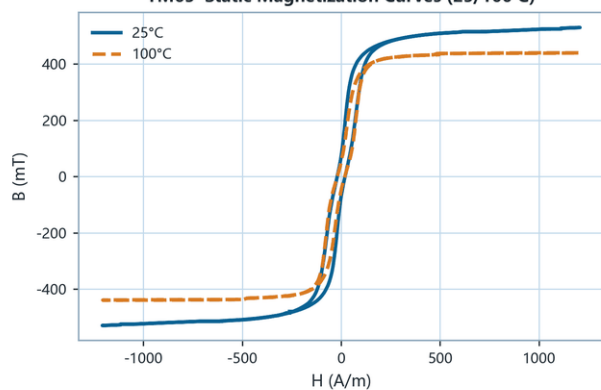
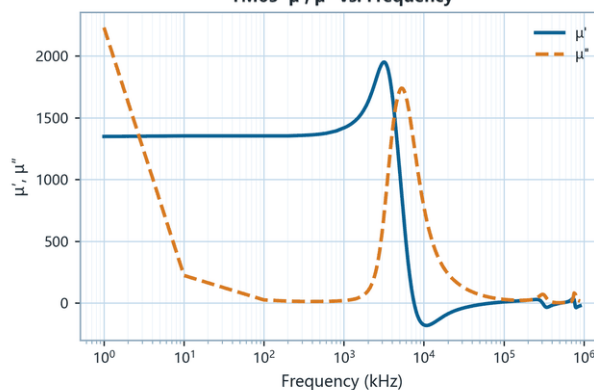
CHARACTERISTIC CURVES

TM65 μ_i vs. Temperature

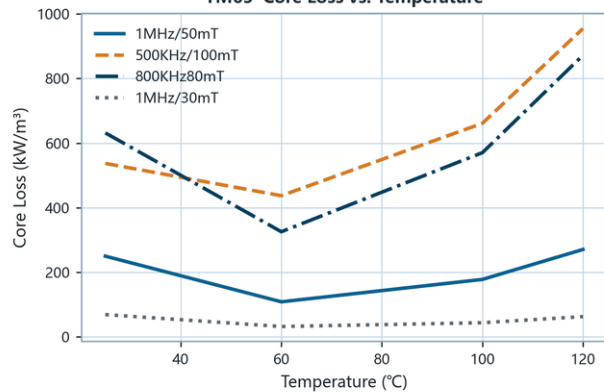
TM65 Amplitude Permeability vs. Bm



TM65 Static Magnetization Curves (25/100°C)

TM65 μ' , μ'' vs. Frequency

TM65 Core Loss vs. Temperature



TM65 Core Loss vs. Flux Density

