

TM81

宽温中频低损耗材料
WIDE-TEMPERATURE MID-FREQUENCY LOW-LOSS FERRITE

TM81 为宽温中频低损耗锰锌功率铁氧体，初始磁导率 (μ) 3000，饱和磁通密度 (Bs) 520 mT (25 °C) / 420 mT (100 °C)，居里温度高于 220 °C。损耗曲线针对 300 kHz / 100 mT 调整：该点为 260 kW/m³ (25 °C) / 310 kW/m³ (100 °C)，200 kHz / 125 mT 为 230 → 270 kW/m³，两个温度的差距都在两成以内，冷机与热态表现一致；残留磁通密度 (Br) 50 mT、矫顽力 (Hc) 7 A/m (100 °C) 把磁滞损压低。100 kHz / 200 mT 为 340 → 400 kW/m³，与 TM80 相当而略高于其 100 °C 值。典型应用为 200–300 kHz 的 LLC 谐振与半桥变压器、伺服器与通信电源、PFC 前级的宽温设计。在宽温三支中，TM81 是 300 kHz 段的选择：工作点在 100 kHz 高磁通时回到 TM80 (100 °C 330 kW/m³)；磁芯长时间停在 120–140 °C 则选 TM83。以工作频率与磁通摆幅定位，再以磁芯实际温度确认损耗。

TM81 is a wide-temperature mid-frequency low-loss MnZn power ferrite with an initial permeability (μ) of 3000, a saturation flux density (Bs) of 520 mT at 25 °C (420 mT at 100 °C) and a Curie temperature above 220 °C. Its loss curve is tuned for 300 kHz / 100 mT: 260 kW/m³ at 25 °C and 310 kW/m³ at 100 °C, with 230 → 270 kW/m³ at 200 kHz / 125 mT — both spreads stay within 20 %, so cold start and hot steady state behave alike; a remanence (Br) of 50 mT and coercivity (Hc) of 7 A/m at 100 °C keep hysteresis loss low. At 100 kHz / 200 mT it reads 340 → 400 kW/m³, comparable to TM80 but slightly above its 100 °C value. Typical uses are 200–300 kHz LLC resonant and half-bridge transformers, server and telecom supplies and wide-temperature PFC front ends. Within the wide-temperature trio TM81 is the choice for the 300 kHz region: return to TM80 (330 kW/m³ at 100 °C) for 100 kHz high-flux operating points, or move to TM83 when the core sits at 120–140 °C. Position by frequency and flux swing, then confirm loss at the actual core temperature.

- LLC Resonant Transformer
- Server / Telecom Power
- PFC Front-End
- Wide-Temperature Supply

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	3000±25%		
增幅磁导率 Amplitude Permeability μ_a	25 kHz/400 mT	> 4000	> 3400	
饱和磁通密度 Saturation Flux Density Bs	1200 A/m 100 Hz	520	420	mT
残留磁通密度 Remanence Br	1200 A/m 100 Hz	70	50	mT
矫顽力 Coercivity Hc	1200 A/m 100 Hz	10	7	A/m
相对损耗因子 Loss Factor	100 kHz & <0.2 mT	<5		10 ⁻⁶
居里温度 Curie Temperature Tc	100 kHz & <0.2 mT	>220		°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	>5		Ω·m

功率损耗 Pcv POWER LOSS · KW/M³

测试条件 Condition	25 °C	100 °C
100 kHz/200 mT	340	400
200 kHz/125 mT	230	270
300 kHz/100 mT	260	310

Steinmetz 系数 Pcv = K · f^α · B^β

频段 Range	K	α	β
100 ≤200	6.48E-08	1.73019	2.7204
100 ≤500	1.07E-06	1.62784	2.27797
100 ≤1000	3.79E-06	1.71035	1.93164

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TM81

特性曲线

CHARACTERISTIC CURVES

