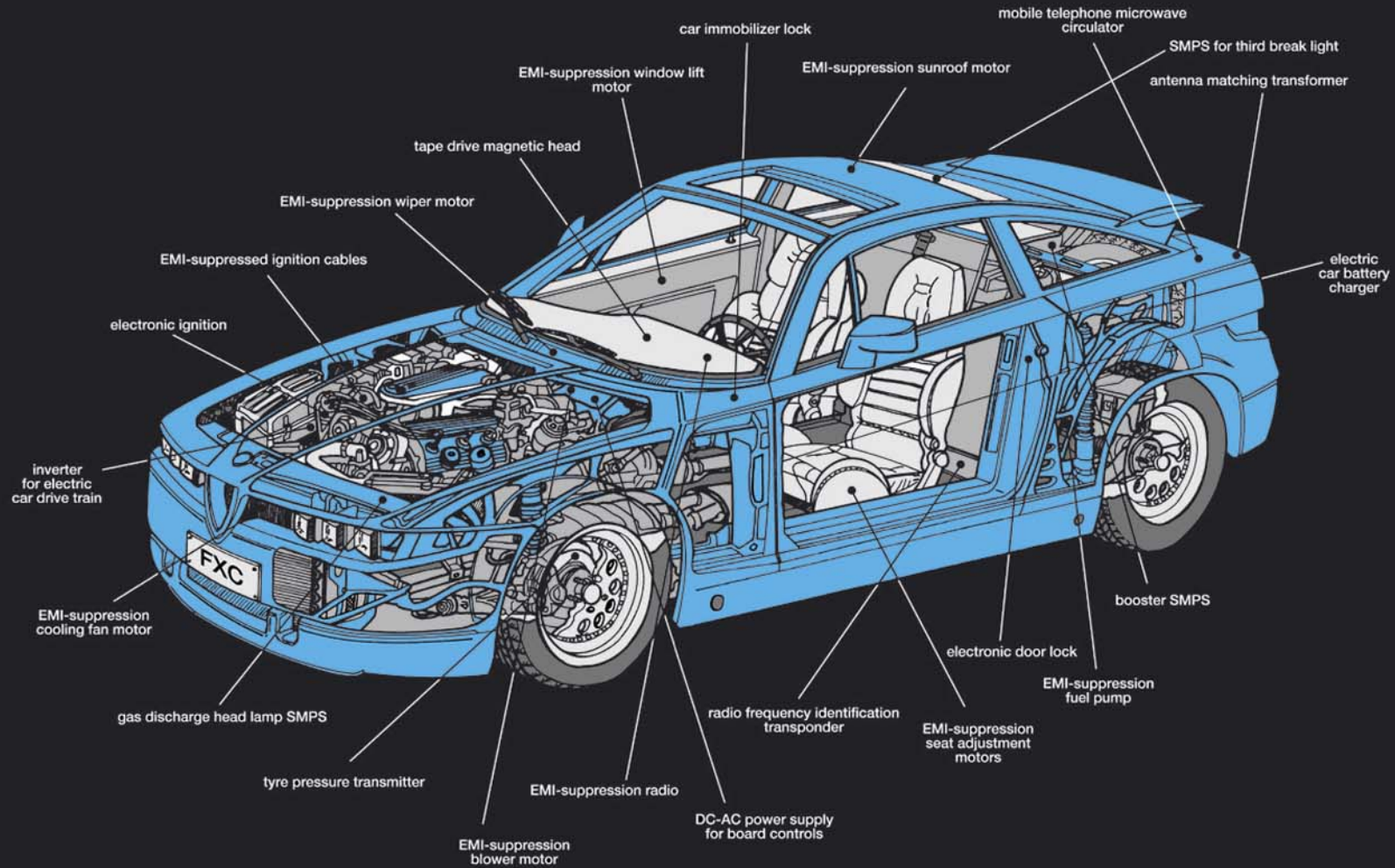
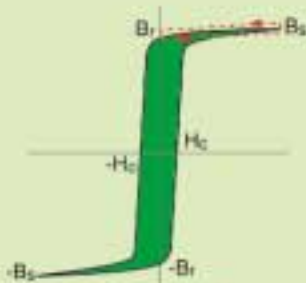
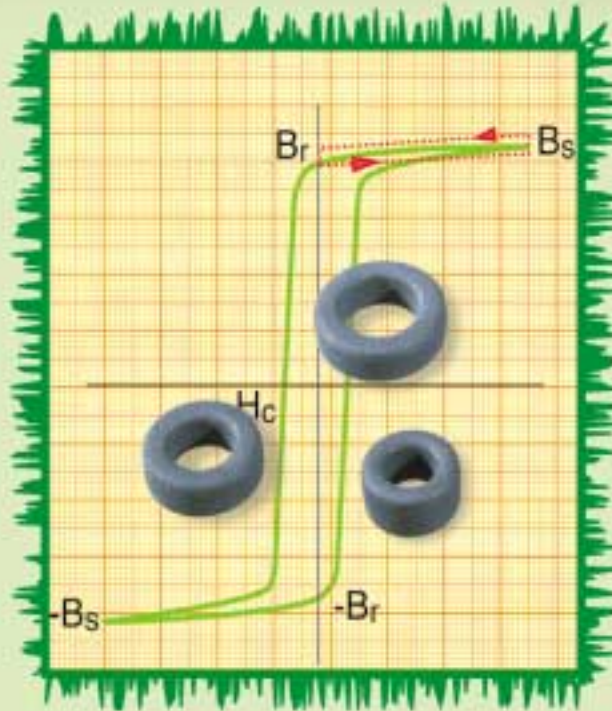


Soft Ferrite Applications

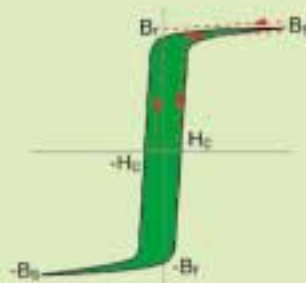


Square Loop Ferrite Toroids for Magnetic Amplifiers



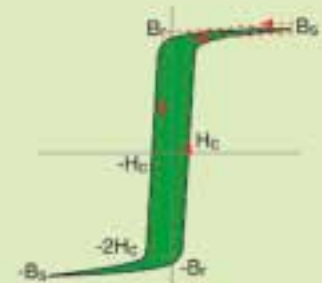
$$I_{reset} = 0$$

BH loop excursion during no blocking



$$I_{reset} = \frac{H_c \times l_e}{N}$$

BH loop excursion during partial blocking



$$I_{reset} = \frac{2H_c \times l_e}{N}$$

BH loop excursion during full blocking

Features

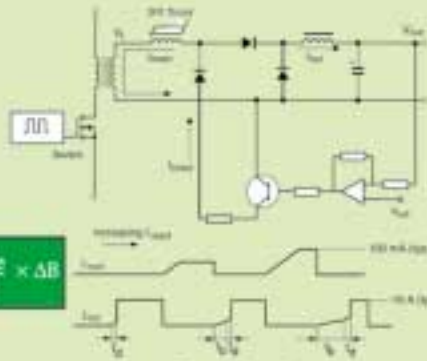
- Squaresness ratio of 85 to 90% at 100 kHz, 100 °C depending on applied field strength
- Excellent load handling
- Low H_c
- Environment friendly, contains no Co, Ni or Cd

Current product range

TN9/6/3-3R1 HC10-14/4-3R1
 TN10/6/6-3R1
 TN13/7.5/5-3R1
 TN14/9/5-3R1
 TN17/11/11-3R1
 TN23/14/7-3R1
 TN36/23/15-3R1



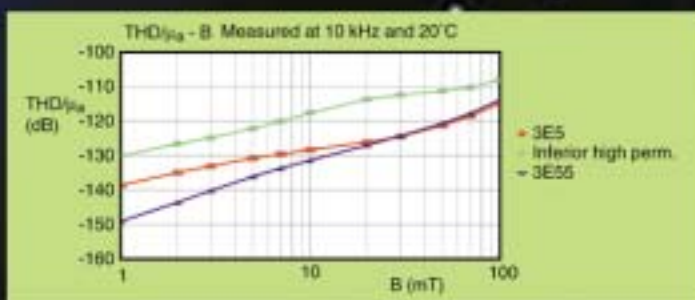
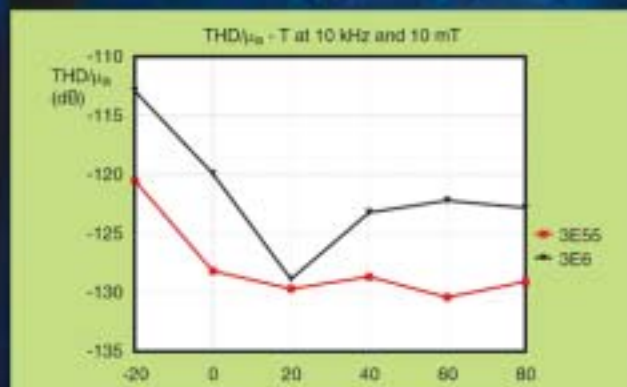
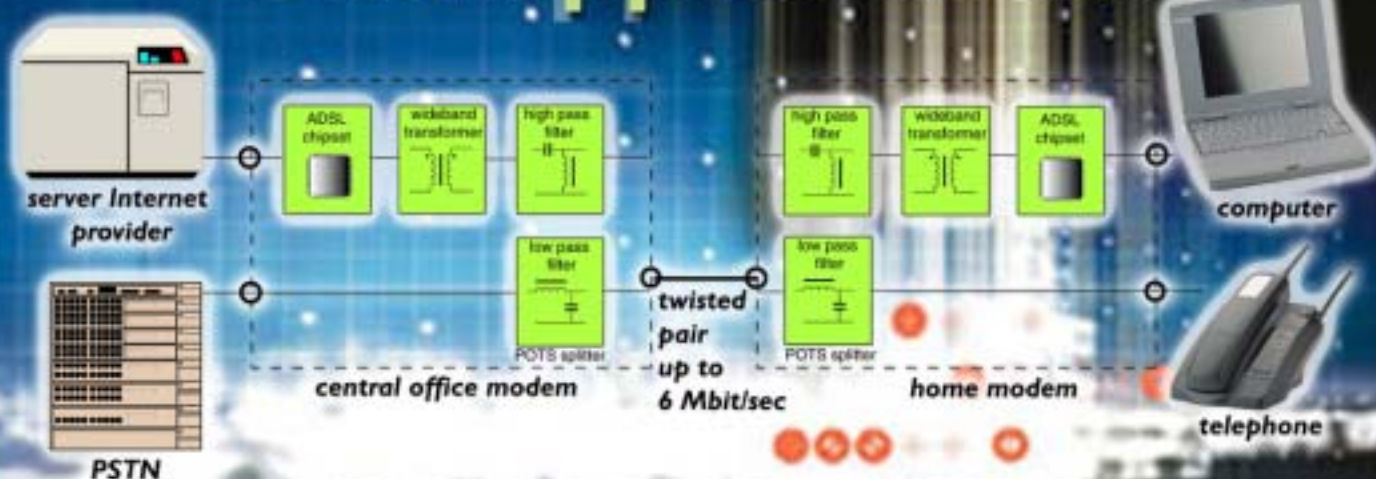
$$I_{reset} = \frac{H_c \times l_e}{B_r \times N} \times \Delta B$$



Basic circuit



Booming DSL-applications



EP5

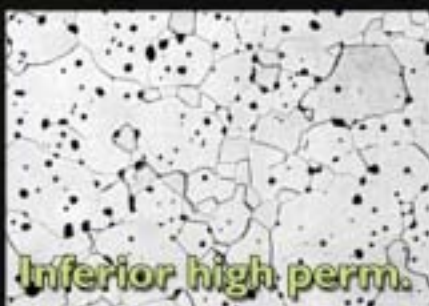


EP13/LP



New core shapes

New DSL ferrite



Advanced Bobbins and Accessories



RoHS
2002/95/EC

We take action



We know

We'll
be
clean

Write us on the BOM - Write off the lead !



FERROXCUBE
A TAGEO COMPANY

Advanced Bobbins and Accessories

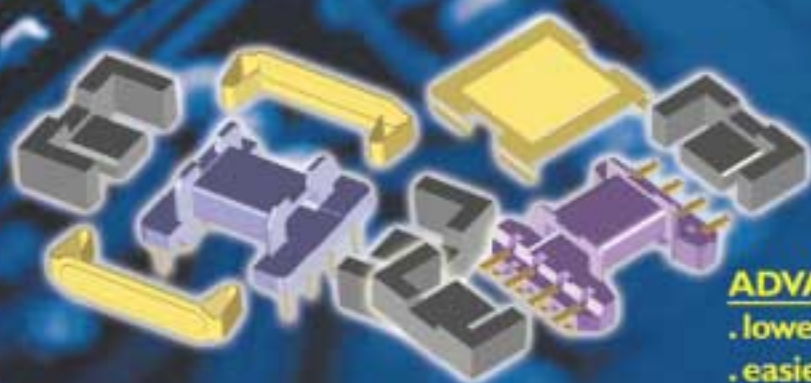


ADVANTAGES of using our C-pin bobbins

- . superior coplanarity
- . easier termination
- . usage of heavier gauge wires
- . clean solder pads

ADVANTAGES of using our inmoulded bobbins

- . superior pin pull-out force
- . excellent pin pitch
- . robust pins for heavy gauge wires
- . conical pin-tips for easy PCB mounting



ADVANTAGES of using our single clips

- . lower overall costs
- . easier assembly
- . suitable for both PTH- and SMD-bobbins



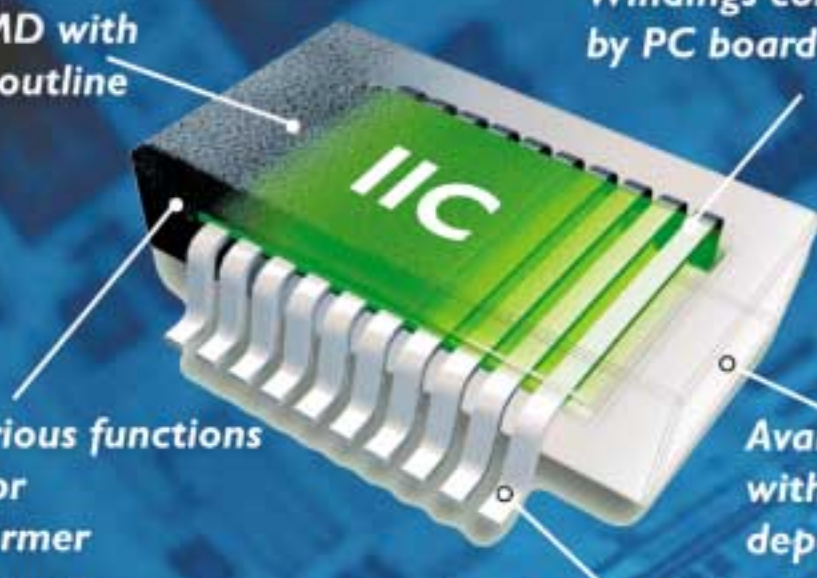
All you need to solve your EMI-suppression problems



Integrated Inductive Components are ready to come on board

Inductive SMD with standard IC outline

Windings completed by PC board tracks



Suitable for various functions

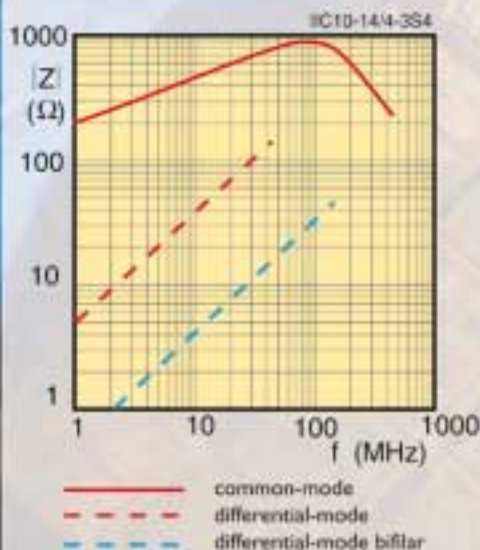
- Power inductor
- Power transformer
- Signal transformer
- Common-mode choke
- Multi-line suppressor

Available with or without partial airgap, depending on function

Low profile SMD component

Common-mode choke

Made in our top-quality 3S4 suppression material or the high-permeability 3E6, the design is ideal for common-mode choke in signal or supply lines, especially if these carry large currents. The sturdy lead frame will take almost any current surge without damage.

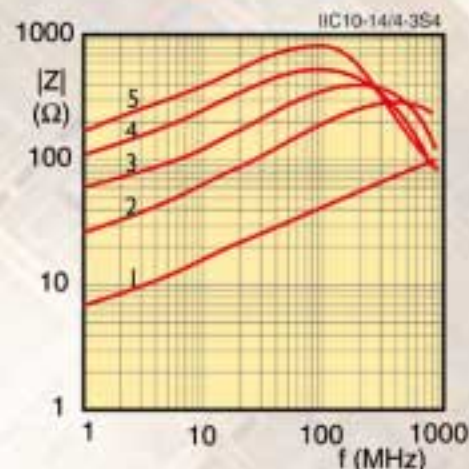


Features and Benefits

- ◆ Inductive surface-mount component that looks like a standard IC outline (SOT).
- ◆ Windings are completed by PC board tracks.
- ◆ Automatic placement and soldering together with other ICs on the board.
- ◆ Suitable for reflow soldering.
- ◆ Wide range of magnetic functions can be realized with the same product, depending on track layout.
- ◆ Superior physical properties
- ◆ Available in standard EIA and EIAJ tape-and-reel.
- ◆ Operating temperature -55 °C to +150 °C.

