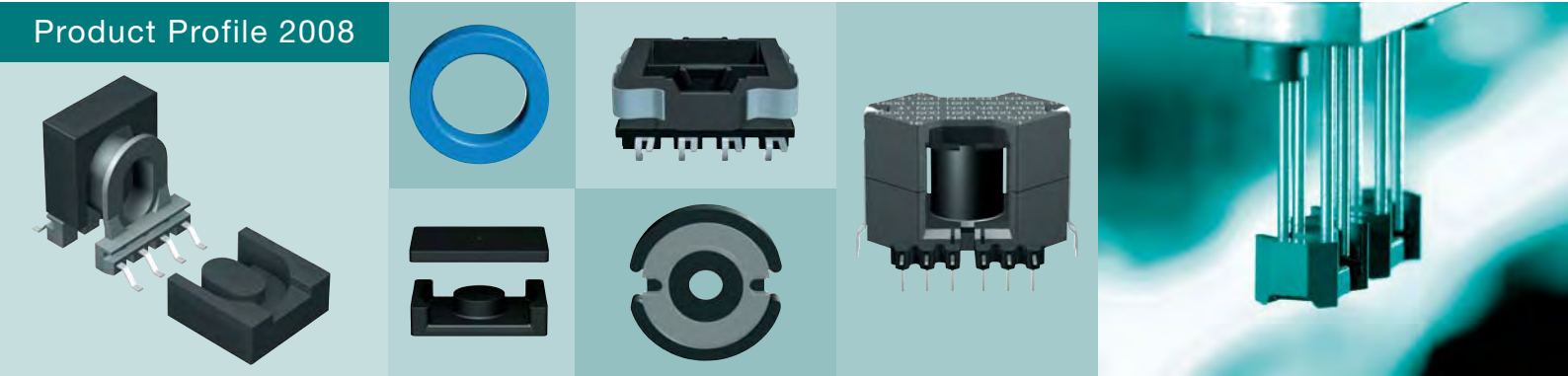




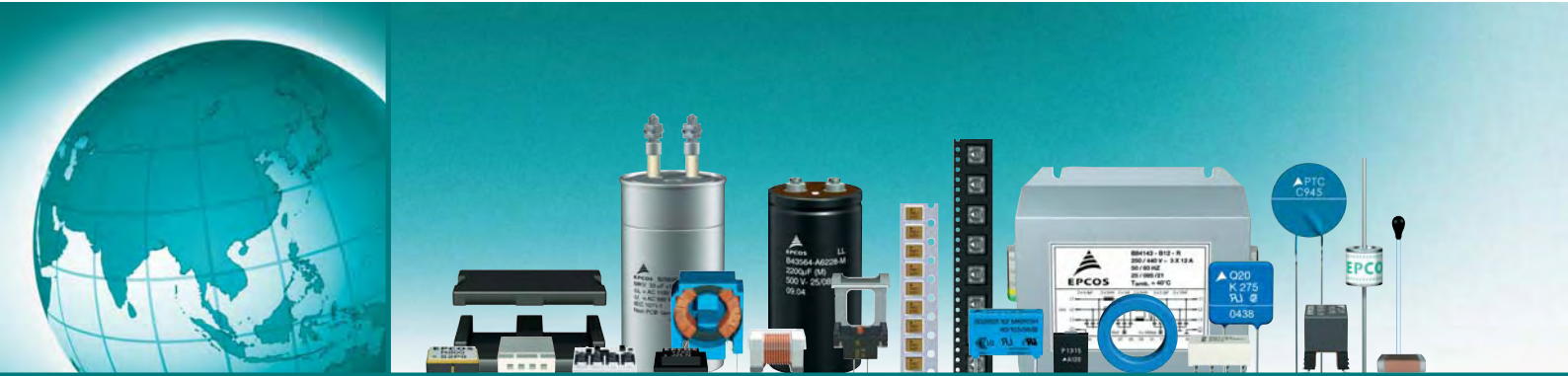
Product Profile 2008



Ferrites and Accessories

Ferrite und Zubehör

Welcome to the World of Electronic Components and Modules



EPCOS is a leading manufacturer of electronic components and modules and provides one-stop shopping for a comprehensive range of products. Our portfolio includes capacitors and inductors, ceramic components, arresters, and surface and bulk acoustic wave components. EPCOS focuses on fast-growing and technologically demanding markets in the areas of information and communications technology, automotive, industrial, and consumer electronics. We offer our customers both standard components as well as application-specific solutions.

EPCOS has design, manufacturing and marketing facilities in Europe, Asia and the Americas. With our global presence we are able to provide our customers with local development know-how and support in the early phases of their projects.

EPCOS is continually improving its processes and thus the quality of its products and services. The Group is ISO/TS 16949 certified.

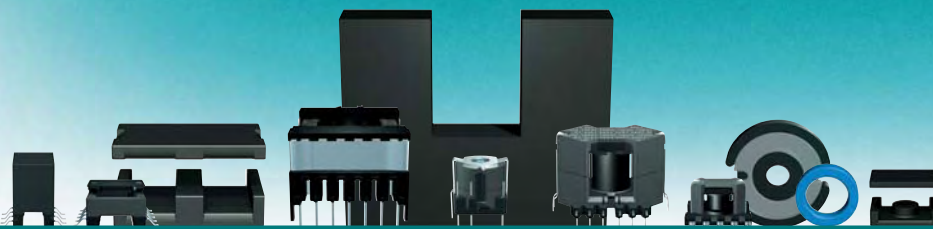
EPCOS ist ein führender Hersteller elektronischer Bauelemente und Module und bietet ein breit gefächertes Produktangebot aus einer Hand. Unser Portfolio umfasst Kondensatoren und Induktivitäten, keramische Bauelemente, Ableiter sowie Surface- und Bulk-Acoustic-Wave-Komponenten. EPCOS konzentriert sich auf schnell wachsende und technologisch anspruchsvolle Märkte im Bereich der Informations- und Kommunikationstechnik sowie der Automobil-, Industrie- und Konsum-Elektronik. Wir bieten unseren Kunden sowohl Standardprodukte als auch anwendungsspezifische Lösungen.

EPCOS verfügt über Entwicklungs-, Produktions- und Vertriebsstätten in Europa, Asien sowie in Nord- und Südamerika. Durch unsere globale Präsenz können wir Kunden bereits in der Frühphase ihrer Projekte mit Entwicklungskompetenz vor Ort unterstützen.

EPCOS verbessert kontinuierlich seine Prozesse und damit die Qualität seiner Produkte und Dienstleistungen. Der Konzern ist nach ISO/TS 16949 zertifiziert.

Ferrites and Accessories

Ferrite und Zubehör



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Ferrites and Accessories

Ferrite und Zubehör



Preview / Vorwort

Ferrites are indispensable key components in many modern, high-performance technologies. They are constantly penetrating new applications, for example, in entertainment and industrial electronics, in lighting, and in information and communication technology. EPCOS ranks among the world's leading suppliers of ferrites and accessories.

In materials for broadband and power engineering we are setting new standards. With an extensive range of ferrite cores plus matching accessories, we are able to offer an optimum solution for nearly every possible application.

Customers all over the world are already profiting from this capability. They all count on our competence and innovation, trust in our quality and logistics. Our experts will be glad to support you. Make our creativity and competence count for your success too.

Ferrite sind unverzichtbare Schlüsselkomponenten in vielen modernen Hochleistungstechnologien. Sie finden immer neue Anwendungen beispielsweise in der Unterhaltungs- und Industrieelektronik, in der Beleuchtungstechnik sowie in der Informations- und Kommunikationstechnik. EPCOS gehört zu den weltweit führenden Anbietern von Ferriten und Zubehör.

Bei hochpermeablen und Leistungsmaterialien setzen wir neue Maßstäbe. Mit einem umfangreichen Typenspektrum von Ferritkernen und dem dazu passenden Zubehör bieten wir optimale Lösungen, die nahezu jeden Lieferwunsch erfüllen. Davon profitieren Kunden in aller Welt. Sie alle setzen auf unsere Kompetenz und Innovationskraft, vertrauen unserer Qualität und Logistik. Unsere Experten stehen Ihnen gerne zur Verfügung. Nutzen auch Sie unsere Kreativität und Kompetenz für Ihren Erfolg.



Our research and development activities constantly keep pace with the demands of the market, orienting fully on customer needs.

Unsere Forschungs- und Entwicklungstätigkeiten messen wir konsequent an den Anforderungen des Marktes und richten sie auf die Wünsche unserer Kunden aus.

| | |
|---|---|
| Miniaturization of power modules Miniaturisierung bei Leistungsmodulen | Reduction of core losses, development of flat and small cores Reduzierung der Kernverlustleistung, Entwicklung flacher und kleiner Kerne |
| DC biasing Gleichstrom-vormagnetisierung | Development and improvement of materials with high saturation Verbesserung und Neuentwicklung von Materialien mit hoher Sättigung |
| Access applications Access-Anwendungen | New materials for broadband transformers, development of optimized core forms Neue Werkstoffe für Breitbandübertrager, Entwicklung optimierter Kernformen |
| Interference suppression Störschutzanwendungen | New materials in expanded core spectrum Neue Werkstoffe bei erweitertem Kernspektrum |
| Environmentally compatible products Umweltverträgliche Produkte | Development of lead-free surfaces in accessories, halogen-free plastics, optimization of packaging Entwicklung bleifreier Oberflächen beim Zubehör, halogenfreie Kunststoffe, Verpackungsoptimierung |
| Customer support Kundenunterstützung | High application understanding, Magnetic design tool, Time to market Hohes Applikationsverständnis, Magnetic Design Tool, Time to Market |

Please read *Cautions and warnings* on page 53 and *Important notes* on page 54.
Bitte beachten Sie die Seite 53 *Warn- und Sicherheitshinweise* sowie *Wichtige Hinweise* auf Seite 54.

Materials Werkstoffe

The starting materials for ferrites are iron, manganese, zinc and nickel oxides. From these raw materials EPCOS laboratories, working with the latest microengineering techniques, constantly produce new ferrite materials with their own specific properties.

Cooperating closely with customers, we continuously match our product spectrum to what the market demands. And in doing this, the properties of ferrite materials are sounded to their physical boundaries.

The following tables give an overview of the major magnetic properties of EPCOS ferrite materials.

Die Ausgangsmaterialien für Ferrite sind Eisen-, Mangan-, Zink- und Nickeloxide. Aus diesen Grundstoffen entstehen in den Labors von EPCOS mit modernsten Microengineering-Techniken immer neue Ferritmaterialien mit jeweils besonderen Eigenschaften.

In enger Zusammenarbeit mit unseren Kunden passen wir unser Produktspektrum ständig an die Erfordernisse des Marktes an. Dabei werden die Eigenschaften der Ferritwerkstoffe bis an die physikalischen Grenzen ausgelotet.

Die folgenden Tabellen geben einen Überblick über die wichtigsten magnetischen Eigenschaften der EPCOS-Ferritwerkstoffe.



