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RAISING THE BAR IN HIGH PERMEABILITY MATERIALS

3E10

TIGHT TOLERANCE

INCREASED  $\mu$

EXTENDED IMPEDANCE BANDWIDTH

3E12

ENHANCED PERFORMANCE IN EMC

# 3E10

## 3E10: The best process control with extended bandwidth

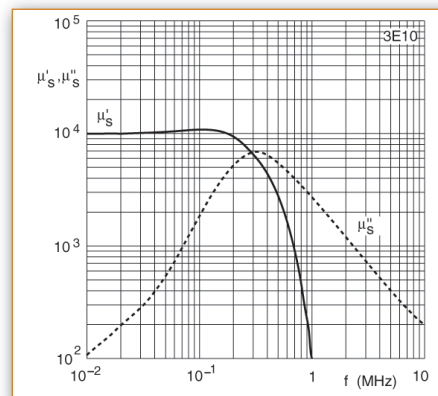
3E10 achieves the tightest tolerance in your final product, so winding and potting operations have less impact on the permeability. This means better control of the final characteristics of the component in you specific application.

Extensive material research at Ferroxcube has lead to the improvement in permeability stability with frequency, which in turn creates reduced magnetic losses and higher common mode impedance over a wider frequency range.

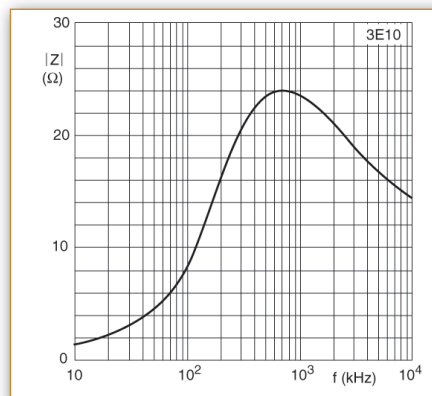
3E10 is the choice when looking for a robust manufacturing process and maximum frequency stability.

**Material characteristics**  
A high permeability material optimized for use in wideband transformers as well as EMI-suppression filters

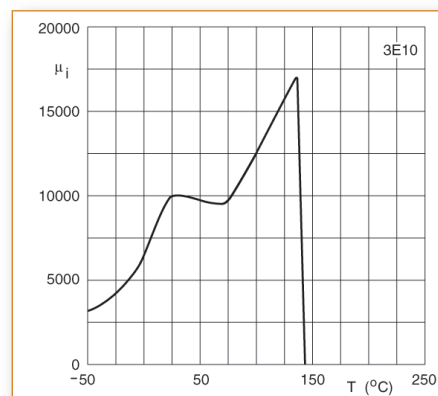
SYMBOL	CONDITIONS	VALUE	UNIT
$\mu_i$	25 °C; $\leq 10$ kHz; 0.25 mT	10000 $\pm$ 20%	
B	25 °C; 10 kHz; 1200 A/m 100 °C; 10 kHz; 1200 A/m	$\approx 460$ $\approx 270$	mT
$\tan\delta/\mu_i$	25 °C; 30 kHz; 0.25 mT 25 °C; 100 kHz; 0.25 mT	$\leq 5 \times 10^{-6}$ $\leq 20 \times 10^{-6}$	
$\eta_B$	25 °C; 10 kHz; 1.5 to 3 mT	$\leq 0.5 \times 10^{-3}$	T <sup>-1</sup>
$\rho$	DC; 25 °C	$\approx 0.5$	$\Omega\text{m}$
$T_C$		$\geq 130$	°C
density		$\approx 5000$	kg/m <sup>3</sup>



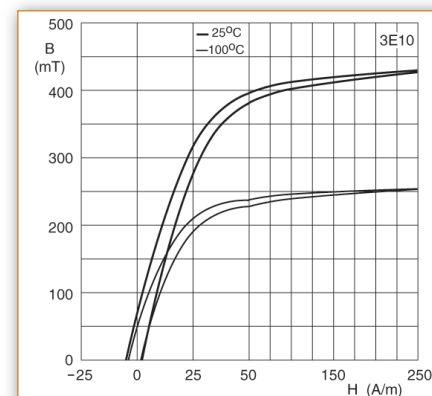
**Fig. 1:** Complex permeability as a function of frequency