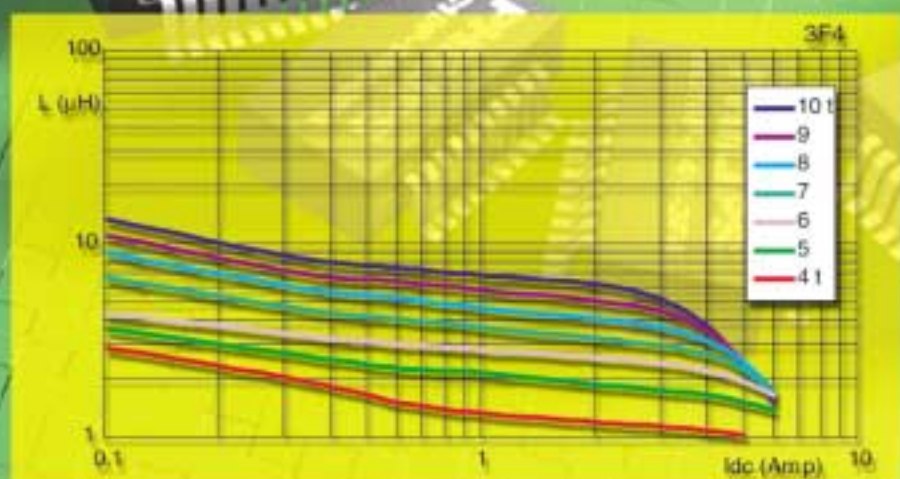
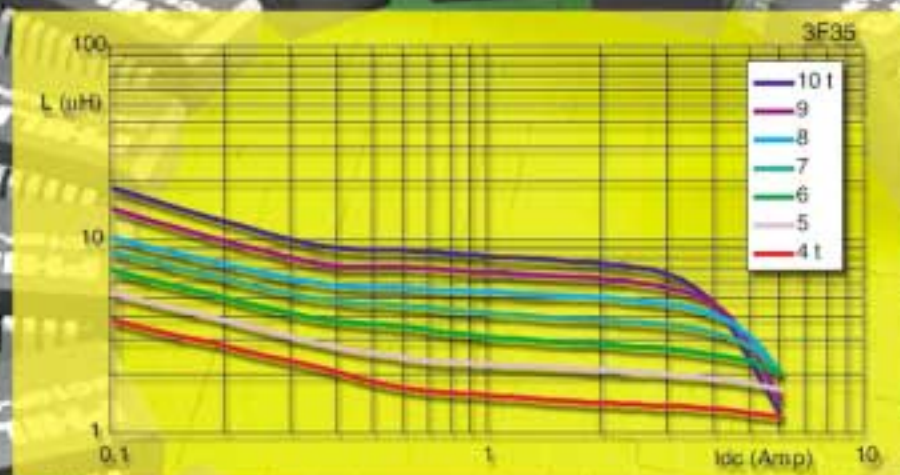
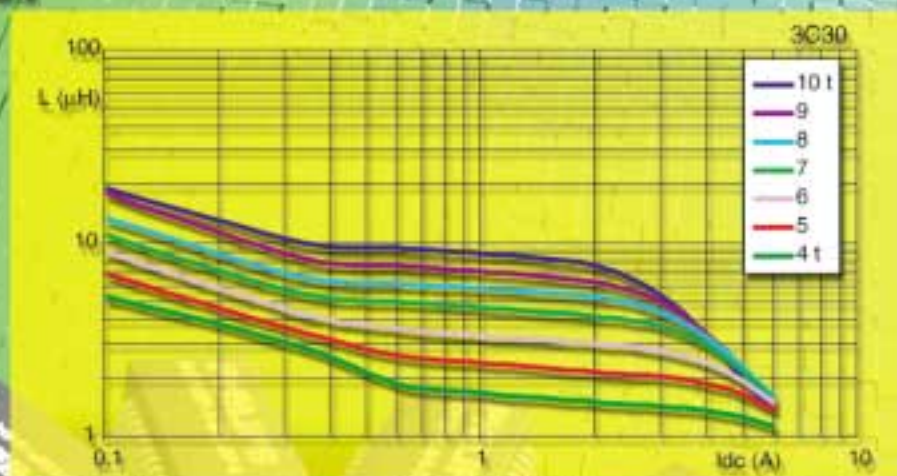
Multi-line choke

The IIC in 3S4 material achieves a high impedance over a wide frequency range depending on the number of turns, as shown in the graph below. With 3E6, damping is optimized between 1 and 10 MHz. Combined with capacitors, the IIC can be effective as supply-line filter at even lower frequencies.



Effect of Bias Current on IIC with Partial

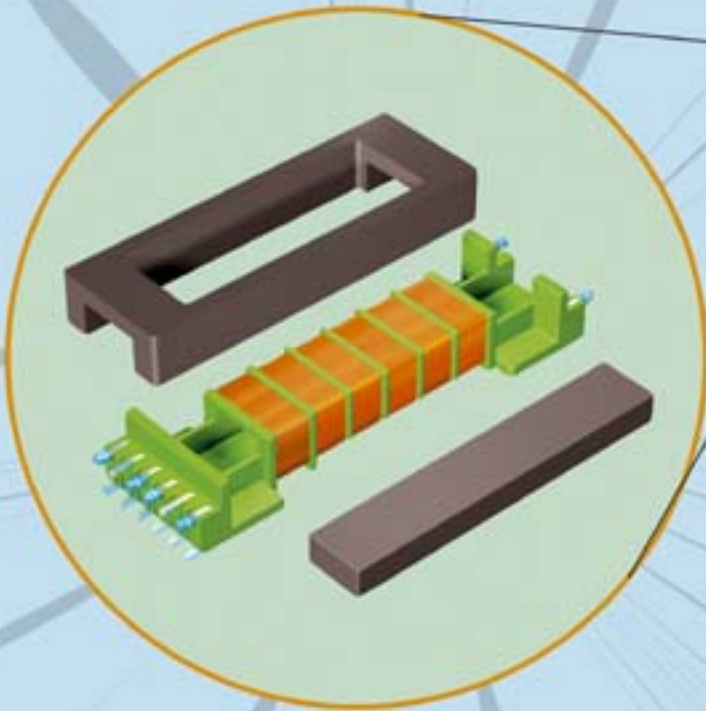
Airgap (IIC10P-14/4)



COVERING THE GLOBE WITH FERRITES



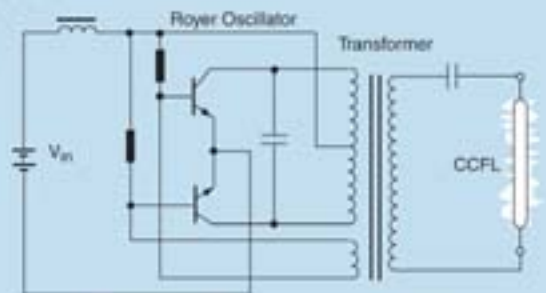
Frame and Bar cores for LCD backlighting



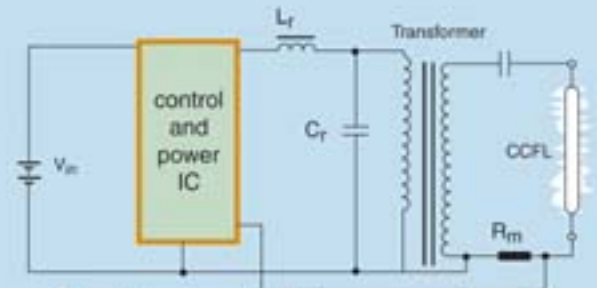
Complete core range

Core type	FRM1	BAR	FRM1	BAR	FRM1	BAR	FRM1	BAR
	205115	20355	21491	2206	243910	25224	27349	281823
core factor ($\pm 5\%$)	3.29	3.29	5.06	5.06	5.65	5.65	5.54	5.54
eff. voltage V_e (V)	655	655	312	312	370	370	504	504
eff. length L_e (mm)	46	46	40	40	45.8	45.8	52.1	52.1
eff. area A_e (mm ²)	14	14	7.9	7.9	8.1	8.1	9.7	9.7
min. area A_{min} (mm ²)	7.4	7.4	5.7	5.7	6	6	8.7	8.7
mean of core half (g)	-2.1	-1.5	-1.5	-1	-1.3	-1.2	-1.6	-1.2
A	197 ± 0.1	199 ± 0.2	21 ± 0.2	21.8 ± 0.3	23.8 ± 0.3	24.7 ± 0.3	26.7 ± 0.7	28 ± 0.5
B	154 ± 0.1	205 ± 0.05	162 ± 0.1	18 ± 0.1	19.2 ± 0.1	2.05 ± 0.05	19.7 ± 0.4	18 ± 0.1
C	148 ± 0.1	5.45 ± 0.15	11.8 ± 0.2	3.3 ± 0.2	1.8 ± 0.2	4.4 ± 0.2	9.0 ± 0.3	2.3 ± 0.1
D	11.4 ± 0.25		8.9 ± 0.2		7.3 ± 0.2		6.5 ± 0.3	
E	66 ± 0.1		40 ± 0.1		3.85 ± 0.1		3.8 ± 0.2	
CPHS	•		•		•		•	
COV	•							

Transformer width: 15 mm 12 mm 10 mm 9 mm



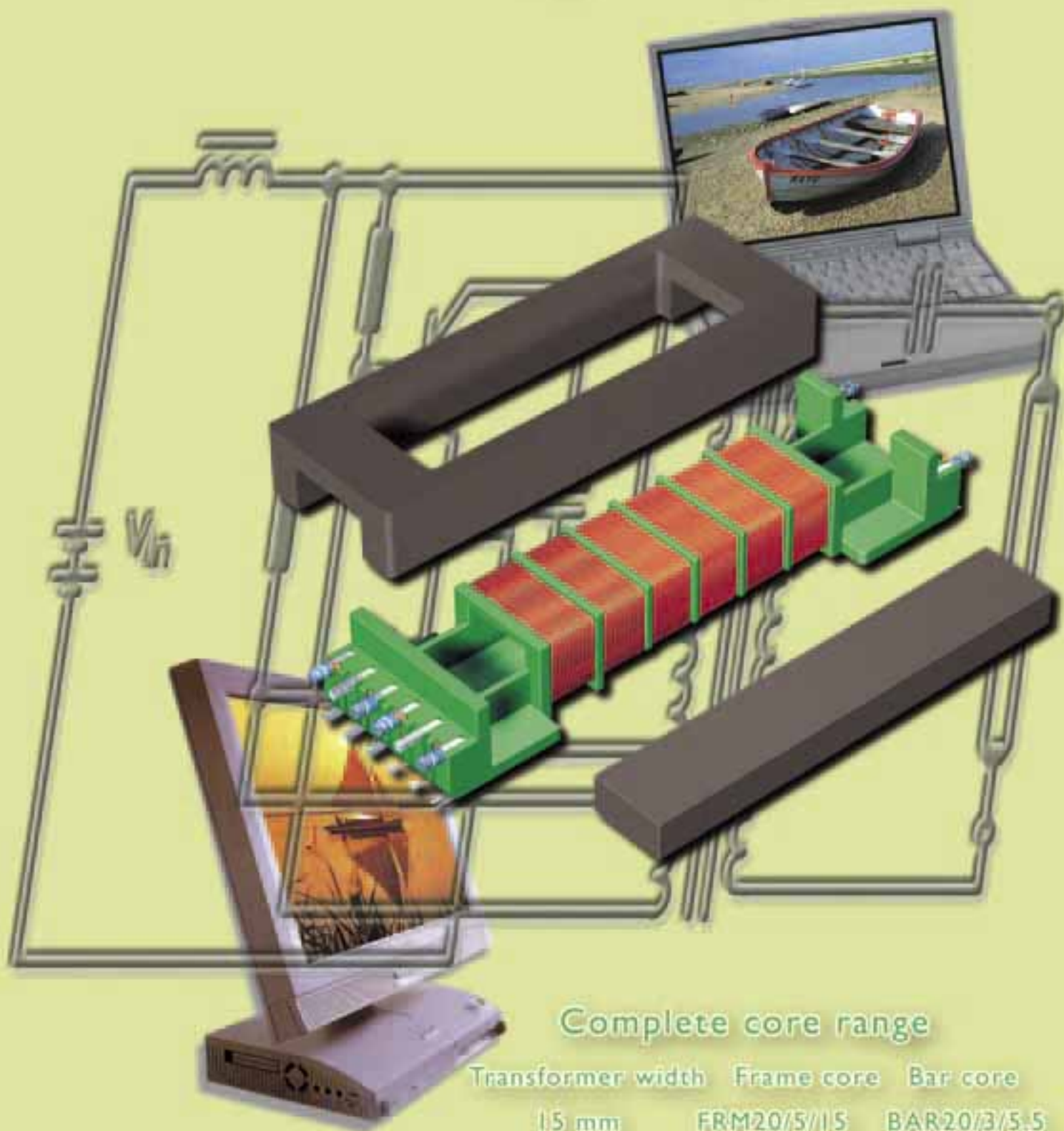
Classical inverter circuit



Sophisticated inverter circuit



Frame & Bar Cores for LCD-backlighting



Complete core range

Transformer width	Frame core	Bar core
15 mm	FRM20/5/15	BAR20/3/5.5
12 mm	FRM21/4/12	BAR22/2/6
10 mm	FRM24/3.5/10	BAR25/2-2/4
9 mm	FRM27/3-8/9	BAR28/3-8/2.3

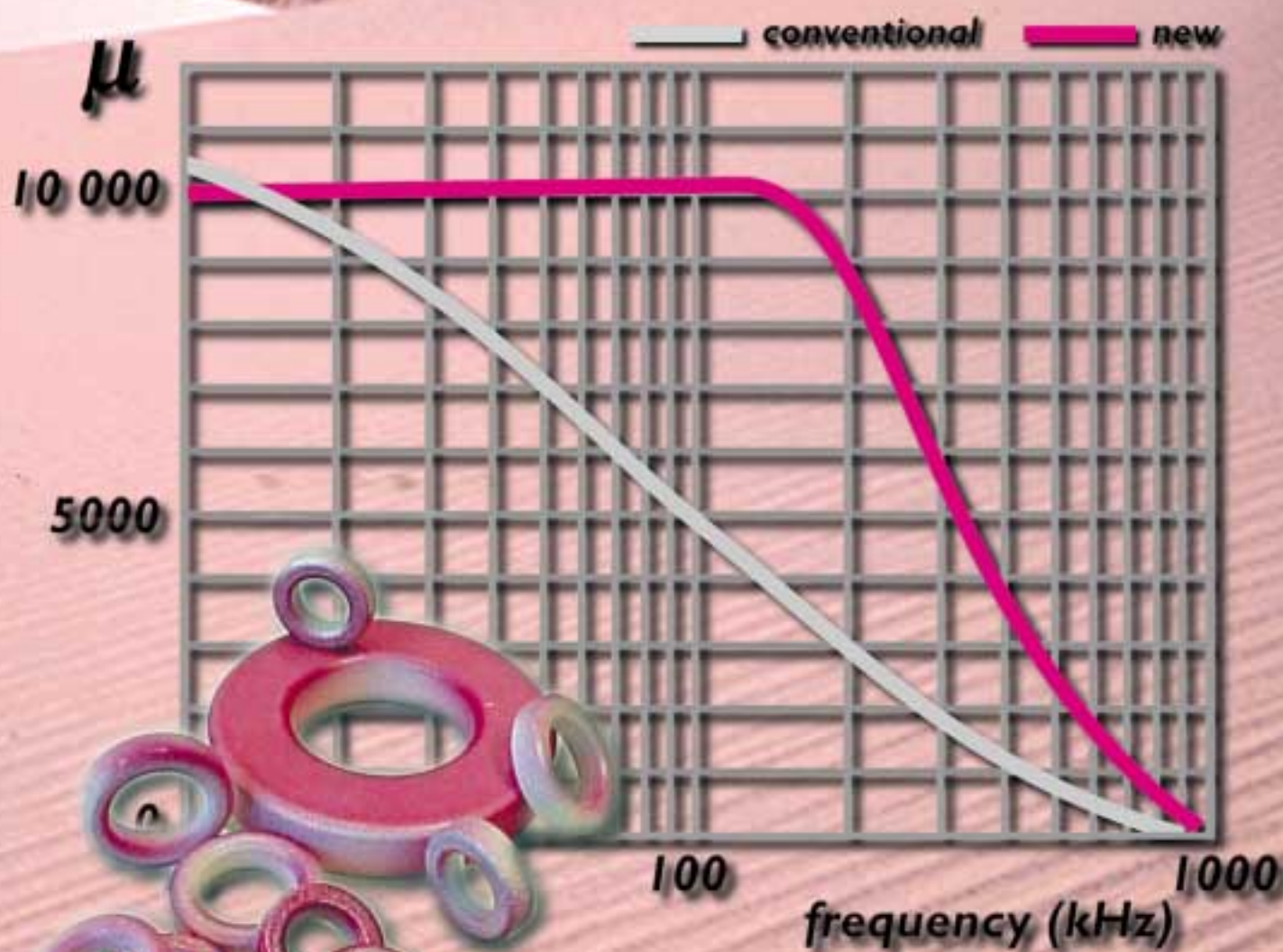


The Future is Planar



 **FERROXCUBE**
A TAGEO COMPANY

Breaking frontiers with Ferroxcube's new μ 10 000 ferrite toroids

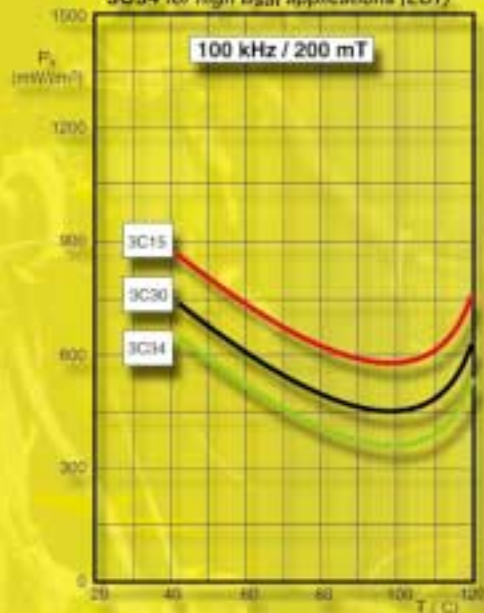


Optimized ferrite Cores to power the Future

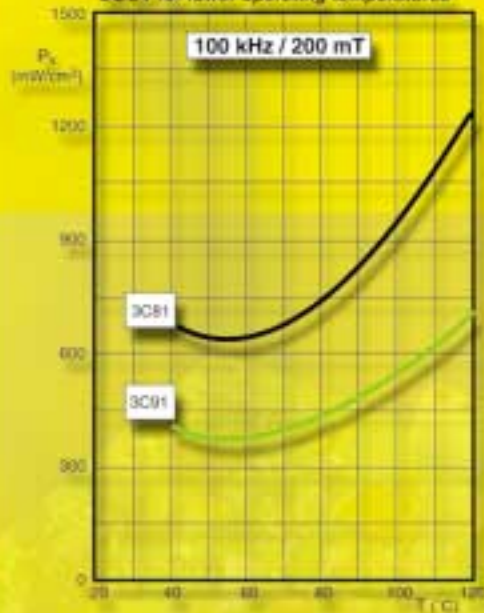


New Improved Power Ferrites

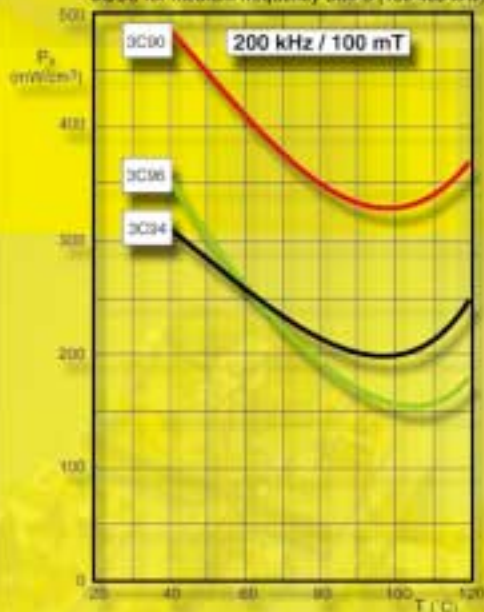
3C34 for high B_{sat} applications (LOT)



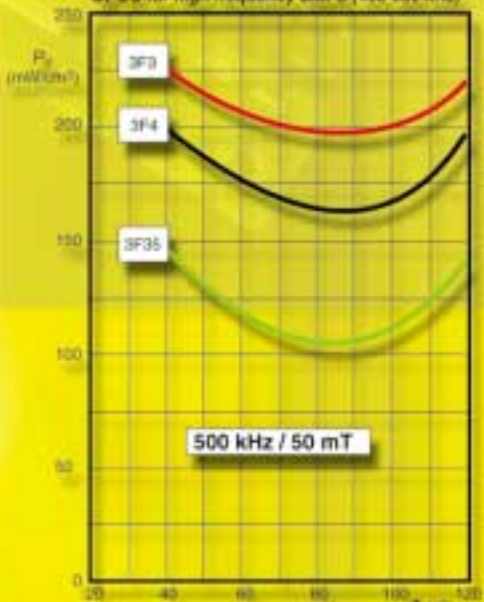
3C91 for lower operating temperatures



3C95 for medium frequency SMPS (100-400 kHz)