Main application: Power transformers and chokes Anwendungsschwerpunkt: Leistungsübertrager und Drosseln

| Performance factor | | μ_i | f | $P_V^{1)}$ | $B_S^{2)}$ | Features | Main applications | Core shapes | |
|----------------------------|-----|---------|------|-------------------|------------------|----------|--|--|--|
| low \longrightarrow high | | | kHz | kW/m ³ | mT | Merkmale | Hauptanwendungen | Kernformen | |
| | N72 | | 2500 | 25 ... 300 | 540 | 370 | Flat power loss vs. temperature Flacher Temperaturverlauf | Ballasts for energy-saving lamps EVG für Energiesparlampen | E, EFD |
| | | N92 | 1500 | 25 ... 500 | 410 | 440 | High flux density, large ΔB swing, low losses (25 ... 300 kHz) Hohe Flussdichte, großer Induktionshub ΔB , kleine Verluste (25 ... 300 kHz) | Diode splitting transformers, high-voltage transformers, chokes Diodenplitting-/Hochspannungsübertrager, Drosseln | RM, ETD, EFD, ER, E, ELP, EQ Toroids / Ring |
| N41 | | | 2800 | 25 ... 150 | 1400 | 390 | High permeability, low losses (25 ... 100 kHz) at low temperatures Hohe Permeabilität, kleine Verluste (25 ... 100 kHz) bei niedrigen Temperaturen | Pulse transformers, inverters for CCFL ⁴⁾ Impulsübertrager, Inverter für CCFL ⁴⁾ | RM, P |
| N27 | | | 2000 | 25 ... 150 | 920 | 410 | Low losses (25 ... 500 kHz), excellent DC bias behavior | Power transformers and chokes for medium- to high-frequency SMPS | ELP, RM, EFD, EP, EQ, P, PM, ETD, ER, E, U Toroids / Ring |
| | | N51 | 3000 | 25 ... 150 | 700 | 380 | Kleine Verluste (25 ... 500 kHz), exzellentes DC-Bias-Verhalten | Leistungsübertrager und Drosseln für SNT (MF bis HF) | |
| | | N87 | 2200 | 25 ... 500 | 375 | 390 | | | |
| | | N97 | 2300 | 25 ... 500 | 300 | 410 | | | |
| | | N95 | 3000 | 25 ... 500 | 350 | 410 | High temperature stability Hohe Temperaturstabilität | Power transformers Leistungsübertrager | E, ER, ETD |
| | | N49 | 1500 | 300 ... 1000 | 80 ³⁾ | 400 | Low losses (0.5 ... 1 MHz) Kleine Verluste (0.5 ... 1 MHz) | High-frequency power transformers and chokes HF-Leistungsübertrager und Drosseln | RM, EFD, ER, ELP, EQ Toroids / Ring |

1) f = 100 kHz, \hat{B} = 200 mT, T = 100 °C, 2) \hat{H} = 1200 A/m, f = 10 kHz, T = 100 °C, 3) f = 500 kHz, \hat{B} = 50 mT, T = 100 °C, 4) Cold cathod fluorescence lamp

Materials Werkstoffe

| Main application: Resonant circuit inductors and filters Anwendungsschwerpunkt: Spulen für Resonanzkreise und Filter | | | | | | | | | |
|---|-----|----------------|-------------------------|----------------------|----------------------|--|---|--|---------------------------|
| tanδ/μ _i level low → high | | μ _i | f _{max} MHz | T _c °C | B _s mT | η _B 10 ⁻⁶ /mT | Features Merkmale | Main applications Hauptanwendungen | Core shapes Kernformen |
| | K1 | 80 | 12 | > 400 | 310 ¹⁾ | < 36 | Low loss factor for high-Q filters Kleiner Verlustfaktor für Filter mit hoher Güte | VHF filters, Balun, CATV, RF transformers UHF Filter, Balun, CATV, HF-Übertrager | RM, P Toroids / Ring |
| | M33 | 750 | 1.0 | > 200 | 400 ²⁾ | < 1.8 | | RF transformers HF-Übertrager | RM, P |
| | N48 | 2300 | 0.1 | > 170 | 420 ³⁾ | < 0.4 | | RF transformers, filters for telecom HF-Übertrager, Filter für Telecom | RM, P |
| | N22 | 2300 | 0.2 | > 145 | 370 ³⁾ | < 1.4 | | Inductive proximity switches Näherungsschalter | PS |
| K10 | | 800 | 1.0 | > 150 | 320 ¹⁾ | < 5.0 | High impedance for EMC applications Hohe Impedanz für EMV-Anwendungen | Line attenuation, current-compensated chokes Leitungsdämpfung, stromkompensierte Drosseln | Toroids / Ring |
| K8 | | 860 | 0.5 | > 150 | 340 ³⁾ | < 4.5 | | | |
| K7 | | 1500 | 0.5 | > 110 | 280 ³⁾ | < 4.0 | | | |
| M13 | | 2300 | 0.1 | > 105 | 280 ³⁾ | < 4.0 | | | |

1) Ĥ = 5000 A/m, f = 10 kHz, T = 25 °C 2) Ĥ = 2000 A/m, f = 10 kHz, T = 25 °C 3) Ĥ = 1200 A/m, f = 10 kHz, T = 25 °C

| Main application: Broadband transformers and EMC applications Anwendungsschwerpunkt: Breitbandübertrager und EMV-Anwendungen | | | | | | | | | |
|---|-----|----------------|-------------------------|----------------------|---------------------------------|--|--|---|----------------------------------|
| Permeability level low → high | | μ _i | f _{max} kHz | T _c °C | B _s @ 25 °C mT | η _B 10 ⁻⁶ /mT | Features Merkmale | Main applications Hauptanwendungen | Core shapes Kernformen |
| N45 | | 3800 | 100 | > 255 | 550 | < 0.3 | High saturation Hohe Sättigung | Filters for telecom Filter für Telecom | RM, EP, ER |
| T57 | | 4000 | 500 | > 140 | 430 | < 0.3 | L _{DC} (0-70 °C) | LAN, DSL | RM, EP, Toroids / Ring |
| N30 | | 4300 | 400 | > 130 | 380 | < 1.1 | | Current-comp. chokes Stromkomp. Drosseln | RM, P, EP, E, Toroids / Ring |
| T65 | | 5200 | 200 | > 160 | 460 | < 1.1 | | RF chokes HF-Drosseln | ER, Toroids / Ring |
| T35 | | 6000 | 200 | > 130 | 390 | < 1.1 | | | RM, P, EP, Toroids / Ring |
| | T37 | 6500 | 300 | > 130 | 380 | < 1.1 | High frequency bandwidth Große Frequenzbandbreite | Power line filters Netzfilter | P, Toroids / Ring |
| | T36 | 7000 | 100 | > 130 | 400 | < 1.1 | | Energy meters Stromzähler | Toroids / Ring |
| | T38 | 10000 | 100 | > 130 | 430 | < 0.3 | | DSL, impedance and matching transformers | RM, P, EP, ER, Toroids / Ring |
| | T66 | 13000 | 100 | > 100 | 360 | < 0.3 | | DSL, Impedanz- und Anpassungsübertrager | RM, P, EP, E |
| | T46 | 15000 | 100 | > 130 | 400 | < 2.0 | Highest permeability Höchste Permeabilität | ISDN transformers ISDN-Übertrager | Toroids Ring |

RM Cores

RM-Kerne

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) AL values (nH); AL tolerance code / AL-Werte (nH); AL-Toleranzbuchstabe | | | | | | | | | |
|-------------|------------------------------|--|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| | | K1 (01) | M33 (33) | N48 (48) | N45 (45) | N30 (30) | T35 (35) | T38 (38) | T66 (66) | N49 (49) | N41 (41) |

Cores (Accessories on page 12-13) / Kerne (Zubehör siehe Seite 12-13)

| | | | | | | | | | | | | | | | | | | | | |
|-------|---|----------|-----------|-----------------|--------|--------|--------|---------|---------|--------|--------|--------|--|--|--|--|--|--|--|-----------------|
| RM 4 | ● | 16, 25 A | 40, 63 A | 63, 100, 160 A | | | | | | | | | | | | | | | | |
| | ○ | | | | 1700 R | 1900 R | 2800 Y | 3700 Y | | | | 750 R | | | | | | | | |
| RM 5 | ● | 25, 40 A | 63, 100 A | 160, 250, 315 A | | | | | | | | | | | | | | | | |
| | ○ | | | 1800 R | | | | | | | | | | | | | | | | |
| | ○ | | | | 2600 R | 3500 R | | | 6700 Y | 9600 Y | 1300 R | 2600 R | | | | | | | | |
| RM 6 | ● | 40 A | 63, 100 A | 160, 250 A | | | | | | | | | | | | | | | | |
| | ● | | | 315, 400 A | | | | | | | | | | | | | | | | 250 A |
| | ○ | | | 2200 R | | | | | | | | | | | | | | | | |
| | ○ | | | | 3500 R | 4300 R | 6200 R | 8600 Y | 12300 Y | 1700 R | 3100 R | | | | | | | | | |
| RM 7 | ● | | | 250, 315 A | | | | | | | | | | | | | | | | |
| | ● | | | | | | | | | | | | | | | | | | | 160, 250 J |
| | ○ | | | | | 5000 R | | 10000 Y | | 1900 R | | | | | | | | | | |
| RM 8 | ● | | | 630 J | | | | | | | | | | | | | | | | |
| | ● | | | 250, 315, 400 A | | | | | | | | | | | | | | | | 160 A |
| | ● | | | | | | | | | | | | | | | | | | | 250, 630 J |
| | ● | | | | | | | | | | | | | | | | | | | 1600 K |
| | ○ | | | 2900 R | | | | | | | | | | | | | | | | |
| | ○ | | | | | | | | | | | | | | | | | | | |
| RM 10 | ● | | | 400, 630 A | | | | | | | | | | | | | | | | |
| | ● | | | | | | | | | | | | | | | | | | | 250 A |
| | ● | | | | | | | | | | | | | | | | | | | 630 J |
| | ● | | | | | | | | | | | | | | | | | | | 1600 K |
| | ○ | | | | | | | | | | | | | | | | | | | |
| | ○ | | | | | | | | | | | | | | | | | | | |
| | ○ | | | | | | | | | | | | | | | | | | | |
| | ○ | | | | | | | | | | | | | | | | | | | |
| | ○ | | | | | | | | | | | | | | | | | | | |
| RM 12 | ● | | | | | | | | | | | | | | | | | | | |
| | ● | | | | | | | | | | | | | | | | | | | 160, 250 A |
| | ○ | | | | | | | | | | | | | | | | | | | 400, 1000 J |
| | ○ | | | | | | | | | | | | | | | | | | | 3700 R |
| | ○ | | | | | | | | | | | | | | | | | | | 6000 R |
| RM 14 | ● | | | | | | | | | | | | | | | | | | | |
| | ● | | | | | | | | | | | | | | | | | | | 160, 250, 400 A |
| | ○ | | | | | | | | | | | | | | | | | | | 1000 J |
| | ○ | | | | | | | | | | | | | | | | | | | 3900 R |
| | ○ | | | | | | | | | | | | | | | | | | | 6800 R |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

1) Cores with center hole (w/o threaded sleeve) also available.
Kerne mit Mittelloch (ohne Gewindehülse) ebenfalls lieferbar.

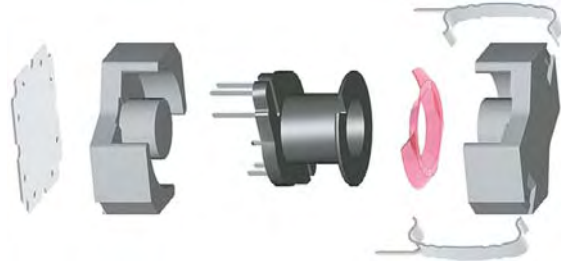
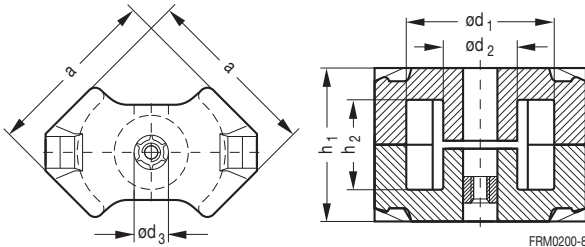
RM cores for optimized PCB real estate

RM cores are ideal for

- extremely low-loss, highly stable filter coils and other resonance-determining inductive components (K1, M33, N48) as well as
- low-distortion broadband transformers for small signals (N45, T38, T57, T66).

- RM cores without center hole are also used in power electronics. Typical materials employed here are N87, N92 and N97.