**Fig. 2:** Impedance as a function of frequency, measured on a toroid  $\varnothing 25 \times \varnothing 15 \times 10$



**Fig. 3:** Initial permeability as a function of temperature



**Fig. 4:** Typical B-H loops

# 3E12

## 3E12: The highest impedance and permeability

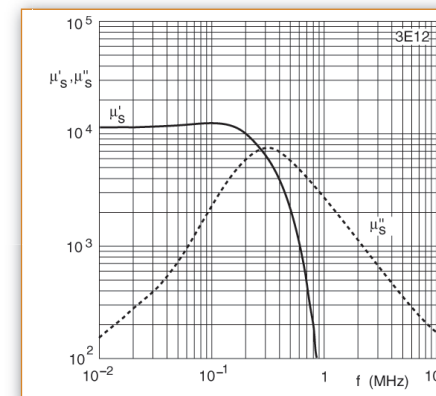
3E12's superior high permeability results in:

- Ability to reduce the size of the toroid or the number of windings, and thus less DC resistance.
- Increased coupling between windings resulting in a decrease of differential mode impedance.

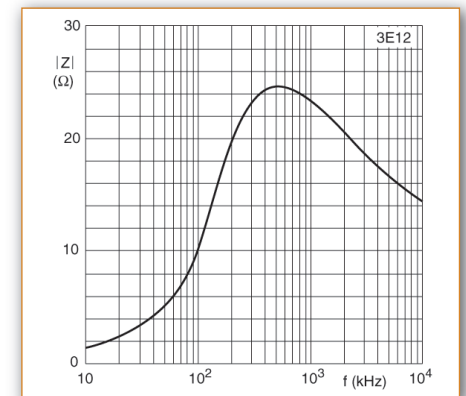
3E12 is your choice if you want the best inductor performance and the highest impedance.

**Material characteristics**  
A high permeability material optimized for use in wideband transformers as well as EMI-suppression filters

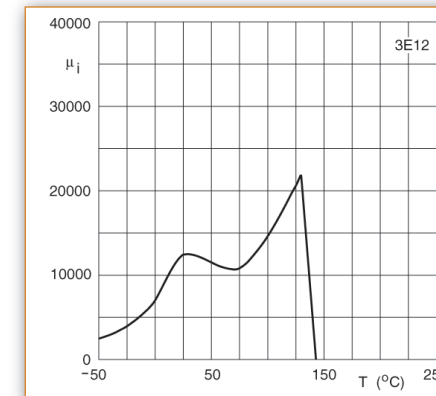
SYMBOL	CONDITIONS	VALUE	UNIT
$\mu_i$	25 °C; $\leq 10$ kHz; 0.25 mT	12000 $\pm$ 20%	
B	25 °C; 10 kHz; 1200 A/m 100 °C; 10 kHz; 1200 A/m	$\approx 470$ $\approx 290$	mT
$\tan\delta/\mu_i$	25 °C; 30 kHz; 0.25 mT 25 °C; 100 kHz; 0.25 mT	$\leq 7 \times 10^{-6}$ $\leq 25 \times 10^{-6}$	
$\eta_B$	25 °C; 10 kHz; 1.5 to 3 mT	$\leq 0.5 \times 10^{-3}$	T <sup>-1</sup>
$\rho$	DC; 25 °C	$\approx 0.5$	$\Omega\text{m}$
$T_C$		$\geq 130$	°C
density		$\approx 5000$	kg/m <sup>3</sup>



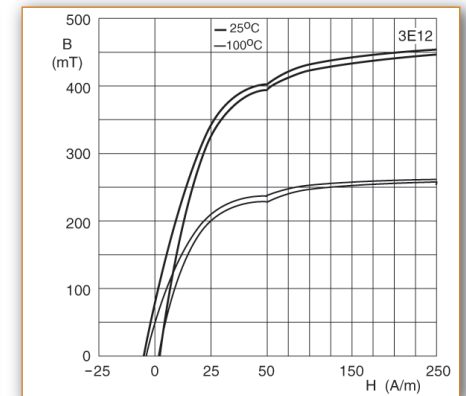
**Fig. 5:** Complex permeability as a function of frequency



**Fig. 6:** Impedance as a function of frequency, measured on a toroid  $\varnothing 25 \times \varnothing 15 \times 10$



**Fig. 7:** Initial permeability as a function of temperature



**Fig. 8:** Typical B-H loops