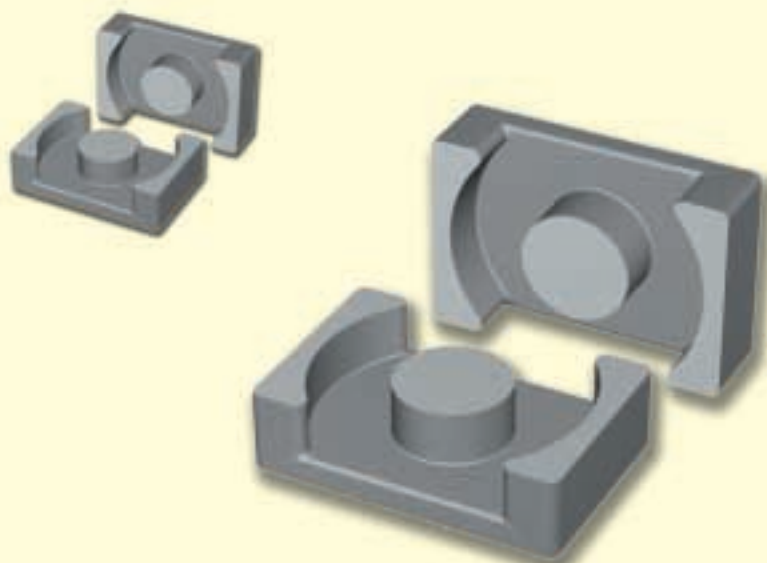
3F35 for high frequency SMPS (400-800 kHz)



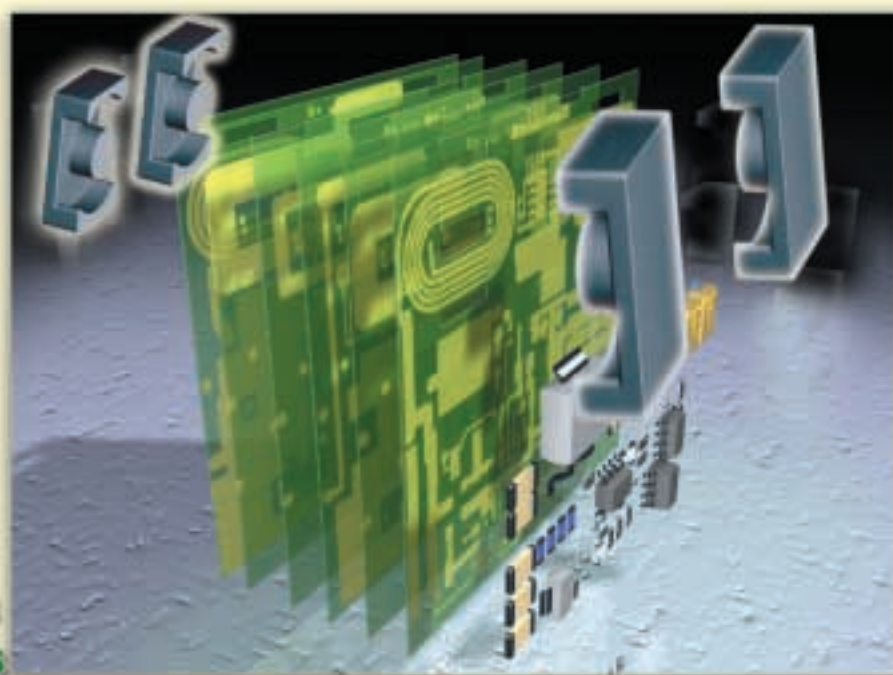
EQ a new ferrite Core Shape for advanced Power Converters



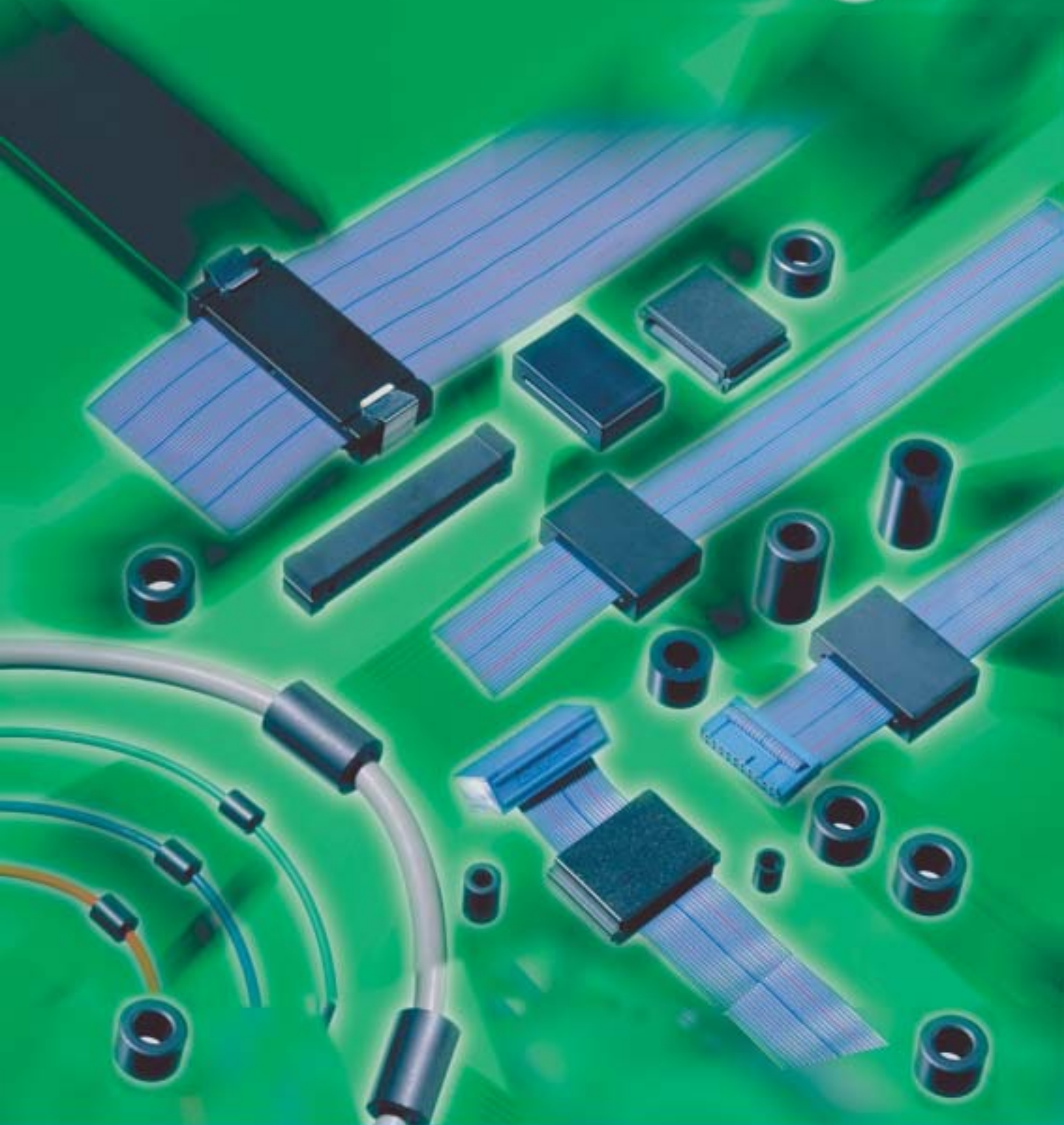
The EQ core design is derived from the ER and PQ shape. The range is optimized for use in compact AC/DC notebook adapters and DC/DC converters.



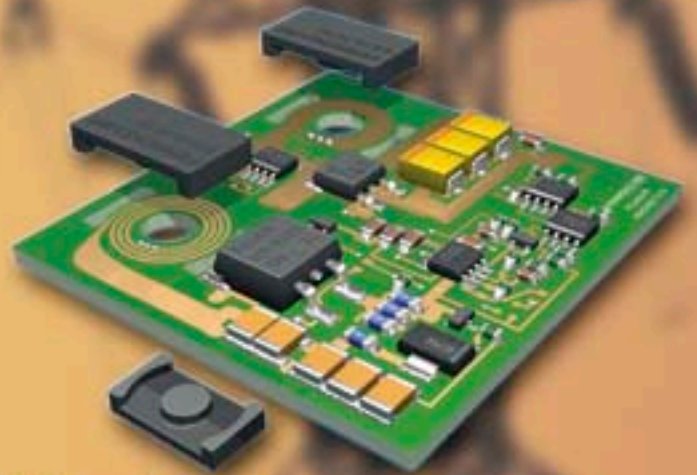
- Simple core shape
- Round centre pole
- High Ae value
- Large winding window
- Low profile
- Large surface area for good heat dissipation
- Also very low versions for planar applications



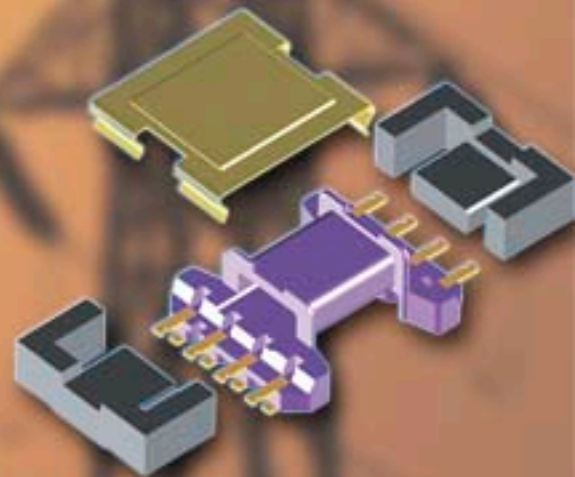
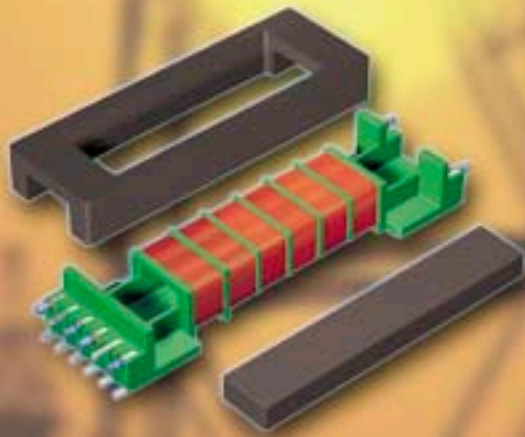
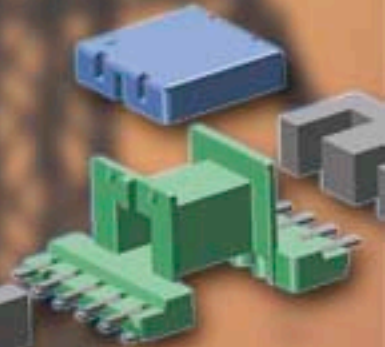
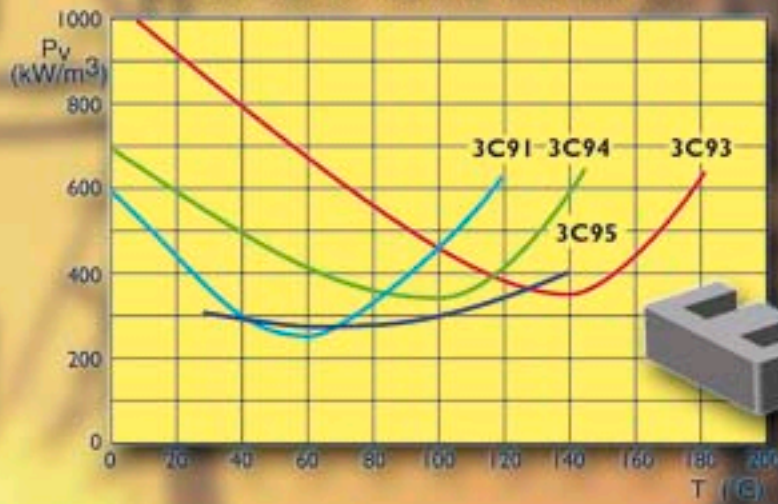
Cable Shielding



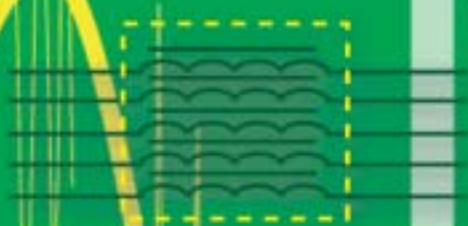
Ferroxcube Power Ferrites for your innovative designs



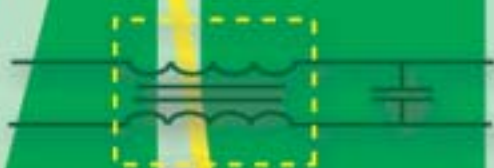
Power loss at 100 kHz and 200 mT



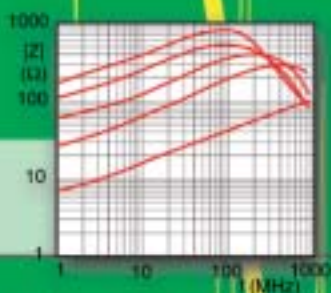
EMC - IIC



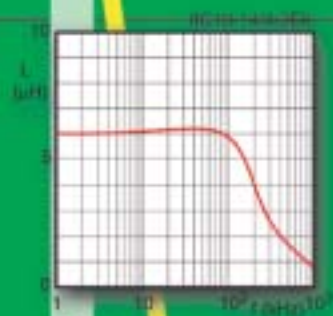
multi-line suppressor



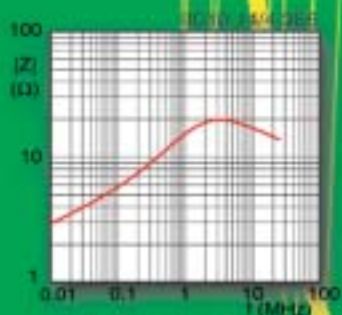
common-mode choke



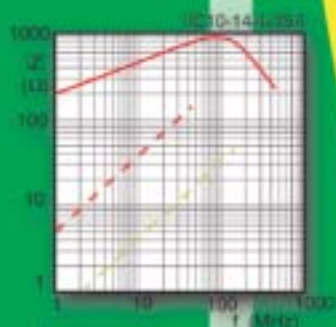
impedance as a function of frequency for different numbers of lines



inductance as a function of frequency



impedance as a function of frequency



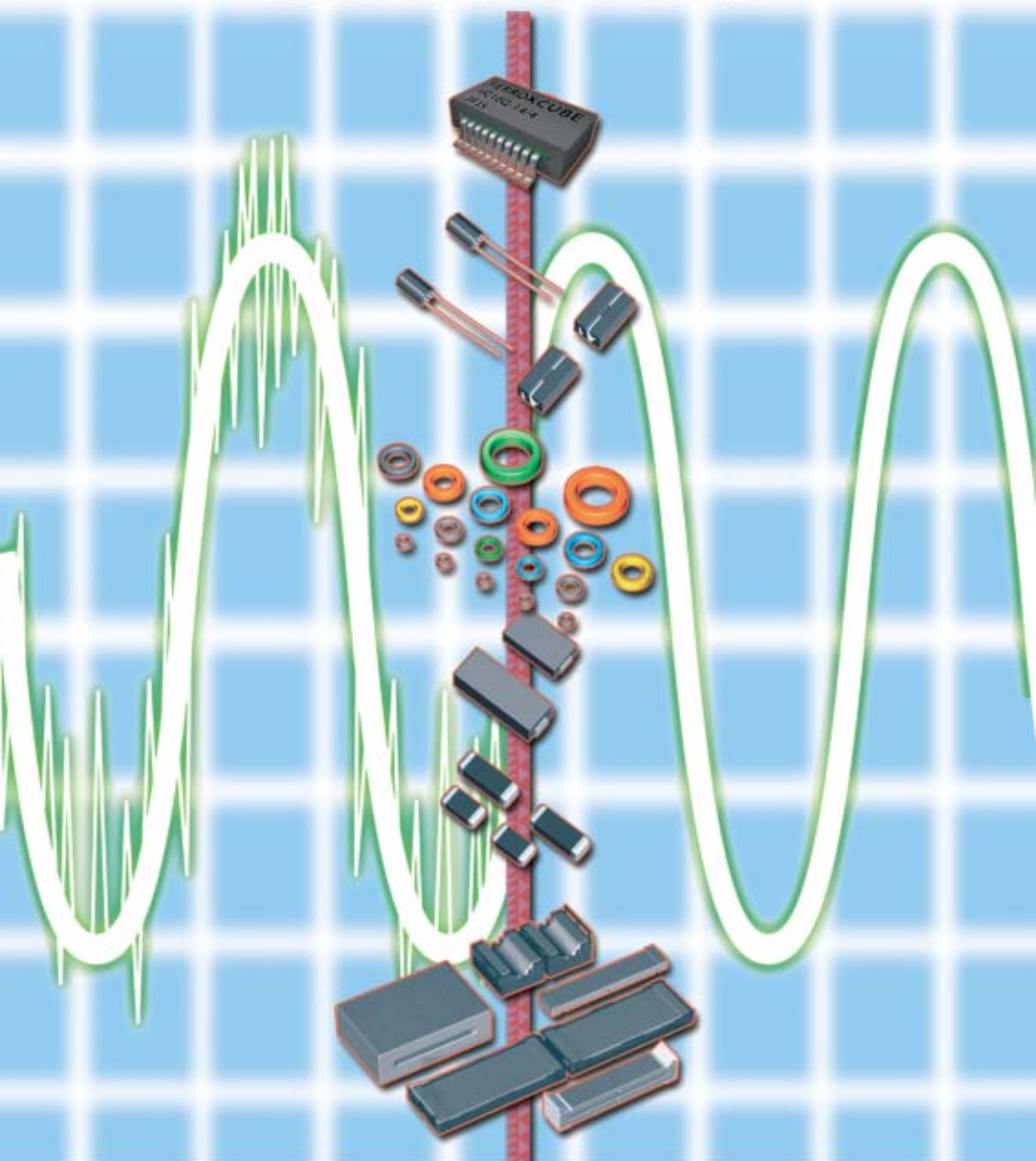
impedance as a function of frequency for N = 4

- common-mode
- - - differential mode
- - - differential mode (100:1)



