

3S5

The new medium frequency EMI ferrite for high bias current conditions



Ferroxcube introduces 3S5, the superb material capable of EMI suppression up to 30 MHz in DC bias applications

In order to meet the EMI regulations in the frequency range from 150 kHz up to 30 MHz, FERROXCUBE has introduced its new 3S5 EMI suppression material. Although several ferrites are available for this frequency range, hardly any material can keep its absolute value of complex permeability (defining the inductor's impedance) when operating on a bias field (DC current). With the introduction of 3S5, FERROXCUBE is filling this gap. Applying 3S5 in an inductor gives EMI suppression over the full frequency range and has the major benefit of sufficient permeability even when high bias currents are applied.

Best of both worlds

As the major property of a common

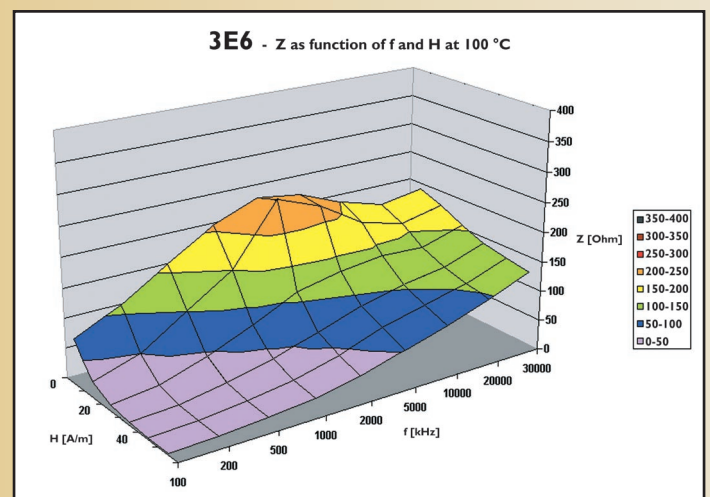
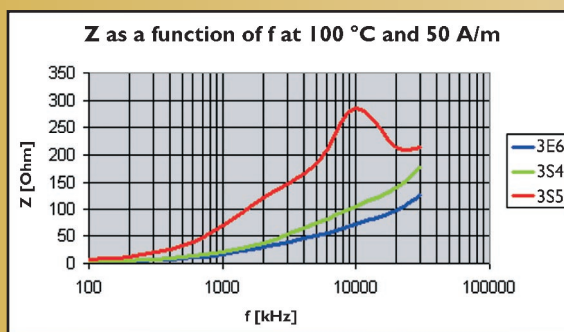
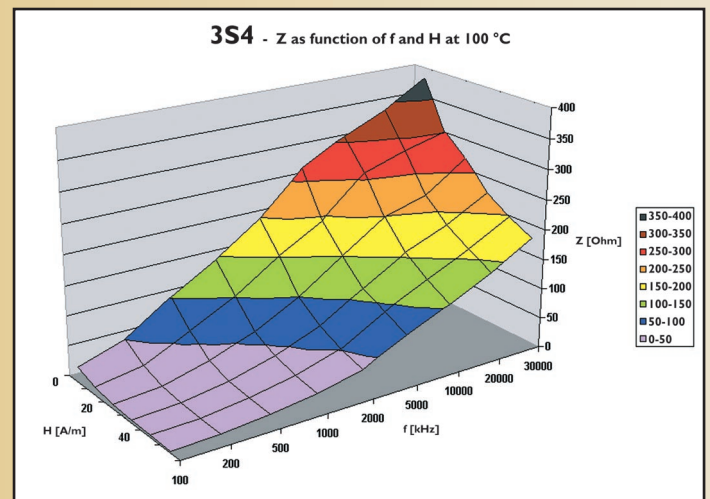
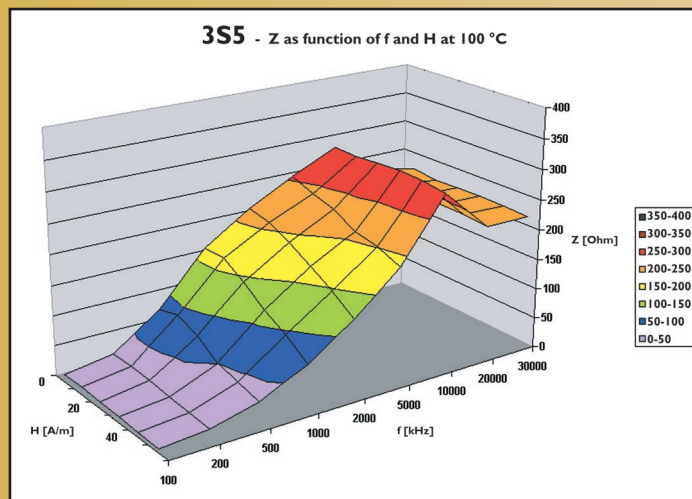
suppression material is a high value of the complex permeability, defining it's required impedance, the saturation value B_{sat} becomes important in those applications where bias currents are applied. It allows an EMI suppression inductor to operate on a high DC bias point without the risk of saturating. Although a high saturation value is a typical power ferrite property, FERROXCUBE has combined the best of both suppression and power properties in the 3S5 material. The material characteristics and typical graphs are given on the next page.

