TM61

MHz 级低损耗功率材料
MHZ-BAND LOW-LOSS POWER FERRITE

TM61 为 MHz 级低损耗锰锌功率铁氧体，初始磁导率（μi）1000，饱和磁通密度（Bs）540 mT（25 ℃）/ 440 mT（100 ℃），居里温度高于 260 ℃。1 MHz / 50 mT 之 Pcv 为 190 → 155 kW/m³，3 MHz / 10 mT 为 100 → 90 kW/m³，两点均呈负温度系数；100 ℃ 之残留磁通密度（Br）50 mT、矫顽力（Hc）15 A/m。μi 1000 使磁导率之交越频率（μ″ = μ′）提高，GaN / SiC 元件以 1–3 MHz 切换时，磁芯损耗不构成效率限制。在 TM65 推出之前，TM61 为 MHz 级功率电感与变压器之共用材料，应用于 MHz DC-DC 之储能与滤波电感、GaN / SiC 谐振与隔离变压器。于高频功率材料之中，TM61 属前一代：新设计之 MHz 级电感建议采用 TM65（μi 1300，100 ℃ 直流偏磁 I@90 % 47.3 A，TM61 为 42.1 A）；TM61 持续供应既有设计，1–3 MHz 变压器亦可沿用（1 MHz / 50 mT 热态 155 kW/m³）。小尺寸 MHz 级变压器首选 TM63；500 kHz / 100 mT 为 550 → 700 kW/m³，700 kHz 以下非其适用范围。

TM61 is an MHz-band low-loss MnZn power ferrite with an initial permeability (μi) of 1000, a saturation flux density (Bs) of 540 mT at 25 °C (440 mT at 100 °C) and a Curie temperature above 260 °C. Pcv at 1 MHz / 50 mT is 190 → 155 kW/m³ and at 3 MHz / 10 mT 100 → 90 kW/m³, both with a negative temperature coefficient; at 100 °C the remanence (Br) is 50 mT and the coercivity (Hc) 15 A/m. A μi of 1000 raises the permeability cut-off frequency, so core loss does not limit efficiency when GaN/SiC devices switch at 1–3 MHz. Before the introduction of TM65, TM61 was the common grade for MHz-class power inductors and transformers, used in storage and filter inductors of MHz DC-DC converters and in GaN/SiC resonant and isolation transformers. Among the high-frequency grades TM61 is the earlier generation: TM65 is recommended for new MHz-class inductor designs (μi 1300, 100 °C I@90 % = 47.3 A against 42.1 A for TM61); TM61 remains in supply for existing designs and remains applicable to 1–3 MHz transformers (155 kW/m³ at 1 MHz / 50 mT, 100 °C). Small-size MHz transformers should use TM63; at 500 kHz / 100 mT it reads 550 → 700 kW/m³, so frequencies below 700 kHz are outside its intended range.

MHz Power Inductor (existing designs) | MHz DC-DC Converter | GaN / SiC Resonant Transformer | Isolation Transformer

电磁特性 MAGNETIC CHARACTERISTICS

特性 Characteristic	条件 Condition	25 ℃	100 ℃	单位 Unit
初始磁导率 Initial Permeability μi	100 kHz & <0.2 mT	1000±25%		
增幅磁导率 Amplitude Permeability μa	25 kHz/400 mT	> 2200	> 2000	
饱和磁通密度 Saturation Flux Density Bs	1200 A/m 50 Hz	540	440	mT
残留磁通密度 Remanence Br	1200 A/m 50 Hz	90	50	mT
矫顽力 Coercivity Hc	1200 A/m 50 Hz	20	15	A/m
相对损耗因子 Loss Factor	100 kHz	<5	<10	10^{-6}
居里温度 Curie Temperature Tc	100 kHz & <0.2 mT	>260		℃
密度 Density D	阿基米德法 Archimedes method	4.85		g/cm³
电阻率 Electrical Resistivity ρ	直流电流 DC Current	10		Ω·m

功率损耗 Pcv POWER LOSS · KW/M³

测试条件 Condition	25 ℃	100 ℃
500 kHz/100 mT	550	700
1 MHz/50 mT	190	155
3 MHz/10 mT	100	90

Steinmetz 系数 Pcv = K·f^α·B^β

频段 Range	K	α	β
100 ≤500	1.15E-08	1.29795	3.63096
100 ≤1000	5.21E-09	1.35237	3.7374
100 ≤3000	5.60E-06	1.65511	1.57087

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

TM61

特性曲线
CHARACTERISTIC CURVES











