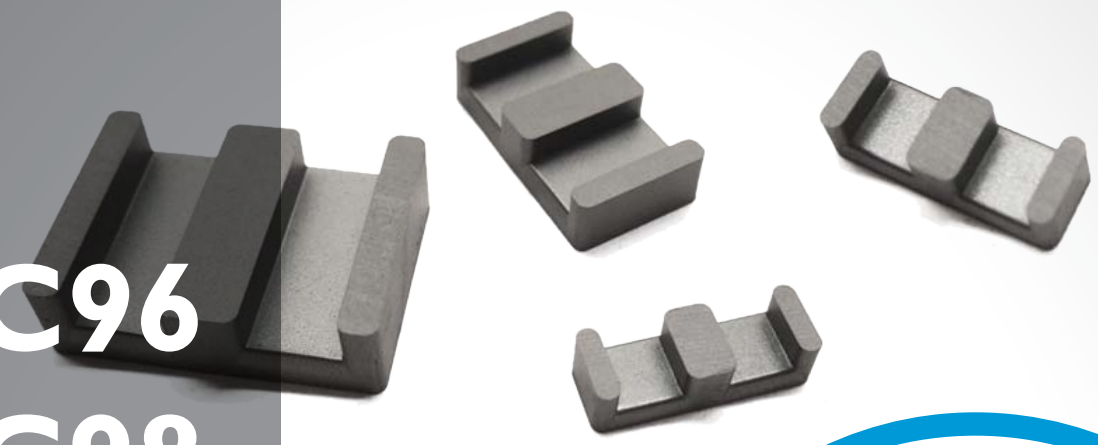
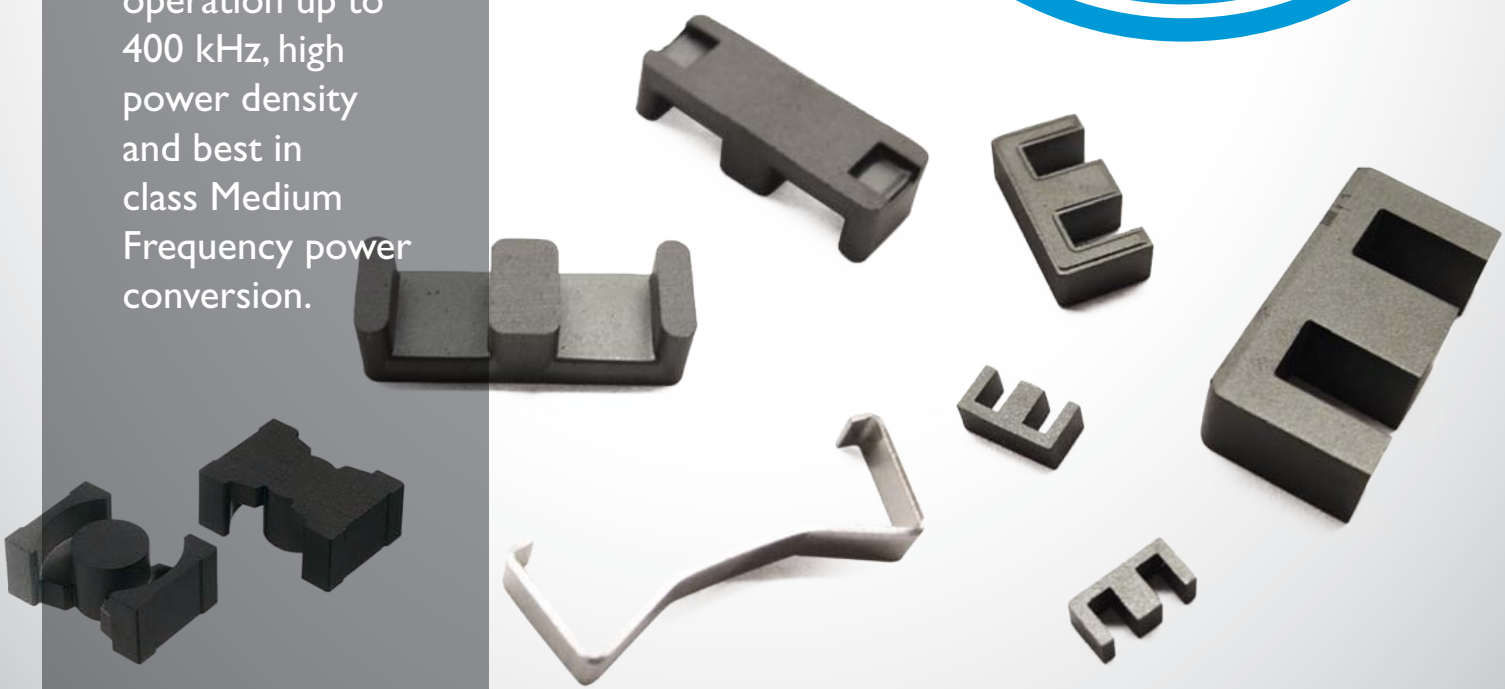
3C96
3C98