The sizes are specified by IEC 62317-4. The accessories are suitable for automatic processing. RM cores are supplied in sets.



| | | Ordering code (per set) Bestellnummer (pro Satz) | |
|----------|----------|---|---|
| N87 (87) | N97 (97) | | |
| | | | B65803N0***A0***) |
| 1100 | R 1100 | R | B65803J0000+0** B65805N****A0***) |
| | | | B65805C0000R048 |
| 2000 | R 2000 | R | B65805J0000+0** B65807N0***A0***) |
| | | | B65807N0***A048 ¹⁾ B65807J0250A041 B65807C0000R048 |
| 2400 | R 2400 | R | B65807J0000+0** B65819N0***A048 ¹⁾ |
| | | | B65819J0***J041 |
| 2700 | R 2700 | R | B65819J0000+0** B65811F0630J048 ¹⁾ B65811F0***A048 ¹⁾ |
| 250, 400 | A | | B65811J0***A0** B65811J0***J041 B65811J1600K041 B65811D0000R048 |
| 3300 | R 3300 | R | B65811J0000+0** B65813N0***A048 ¹⁾ B65813J0250A041 B65813J0630J041 B65813J1600K041 |
| 4200 | R 4200 | R | B65813J0000+0** B65815E0***A041 B65815E****J041 |
| 5300 | R 5300 | R | B65815E0000R0** B65887E0***A041 B65887E1000J041 |
| 6000 | R 6000 | R | B65887E0000R0** |

*, +: See ordering code example
Siehe Bestellbeispiel

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| RM 4 | 1.9 (1.7) | 21.0 (22.0) | 11.0 (13.0) | – (11.3) | 231 (286) |
| RM 5 | 1.0 (0.93) | 20.8 (22.1) | 20.8 (23.8) | – (18) | 433 (526) |
| RM 6 | 0.86 (0.78) | 26.9 (28.6) | 31.3 (36.6) | – (31) | 840 (1050) |
| RM 7 | 0.75 (0.70) | 29.8 (30.4) | 40 (43) | – (39) | 1190 (1310) |
| RM 8 | 0.68 (0.59) | 35.1 (38) | 52 (64) | – (55) | 1825 (2430) |
| RM 10 | 0.50 (0.45) | 42 (44) | 83 (98) | – (90) | 3490 (4310) |
| RM 12 | – (0.39) | – (57) | – (146) | – (125) | – (8320) |
| RM 14 | – (0.35) | – (70) | – (200) | – (170) | – (14000) |

Values in parantheses for core sets without center hole
Werte in Klammern für Kernsätze ohne Mittelloch

Main dimensions (mm) / Hauptmaße (mm)

| Type | a | Ø d ₁ | Ø d ₂ | Ø d ₃ | h ₁ | h ₂ |
|-------|-----------|------------------|------------------|------------------|----------------|----------------|
| RM 4 | 9.8 –0.4 | 8.0 +0.3 | 3.9 –0.2 | 2.0 +0.1 | 10.5 –0.2 | 7.0 +0.4 |
| RM 5 | 12.3 –0.5 | 10.2 +0.4 | 4.9 –0.2 | 2.0 +0.1 | 10.5 –0.2 | 6.3 +0.4 |
| RM 6 | 14.7 –0.6 | 12.4 +0.5 | 6.4 –0.2 | 3.0 +0.1 | 12.5 –0.2 | 8.0 +0.4 |
| RM 7 | 17.2 –0.7 | 14.75 +0.65 | 7.25 –0.3 | 3.0 +0.1 | 13.5 –0.2 | 8.4 +0.5 |
| RM 8 | 19.7 –0.8 | 17.0 +0.6 | 8.55 –0.3 | 4.4 +0.2 | 16.5 –0.2 | 10.8 +0.4 |
| RM 10 | 24.7 –1.1 | 21.2 +0.9 | 10.9 –0.4 | 5.4 +0.2 | 18.7 –0.2 | 12.4 +0.6 |
| RM 12 | 29.8 –1.2 | 25.0 +1.0 | 12.8 –0.4 | – | 24.6 –0.2 | 16.8 +0.6 |
| RM 14 | 34.8 –1.3 | 29.0 +1.0 | 15.0 –0.5 | – | 30.2 –0.2 | 20.8 +0.6 |

Ordering code example / Bestellbeispiel

B65803N0160A048

- Type / Bauform
- Version / Ausführungsart
- A_L value in nH for cores with air gap (4 digits). For cores without air gap: 0000
A_L-Wert in nH für Kerne mit Luftspalt (4 Ziffern). Für Kerne ohne Luftspalt: 0000
- Code letter for A_L tolerance
Kennbuchstabe für A_L-Toleranz
A ± 3%, J ± 5%, K ± 10%
R ± +30/–20%, Y ± +40/–30%
- Code number for material
Kennziffern für Material

Versions / Ausführungsarten
A, C, D
 with center hole (without threaded sleeve) mit Mittelloch (ohne Gewindehülse)
F, N
 with center hole (with threaded sleeve) mit Mittelloch (mit Gewindehülse)
E, J
 without center hole / ohne Mittelloch

RM-Kerne für optimale Platznutzung auf Leiterplatten

RM-Kerne sind ideal für

- äußerst verlustarme, hochstabile Filterspulen und andere resonanzbestimmende Induktivitäten (K1, M33, N48) sowie

- klirrarmer Breitbandübertrager bei kleiner Signalaussteuerung (N45, T38, T57, T66).
- RM-Kerne ohne Mittelloch werden auch in der Leistungselektronik verwendet (N87, N92, N97).

Die Größen sind in IEC 62317-4 festgelegt. Das Zubehör ist für automatische Verarbeitung geeignet. RM-Kerne werden satzweise geliefert.

Low-Profile RM Cores

Low-Profile RM-Kerne

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material A _L values (nH) / A _L -Werte (nH) | | | |
|--|------------------------------|---|---------------|---------------|---------------|
| | | T38 | N49 | N87 | N92 |
| Cores (Accessories on page 12-13) / Kerne (Zubehör siehe Seite 12-13) | | | | | |
| RM 4 LP | ○ | 5000 +40/-30% | | | |
| | ○ | | 950 +30/-20% | | |
| | ○ | | | 1300 +30/-20% | |
| | ○ | | | | 1000 +30/-20% |
| RM 5 LP | ○ | 7700 +40/-30% | | | |
| | ○ | | 1700 +30/-20% | | |
| | ○ | | | 2400 +30/-20% | |
| | ○ | | | | 1900 +30/-20% |
| RM 6 LP | ○ | 10500 +40/-30% | | | |
| | ○ | | 2200 +30/-20% | | |
| | ○ | | | 3000 +30/-20% | |
| | ○ | | | | 2300 +30/-20% |
| RM 7 LP | ○ | 11500 +40/-30% | | | |
| | ○ | | 2400 +30/-20% | | |
| | ○ | | | 3300 +30/-20% | |
| | ○ | | | | 2600 +30/-20% |
| RM 8 LP | ○ | | 2900 +30/-20% | | |
| | ○ | | | 4100 +30/-20% | |
| | ○ | | | | 3100 +30/-20% |
| RM 10 LP | ○ | | 3700 +30/-20% | | |
| | ○ | | | 5200 +30/-20% | |
| | ○ | | | | 4000 +30/-20% |
| RM 12 LP | ○ | | 4500 +30/-20% | | |
| | ○ | | | 6300 +30/-20% | |
| | ○ | | | | 4800 +30/-20% |
| RM 14 LP | ○ | | 5100 +30/-20% | | |
| | ○ | | | 7100 +30/-20% | |
| | ○ | | | | 5400 +30/-20% |

○ = ungapped / ohne Luftspalt

RM cores with substantially reduced total height

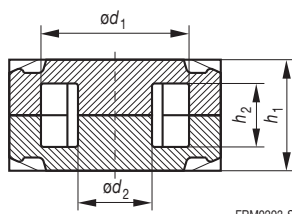
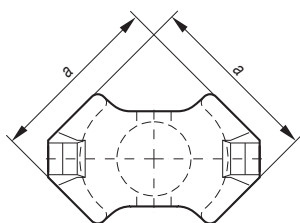
These cores can be used for small-signal, interface and matching transformers as well as for transformer and storage chokes in DC/DC converters with a high switching frequency.

The low-profile models are especially suitable for applications in which the winding is printed on the board and the cores are inserted from both sides.

Beside the standard material N87, further power materials such as N49, N97 and N92 are usable.

Low-profile cores are in accordance with IEC 62317-4.

They are supplied in sets.



FRM0293-S

**Ordering code (per set)****Bestellnummer (pro Satz)**

| |
|-----------------|
| B65803P0000Y038 |
| B65803P0000R049 |
| B65803P0000R087 |
| B65803P0000R092 |
| B65805P0000Y038 |
| B65805P0000R049 |
| B65805P0000R087 |
| B65805P0000R092 |
| B65807P0000Y038 |
| B65807P0000R049 |
| B65807P0000R087 |
| B65807P0000R092 |
| B65819P0000Y038 |
| B65819P0000R049 |
| B65819P0000R087 |
| B65819P0000R092 |
| B65811P0000R049 |
| B65811P0000R087 |
| B65811P0000R092 |
| B65813P0000R049 |
| B65813P0000R087 |
| B65813P0000R092 |
| B65815P0000R049 |
| B65815P0000R087 |
| B65815P0000R092 |
| B65887P0000R049 |
| B65887P0000R087 |
| B65887P0000R092 |

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|----------|-------------------------------|----------|-----------------------|---------------------------|-----------------------|
| RM 4 LP | 1.20 | 17.3 | 14.5 | 11.3 | 251 |
| RM 5 LP | 0.71 | 17.5 | 24.5 | 18.0 | 430 |
| RM 6 LP | 0.58 | 21.8 | 37.5 | 31.2 | 820 |
| RM 7 LP | 0.52 | 23.5 | 45.3 | 39.6 | 1060 |
| RM 8 LP | 0.44 | 28.7 | 64.9 | 55.4 | 1860 |
| RM 10 LP | 0.34 | 33.9 | 99.1 | 90.0 | 3360 |
| RM 12 LP | 0.29 | 42.0 | 147.5 | 124.7 | 6195 |
| RM 14 LP | 0.25 | 50.9 | 201.0 | 170.0 | 10230 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | $\varnothing d_1$ | $\varnothing d_2$ | h_1 | h_2 |
|----------|-----------|-------------------|-------------------|-----------|-----------|
| RM 4 LP | 9.8 -0.4 | 8.0 +0.3 | 3.9 -0.2 | 7.8 -0.2 | 4.3 +0.4 |
| RM 5 LP | 12.3 -0.5 | 10.2 +0.4 | 4.9 -0.2 | 7.8 -0.2 | 3.6 +0.4 |
| RM 6 LP | 14.7 -0.6 | 12.4 +0.5 | 6.4 -0.2 | 9.0 -0.2 | 4.5 +0.4 |
| RM 7 LP | 17.2 -0.7 | 14.75 +0.65 | 7.25 -0.3 | 9.8 -0.2 | 4.7 +0.5 |
| RM 8 LP | 19.7 -0.8 | 17.0 +0.6 | 8.55 -0.3 | 11.6 -0.2 | 5.9 +0.4 |
| RM 10 LP | 24.7 -1.1 | 21.2 +0.9 | 10.9 -0.4 | 13.0 -0.2 | 6.7 +0.4 |
| RM 12 LP | 29.8 -1.2 | 24.9 +1.1 | 12.8 -0.4 | 16.8 -0.2 | 9.0 +0.5 |
| RM 14 LP | 34.8 -1.3 | 29.0 +1.0 | 15.0 -0.5 | 20.5 -0.2 | 11.1 +0.6 |

RM-Kerne mit deutlich verringerter Bauhöhe

Diese Kerne bieten sich an für Kleinsignal-, Schnittstellen- und Anpassungsübertrager sowie für Übertrager und Speicherdrosseln in DC/DC-Wandlern mit hoher Taktfrequenz.

Die Low-Profile-Formen eignen sich besonders für Leiterplatten, bei denen die Wicklung aufgedruckt ist und die Kerne von beiden Seiten durch die Platine gesteckt werden.