In the graphs below, the impedance plot of a number of our suppression ferrites is given for several load conditions. They have been measured

on T14/9/5 ring cores at an ambient temperature of 100 °C. It is clear that 3S5 gives the highest impedance and therefore the best suppressing capabilities over a wide frequency range with increasing load current.

Preferred applications

With the ever increasing demand of interference suppression, 3S5 can be applied in those applications where both high operating temperatures (140°C) and high currents are involved e.g. power lines in industrial, but especially automotive environments. Suppressing of interference signals along these lines can be achieved by inserting 3S5-based inductors. Suitable core shapes are those that are generally used for EMI suppression.



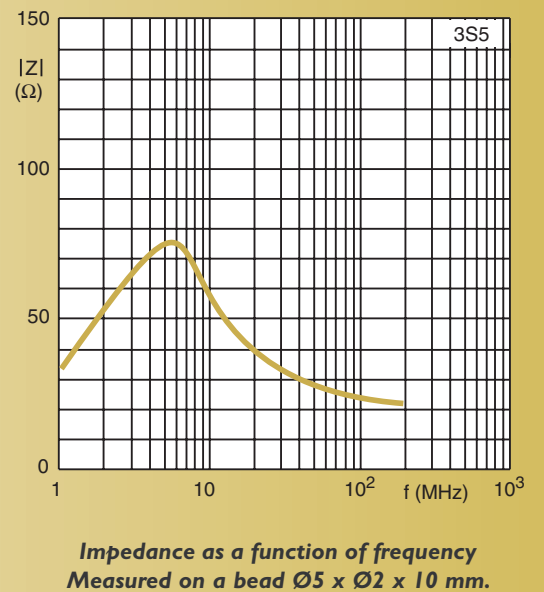
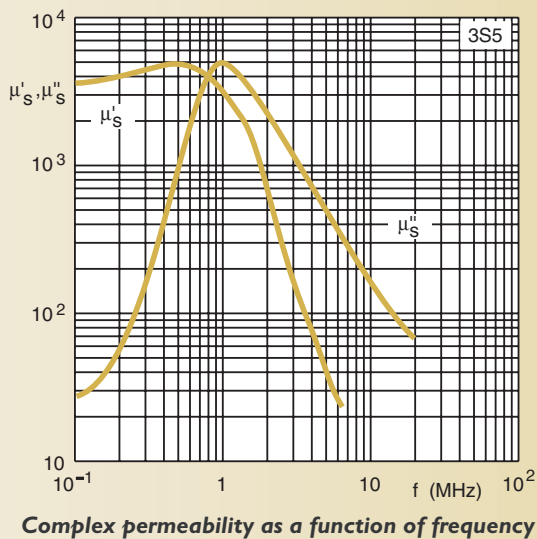
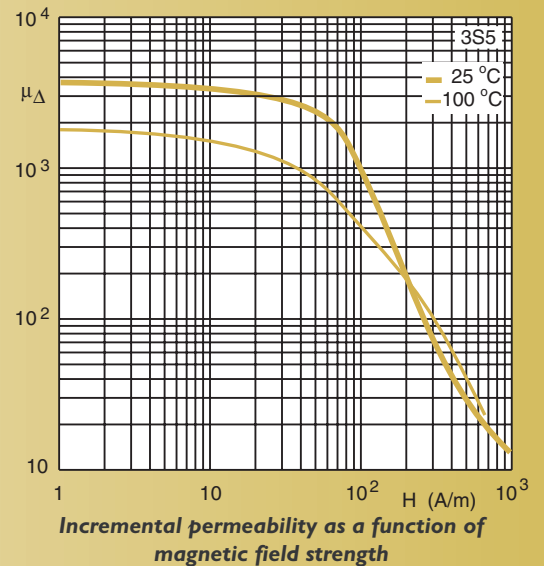
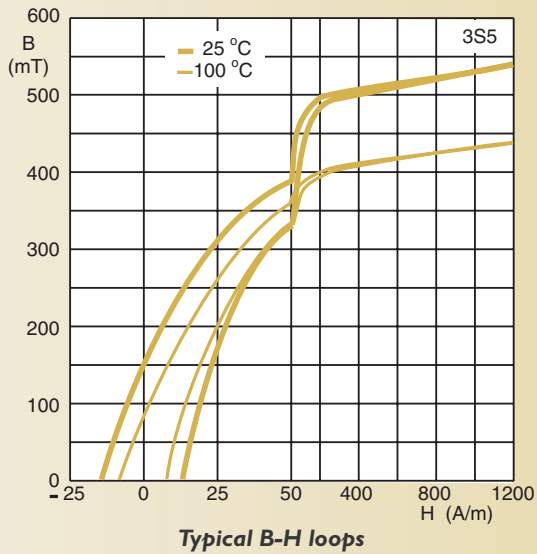
**Impedance curves at 100 °C,
measured on a toroid Ø14 x Ø9 x 5 mm
with 5 turns**