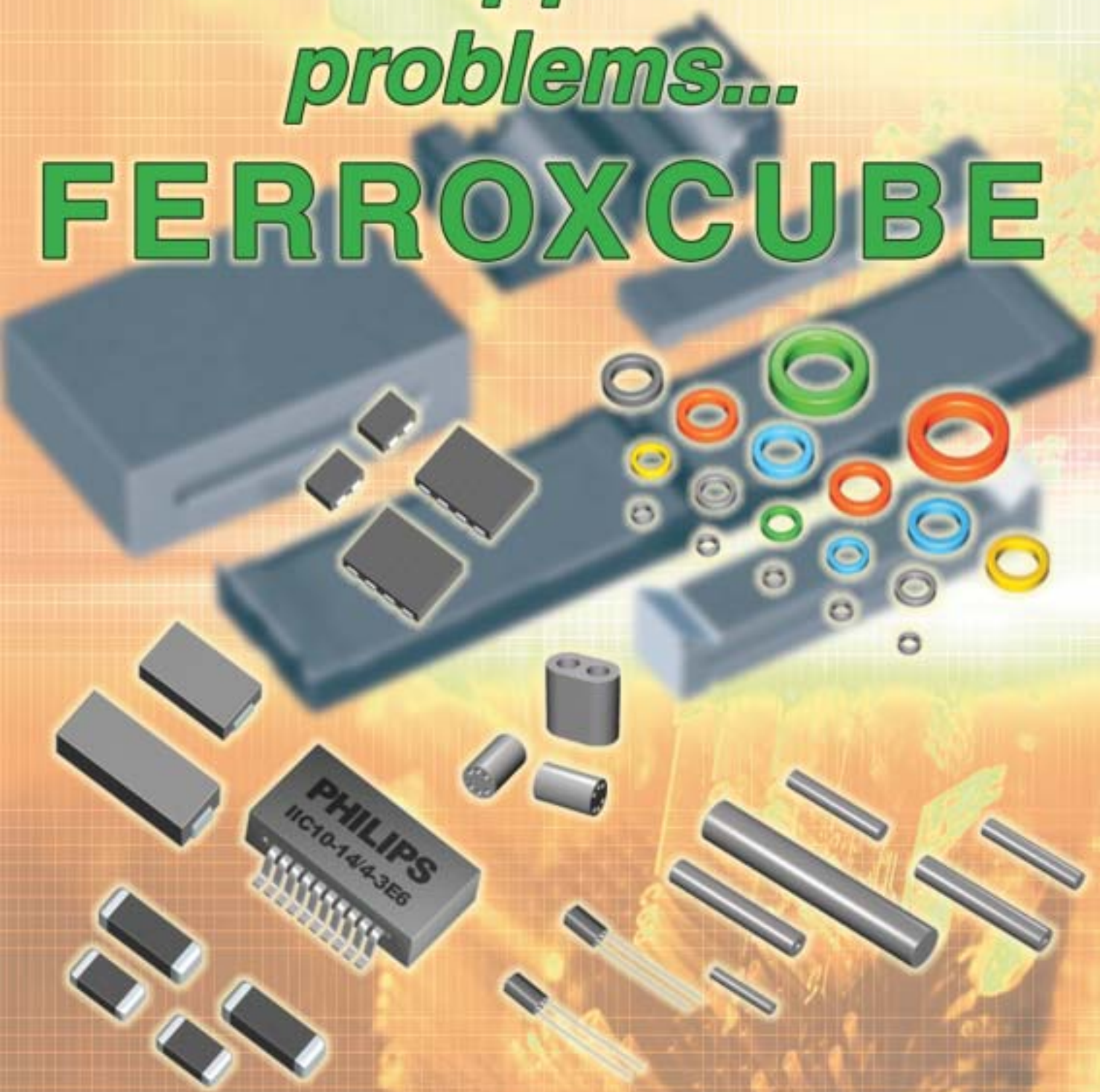
The Ferroxcube Firewall

Check it out!!



*All you need to solve
EMI-suppression
problems...*

FERROXCUBE

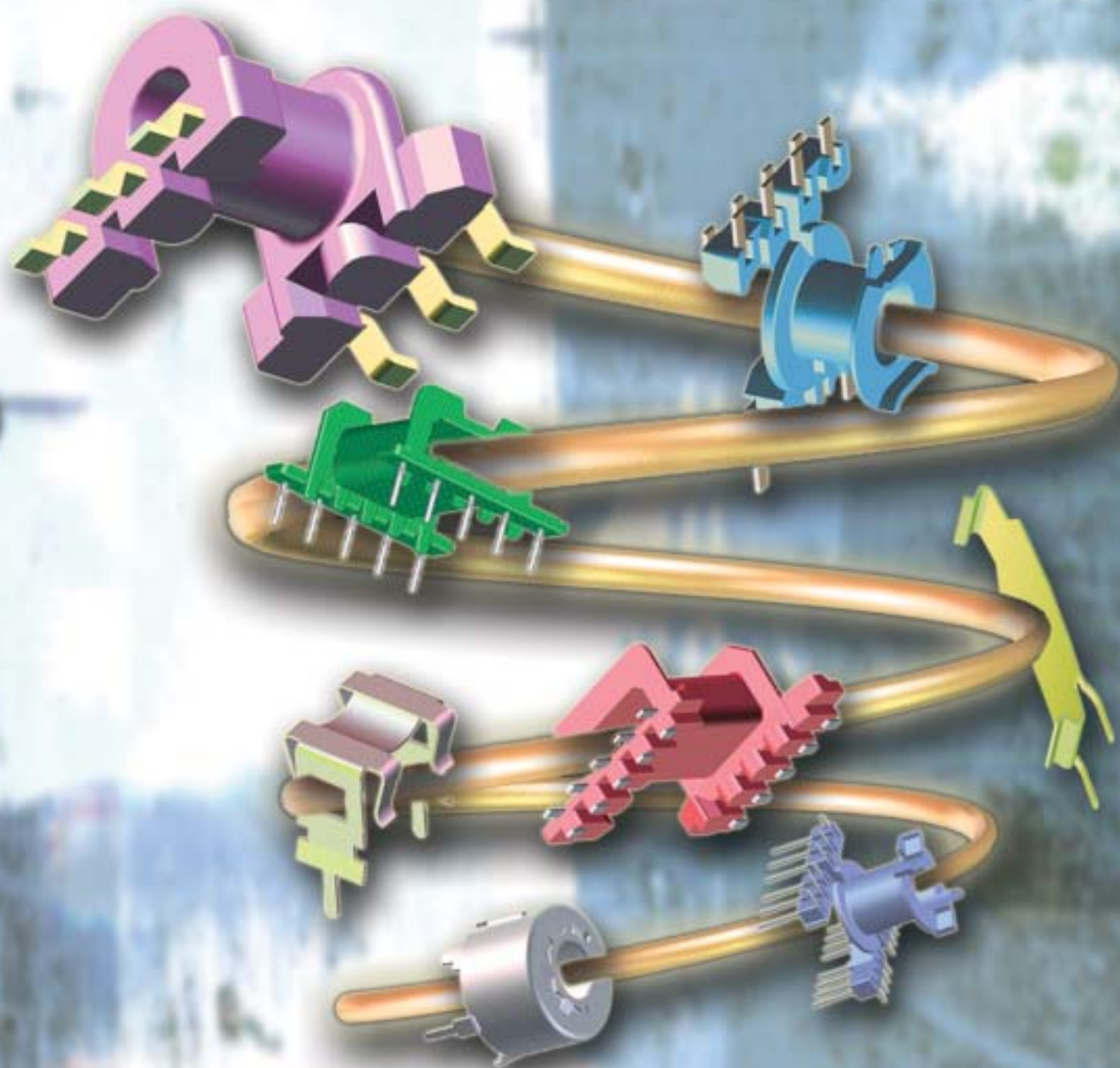


FERROXCUBE, formerly Philips Components, Ferrite Ceramics, offers a complete range of ferrite products to meet all your EMI-suppression requirements. Please visit our web-site on: www.ferroxcube.com

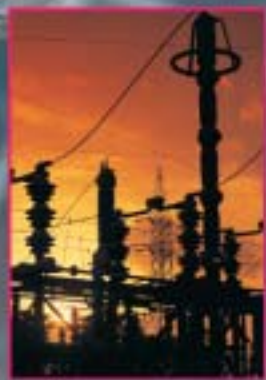


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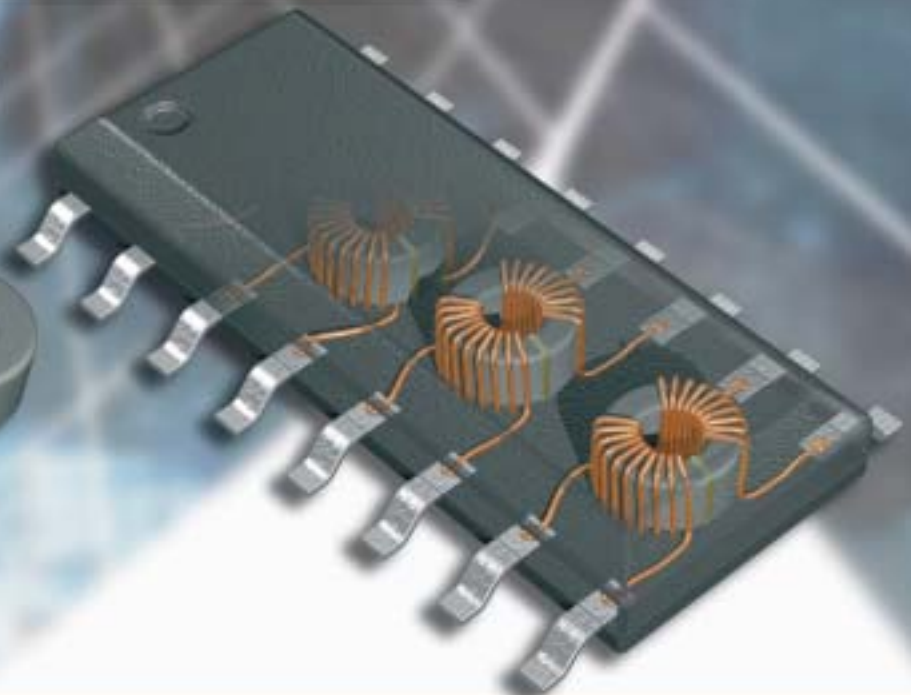
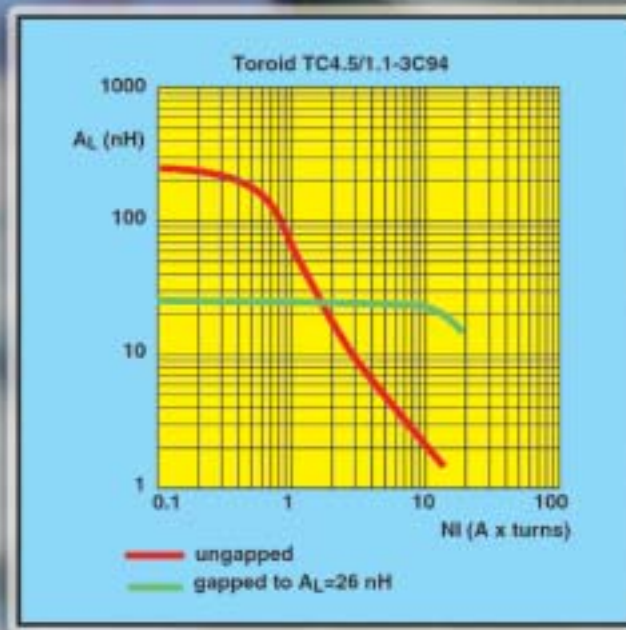
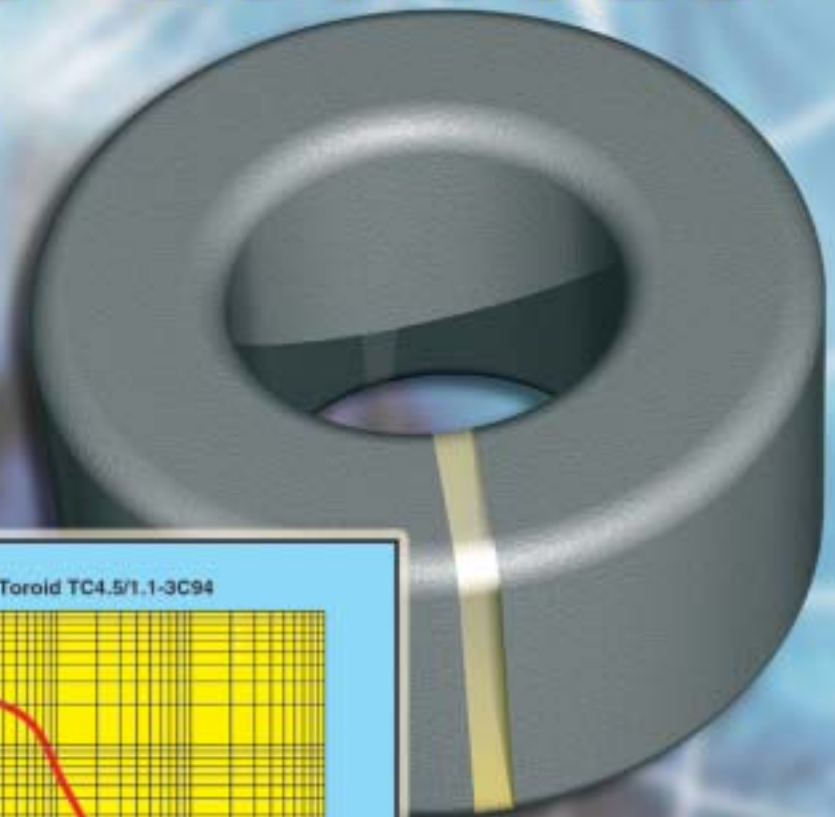
Advanced Bobbins and Accessories