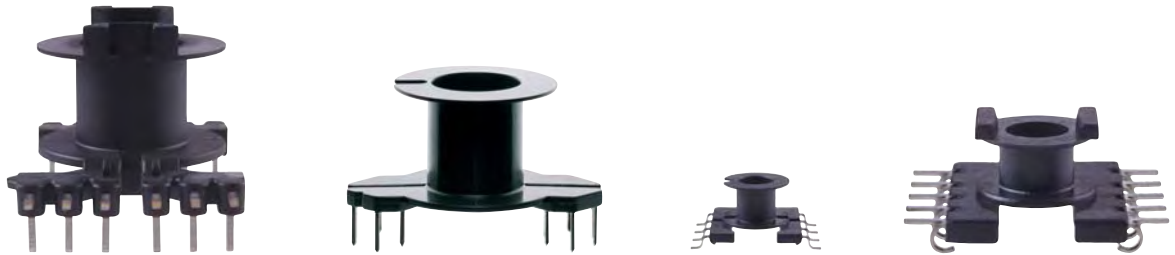
Für diese Anwendungen kommen auch die Leistungs-Materialien N49, N97 und N92 zum Einsatz.

Low-Profile-Kerne entsprechen IEC 62317-4.

Sie werden satzweise geliefert.

Accessories for RM Cores Zubehör für RM-Kerne

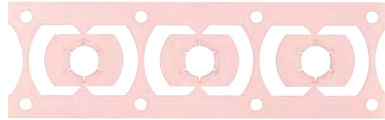
Technical data Technische Daten



| Type Typ | Coil formers Spulenkörper | | | |
|-------------|------------------------------|----------------|--|---|
| | Sections Kammern | Pins Stifte | Ordering code ¹⁾ Bestellnummer ¹⁾ | Features ²⁾ Merkmale ²⁾ |
| RM 4 | | 1 5, 6 | B65804K100*D001 | PTH / Stifte |
| RM 4 LP | SMD | 1 10 | B65804B6010T001 | J terminals |
| RM 5 | | 1 4, 5, 6, 8 | B65806K100*D001 | PTH / Stifte |
| | | 2 6 | B65806K1006D002 | PTH / Stifte |
| | SMD | 1 8 | B65822F1008T001 | Gullwing terminals |
| | SMD | 2 8 | B65822F1008T002 | Gullwing terminals |
| | SMD | 1 8 | B65822J1008T001 | J terminals |
| RM 6 | | 1 4, 5, 6 | B65808N100*D001 | PTH / Stifte |
| | | 2 4, 6 | B65808N100*D002 | PTH / Stifte |
| | | 1 4, 5, 6 | B65808K100*D001 | PTH / Stifte |
| | | 1 8 | B65808E1508T001 | For power applications / Für Leistungsanwendungen |
| | SMD | 2 8 | B65808X1108D002 | For SMPS transformers / Für SNT-Übertrager |
| RM 7 | | 1 8 | B65820W1008D001 | Gullwing terminals |
| | | 2 8 | B65820W1008D002 | PTH / Stifte |
| | | 2 8 | B65820W1008D002 | PTH / Stifte |
| RM 8 | | 1 5, 8, 12 | B65812N10**D001 | PTH / Stifte |
| | | 2 5 | B65812N1005D002 | PTH / Stifte |
| | | 1 5, 8, 12 | B65812K10**D001 | PTH / Stifte |
| | | 2 8 | B65812K1008D002 | PTH / Stifte |
| | | 1 12 | B65812C1512T001 | For power applications / Für Leistungsanwendungen |
| | | 2 8 | B65812X1108D002 | For SMPS transformers / Für SNT-Übertrager |
| RM 10 | | 1 8, 12 | B65814N10**D001 | PTH / Stifte |
| | | 2 8 | B65814N1008D002 | PTH / Stifte |
| | | 1 12 | B65814C1512T001 | For power applications / Für Leistungsanwendungen |
| RM 12 | | 1 11, 12 | B65816N10**D001 | PTH / Stifte |
| | | 1 12 | B65816C1512T001 | For power applications / Für Leistungsanwendungen |
| RM 14 | | 1 10, 12 | B65888N10**D001 | PTH / Stifte |
| | | 1 12 | B65888C1512T001 | For power applications / Für Leistungsanwendungen |

1) * Please insert number of pins
* Bitte Anzahl der Stifte einsetzen

2) Pin versions (PTH) on request
Stiftvarianten (PTH) auf Anfrage



| Type Typ | Clamps ³⁾ Klammern ³⁾ | Insulating washer 1 Isolierscheibe 1 | Insulating washer 2 Isolierscheibe 2 |
|-------------|--|---|---|
| RM 4 | B65806A2203X000 | B65804A5000X000 | B65804C2005X000 |
| RM 4 LP | B65804P2204X000 | | |
| RM 5 | B65806A2203X000 | B65806A5000X000 | B65806D2005X000 |
| | B65806J2204X000 | | |
| RM 6 | B65808A2203X000 | B65808A5000X000 | B65808C2005X000 |
| | B65808J2204X000 | B65808A5000X000 | B65808C2005X000 |
| RM 7 | B65820B2001X000 | B65820A5000X000 | B65820C2005X000 |
| RM 8 | B65812A2203X000 | B65812A5000X000 | B65812C2005X000 |
| | | | |
| RM 10 | B65814A2203X000 | B65814B5000X000 | B65814B2005X000 |
| RM 12 | B65816A2002X000 | | |
| RM 14 | B65888A2002X000 | | B65888B2005X000 |

³⁾ Ordering code per piece, 2 pieces required
Bestellnummer pro Stück, 2 Stück erforderlich

Adjusting screws on request
Abgleichschrauben auf Anfrage

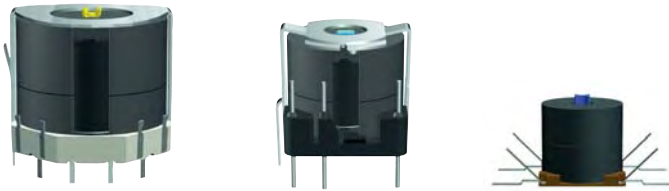
Insulating washer 1 = between core and coil former
Insulating washer 2 = for double-clad PCBs

Isolierscheibe 1 = zwischen Kern und Spulenkörper
Isolierscheibe 2 = für doppelt kaschierte Leiterplatten

P Cores P 3.3 ... P 22

P-Kerne P 3.3 ... P 22

Technical data Technische Daten



| Type Typ | Air gap Luftspalt | Material (Code number / Kennziffer) AL values (nH); AL tolerance code / AL-Werte (nH); AL-Toleranzbuchstabe | | | | | |
|-------------|----------------------|--|----------|----------|----------|----------|----------|
| | | K1 (01) | M33 (33) | N48 (48) | N30 (30) | T38 (38) | N41 (41) |

Cores (Accessories on page 17) / Kerne (Zubehör siehe Seite 17)

| | | | | | | | | | |
|-------------|---|--------|---|--------|---|---------------|---|-------|------|
| P 3.3 x 2.6 | ○ | 25 | Y | | | 500 | Y | | |
| P 4.6 x 4.1 | ○ | | | 200 | Y | | | | |
| | ○ | | | | | 800 | Y | | |
| P 5.8 x 3.3 | ○ | | | 350 | R | 800 | Y | | |
| P 7 x 4 | ● | 25 | A | 63 | A | | | | |
| | ● | | | | | 100 | A | | |
| | ○ | | | | | 1000 | Y | 2000 | Y |
| P 9 x 5 | ● | 25, 40 | A | 63 | A | 100, 160, 200 | A | | |
| | ● | | | | | 250 | J | | |
| | ○ | | | | | 1300 | R | 2500 | R |
| | ○ | | | | | | | 5500 | Y |
| P 11 x 7 | ● | 25, 40 | A | 40, 63 | A | 100, 160, 250 | A | | |
| | ● | | | | | 400 | J | | |
| | ○ | | | 780 | R | 1800 | R | | |
| | ○ | | | | | | | 3500 | R |
| | ○ | | | | | | | 7000 | Y |
| P 14 x 8 | ● | | | 100 | A | 160 | A | | |
| | ● | | | | | 250, 315, 400 | A | | |
| | ○ | 140 | R | 970 | R | 2100 | R | | |
| | ○ | | | | | | | 4600 | R |
| | ○ | | | | | | | 9800 | Y |
| | ○ | | | | | | | | 3300 |
| P 18 x 11 | ● | 40 | A | 100 | A | 160, 250 | A | | |
| | ● | | | | | 315, 400, 500 | A | | |
| | ● | | | | | 630 | J | | |
| | ○ | | | | | 2800 | R | | |
| | ○ | | | | | | | 5900 | R |
| | ○ | | | | | | | 12600 | Y |
| P 22 x 13 | ● | | | | | 160, 250, 315 | A | | |
| | ● | | | | | 630 | A | | |
| | ● | | | | | 1250 | J | | |
| | ○ | 220 | R | | | 3800 | R | | |
| | ○ | | | | | | | 8300 | R |
| | ○ | | | | | | | 16000 | Y |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

1) Cores with threaded sleeve (version T) also available.
Kerne mit Gewindehülse (Version T) ebenfalls lieferbar.

2) Cores with threaded sleeve (version N) also available.
Kerne mit Gewindehülse (Version N) ebenfalls lieferbar.

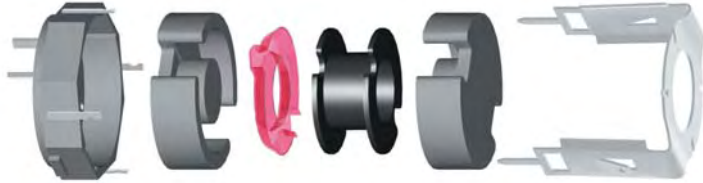
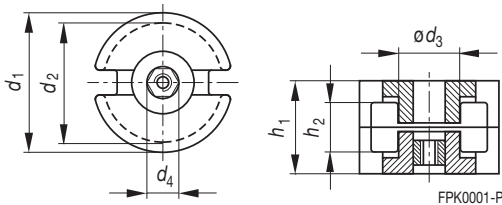
Magnetically closed pot cores, very low leakage

These cores are suitable for

- resonant-circuit coils (filters) with high inductance stability and Q,
- low-distortion broadband small-signal transformers in materials T38 and N30.

■ P cores without center hole of N87 material are suitable for power applications. The larger, effective magnetic cross-section means that they feature higher AL, better flux density distribution and thus lower power loss.