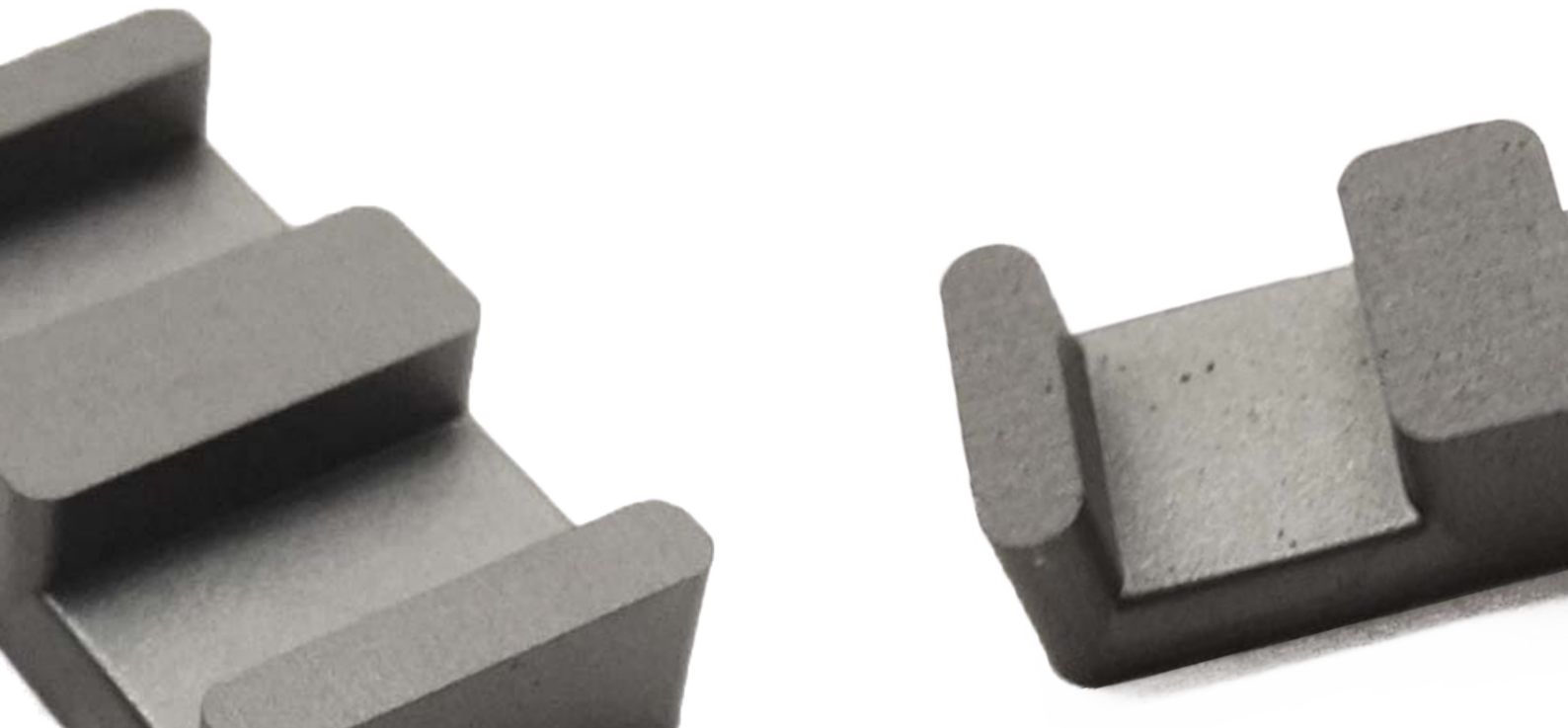


FERROXCUBE

BEST IN CLASS

High efficiency, operation up to 400 kHz, high power density and best in class Medium Frequency power conversion.

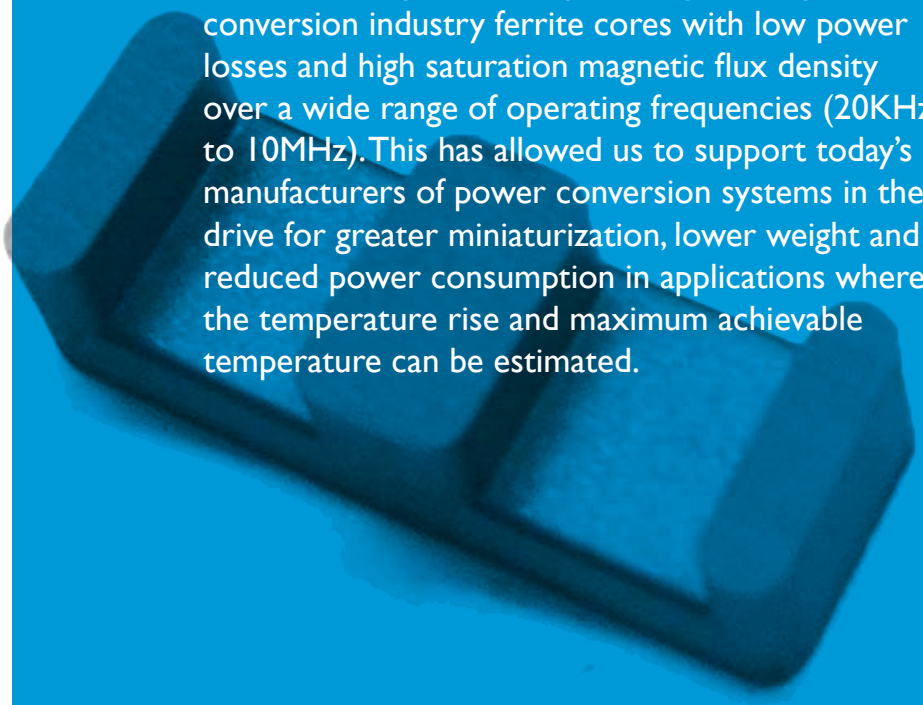




Formerly, a Philips Components company we now belong to the Yageo Group, one of the world's strongest suppliers of passive components. As a leading supplier of ferrite components, FERROXCUBE has manufacturing operations, sales offices, and customer service centers all over the world.