Specialty Ferrite for Science and Industry



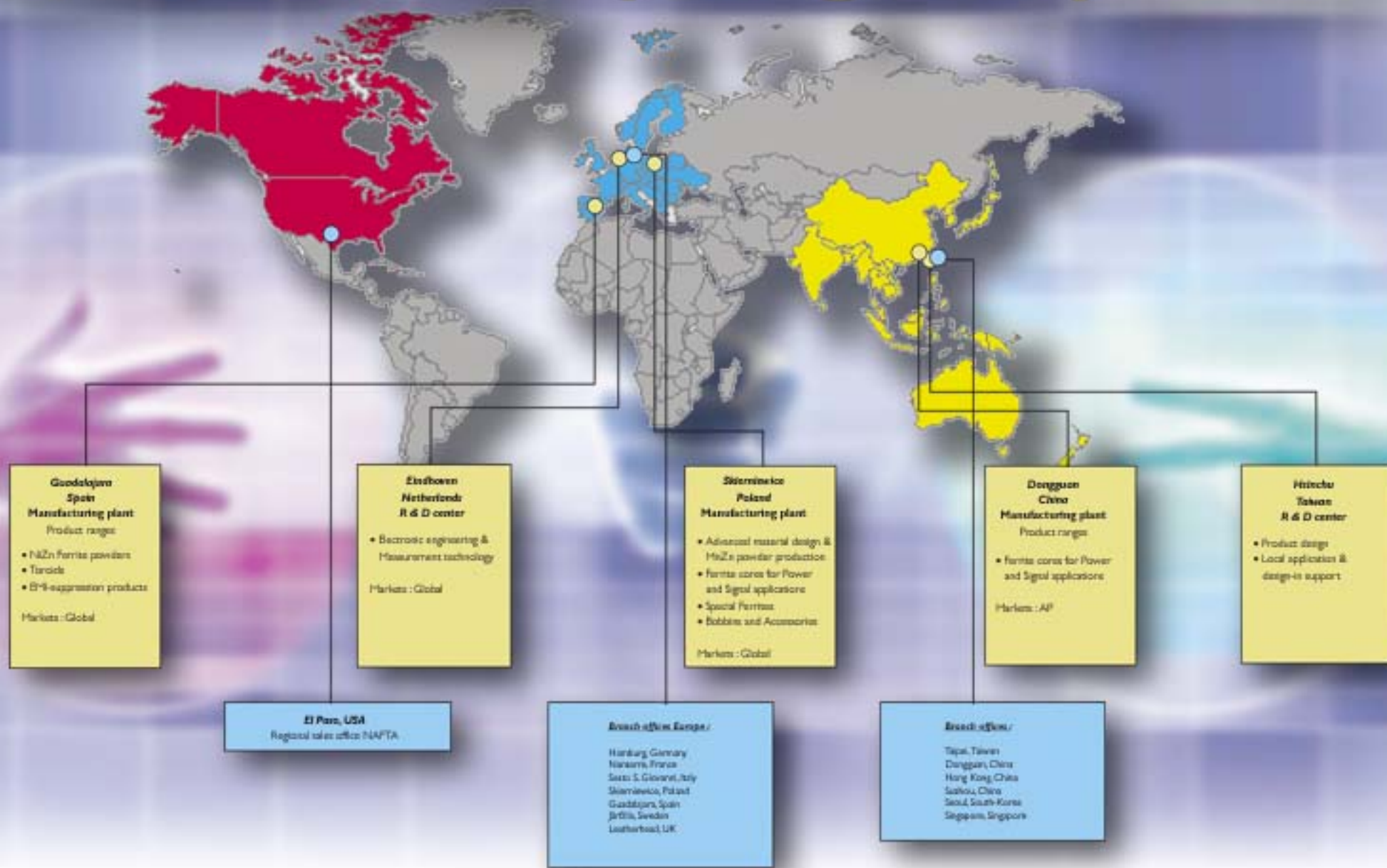
Gapped Toroids



New Ferroxcube Ferrite Factory Dongguan



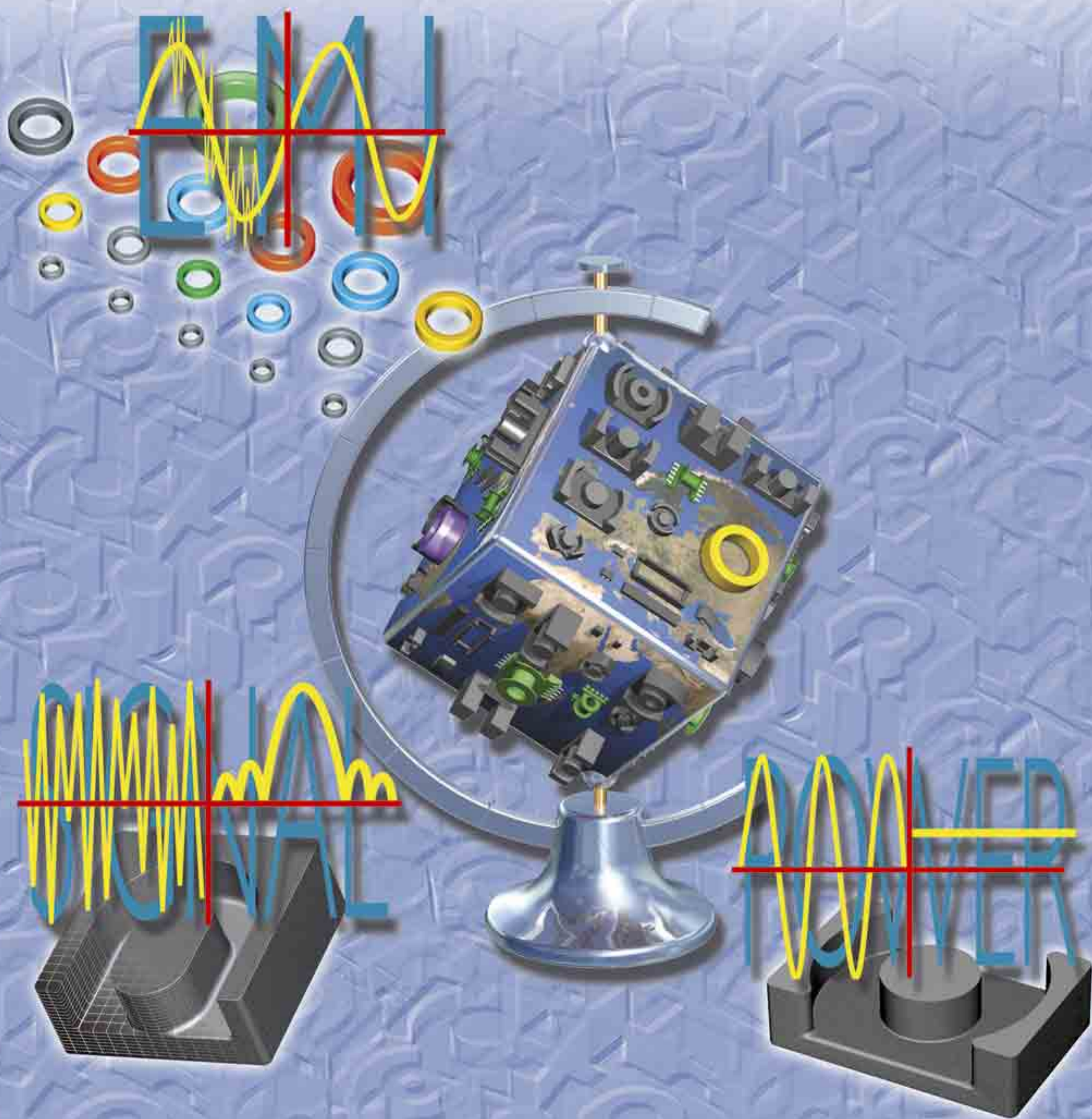
FERROXCUBE - your global partner



Soft Ferrites and Accessories

2002

Data Handbook



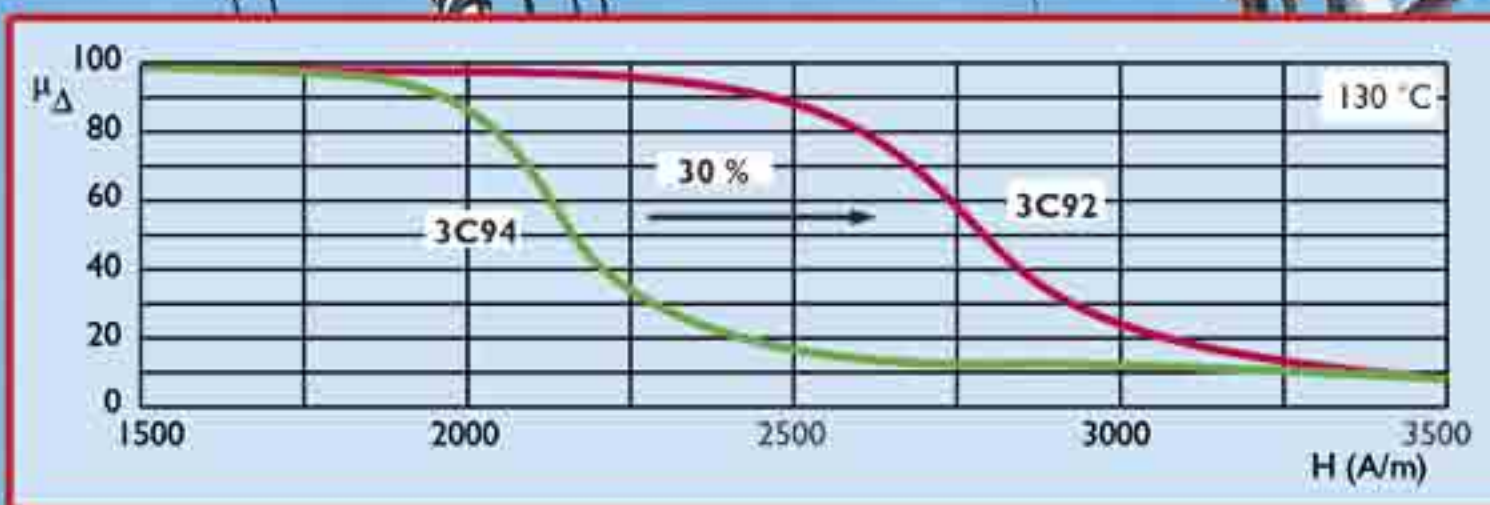
3C92

The new high saturation power ferrite

500 mT

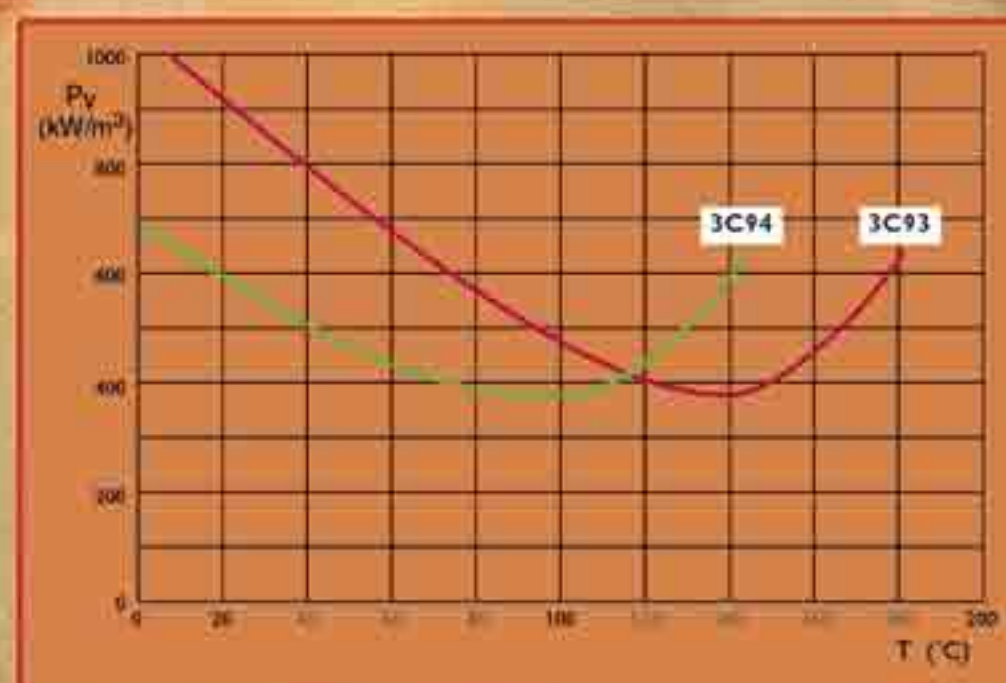
400 mT

300 mT

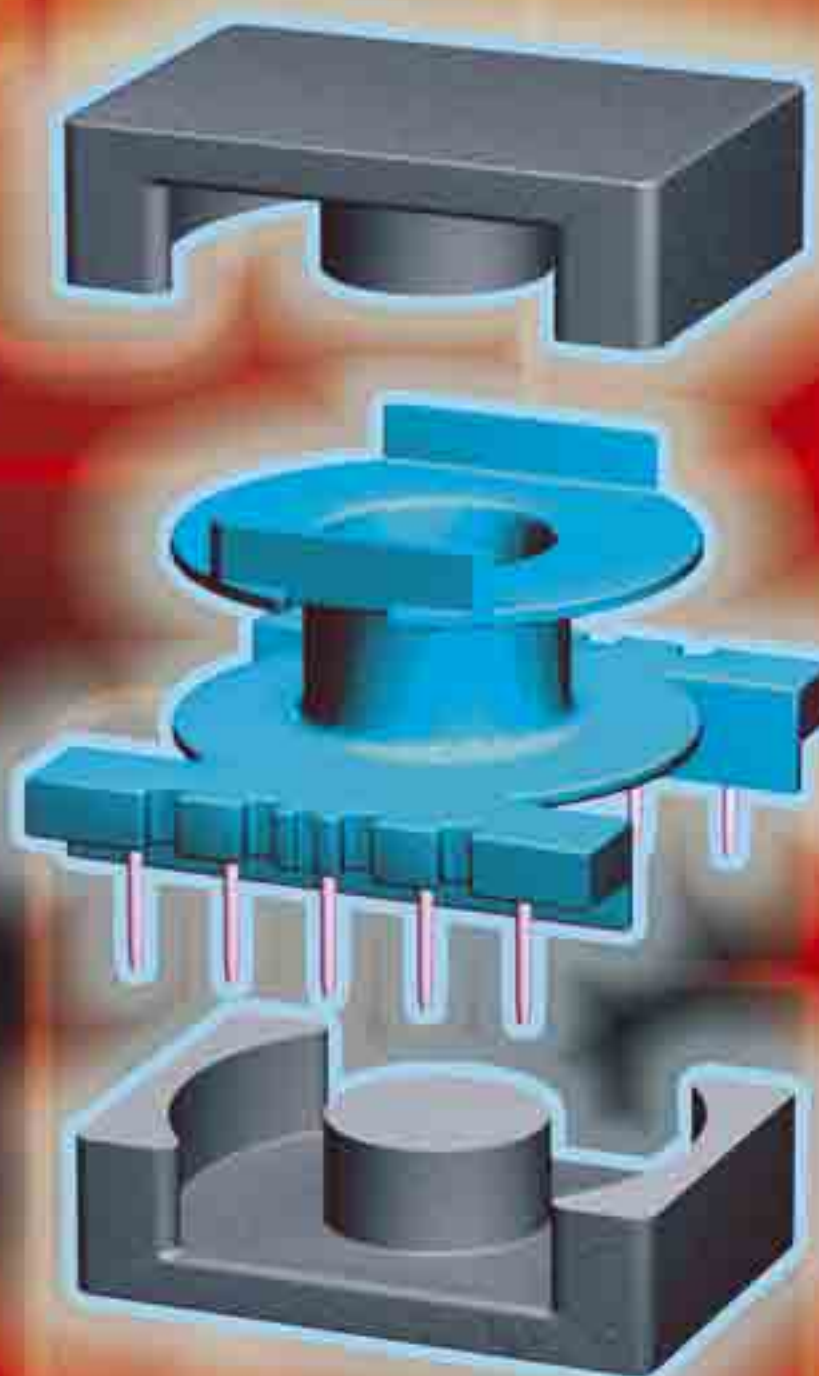


3C93

The new high temperature
low loss power ferrite



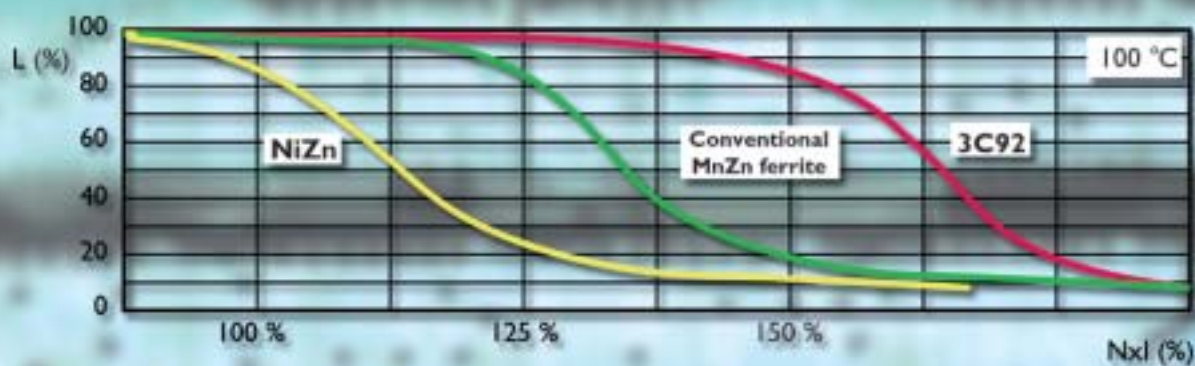
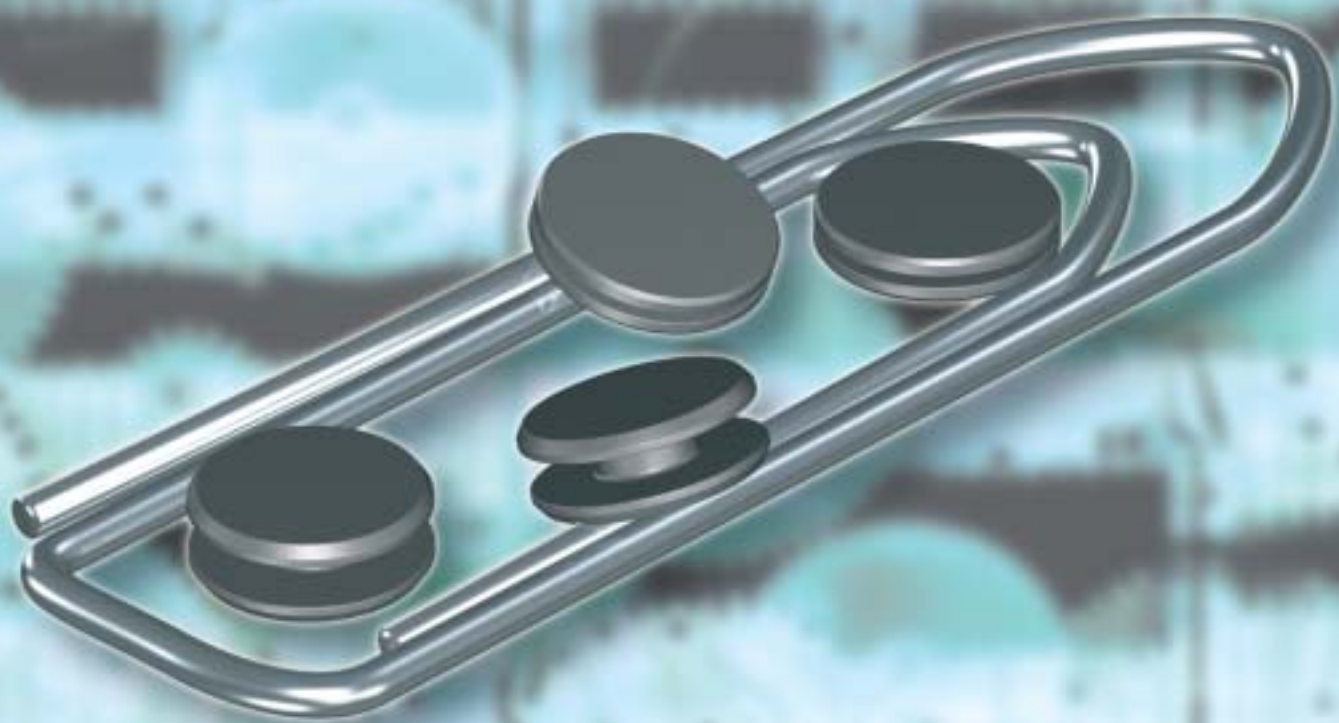
come down to the core