P 9 x 5 through P 30 x 19 are acc. to IEC 60133, P 3.3 x 2.6 and P 5.8 x 3.3 to IEC 62323. They are supplied in sets.



| | | Ordering code (per set) Bestellnummer (pro Satz) |
|----------|---|---|
| N87 (87) | | |
| | | B65491C0000Y0** |
| | | B65495B0000Y033 |
| | | B65495B0000Y030 |
| | | B65501D0000+0** |
| | | B65511A00**A0** |
| | | B65511A0100A048 |
| | | B65511A0000Y0** |
| | | B65517D0***A0**1) |
| | | B65517D0250J048 |
| | | B65517D0000R0** |
| | | B65517W0000Y038 |
| | | B65531D0***A0** |
| | | B65531D0400J048 |
| | | B65531D0000R0** |
| 2000 | R | B65531W0000+0** |
| | | B65541D0***A0**1) |
| | | B65541D0***A048 ¹⁾ |
| 2800 | R | B65541D0000R0** |
| | | B65541W0000+0** |
| | | B65651D0***A0**1) |
| | | B65651D0***A048 ¹⁾ |
| | | B65651D0630J048 |
| | | B65651D0000R048 |
| 3600 | R | B65651W0000+0** |
| | | B65661D0***A048 ²⁾ |
| | | B65661D0630A048 ²⁾ |
| | | B65661D1250J048 |
| | | B65661D0000R0** |
| 4400 | R | B65661W0000+0** |

*, +: See ordering code example
Siehe Bestellbeispiel

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| P 3.3 x 2.6 | – (3.72) | – (5.1) | – (1.37) | – | – (7.0) |
| P 4.6 x 4.1 | 2.70 | 7.6 | 2.8 | – | 21.3 |
| P 5.8 x 3.3 | 1.68 | 7.9 | 4.7 | – | 37 |
| P 7 x 4 | 1.43 | 10.0 | 7.0 | – | 70 |
| P 9 x 5 | 1.25 (1.13) | 12.5 (13.4) | 10.0 (11.9) | – (9.3) | 125 (159) |
| P 11 x 7 | 1.00 (0.92) | 15.9 (16.3) | 15.9 (17.7) | – (14.1) | 253 (289) |
| P 14 x 8 | 0.80 (0.73) | 20.0 (21.0) | 25.0 (28.7) | 20.0 (23.6) | 500 (603) |
| P 18 x 11 | 0.60 (0.57) | 25.9 (26.6) | 43.0 (46.7) | – (33.9) | 1114 (1242) |
| P 22 x 13 | 0.50 (0.46) | 31.6 (33.2) | 63.0 (72.6) | – (58.1) | 1990 (2410) |

Values in parantheses for core sets without center hole / Werte in Klammern für Kernsätze ohne Mittelloch

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | $\varnothing d_1$ | $\varnothing d_2$ | $\varnothing d_3$ | $\varnothing d_4$ | h_1 | h_2 |
|-------------|-------------------|-------------------|-------------------|-------------------|-----------|----------|
| P 3.3 x 2.6 | 3.35 –0.17 | 2.45 +0.15 | 1.2 –0.1 | – | 2.6 –0.1 | 1.7 +0.2 |
| P 4.6 x 4.1 | 4.65 –0.19 | 3.7 +0.15 | 2.2 –0.1 | 1.4 +0.05 | 4.1 –0.1 | 2.7 +0.2 |
| P 5.8 x 3.3 | 5.80 –0.25 | 4.5 +0.2 | 2.5 –0.15 | 0.95 +0.1 | 3.4 –0.3 | 2.2 +0.2 |
| P 7 x 4 | 7.35 –0.25 | 5.8 +0.2 | 3.0 –0.1 | 1.4 +0.05 | 4.2 –0.1 | 2.8 +0.2 |
| P 9 x 5 | 9.30 –0.3 | 7.5 +0.25 | 3.9 –0.2 | 2.0 +0.1 | 5.4 –0.2 | 3.6 +0.3 |
| P 11 x 7 | 11.3 –0.4 | 9.0 +0.4 | 4.7 –0.2 | 2.0 +0.1 | 6.6 –0.2 | 4.4 +0.3 |
| P 14 x 8 | 14.3 –0.5 | 11.6 +0.4 | 6.0 –0.2 | 3.0 +0.1 | 8.5 –0.3 | 5.6 +0.4 |
| P 18 x 11 | 18.4 –0.8 | 14.9 +0.5 | 7.6 –0.3 | 3.0 +0.1 | 10.6 –0.2 | 7.2 +0.4 |
| P 22 x 13 | 22.0 –0.8 | 17.9 +0.6 | 9.4 –0.3 | 4.4 +0.2 | 13.6 –0.4 | 9.2 +0.4 |

Ordering code example / Bestellbeispiel

B65541D0040A048

Versions / Ausführungsarten

A, B, D: with center hole (w/o threaded sleeve)
mit Mittelloch (ohne Gewindehülse)

N, T: with center hole (with threaded sleeve)
mit Mittelloch (mit Gewindehülse)

C, W: without center hole / ohne Mittelloch

■ Type / Bauform

■ Version / Ausführungsart

■ A_L value in nH for cores with air gap
(4 digits). For cores without air gap: 0000
 A_L -Wert in nH für Kerne mit Luftspalt
(4 Ziffern). Für Kerne ohne Luftspalt: 0000

■ Code letter for A_L tolerance
Kennbuchstabe für A_L -Toleranz
 $A \pm 3\%$, $J \pm 5\%$, $R \pm +30/-20\%$,
 $Y \pm +40/-30\%$

■ Code no. for material / Kennziffern für Material

Magnetisch geschlossene Schalenkernform, sehr streufeldarm

Diese Kerne eignen sich für

- Schwingkreissspulen (Filter) mit großer Induktivitätskonstanz und hoher Güte,
- klirrarmer breitbandiger Kleinsignalübertrager in den Werkstoffen T38 und N30.

- Für Leistungsanwendungen eignen sich P-Kerne ohne Mittelloch aus dem Werkstoff N87. Aufgrund des größeren effektiven magnetischen Querschnitts zeichnen sie sich durch einen höheren A_L -Wert, eine bessere Flussdichteverteilung und damit eine geringere Verlustleistung aus.

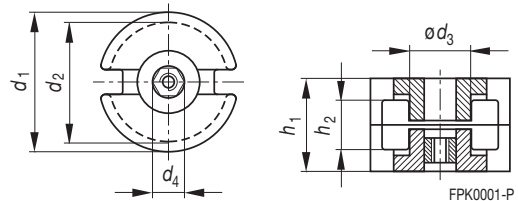
P 9 x 5 bis P 30 x 19 entsprechen IEC 60133, P 3.3 x 2.6 und P 5.8 x 3.3 nach IEC 62323.

Sie werden satzweise geliefert.

P Cores P 26 ... P 41

P-Kerne P 26 ... P 41

Technical data Technische Daten



FPK0001-P

| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) AL values (nH); AL tolerance code / AL-Werte (nH); AL-Toleranzbuchstabe | | | | | | Ordering code (per set) Bestellnummer (pro Satz) |
|-------------|------------------------------|--|----------|----------|----------|----------|----------|---|
| | | K1 (01) | M33 (33) | N48 (48) | N30 (30) | T38 (38) | N87 (87) | |

Cores (Accessories on page 17) / Kerne (Zubehör siehe Seite 17)

| Type Typ | ● | ○ | Material (Code number / Kennziffer) AL values (nH); AL tolerance code / AL-Werte (nH); AL-Toleranzbuchstabe | Ordering code (per set) Bestellnummer (pro Satz) |
|-------------|---|---|--|---|
| P 26 x 16 | ● | ○ | 100 A | B65671D0***A0** ¹⁾ |
| | ● | ○ | 100, 160 A | B65671D0***A048 ¹⁾ |
| | ● | ○ | 160, 250, 315 A | B65671D1000J048 |
| | ● | ○ | 400, 630, 800 A | B65671D0000R048 |
| | ● | ○ | 1000 J | B65671W0000+0** |
| P 30 x 19 | ● | ○ | 250, 400, 630 A | B65701D0***A048 ¹⁾ |
| | ● | ○ | 1000 A | B65701D1000A048 ¹⁾ |
| | ● | ○ | 2000 J | B65701D2000J048 |
| | ● | ○ | 6200 R | B65701D0000R048 |
| | ● | ○ | 11500 R | B65701W0000+0** |
| P 36 x 22 | ● | ○ | 250, 400 A | B65611D0***A048 ¹⁾ |
| | ● | ○ | 630, 1000 A | B65611D****A048 ¹⁾ |
| | ● | ○ | 7600 R | B65611D0000R048 |
| | ● | ○ | 15200 R | B65611W0000R030 |
| P 41 x 25 | ● | ○ | 250, 630 A | B65621J0***A048 |
| | ● | ○ | 3150 K | B65621J3150K048 |
| | ● | ○ | 8400 R | B65621J0000R048 |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

1) Cores with threaded sleeve (version T) also available.
Kerne mit Gewindehülse (Version T) ebenfalls lieferbar.

*, +: See ordering code example
Siehe Bestellbeispiel

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| P 26 x 16 | 0.40 (0.37) | 37.2 (40.0) | 93 (108) | 76.5 (87) | 3460 (4320) |
| P 30 x 19 | 0.33 (0.32) | 45.0 (46.0) | 136 (145) | – (117) | 6120 (6670) |
| P 36 x 22 | 0.26 (0.25) | 52.0 (53.5) | 202 (213) | – (173) | 10500 (11400) |
| P 41 x 25 | 0.257 | 62.1 | 242 | 200 | 15030 |

Values in parantheses for core sets without center hole
Werte in Klammern für Kernsätze ohne Mittelloch

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | $\varnothing d_1$ | $\varnothing d_2$ | $\varnothing d_3$ | h_1 | h_2 |
|-------------|-----------|-------------------|-------------------|-------------------|-----------|-----------|
| P 26 x 16 | 26.0 –1.0 | 21.2 +0.8 | 11.5 –0.4 | 5.4 +0.2 | 16.3 –0.4 | 11.0 +0.4 |
| P 30 x 19 | 30.5 –1.0 | 25.0 +0.8 | 13.5 –0.4 | 5.4 +0.2 | 19.0 –0.4 | 13.0 +0.4 |
| P 36 x 22 | 36.0 –1.0 | 29.9 +0.8 | 16.2 –0.4 | 5.4 +0.3 | 22.0 –0.6 | 14.6 +0.4 |
| P 41 x 25 | 41.0 –1.1 | 34.0 +0.9 | 17.5 –0.5 | 5.5 +0.2 | 25.0 –0.6 | 17.0 +0.6 |

Ordering code example / Bestellbeispiel

B65701D0400A048

Versions / Ausführungsarten

D, J

with center hole (without threaded sleeve)
mit Mittelloch (ohne Gewindehülse)

T

with center hole (with threaded sleeve)
mit Mittelloch (mit Gewindehülse)

W

Without center hole / ohne Mittelloch

■ Type / Bauform

■ Version / Ausführungsart

■ AL value in nH for cores with air gap
(4 digits). For cores without air gap: 0000
AL-Wert in nH für Kerne mit Luftspalt
(4 Ziffern). Für Kerne ohne Luftspalt: 0000

■ Code letter for AL tolerance
Kennbuchstabe für AL-Toleranz
A $\geq \pm 3\%$, J $\geq \pm 5\%$, K $\geq \pm 10\%$,
R $\geq +30/-20\%$, Y $\geq +40/-30\%$

■ Code number for material
Kennziffern für Material

Accessories for P Cores P 4.6 ... P 36

Zubehör für P-Kerne P 4.6 ... P 36

Technical data Technische Daten



| Type Typ | Coil formers Spulenkörper | | | Mounting assemblies Halterung | | | Insulating washer Isolierscheibe |
|-------------|------------------------------|----------------|--------------------------------|----------------------------------|--------------------------------|----------------------|---------------------------------------|
| | Sections Kammern | Pins Stifte | Ordering code Bestellnummer | Pins Stifte | Ordering code Bestellnummer | Features Merkmale | |
| P 7 x 4 | 1 | – | B65512C0000T001 | 5 | B65512C2001X000 | PTH Steckmontage | |
| P 9 x 5 | 1 | – | B65522B0000T001 | 4 | B65518D2001X000 | PTH Steckmontage | |
| | | | | 6 | B65518D2002X000 | PTH Steckmontage | |
| | SMD | 1 | 4 | B65524C1004T001 | | | Steckmontage Gullwing terminals |
| | SMD | 1 | 8 | B65524C1008T001 | | | |
| P 11 x 7 | 1 | – | B65532B0000T001 | 4 | B65535B0002X000 | | |
| | | | | 8 | B65535B0003X000 | | |
| P 14 x 8 | 1 | – | B65542B0000T001 | 4 | B65545B0009X000 | | B65542A5000X000 |
| | | | | 6 | B65545B0010X000 | | |
| P 18 x 11 | 1 | – | B65652B0000T001 | 4 | B65655B0009X000 | | B65652A5000X000 |
| | | | | 8 | B65655B0010X000 | | |
| P 22 x 13 | 1 | – | B65662B0000T001 | 8 | B65665C0004X000 | | B65662A5000X000 |
| P 26 x 16 | 1 | – | B65672B0000T001 | 8 | B65675B0005X000 | | B65672B5000X000 |
| P 30 x 19 | 1 | – | B65702B0000T001 | 8 | B65705B0003X000 | | B65702A5000X000 |
| P 36 x 22 | 1 | – | B65612B0000T001 | 10 | B65615B0001X000 | | B65612A5000X000 |