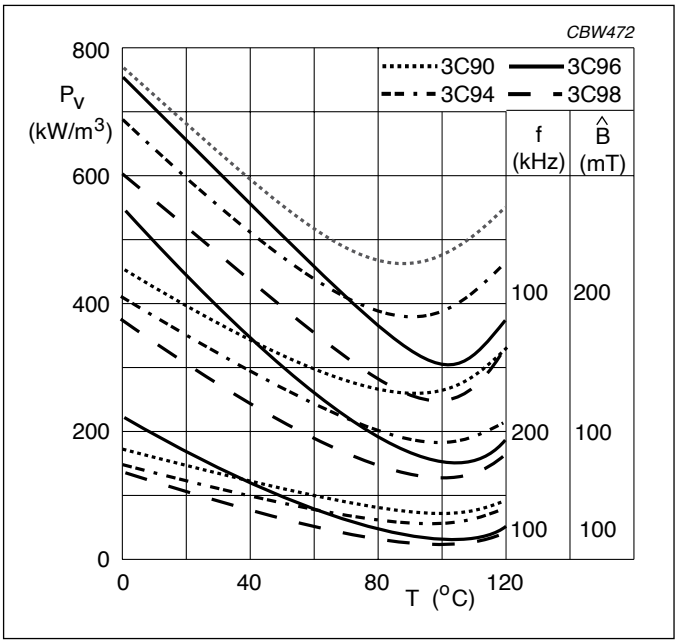
We supply one of the broadest ranges of high-quality, innovative products and place strong emphasis on miniaturization of magnetic functions. Ferrite components and accessories from FERROXCUBE are used in a wide range of applications, from telecommunications and computing electronics through consumer electronic products to automotive.

FERROXCUBE as the leading manufacturer in the ferrite industry, has been providing to the power conversion industry ferrite cores with low power losses and high saturation magnetic flux density over a wide range of operating frequencies (20KHz to 10MHz). This has allowed us to support today's manufacturers of power conversion systems in their drive for greater miniaturization, lower weight and reduced power consumption in applications where the temperature rise and maximum achievable temperature can be estimated.



Energy loss in power conversion systems is generated, among others, in the magnetic components. Within the magnetics there are losses in the windings (due to ohmic losses) and on the ferrite core. Ferroxcube keeps on working to improve the ferrite materials used on them to offer solutions that enable fulfilling the most stringent energy efficiency standards, such as Energy Star or 80 Plus.

Power loss comparison



FXC 3C96 is a premium material for power conversion used in transformers and inductors working below 400 kHz. Low losses and high saturation flux have lead 3C96 to be the preferred material on applications demanding high efficiency. Together with FXC 3C90 and 3C94 completes the low loss power conversion material family with optimal working temperature at 100°C.