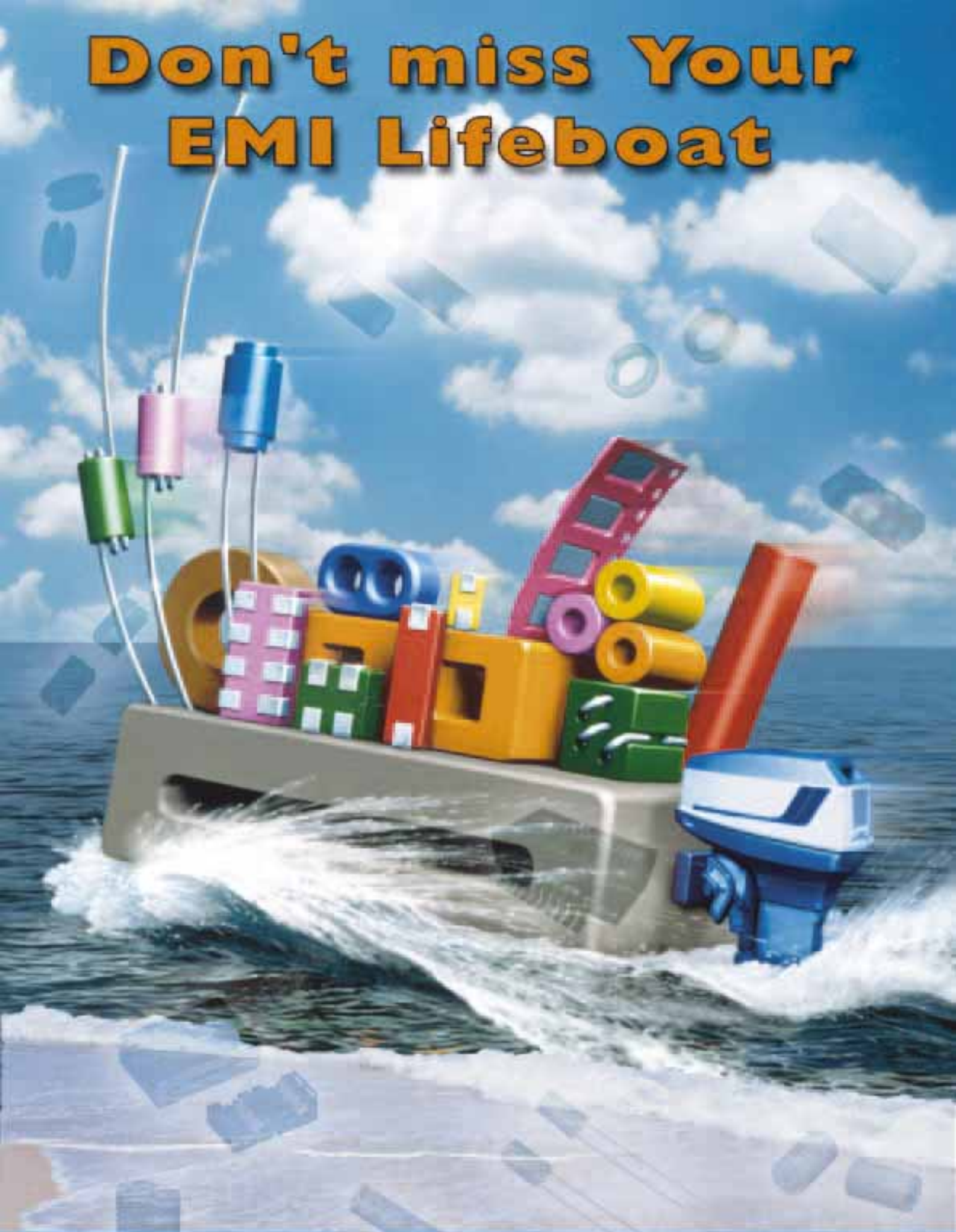
stay cool when things get hot



Miniature drum cores for power inductors



Don't miss Your EMI Lifeboat

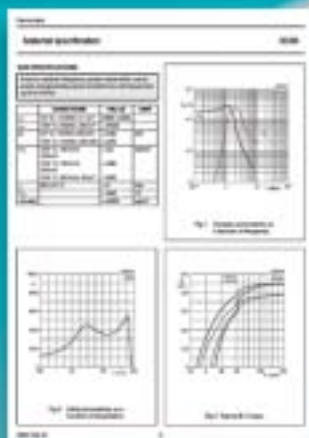


FERROXCUBE

A TARGO COMPANY

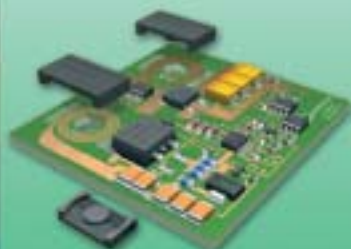
Soft Ferrites and Accessories CD 2002

Data sheets



Application notes

New ER cores
for planar converters



Ferrite design tools

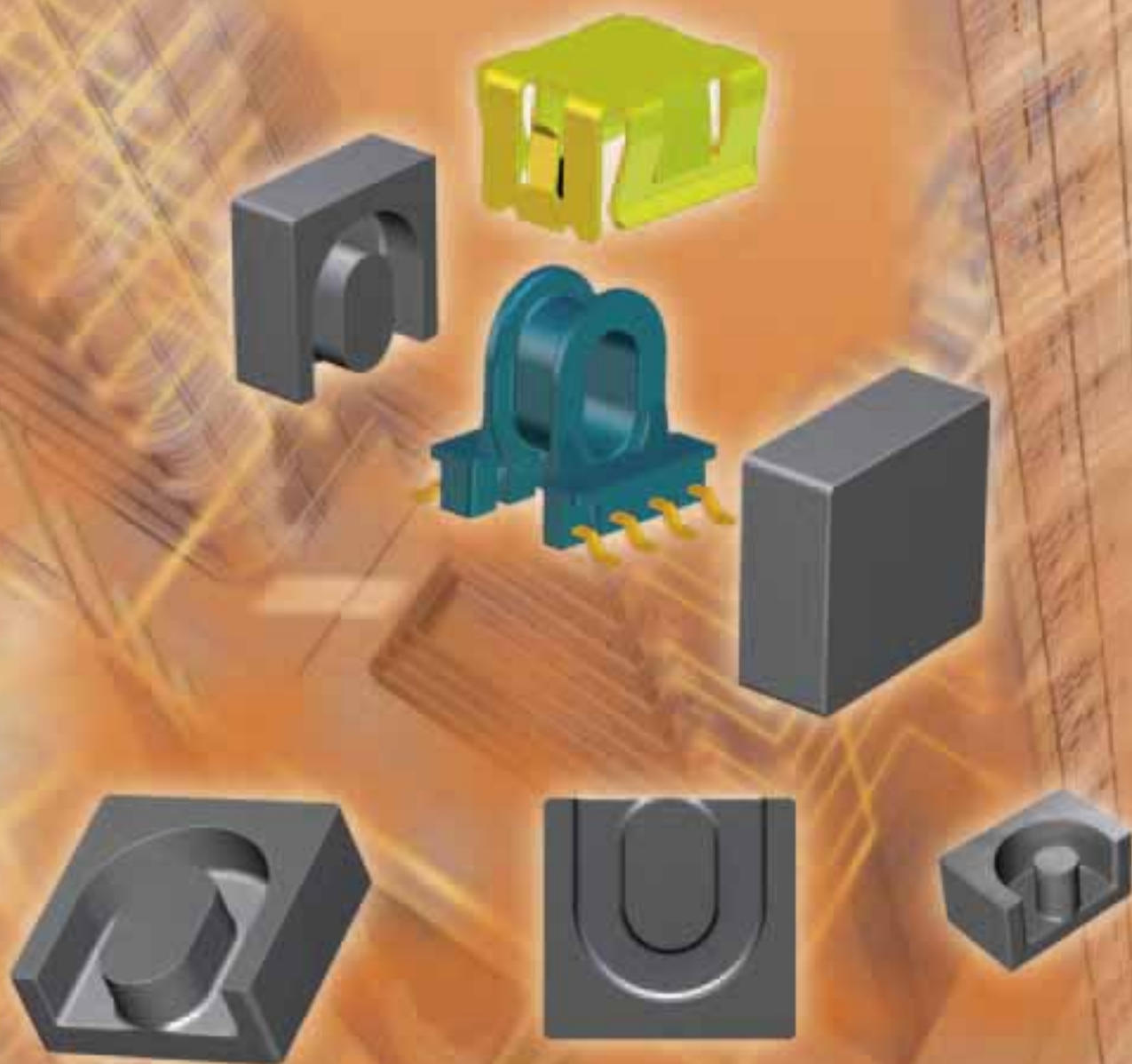
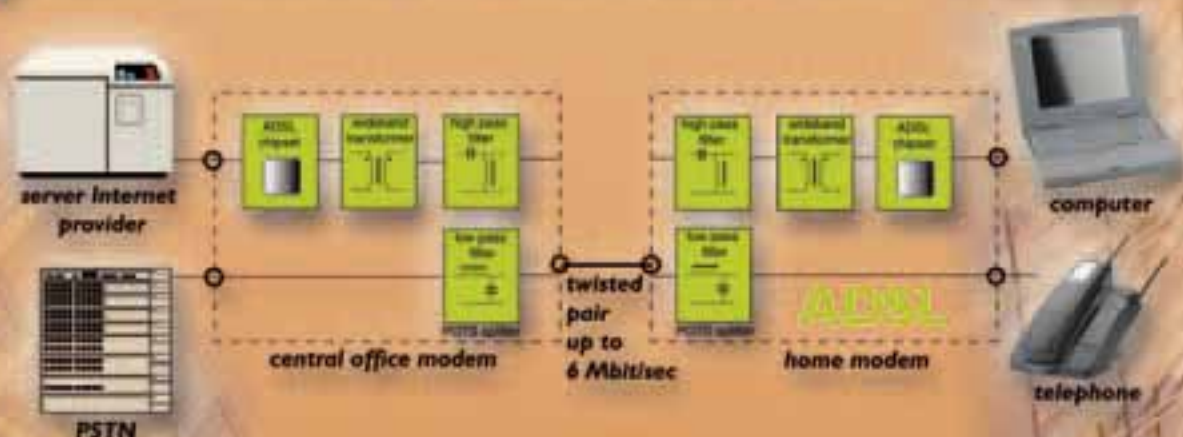


Bobbin data



EPX7/9/10 - EP5

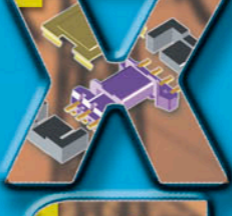
Optimized Cores for XDSL



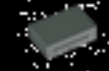
ER core range extension for planar converters

*Give 'em
what they
want!*



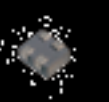


TECHNICAL



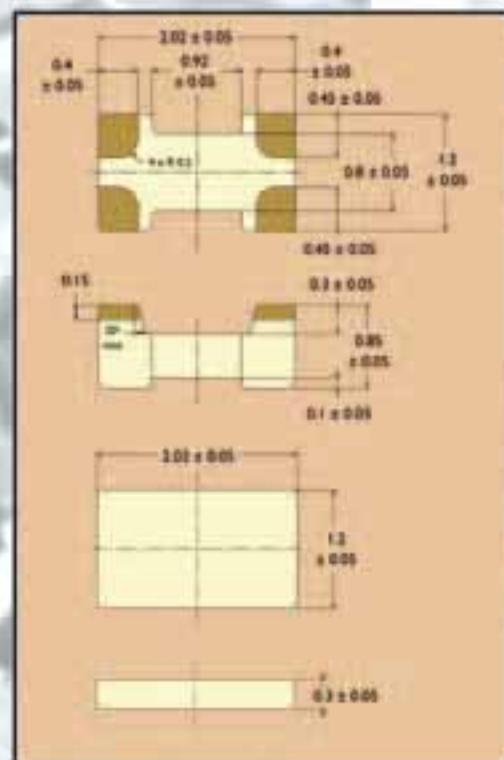
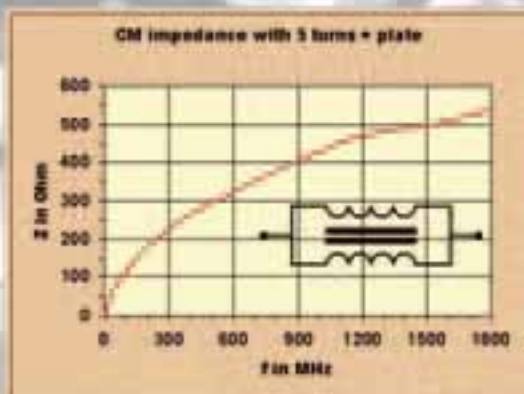
FERROXCUBE

A YAGEO COMPANY



Common-Mode Choke Cores for High Speed Differential Signaling

USB 2.0 – LVDS – IEEE 1394
data line LCD link data line



- Small size : SMD 0805 = 2.0 × 1.2 × 1.2 mm
- Top plate for vacuum pickup
- Metallized pads
- Specific Ferroxcube optimized design



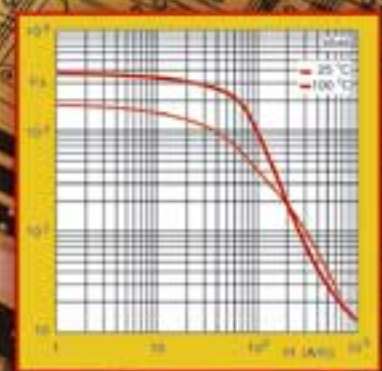
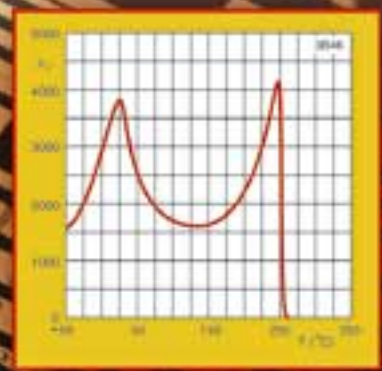
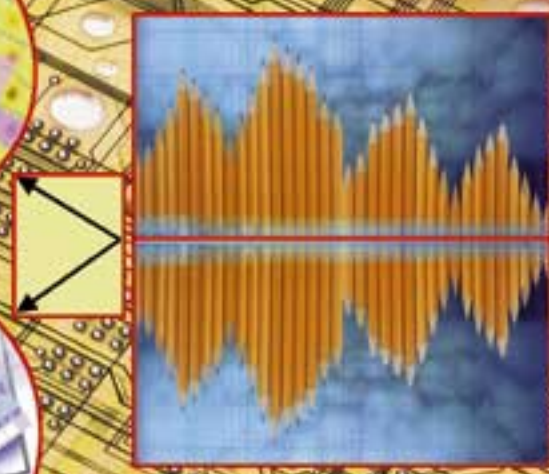
FERROXCUBE

wide range of
FERRITES
and
ACCESSORIES

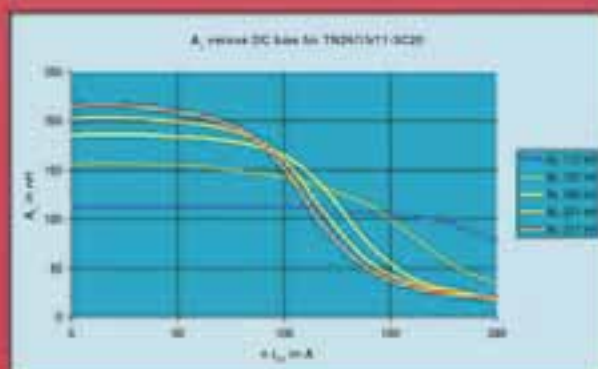
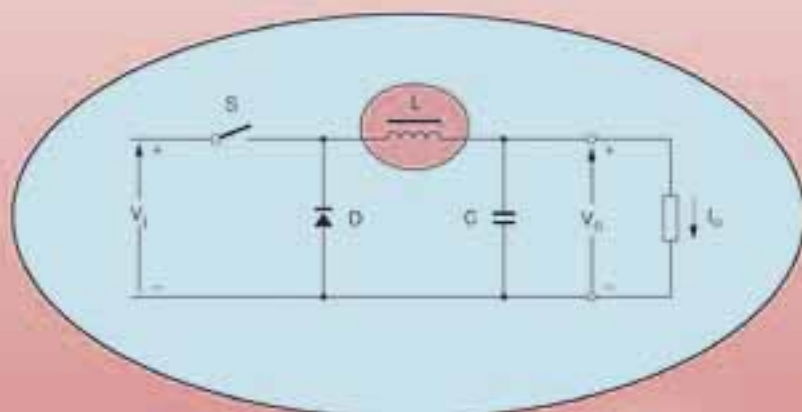


3B46

The new high permeability filter ferrite for bias current conditions



Gapped ferrite toroids for power inductors



Complete core range
in high flux material 3C20

- TN13/7.5/5
- TN17/11/6.4
- TN20/10/6.4
- TN23/14/7.5
- TN26/15/11

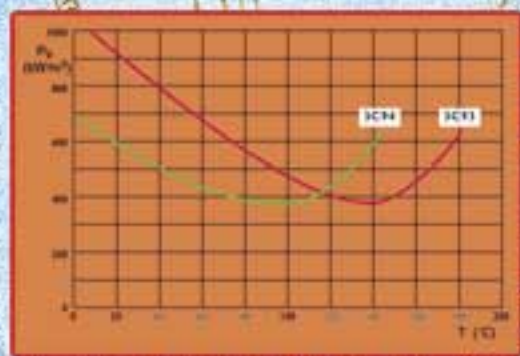
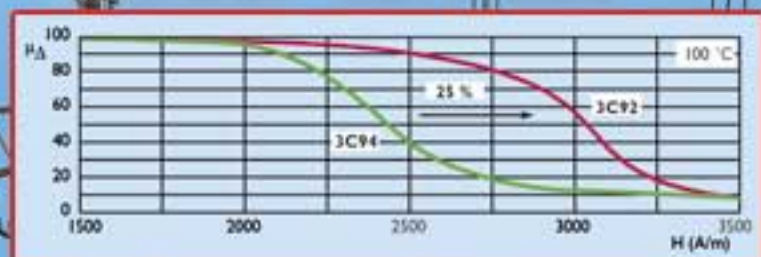


3C92 & 3C93

The high saturation & high temperature low loss power ferrites

500 mT

400 mT



Ferroxcube publications

Catalogues



Data handbook soft ferrites & accessories



CD-ROM soft ferrites & accessories



Product Selection guide soft ferrites & accessories

Signal processing



Ferrite cores for RFID transponders



EPX - A new telecom core range



3B46 - The new high permeability filter ferrite



EP5 - A new telecom core size

Power conversion



Gapped SMD beads for power inductors



New ER cores for planar converters



Gapped ferrite toroids for power inductors



14 W DC/DC converter using IICs



Design of CCFL backlight inverters with frame & bar cores



3C92 & 3C93 - The high saturation & high temperature low loss power ferrites



Power ferrite measuring setup EMMA 2.1



Design of planar power transformers

EMI suppression



Ferrite absorber tiles



The use of soft ferrite for interference suppression



Multilayer suppressors and inductors



3S5 - The new medium frequency EMI ferrite for high bias current conditions



SMD wideband choke with extra metallization

General



Ferroxcube - Company profile



Ferrite for science and industry



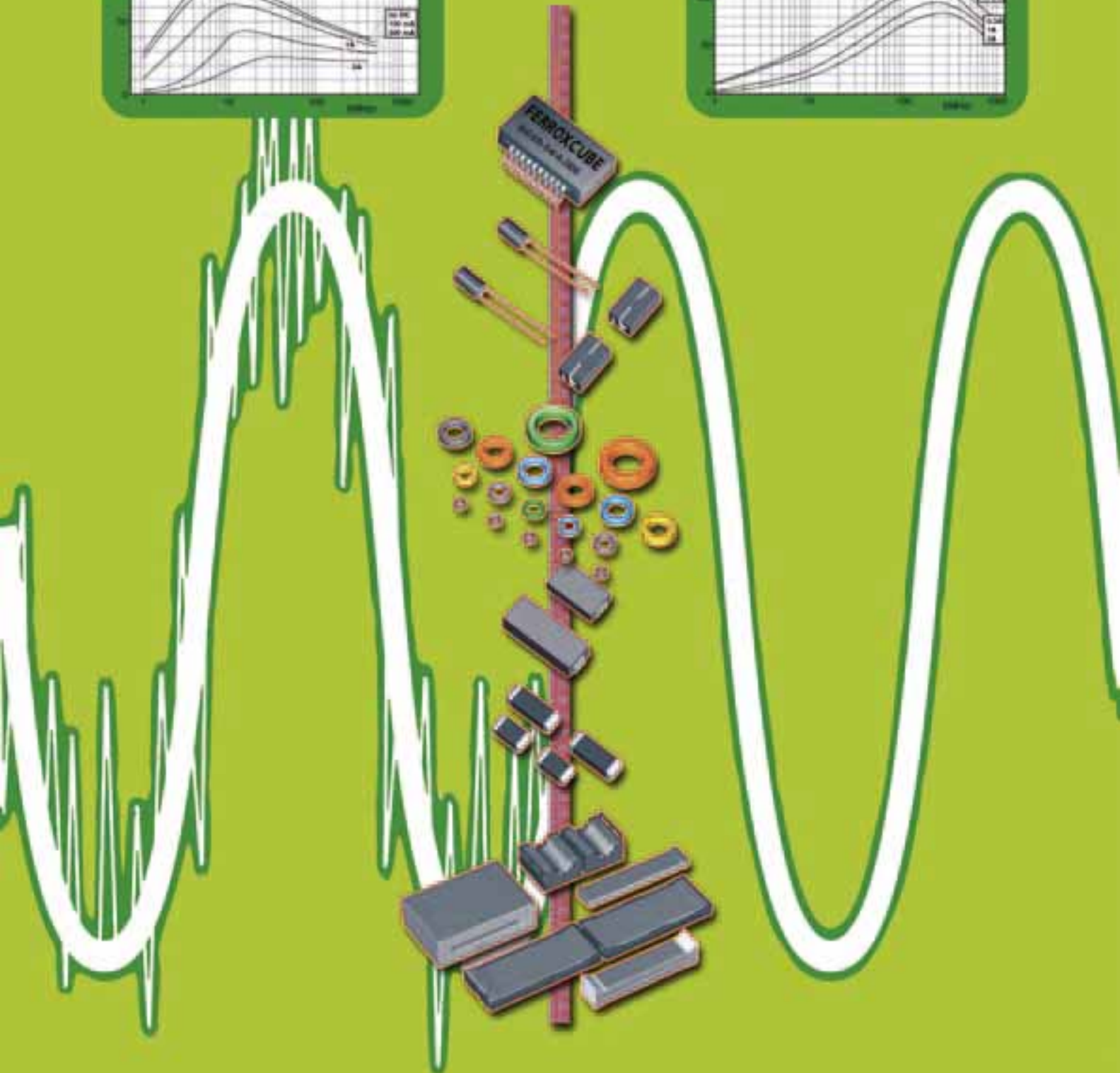
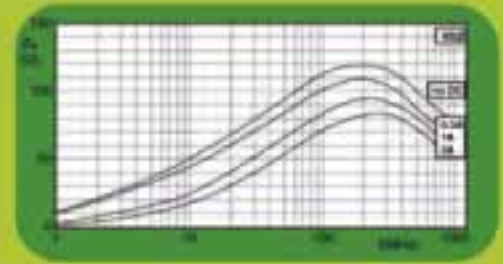
EED - Business profile