EP Cores

EP-Kerne

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) A _L values (nH); A _L tolerance code / A _L -Werte (nH); A _L -Toleranzbuchstabe | | | | | | | Ordering code ¹⁾ (per set) Bestellnummer ¹⁾ (pro Satz) | | Coil formers ²⁾ Spulenkörper ²⁾ | | | | |
|----------------------|------------------------------|--|----------|----------|----------|----------|----------|----------|---|----------------|--|-----------------|-----------------|---|----|
| | | N45 (45) | N30 (30) | T38 (38) | T57 (57) | T65 (65) | T66 (66) | N87 (87) | Sections Kammern | Pins Stifte | | | | | |
| Cores / Kerne | | | | | | | | | | | Accessories / Zubehör | | | | |
| EP 5 | ● | | | 16, 25 | A | | | | | | B65855A00**A038 | | | | |
| | ● | | | 40 | J | | | | | | B65855A0040J038 | | | | |
| | ● | | | 63 | D | | | | | | B65855A0063D038 | | | | |
| | ○ | 550 | R | 2000 | Y | 560 | R | | 2200 | Y | 430 | R | B65855A0000+0** | | |
| EP 6 | ● | | | 16, 25 | A | | | | | | | B65855B00**A038 | | | |
| | ● | | | 40 | J | | | | | | | B65855B0040J038 | | | |
| | ● | | | 63 | D | | | | | | | B65855B0063D038 | | | |
| | ○ | 530 | R | 1900 | Y | 900 | R | | 1700 | Y | 410 | R | B65855B0000+0** | | |
| EP 7 | ● | 63, 100 | A | 63, 100 | A | 63, 100 | A | | | | 63, 100 | A | B65839A0***A0** | | |
| | ● | 160 | J | 160 | J | 160 | J | | | | 160 | J | B65839A0160J0** | 1 | 6 |
| | ● | 200 | C | 200 | C | 200 | C | | | | 200 | C | B65839A0200C0** | 2 | 6 |
| | ● | 250 | E | 250 | E | 250 | E | | | | 250 | E | B65839A0250E0** | 1 | 6 |
| | ○ | 1500 | R | 2000 | R | 1500 | R | 3000 | R | | 1100 | R | B65839A0000R0** | | |
| | ○ | | | 5200 | Y | | | | 5800 | Y | | | B65839A0000Y0** | | |
| EP 10 | ● | 63, 100 | A | 63, 100 | A | 63, 100 | A | | | | 63, 100 | A | B65841A0***A0** | 1 | 8 |
| | ● | 160 | J | 160 | J | 160 | J | | | | 160 | J | B65841A0160J0** | 2 | 8 |
| | ● | 200 | C | 200 | C | 200 | C | | | | 200 | C | B65841A0200C0** | | |
| | ● | 250 | E | 250 | E | 250 | E | | | | 250 | E | B65841A0250E0** | | |
| | ○ | 1600 | R | 2000 | R | 1600 | R | 2900 | R | | 1100 | R | B65841A0000R0** | | |
| | ○ | | | 4800 | Y | | | | 6000 | Y | | | B65841A0000Y0** | | |
| EP 13 | ● | 63, 100 | A | 63, 100 | A | 63, 100 | A | | 63, 100 | A | 63, 100 | A | B65843A0063A0** | 1 | 10 |
| | ● | 160 | B | 160 | B | 160 | B | | 160 | B | 160 | B | B65843A0***B0** | 2 | 10 |
| | ● | 200 | B | 200 | B | 200 | B | | 200 | B | 200 | B | B65843A0200B0** | | |
| | ● | 250 | J | 250 | J | 250 | J | | 250 | J | 250 | J | B65843A0250J0** | | |
| | ● | 315 | C | 315 | C | 315 | C | | 315 | C | 315 | C | B65843A0315C0** | | |
| | ● | 400 | E | 400 | E | 400 | E | | 400 | E | 400 | E | B65843A0400E0** | | |
| | ○ | 2400 | R | 2800 | R | 2500 | R | 4000 | R | | 1600 | R | B65843A0000R0** | | |
| | ○ | | | 7000 | Y | | | | 8500 | Y | | | B65843A0000Y0** | | |
| EP 17 | ○ | | 4300 | R | | | | 6200 | R | | 2400 | R | B65845J0000R0** | 1 | 8 |
| | ○ | | | 10800 | Y | | | | 13000 | Y | | | B65845J0000Y0** | | |
| EP 20 | ○ | | | | | | | | | | 200 | A | B65847A0200A087 | 1 | 10 |
| | ○ | | 6700 | R | | | | 10200 | R | | 4000 | R | B65847A0000R0** | 1 | 10 |
| | ○ | | | 18700 | Y | | | | | | | | B65847A0000Y038 | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

1) *: See ordering code example / Siehe Bestellbeispiel
2) Pin versions for PTH coil formers on request. / Stiftvarianten für Stiftspulenkörper auf Anfrage.

For compact transformer

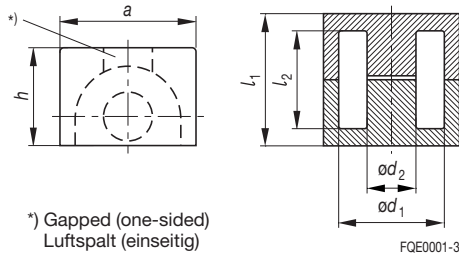
With their cubic geometry, EP cores are recommended for space-saving onboard solutions.

In conjunction with our materials, these models feature excellent characteristics for broadband, small-signal transformation with low leakage field.

EP core are consequently ideal for xDSL applications. Preferred materials, depending on conditions of use, are T38, T66, N45 and T57.

EP 7, 10, 13, 17 and 20 in accordance with IEC 61596.

EP cores are supplied in sets.



Example: EP 13
Beispiel: EP 13



| Ordering code Bestellnummer | Features Merkmale | Yoke or cap Bügel oder Kappe |
|---|---|------------------------------------|
| B65840B1006D001 B65840B1006D002 B65840N1106T001 | PTH / Stifte PTH / Stifte Gullwing terminals | B65840D2000X000 (Cap / Kappe) |
| B65842W1008D001 B65842W1008D002 | PTH / Stifte PTH / Stifte | B65842A2000X000 (Yoke / Bügel) |
| B65844W1010D001 B65844X1010D002 | PTH / Stifte High-voltage | B65844A2000X000 (Yoke / Bügel) |
| B65846W1008D001 | PTH / Stifte | B65846J2000X000 (Yoke / Bügel) |
| B65848D1010D001 B65848E1010D001 | PTH / Stifte PTH / Stifte | B65848A2000X000 (Yoke / Bügel) |

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| EP 5 | 3.149 | 9.73 | 3.09 | 2.3 | 30 |
| EP 6 | 3.359 | 10.28 | 3.06 | 2.3 | 31 |
| EP 7 | 1.52 | 15.7 | 10.3 | 8.5 | 162 |
| EP 10 | 1.70 | 19.2 | 11.3 | 8.5 | 217 |
| EP 13 | 1.24 | 24.2 | 19.5 | 14.9 | 472 |
| EP 17 | 0.84 | 28.5 | 33.9 | 25.5 | 966 |
| EP 20 | 0.51 | 40.0 | 78.0 | 60.0 | 3120 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | h | $\varnothing d_1$ | $\varnothing d_2$ | l_1 | l_2 |
|-------------|-----------|------------|-------------------|-------------------|-----------|-----------|
| EP 5 | 6.15 -0.3 | 3.9 -0.25 | 4.3 +0.25 | 1.8 -0.15 | 5.7 -0.2 | 3.8 +0.4 |
| EP 6 | 6.15 -0.3 | 3.9 -0.25 | 4.3 +0.25 | 1.8 -0.15 | 6.1 -0.2 | 4.2 +0.4 |
| EP 7 | 9.4 -0.4 | 6.5 -0.3 | 7.2 +0.4 | 3.4 -0.2 | 7.5 -0.2 | 5.0 +0.4 |
| EP 10 | 11.8 -0.6 | 7.85 -0.4 | 9.2 +0.4 | 3.45 -0.3 | 10.4 -0.2 | 7.2 +0.4 |
| EP 13 | 12.8 -0.6 | 9.0 -0.4 | 9.7 +0.6 | 4.5 -0.3 | 13.0 -0.3 | 9.0 +0.4 |
| EP 17 | 18.4 -0.8 | 11.25 -0.3 | 11.6 +0.8 | 5.85 -0.35 | 17.0 -0.6 | 11.0 +0.6 |
| EP 20 | 24.5 -1.0 | 15.3 -0.7 | 16.1 +0.8 | 9.0 -0.5 | 21.6 -0.4 | 14.0 +0.6 |

Ordering code example / Bestellbeispiel

B65839A0100A087

- Type / Bauform
- Version / Ausführungsart
- A_L value in nH for cores with air gap (4 digits). For cores without air gap: 0000
 A_L -Wert in nH für Kerne mit Luftspalt (4 Ziffern). Für Kerne ohne Luftspalt: 0000
- Code letter for A_L tolerance
Kennbuchstabe für A_L -Toleranz
A $\geq \pm 3\%$, B $\geq \pm 4\%$, C $\geq \pm 6\%$
D $\geq \pm 8\%$, E $\geq \pm 7\%$, J $\geq \pm 5\%$
R $\geq +30/-20\%$, Y $\geq +40/-30\%$
- Code number for material
Kennziffern für Material

Für kompakte Übertrager

EP-Kerne empfehlen sich wegen ihrer kubischen Geometrie für Raum sparenden Aufbau auf der Leiterplatte.

In Verbindung mit unseren Ferrit-Werkstoffen liefert diese Bauform ausgezeichnete Eigenschaften für breitbandige, streufeldarme Kleinsignalübertragung.

EP-Kerne eignen sich daher hervorragend für xDSL-Anwendungen. Bevorzugte Werkstoffe sind je nach Einsatzbedingungen T38, T66, N45 und T57.

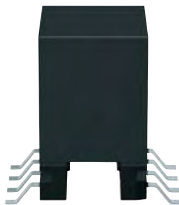
EP 7, 10, 13, 17 und 20 entsprechen IEC 61596.

EP-Kerne werden satzweise geliefert.