3C96

High efficiency, operation up to 400 kHz, high power density

Material Specifications

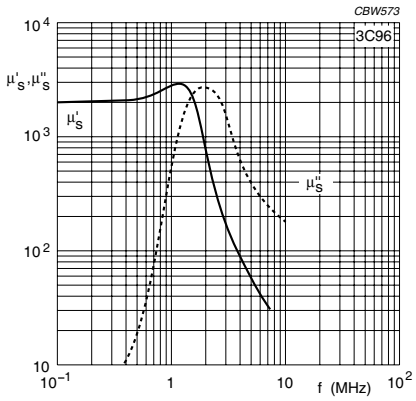


Fig. 1 Complex permeability as a function of frequency

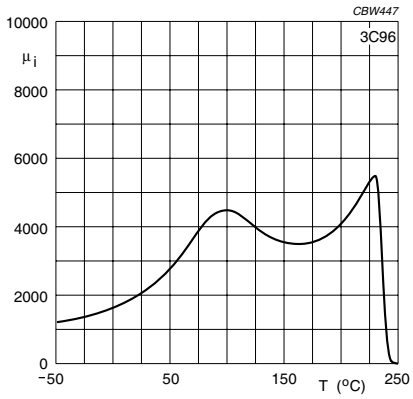


Fig. 2 Initial permeability as a function of temperature

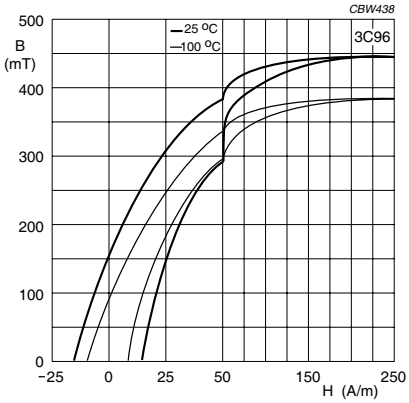


Fig. 3 Typical B-H loops

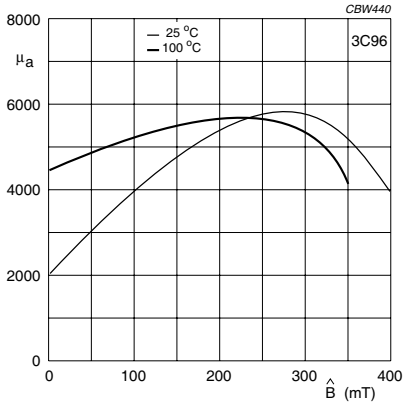


Fig. 4 Amplitude permeability as a function of peak flux density

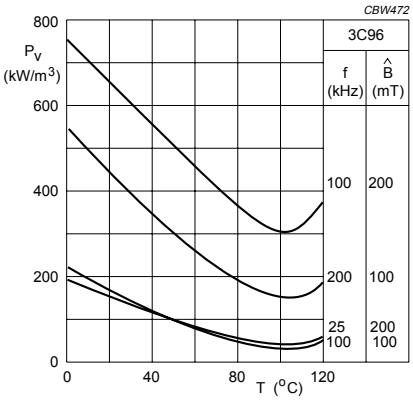


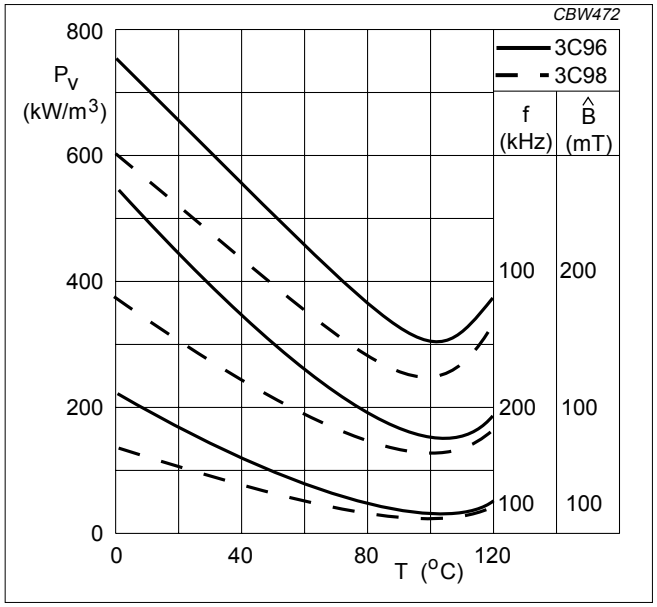
fig. 5 Specific power loss for several frequency/flux density combinations as a function of temperature

Property	Conditions			3C90	3C94	3C96	Unit
μ_i	25°C	10 kHz	0.25 mT	2300 ±20%	2300 ±20%	2000 ±20%	
μ_a	100°C	25 kHz	200 mT	≈ 5500	≈ 5500	≈ 5500	
B_{sat}	25°C	10 kHz	1.2 kA/m	≈ 470	≈ 470	≈ 500	mT
	100°C			≈ 380	≈ 380	≈ 440	
P_v	100°C	25 kHz	200 mT	< 80			kw/m^3
		100	100	< 80	≈ 50	≈ 40	
		100	200	≈ 450	≈ 350	≈ 300	
		500	50			≈ 250	
ρ	DC; 25°C			≈ 5	≈ 5	≈ 5	Ωm
T_c				≥ 220	≥ 220	≥ 240	°C
Density				≈ 4800	≈ 4800	≈ 4800	kg/m^3

FXC 3C98 is the new best in class medium frequency power conversion material, making a break-through on the key parameters that define the performance of power ferrites: extremely low losses under high flux conditions (250 mw/cm^3 at 100 kHz, 200 mT) and high saturation flux (530 mT). Being a material with minimum loss at 100°C, the loss curve has been flattened, resulting in good performance at room temperature.