Gluing of ferrite cores



The use of soft ferrites for interference suppression

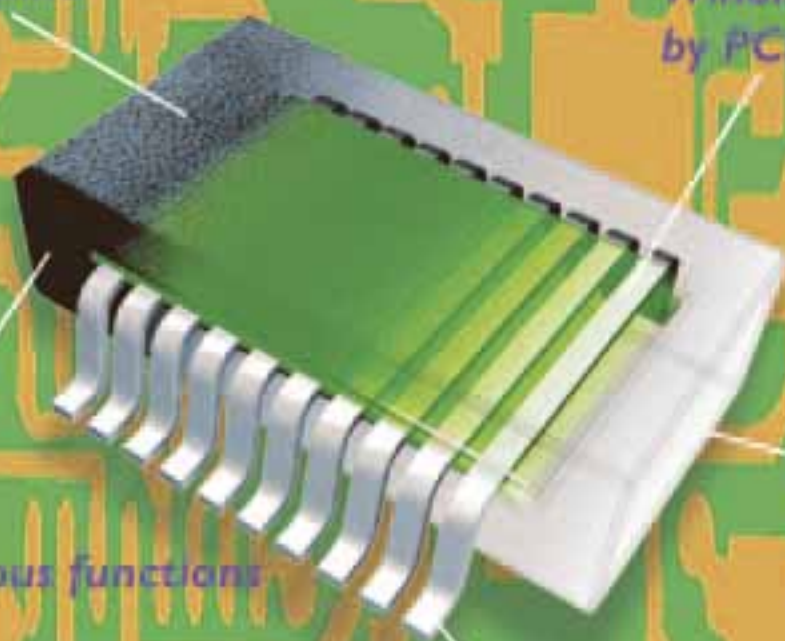


Integrated Inductive Components Ready to come on board



Inductive SMD with
standard IC outline

Windings completed
by PCB tracks

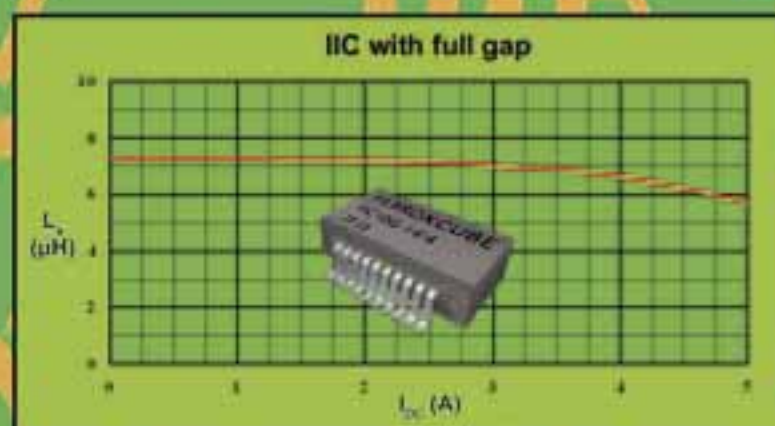


With or without
(full) airgap,
depending on
function

Suitable for various functions

- Power inductor
- Power transformer
- Signal transformer
- Common-mode choke
- Multi-line suppressor

Low profile SMD
component

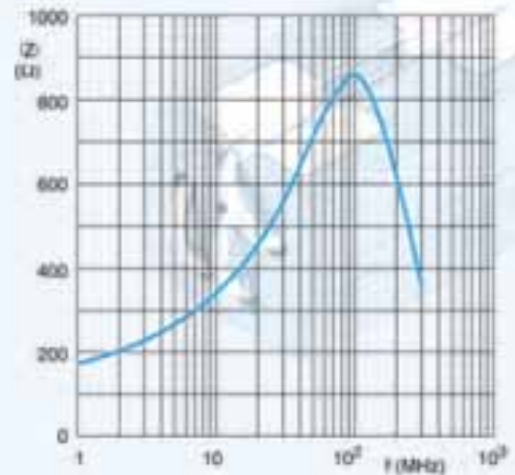
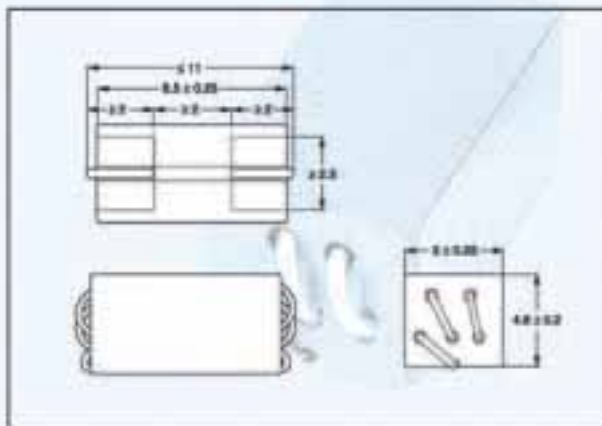


New !!!

SMD WIDEBAND CHOKE WITH EXTRA METALLIZATION

Features

- Outperforming ferrite material
- Large soldering area, still side by side mounting possible
- Very thin metallization
- Reflow soldering with SnAgCu solderpaste
- Ready for SMD automatic mounting
- Higher robustness than traditional metallization
- Able to stand the toughest life and mechanical on-board tests (automotive)
- **Lead-free (Sn) plated available**



Ferroxcube
Universal range of
ferrites and accessories



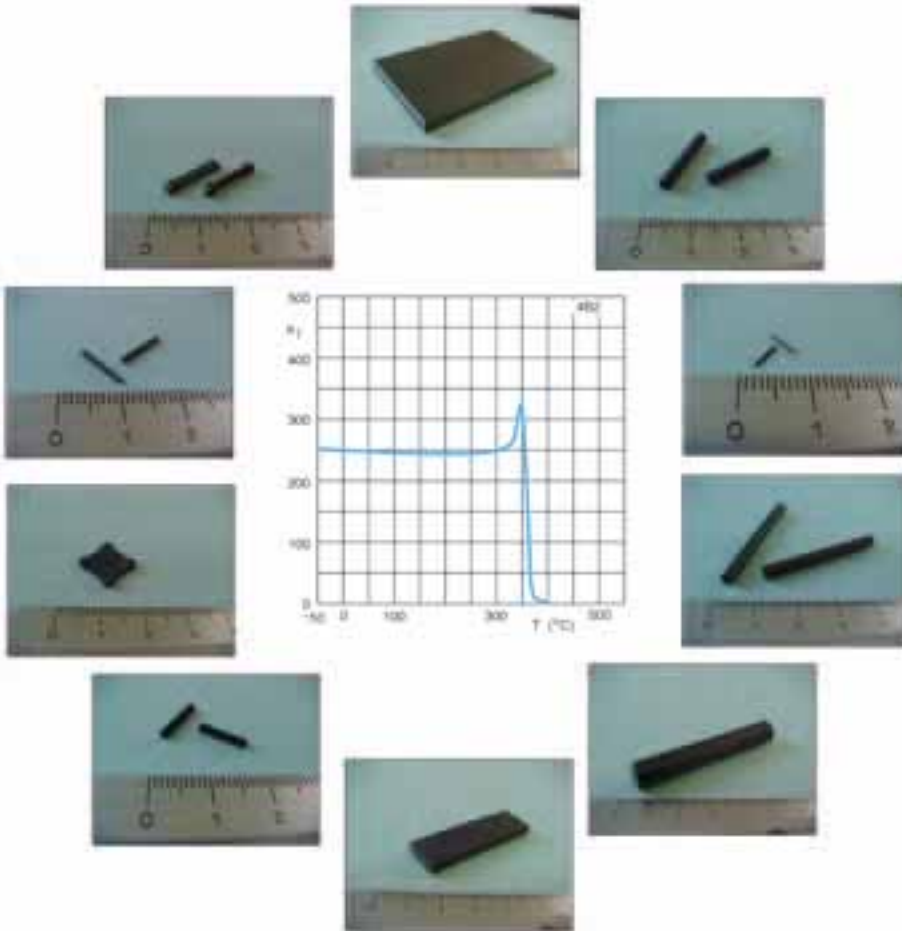
FERROXCUBE

Products for power & signal applications



Ferroxcube

Small ferrites / EMI suppression

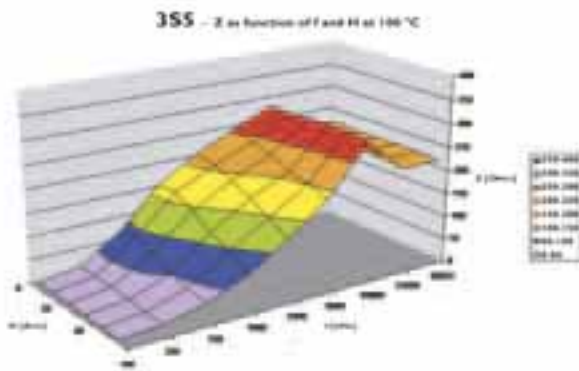


Ferrite cores
for
RFID transponders

- * Flat $\mu(T)$ grades 4B2 and 4B4
- * Tight dimensional tolerances
- * PVD metallization

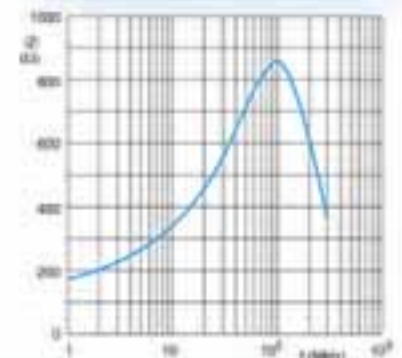
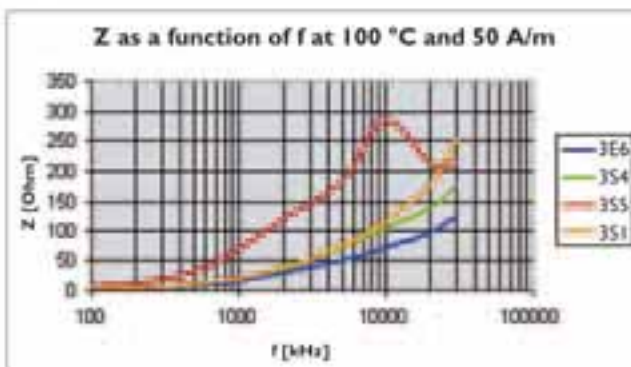
- * Automotive sensors
- * Animal tracking
- * Personal monitoring functions

EMI suppression material for high bias current

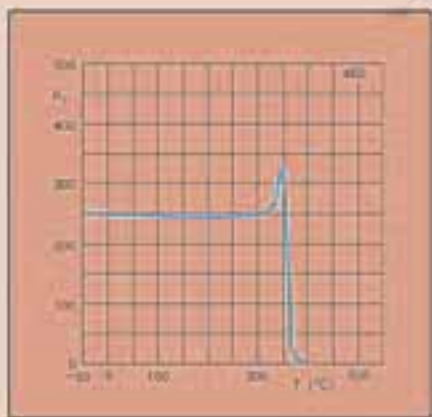
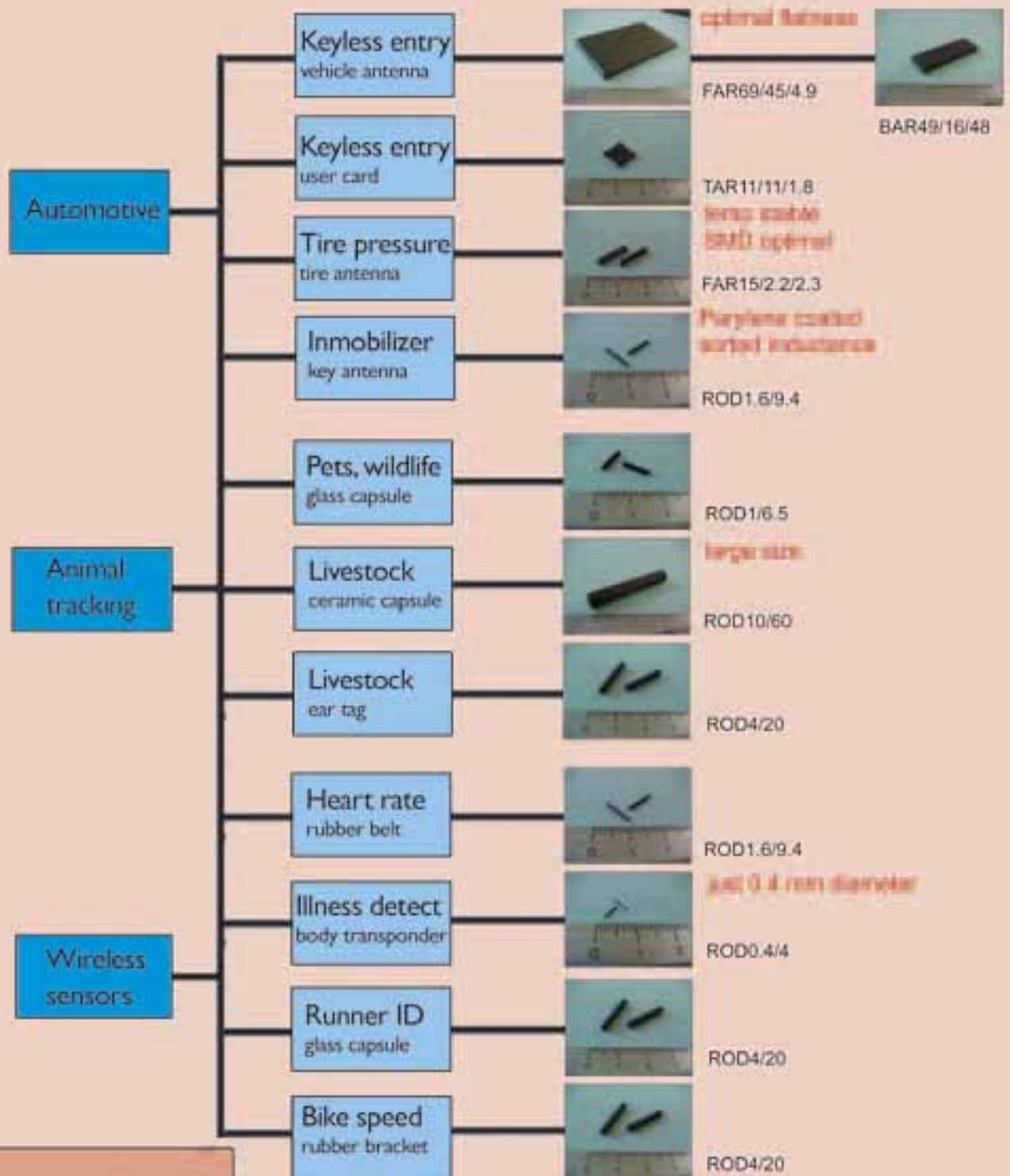


High
temperature
environment
(automotive)

Metallized SMD wideband chokes



Ferrites cores for RFID transponders



- * Flat $\mu(T)$ grades 4B2 and 4B4
- * Tight dimensional tolerances
- * PVD metallization

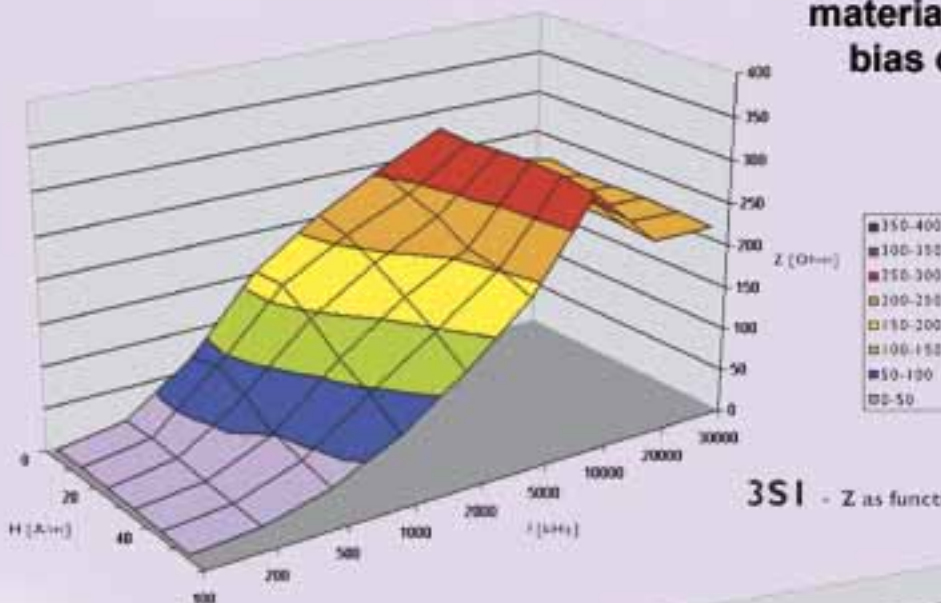


Ferroxcube 3S5

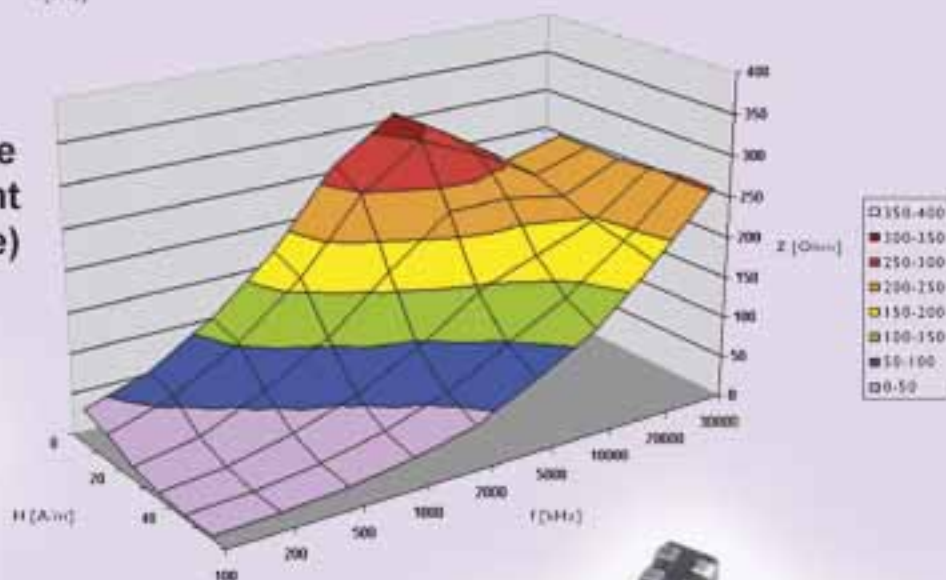
High bias / high temp EMI suppression

3S5 - Z as function of f and H at 100 °C

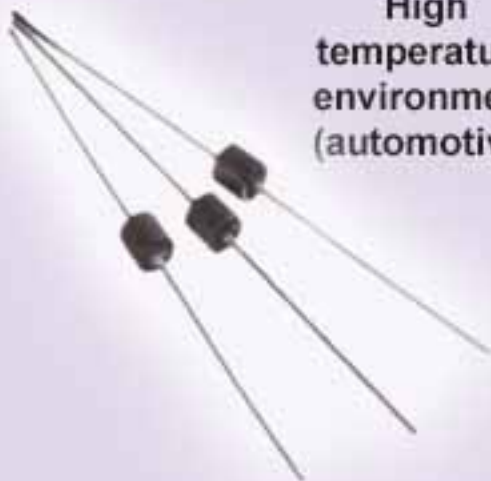
EMI suppression material for high bias current