EPX/EPO Cores

EPX-/EPO-Kerne

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) AL values (nH); AL tolerance code / AL-Werte (nH); AL-Toleranzbuchstabe | | | | | | | | Ordering code (per set) Bestellnummer (pro Satz) | Coil formers Spulenkörper | | |
|----------------------|------------------------------|--|---|----------|---|----------|---|----------|---|---|------------------------------|----------------|----|
| | | N45 (45) | | T38 (38) | | T57 (57) | | T66 (66) | | | Sections Kammern | Pins Stifte | |
| Cores / Kerne | | | | | | | | | | Accessories / Zubehör | | | |
| EPX 7/9 | ● | 63, 100 | A | 63, 100 | A | 63, 100 | A | 63, 100 | A | B65857A0***A0** | SMD | 1 | 8 |
| | ● | 160, 200 | B | 160, 200 | B | 160, 200 | B | 160, 200 | B | B65857A0***B0** | | | |
| | ● | 250 | J | 250 | J | 250 | J | 250 | J | B65857A0250J0** | | | |
| | ● | 315 | C | 315 | C | 315 | C | 315 | C | B65857A0315C0** | | | |
| | ● | 400 | E | 400 | E | 400 | E | 400 | E | B65857A0400E0** | | | |
| | ○ | 2500 | R | | | 2600 | R | | | B65857A0000R0** | | | |
| EPX 9/9 | ● | 63, 100 | A | 63, 100 | A | 63, 100 | A | 63, 100 | A | B65857C0***A0** | SMD | 1 | 8 |
| | ● | 160, 200 | B | 160, 200 | B | 160, 200 | B | 160, 200 | B | B65857C0***B0** | | | |
| | ● | 250 | J | 250 | J | 250 | J | 250 | J | B65857C0250J0** | | | |
| | ● | 315 | C | 315 | C | 315 | C | 315 | C | B65857C0315C0** | | | |
| | ● | 400 | E | 400 | E | 400 | E | 400 | E | B65857C0400E0** | | | |
| | ○ | 2400 | R | | | 2400 | R | | | B65857C0000R0** | | | |
| EPX 10 | ● | | | 63, 100 | A | 63, 100 | A | | | B65859A0***A0** | | | |
| | ● | | | 160 | J | 160 | J | | | B65859A0160J0** | | | |
| | ● | | | 200 | C | 200 | C | | | B65859A0200C0** | | | |
| | ● | | | 250 | E | 250 | E | | | B65859A0250E0** | | | |
| | ○ | | | | | 2000 | R | | | B65859A0000R057 | | | |
| EPO 13 | ● | | | 63 | A | 63 | A | | | B65843P0063A0** | | 1 | 10 |
| | ● | | | 100 | A | 100 | A | | | B65843P0100A0** | | | |
| | ● | | | 160, 200 | B | 160, 200 | B | | | B65843P0***B0** | | | |
| | ● | | | 250 | J | 250 | J | | | B65843P0250J0** | | | |
| | ● | | | 315 | C | 315 | C | | | B65843P0315C0** | | | |
| | ● | | | 400 | E | 400 | E | | | B65843P0400E0** | | | |
| | ○ | | | | | 2400 | R | | | B65843P0000R057 | | | |
| | ○ | | | 6600 | Y | | | | | B65843P0000Y038 | | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

*: See ordering code example
Siehe Bestellbeispiel

EPX cores from EPCOS are patented. / EPX-Kerne von EPCOS sind patentiert.
US: publication no. US-2002-0158743 / DE: application no. 10056945.5

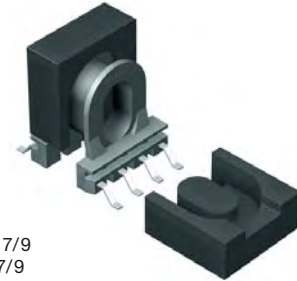
Optimized ferrite cores for xDSL applications

Internet access with DSL is the fastest growing broadband technology.

For the new requirements EPCOS has created ferrite cores and materials for DSL line transformers. These new EPX and EPO cores increase loop reach at a given data rate for DSL applications.

The major goal of all developments is miniaturization of the line transformer without any performance degradation. The lines per board can be increased, which enables further cost reduction.

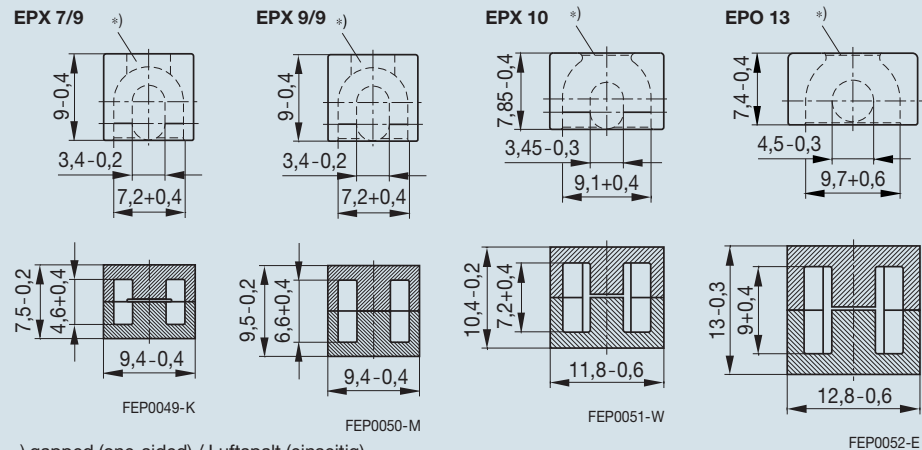
EPX and EPO cores and supplied in sets.



Example: EPX 7/9
Beispiel: EPX 7/9

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | I_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| EPX 7/9 | 0.91 | 15.7 | 17.2 | 13.9 | 270 |
| EPX 9/9 | 1.09 | 19.0 | 17.5 | 13.9 | 333 |
| EPX 10 | 1.37 | 21.7 | 15.9 | 13.2 | 345 |
| EPO 13 | 1.34 | 25.8 | 19.3 | 14.9 | 498 |



*) gapped (one-sided) / Luftspalt (einseitig)

Ordering code example / Bestellbeispiel

B65857A0160B066

- Type / Bauform
- Version / Ausführungsart
- A_L value in nH for cores with air gap (4 digits). For cores without air gap: 0000
 A_L -Wert in nH für Kerne mit Luftspalt (4 Ziffern). Für Kerne ohne Luftspalt: 0000
- Code letter for A_L tolerance
Kennbuchstabe für A_L -Toleranz
A $\cong \pm 3\%$, B $\cong \pm 4\%$, C $\cong \pm 6\%$
E $\cong \pm 7\%$, J $\cong \pm 5\%$, R $\cong +30/-20\%$
Y $\cong +40/-30\%$
- Code number for material
Kennziffern für Material

Optimierte Ferritkerne für xDSL-Anwendungen

Internet-Zugang mit DSL ist die am schnellsten wachsende Breitband-Technologie. Für entsprechende neue Anforderungen hat EPCOS Ferritkerne und -werkstoffe für DSL-Schnittstellenübertrager entwickelt. Die neuen EPX- und EPO-Kerne erhöhen bei gegebener Übertragungsrates die Reichweite der Teilnehmerleitungen bei DSL-Anwendungen.

Mit diesen Neuentwicklungen gelang eine Miniaturisierung der DSL-Schnittstellenübertrager, ohne deren Leistung zu mindern. Durch die Erweiterung der Anschlüsse pro Baugruppe werden Kosteneinsparungen ermöglicht. EPX- und EPO-Kerne werden satzweise geliefert.

P Core Halves Einzelschalen

Technical data Technische Daten



| Type Typ | Material | | | Ordering code Bestellnummer | Coil formers Spulenkörper |
|----------------------|----------|-----|-----|--------------------------------|------------------------------|
| | N22 | M33 | N27 | | |
| Cores / Kerne | | | | | Accessories / Zubehör |
| PS 7.35 x 3.6 | X | | | B65933A0000X022 | B65512C0000T001 |
| | | X | | B65933A0000X033 | |
| PS 9 x 3.5 | X | | | B65935E0000X022 | B65936A0000T001 |
| | | X | | B65935E0000X033 | |
| PCH 14 x 7.5 | X | | | B65937A0000X022 | B65542B0000T001 |
| PS 25 x 8.9 | X | | | B65939A0000X022 | B65940B0000T001 |
| PS 30.5 x 10.2 | X | | | B65941A0000X022 | B65942B0000T001 |
| PS 35 x 10.8 | X | | | B65947A0000X022 | |
| PS 47 x 14.9 | X | | | B65943A0000X022 | |
| PS 68 x 14.5 | X | | | B65928A0000X022 | B65946B0000T001 |
| PCH 70 x 14.5 | X | | | B65945A0000X022 | B65946B0000T001 |
| PCH 150 x 30 | | | X | B65949A0000X027 | |

P core halves for inductive proximity switches

Inductive proximity switches can be used as noncontacting motion detectors and output indicators.

Pot core halves are matched to standard switches in their dimensions. Maximum operating distances can thus be achieved for individual P core sizes.

Cores with the "PS" designation have been standardized to IEC 62323.

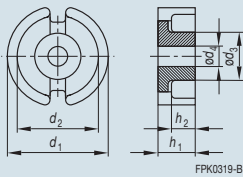
Material choice:

- up to 1 MHz: N22
- up to 2 MHz: M33

Main dimensions (mm) / Hauptmaße (mm)

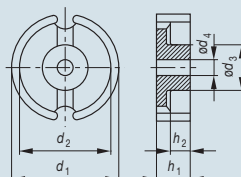
| Type Typ | d ₁ | Ø d ₂ | Ø d ₃ | Ø d ₄ | h ₁ | h ₂ |
|----------------|----------------|------------------|------------------|------------------|----------------|----------------|
| PS 25 x 8.9 | 24.8 -1.0 | 20.5 +0.8 | 11.3 -0.5 | 5.2 +0.4 | 8.9 -0.2 | 5.9 +0.3 |
| PS 30.5 x 10.2 | 30.5 -1.0 | 25.0 +0.8 | 13.5 -0.4 | 5.4 +0.2 | 10.2 -0.5 | 7.0 +0.4 |
| PS 35 x 10.8 | 35.0 -1.0 | 29.2 +1.2 | 15.7 -0.6 | 5.3 +0.3 | 10.8 -0.5 | 7.2 +0.4 |
| PS 47 x 14.9 | 47.0 -1.3 | 39.0 +1.8 | 20.0 -0.6 | 5.5 +0.2 | 14.9 -0.7 | 10.0 +0.5 |

PS 25 x 8.9 / PS 30.5 x 10.2



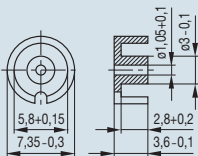
FPK0319-B

PS 35 x 10.8 / PS 47 x 14.9



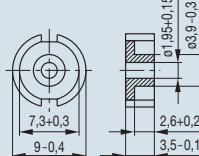
FPK0320-E

PS 7.35 x 3.6



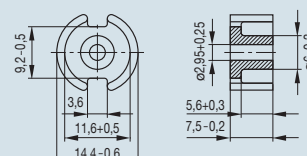
FPK0314-5

PS 9 x 3.5



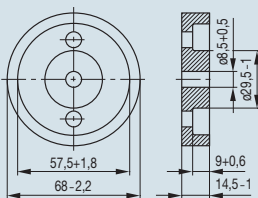
FPK0315-D

PCH 14 x 7.5



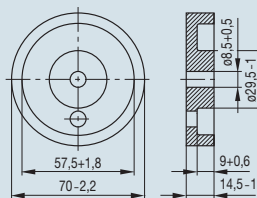
FPK0218-W

PS 68 x 14.5



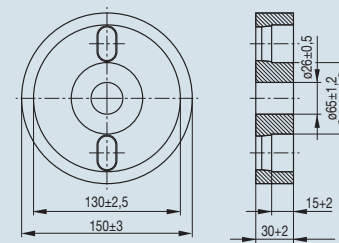
FPK0321-M

PCH 70 x 14.5



FPK0322-V

PCH 150 x 30



FPK0323-4

Einzelschalen für induktive Näherungsschalter

Mit induktiven Näherungsschaltern lassen sich Bewegungsabläufe und Schaltzustände berührungslos erfassen. Hinsichtlich der Abmessungen sind Einzelschalen an die genormten Schalter angepasst. Damit können für die Schalenkerngrößen jeweils maximale Schaltabstände erreicht werden.

Kerne mit der Bezeichnung „PS“ sind nach IEC 62323 genormt.