3S5 - Material Characteristics

	CONDITIONS	VALUE	UNIT
μ_i	25 °C, ≤ 10 kHz, 0.1 mT	$3800 \pm 20 \%$	
B	25 °C, 10 kHz, 1200 A/m 100 °C, 10 kHz, 1200 A/m	≈ 545 ≈ 435	mT
$ Z ^{(1)}$	25 °C, 1 MHz 25 °C, 10 MHz	≥ 20 ≥ 40	Ω
ρ	DC, 25 °C	≈ 10	Ωm
T_c		≥ 255	°C
density		≈ 4800	kg/m^3

Note

1. Measured on a bead $\varnothing 5 \times \varnothing 2 \times 10$ mm.



FERROXCUBE - your global partner

Australia: Contact Ferroxcube Taiwan
Tel. +886 2 86650099, Fax: +886 2 86650145

Austria: Contact Ferroxcube Germany
Tel: +49 (040) 527 28 305, Fax: +49 (040) 527 28 306

Benelux: Ferroxcube Netherlands, EINDHOVEN
Tel: +31 (0)40 27 24 216, Fax: +31 (0)40 27 24 411

Canada: Contact Ferroxcube USA
Tel: +1 915 599 2513/2328, Fax: +1 915 599 2555

China: Ferroxcube Hong Kong
Tel: +852 2319 2740, Fax: +852 2319 2757
Ferroxcube South of China
Tel: +86 769 7382420, Fax: +86 769 7339561
Ferroxcube Suzhou
Tel: +86 512 68095048, Fax: +86 512 68097128

Czech Republic: Contact Ferroxcube Poland
Tel: +48 46 834 00 07, Fax: +48 46 834 00 35