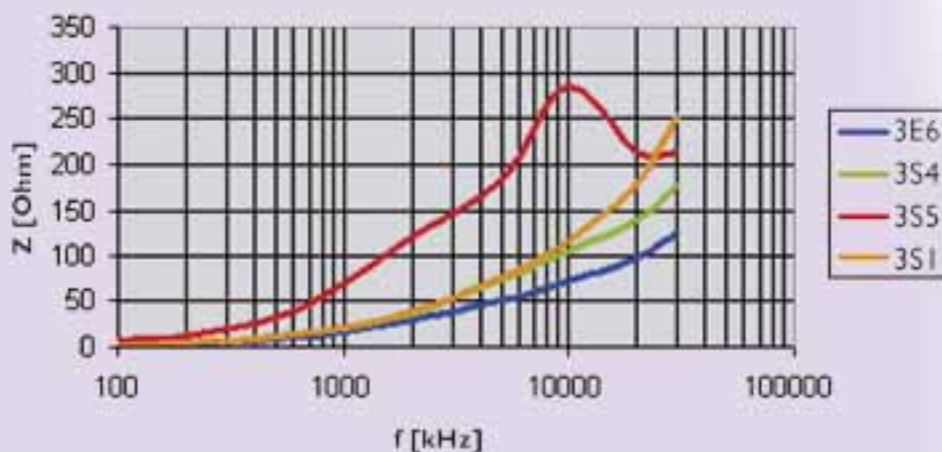
3S1 - Z as function of f and H at 100 °C



High temperature environment (automotive)

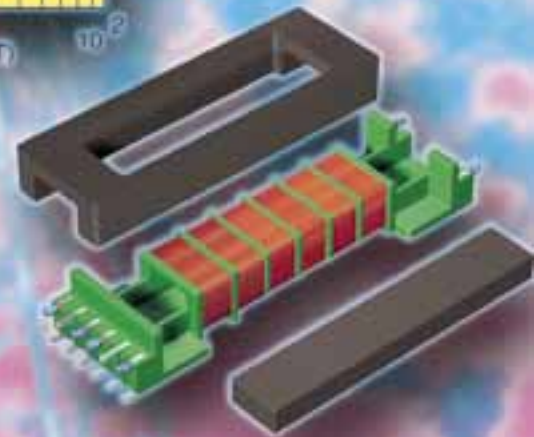
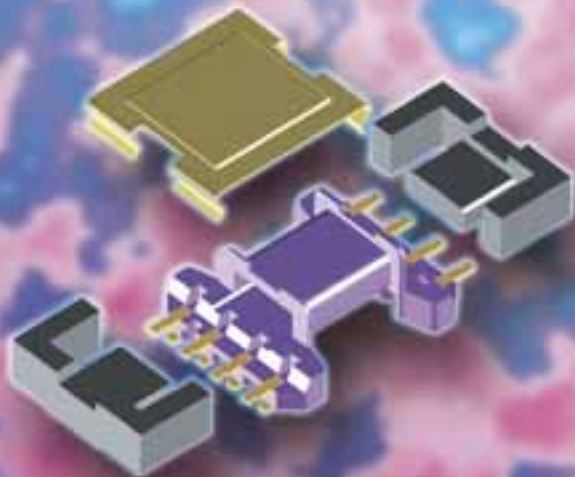
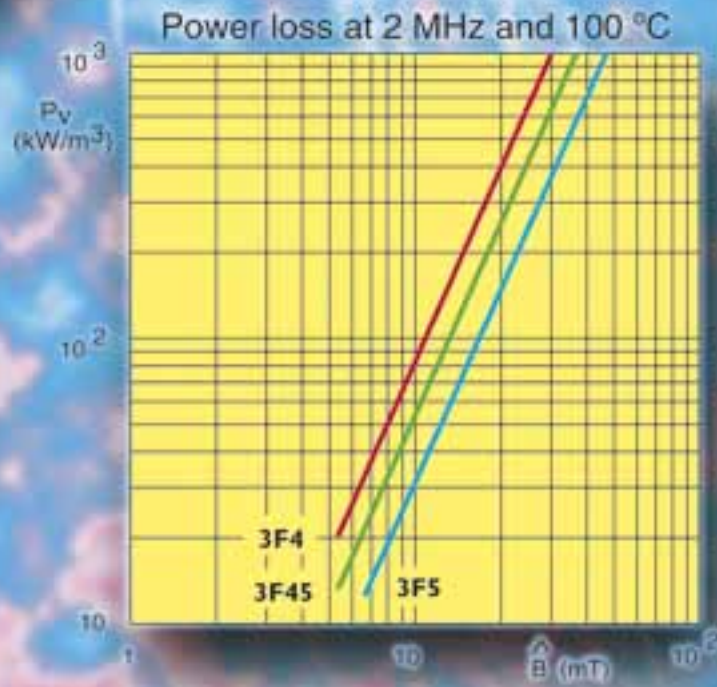


Z as a function of f at 100 °C and 50 A/m



Ferroxcube Power Ferrites

for your high frequency designs



ULTRA WIDEBAND AND HIGH-FREQUENCY FILTER FOR DC POWER LINE DECOUPLING AND EMI SUPPRESSION

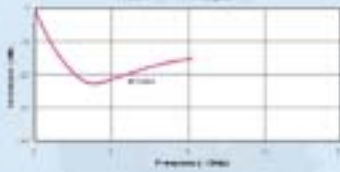
COILFILTER KFI-09-3

• ELECTRICAL CHARACTERISTICS

AC CHARACTERISTICS (Ta = 25 °C)	
BANDWIDTH	2800-8500 MHz: -12 dB
	1600-2000 MHz: -20 dB

DC CHARACTERISTICS (Ta = 25 °C)	
DC RESISTANCE	40 mΩ (max)
RATED CURRENT	2000 mA (max)

• ISOLATION vs. FREQUENCY



COILFILTER KPS-13-3

• ELECTRICAL CHARACTERISTICS

AC CHARACTERISTICS (Ta = 25 °C)	
BANDWIDTH	800-8000 MHz: -15 dB
	1600-2000 MHz: -20 dB

DC CHARACTERISTICS (Ta = 25 °C)	
DC RESISTANCE	80 mΩ (max)
RATED CURRENT	1500 mA (max)

• ISOLATION vs. FREQUENCY



FEATURES :

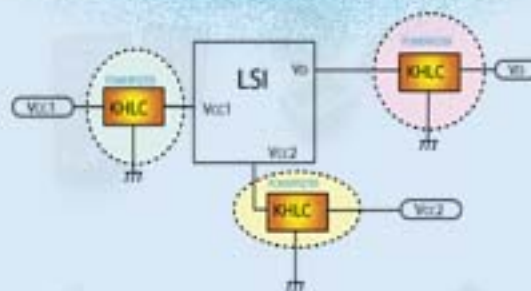
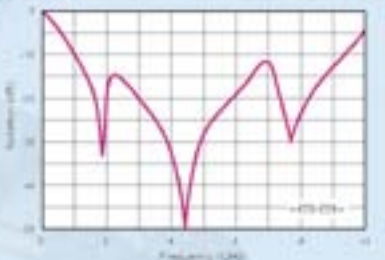
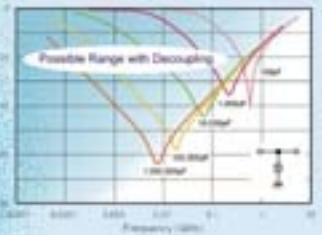
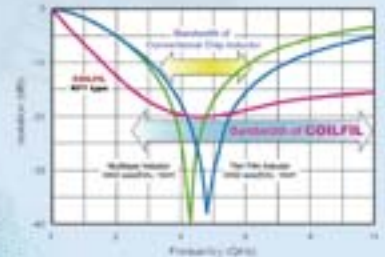
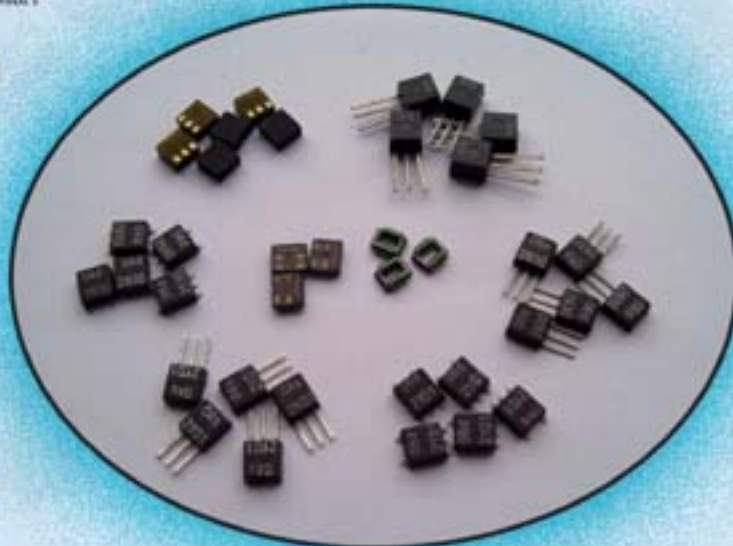
- ULTRA WIDEBAND ISOLATION - 30 kHz - 12 GHz (-20 dB)
- LOW RESISTANCE, HIGH CURRENT (2 A)
- NO RESIN PACKAGE, EXCELLENT RF CHARACTERISTICS
- VARIABLE L, Π, T TYPE FILTER CAN BE EASILY DESIGNED
- SMALL, SMD MOUNTABLE COMPONENTS



LOW Q CONSTRUCTION :
WIDERBAND & NO RESONANCE



CONVENTIONAL TERMINALS



TYPICAL APPLICATIONS

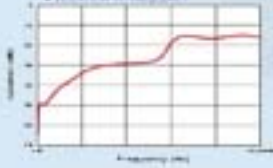
- TODAY'S PERSONAL COMPUTER !
(CLOCK FREQUENCY, HARMONICS)
- HIGH-SPEED IMAGE PROCESSING
- HIGH-SPEED INTERFACES
- HIGH-SPEED WIRELESS LAN
- ON-BOARD POWER SUPPLY

• ELECTRICAL CHARACTERISTICS

AC CHARACTERISTICS (Ta = 25 °C)	
BANDWIDTH	0.1 - 8000 MHz: -20 dB
	0.4 - 1000 MHz: -10 dB

DC CHARACTERISTICS (Ta = 25 °C)	
DC RESISTANCE	100 mΩ (max)
RATED CURRENT	2000 mA (max)

• ISOLATION vs. FREQUENCY

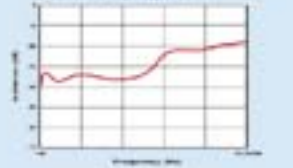


• ELECTRICAL CHARACTERISTICS

AC CHARACTERISTICS (Ta = 25 °C)	
BANDWIDTH	0.1 - 8000 MHz: -20 dB
	0.3 - 5000 MHz: -10 dB

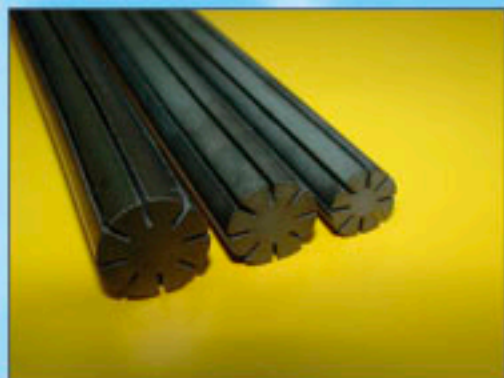
DC CHARACTERISTICS (Ta = 25 °C)	
DC RESISTANCE	100 mΩ (max)
RATED CURRENT	2000 mA (max)

• ISOLATION vs. FREQUENCY

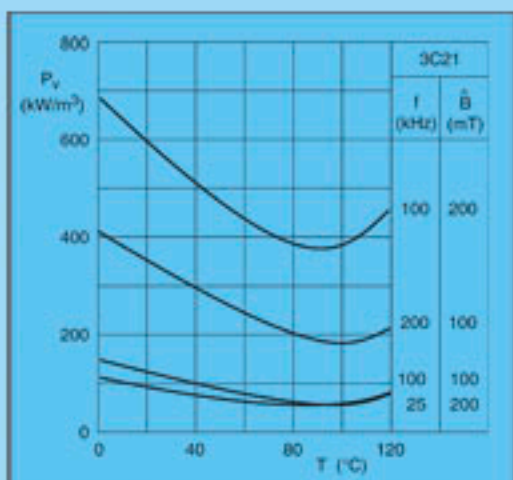
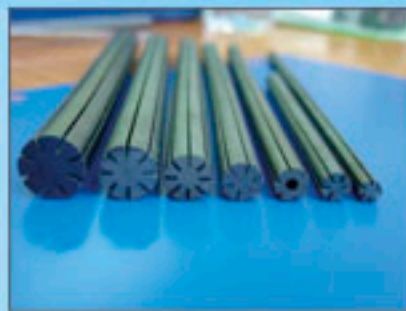
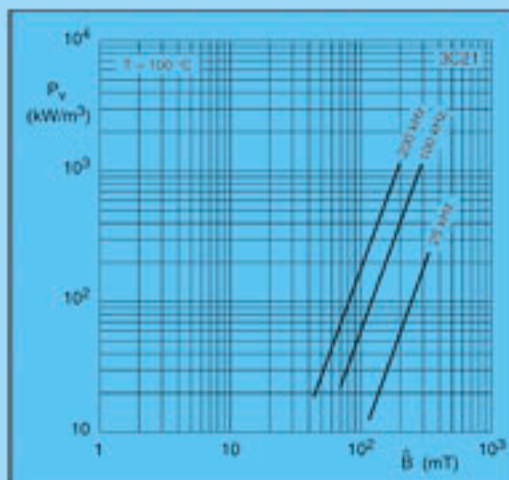


Large impeder cores for inductive pipe welding

3C21 - Robust HF power grade



3C21	CONDITIONS	VALUE	UNIT
μ	25 °C, ≤ 10 kHz, 0.1 mT	$2000 \pm 20 \%$	
P_v	100 °C, 25 kHz, 200 mT	≈ 5500	
B	25 °C, 10 kHz, 250 A/m	≈ 500	mT
	100 °C, 10 kHz, 250 A/m	≈ 440	
P_v	100 °C, 100 kHz, 100 mT	≈ 40	kW/m^2
	100 °C, 100 kHz, 200 mT	≈ 300	
	100 °C, 500 kHz, 50 mT	≈ 250	
ρ	DC, 25 °C	≈ 5	Ωm
T_c		≥ 240	°C
Density		≈ 4800	kg/m^3

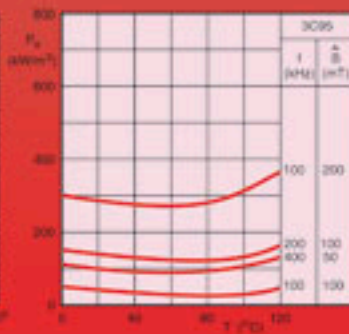
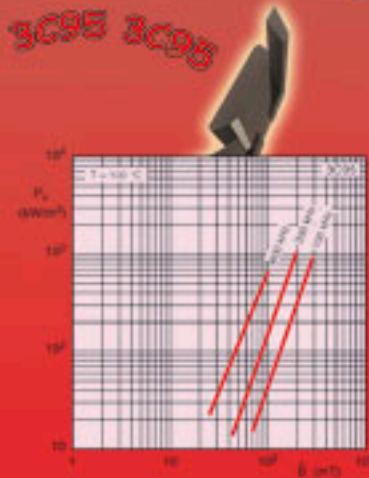
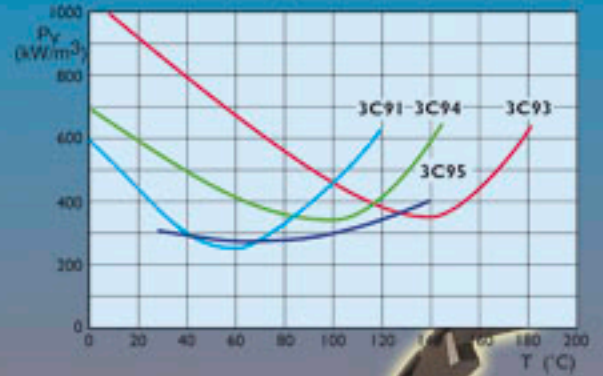


GRADE	NR OF SLOTS	DIMENSIONS (mm)		TYPE NUMBER	
		D	L	SOLID	HOLE
3C21	6	7 ± 0.1	200 ± 4	3PF7-200	3PFH7-200
	8	8 ± 0.1	200 ± 4	3PF8-200	3PFH8-200
	8	9 ± 0.1	200 ± 4	3PF9-200	3PFH9-200
	8	10 ± 0.15	200 ± 4	3PF10-200	3PFH10-200
	8	11 ± 0.15	200 ± 4	3PF11-200	3PFH11-200
	8	12 ± 0.15	200 ± 4	3PF12-200	3PFH12-200
	8	13 ± 0.4	200 ± 4	3PF13-200	3PFH13-200
	8	14 ± 0.4	200 ± 4	3PF14-200	3PFH14-200
	8	15 ± 0.45	200 ± 4	3PF15-200	3PFH15-200
	8	16 ± 0.5	200 ± 4	3PF16-200	3PFH16-200
	8	17 ± 0.5	200 ± 4	3PF17-200	3PFH17-200
	8	18 ± 0.55	200 ± 4	3PF18-200	3PFH18-200
	8	19 ± 0.55	200 ± 4	3PF19-200	3PFH19-200
	8	20 ± 0.6	200 ± 4	3PF20-200	3PFH20-200
	8	21 ± 0.6	200 ± 4	3PF21-200	3PFH21-200
	8	22 ± 0.65	200 ± 4	3PF22-200	3PFH22-200
	8	23 ± 0.7	200 ± 4	3PF23-200	3PFH23-200
8	24 ± 0.75	200 ± 4	3PF24-200	3PFH24-200	
8	25 ± 0.85	200 ± 4	3PF25-200	3PFH25-200	
8	27 ± 0.85	200 ± 4	3PF27-200	3PFH27-200	



3C95

Ferroxcube's all temperature power ferrite





FAKULTÄT FÜR BIBLIOTHEKSWISSENSCHAFT UND INFORMATIONSWISSENSCHAFT



FERRONCUBE

A YAGEO COMPANY

New metal alloy powder grades in toroids

MPP, Sendust & High Flux

MPP (Ni 80% - Fe 20%, with some Mo substitution)
 Lowest core losses
 Excellent stability under DC Bias conditions
 Ultra stable temperature response
 Good frequency range
 Perm: 14 - 26 - 60 - 125 - 160 - 200 - 300

Sendust (Fe 85% - Si 10% - Al 5%)
 Good core losses
 Good DC bias characteristics
 Very economical
 Perm: 26 - 60 - 75 - 90 - 125

High Flux (Fe 50% - Ni 50%)
 Relatively low core losses
 Highest biasing capability
 Highest saturation flux density
 Perm: 14 - 26 - 60 - 125 - 160

	HIGH FLUX	SENDUST	MPP	UNIT
coating colour	khaki	cream	gray	
permeability range	14-160	26-125	14-300	
Curie temperature	500	500	460	°C
thermal conductivity	0.08	0.08	0.08	W.K ⁻¹ .mm ⁻¹
linear expansion coef. cient	5.8x10 ⁻⁶	10.8x10 ⁻⁶	12.9x10 ⁻⁶	K ⁻¹
density for 125μ	8200	7000	8700	kg/m ³



Wide range of ring cores
 Industry-standard sizes from 3.56 x 1.78 x 1.52 mm to 77.8 x 49.2 x 15.9 mm
 Insulating layer of epoxy coating, withstanding 500 Vrms
 Maximum steady-state operating temperature 200 °C
 Alternative coating with Parylene to reduce the mechanical friction
 Tolerance on AL is equal to permeability tolerance ± 8 %.