These characteristics are more remarkable in the frequency band below 200 kHz, though the operating frequency spans up to 400 kHz.

Power loss comparison



3C98

Best in class Medium Frequency power conversion

Material Specifications

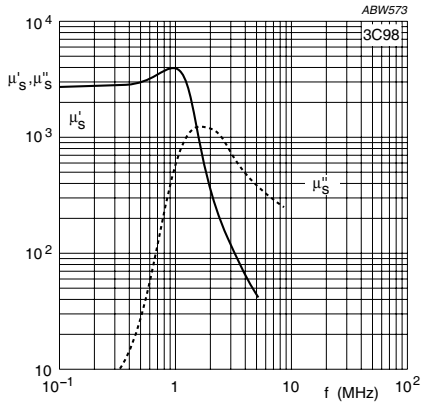
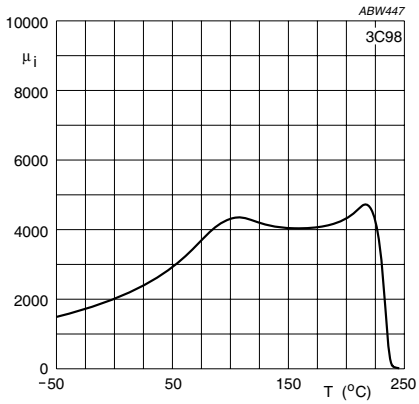


Fig. 1 Complex permeability as a function of frequency



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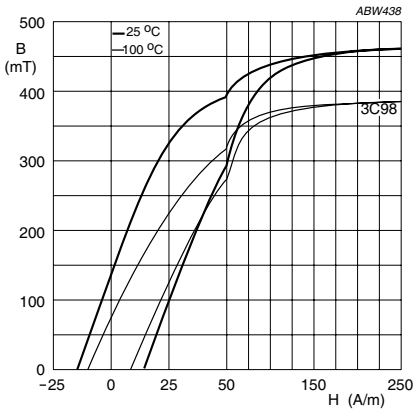

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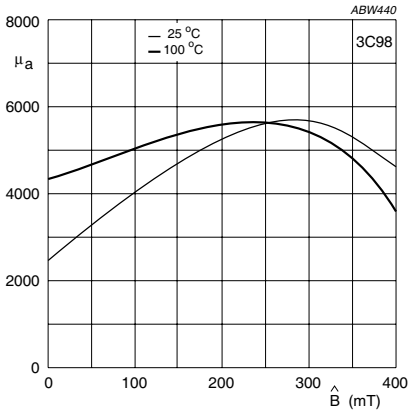

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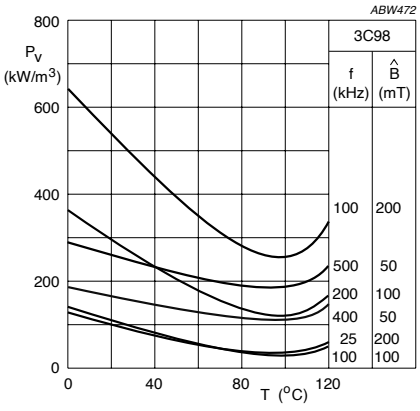

fig. 5 Specific power loss for several frequency/flux density combinations as a function of temperature

Symbol	Conditions	3C98	3C96	UNIT
μ_i	25 °C; 10 kHz; 0.25 mT	2500 ± 20%	2000 ± 20%	
μ_a	100 °C; 25 kHz; 200 mT	5500	5500	
B_{sat}	25 °C; 10 kHz; 1200 A/m 100 °C; 10 kHz; 1200 A/m	530 440	500 440	mT
P_v	100 °C; 100 kHz; 100 mT 100 °C; 100 kHz; 200 mT 100 °C; 500 kHz; 50 mT	40 250 250	40 300 250	kW/m³
T_c		>230	>240	°C
ρ	DC; 25 °C	8	5	Ωm
Density		4850	4800	kg/m³

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