Denmark: Contact Ferroxcube Sweden
Tel: +46 8 580 119 76, Fax: +46 8 580 121 60

Finland: Contact Ferroxcube Sweden
Tel: +46 8 580 119 76, Fax: +46 8 580 121 60

France: Ferroxcube France, NANTERRE
Tel: +33 (01) 5551 8422, Fax: +33 (01) 5551 8423

Germany: Ferroxcube Germany, HAMBURG
Tel: +49 (040) 527 28 302, Fax: +49 (040) 527 28 306

Greece: Contact Ferroxcube Italy
Tel: +39 02 241131 1, Fax: +39 02 241131 11

Hungary: Contact Ferroxcube Poland
Tel: +48 46 834 00 07, Fax: +48 46 834 00 35

Indonesia: Contact Ferroxcube Singapore
Tel: +65 6244 7815, Fax: +65 6449 0446

Ireland: Contact Ferroxcube UK
Tel: +44 870 2418759, Fax: +44 870 2418761

Israel: Arrow\Rapac Ltd., PETACH TIKVA
Tel: +972 3 9203480, Fax: +972 3 9203443

Italy: Ferroxcube Italy, SESTO S. GIOVANNI (MI)
Tel: +39 02 241131 1, Fax: +39 02 241131 11

Korea: FC Tech Co., Ltd., SEOUL
Tel: +82 2 6352 4422, Fax: +82 2 6352 4420

Malaysia: Contact Ferroxcube Singapore
Tel: +65 6244 7815, Fax: +65 6449 0446

Mexico: Contact Ferroxcube USA
Tel: +1 915 599 2513/2328, Fax: +1 915 599 2555

New Zealand: Contact Ferroxcube Taiwan
Tel. +886 2 86650099, Fax: +886 2 86650145

Norway: Contact Ferroxcube Sweden

Philippines: Contact Ferroxcube Singapore
Tel: +65 6244 7815, Fax: +65 6449 0446

Poland: Ferroxcube Polska, SKIERNIEWICE
Tel: +48 46 834 00 07, Fax: +48 46 834 00 35

Portugal: Contact Hispano Ferritas, Spain
Tel: +34 (93) 317 2518, Fax: +34 (93) 302 3387

Singapore: Ferroxcube Singapore, SINGAPORE
Tel: +65 6244 7815, Fax: +65 6449 0446

Slovak Republic: Contact Ferroxcube Poland
Tel: +48 46 834 00 07, Fax: +48 46 834 00 35

Spain: Hispano Ferritas, GUADALAJARA
Tel: +34 (949) 247 153, Fax: +34 (949) 247 146

Sweden: Ferroxcube Sweden, JÄRFÄLLA
Tel: +46 8 580 119 76, Fax: +46 8 580 121 60

Switzerland: Contact Ferroxcube Germany
Tel: +49 (040) 527 28 305, Fax: +49 (040) 527 28 306

Taiwan: Ferroxcube Taiwan, TAIPEI
Tel. +886 2 86650099, Fax: +886 2 86650145

Turkey: Contact Ferroxcube Italy
Tel: +39 02 241131 1, Fax: +39 02 241131 11

United Kingdom: Ferroxcube UK, LEATHERHEAD
Tel: +44 870 2418759, Fax: +44 870 2418761

United States: Ferroxcube USA, EL PASO (TX)
Tel: +1 915 599 2513/2328, Fax: +1 915 599 2555

For all other countries apply to closest regional sales office:

■ HAMBURG, Germany
Tel: +49 (040) 527 28 302, Fax: +49 (040) 527 28 306
e-mail: saleseurope@ferroxcube.com

■ EL PASO (TX), USA
Tel: +1 915 599 2513/2328, Fax: +1 915 599 2555
e-mail: salesusa@ferroxcube.com

■ TAIPEI, Taiwan
Tel. +886 2 86650099, Fax: +886 2 86650145
e-mail: salesasia@ferroxcube.com

© Ferroxcube International Holding B.V. 2004

All rights are reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner.

The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Visit our web-site for the latest information on new products, application info as well as updated phone- and fax numbers

Internet: www.ferroxcube.com

Printed in The Netherlands 9398 288 0141 |

Date of release: August 2004