Werkstoffauswahl:

- bis 1 MHz: N22
- bis 2 MHz: M33

PM Cores

PM-Kerne

Technical data Technische Daten



Industrial

| Type Typ | Air gap Luft- spalt | Material A _L values (nH) / A _L -Werte (nH) | | Ordering code (per set) | Coil formers Spulenkörper | | |
|----------------------|------------------------------|---|----------------|-----------------------------|------------------------------|------------------------------|------------------------------------|
| | | N27 | N87 | Bestellnummer (pro Satz) | Sections Kammern | Solder pins Lötanschlüsse | Ordering code Bestellnummer |
| Cores / Kerne | | | | | Accessories / Zubehör | | |
| PM 50/39 | ● | 250 ±3% | | B65646A0250A027 | 1 | 14 | B65647B1014T001 |
| | ● | 630 ±3% | | B65646A0630A027 | | | |
| | ○ | 7400 +30/-20% | | B65646A0000R027 | | | |
| | ○ | | 7400 +30/-20% | B65646A0000R087 | | | |
| PM 62/49 | ● | 315 ±3% | | B65684A0315A027 | 1 | - | B65685B1016T001 B65685A1000T001 |
| | ● | 630 ±3% | | B65684A0630A027 | 1 | | |
| | ○ | 9200 +30/-20% | | B65684A0000R027 | | | |
| | ○ | | 9200 +30/-20% | B65684A0000R087 | | | |
| PM 74/59 | ● | 315 ±3% | | B65686A0315A027 | 1 | 18 | B65687A1018T001 B65687A1000T001 |
| | ● | 630 ±3% | | B65686A0630A027 | 1 | | |
| | ○ | 10000 +30/-20% | | B65686A0000R027 | | | |
| | ○ | | 10000 +30/-20% | B65686A0000R087 | | | |
| PM 87/70 | ● | 400 ±3% | | B65713A0400A027 | 1 | 20 | B65714K1020T001 B65714J1000T001 |
| | ● | 5000 ±15% | | B65713A5000L027 | 1 | | |
| | ○ | 12000 +30/-20% | | B65713A0000R027 | | | |
| | ○ | 12000 +30/-20% | | B65713A0000R087 | | | |
| PM 114/93 | ● | 630 ±3% | | B65733A0630A027 | 1 | - | B65734B1000T001 |
| | ● | 6300 ±15% | | B65733A6300L027 | | | |
| | ○ | 16000 +30/-20% | | B65733A0000R027 | | | |
| | ○ | 16000 +30/-20% | | B65733A0000R087 | | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

1) Complete mounting assembly incl. nuts and washers
Komplette Halterung mit Muttern und Scheiben

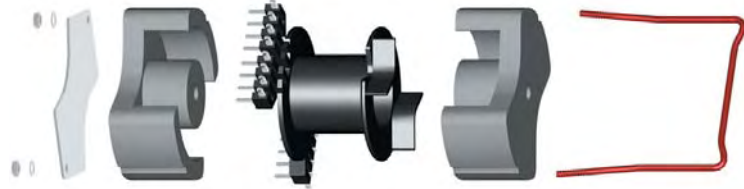
PM cores for handling very high powers

The benefits of this pot core have been proven in numerous applications in telecommunications and industrial electronics:

- wide flux area for high power at minimum number of turns,

- low magnetic leakage and stray capacitance,
- a good shielding owing to the closed form,
- precisely ground air gaps.

PM cores are in accordance with IEC 61247.
They are supplied in sets.


**Mounting assemblies¹⁾
Halierung¹⁾**

B65647A2000X000

B65685A2000X000

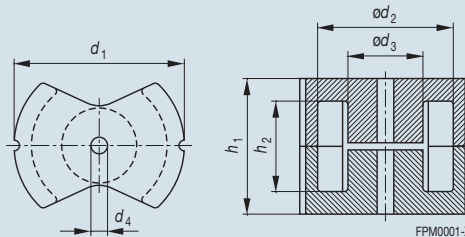
B65687A2000X000

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| PM 50/39 | 0.227 | 84 | 370 | 280 | 31000 |
| PM 62/49 | 0.191 | 109 | 570 | 470 | 62000 |
| PM 74/59 | 0.162 | 128 | 790 | 630 | 101000 |
| PM 87/70 | 0.160 | 146 | 910 | 700 | 133000 |
| PM 114/93 | 0.116 | 200 | 1720 | 1380 | 344000 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | d_1 | $\varnothing d_2$ | $\varnothing d_3$ | $\varnothing d_4$ | h_1 | h_2 |
|-------------|----------|-------------------|-------------------|-------------------|---------|-----------|
| PM 50/39 | 50 -1.7 | 39.0 +1.3 | 20.0 -0.6 | 5.4 +0.2 | 39 -0.4 | 26.4 +0.8 |
| PM 62/49 | 62 -2.0 | 48.8 +1.5 | 25.5 -0.8 | 5.4 +0.2 | 49 -0.4 | 33.4 +0.8 |
| PM 74/59 | 74 -2.5 | 57.5 +1.8 | 29.5 -1.0 | 5.4 +0.3 | 59 -0.6 | 40.7 +0.8 |
| PM 87/70 | 87 -3.0 | 67.1 +2.1 | 31.7 -1.0 | 8.5 +0.3 | 70 -0.8 | 48.0 +0.8 |
| PM 114/93 | 114 -4.5 | 88.0 +3.7 | 43.0 -1.4 | 5.4 +0.4 | 93 -1.0 | 63.0 +1.6 |


PM-Kerne für die Übertragung sehr hoher Leistungen

In zahlreichen Anwendungen in der Nachrichtentechnik und Industrieelektronik hat sich diese Schalenkernform als vorteilhaft erwiesen:

- Großer Flussquerschnitt, daher günstig für hohe Leistungen bei wenig Windungszahlen,

- geringe Streuinduktivität und Eigenkapazität,
- gute Schirmung durch kompakte Form,
- die Möglichkeit, einen Luftspalt sehr genau einzuschleifen.

PM-Kerne entsprechen IEC 61247.
Sie werden satzweise geliefert.

U/I Cores

U-/I-Kerne

Technical data Technische Daten



| Type Typ | Material A _L values (nH) / A _L -Werte (nH) | | Ordering code (per piece) Bestellnummer (pro Stück) |
|-------------|---|-----|--|
| | N27 | N87 | |

U cores / U-Kerne¹⁾

| | | | |
|-------------|---------------|---------------|-----------------|
| U 93/76/16 | 2900 +30/-20% | | B67345B0003X027 |
| | | 3100 +30/-20% | B67345B0003X087 |
| U 93/76/20 | 3600 +30/-20% | | B67345B0010X027 |
| | | 3900 +30/-20% | B67345B0010X087 |
| U 93/76/30 | 5400 +30/-20% | | B67345B0001X027 |
| | | 5700 +30/-20% | B67345B0001X087 |
| U 101/76/30 | 4600 +30/-20% | | B67370A0002X027 |
| | | 5700 +30/-20% | B67370A0002X087 |
| U 126/91/20 | | 3000 ±25% | B67385G0000X187 |
| U 141/78/30 | 7500 ±30% | | B67374G0000X127 |
| | | 8900 ±30% | B67374G0000X187 |

I cores / I-Kerne²⁾

| | | | |
|-------------|---------------|---------------|-----------------|
| I 93/28/16 | 3800 +30/-20% | | B67345B0004X027 |
| | | 4100 +30/-20% | B67345B0004X087 |
| I 93/28/20 | 4900 +30/-20% | | B67345B0011X027 |
| | | 5300 +30/-20% | B67345B0011X087 |
| I 93/28/30 | 7400 +30/-20% | | B67345B0002X027 |
| | | 7900 +30/-20% | B67345B0002X087 |
| I 126/28/20 | | 3900 ±25% | B67385P0000X187 |

1) A_L values apply to an UU core set.
A_L-Werte gelten für einen UU-Kernsatz.

2) A_L values apply to an UI core set.
A_L-Werte gelten für einen UI-Kernsatz.

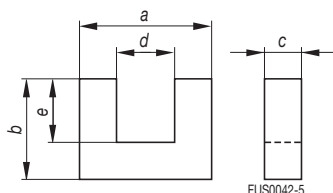
For power, pulse and high-voltage transformers

■ U cores with a rectangular cross-section are a low-cost but somewhat bulky core form. Offering various combination possibilities, they are preferred for high-power transformation and can be used into the kW region.

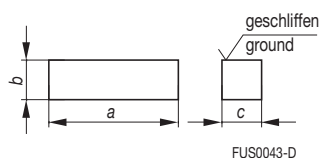
■ I cores combined with U cores allow the design of simple transformers.

U and I cores are supplied in single units.

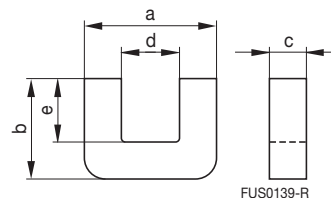
U 93 ... U 126



I 93 ... I 126



U 141

**Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)**

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|---------------------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| U 93/76/16 ¹⁾ | 0.79 | 354 | 448 | 448 | 159000 |
| U 93/76/20 ¹⁾ | 0.63 | 354 | 560 | 560 | 198000 |
| U 93/76/30 ¹⁾ | 0.42 | 354 | 840 | 840 | 297000 |
| U 101/76/30 ¹⁾ | 0.44 | 368 | 840 | 840 | 310800 |
| U 126/91/20 ¹⁾ | 0.86 | 480 | 560 | 560 | 269000 |
| U 141/78/30 ¹⁾ | 0.28 | 377 | 1350 | 1350 | 508950 |
| I 93/28/16 ²⁾ | 0.58 | 258 | 448 | 448 | 116000 |
| I 93/28/20 ²⁾ | 0.46 | 258 | 560 | 560 | 144000 |
| I 93/28/30 ²⁾ | 0.31 | 258 | 840 | 840 | 217000 |
| I 126/28/20 ²⁾ | 0.63 | 354 | 560 | 560 | 198000 |

1) UU core set
2) UI core set

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | b | c | d | e |
|-------------|------------|-----------|-----------|-----------|-----------|
| U 93/76/16 | 93.0 ±1.8 | 76.0 ±0.5 | 16.0 ±0.5 | 34.6 min. | 48.0 ±0.9 |
| I 93/28/16 | 93.0 ±1.8 | 28.0 ±0.5 | 16.0 ±0.5 | – | – |
| U 93/76/20 | 93.0 ±1.8 | 76.0 ±0.5 | 20.0 ±0.5 | 34.6 min. | 48.0 ±0.9 |
| I 93/28/20 | 93.0 ±1.8 | 28.0 ±0.5 | 20.0 ±0.5 | – | – |
| U 93/76/30 | 93.0 ±1.8 | 76.0 ±0.5 | 30.0 ±0.6 | 34.6 min. | 48.0 ±0.9 |
| I 93/28/30 | 93.0 ±1.8 | 28.0 ±0.5 | 30.0 ±0.6 | – | – |
| U 101/76/30 | 101.0 ±1.8 | 76.0 ±0.5 | 30.0 ±0.6 | 45.0 min. | 48.0 ±0.9 |
| U 126/91/20 | 126.0 ±4 | 91.0 ±1 | 20.0 ±0.6 | 70.0 ±2 | 63.0 ±2 |
| I 126/28/20 | 126.0 ±4 | 28.0 ±1 | 20.0 ±0.6 | – | – |
| U 141/78/30 | 141.0 ±5 | 78.5 ±0.5 | 30.0 ±1 | 50.0 min. | 33.5 ±1 |

Für Leistungs-, Impuls- und Hochspannungsübertrager

■ U-Kerne mit rechteckiger Querschnittsfläche sind preisgünstige, jedoch etwas sperrige Kernformen. Für hohe übertragbare Leistungen werden sie jedoch bevorzugt verwendet, da sie durch verschiedene Kombinationsmöglichkeiten Leistungsübertragungen bis in den kW-Bereich ermöglichen.

■ I-Kerne in Kombination mit U-Kernen erlauben den Aufbau einfacher Übertrager.

U- und I-Kerne werden stückweise geliefert.

E Cores E 5 ... E 20

E-Kerne E 5 ... E 20

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) A _L values (nH) or dim. g (mm) for cores with air gap A _L -Werte (nH) bzw. Maß g (mm) für Kerne mit Luftspalt | | | | | | | Ordering code (per piece) Bestellnummer (pro Stück) | Coil formers Spulenkörper | | |
|---|------------------------------|---|-----------------|--------------|----------|----------|--------------|--------------|--|------------------------------|-----------------|---------------------|
| | | N45 (45) | N30 (30) | T38 (38) | T46 (46) | N27 (27) | N41 (41) | N87 (87) | | Sections Kammern | Pins Stifte | |
| Cores / Kerne | | | | | | | | | | Accessories / Zubehör | | |
| E 5 ²⁾ | ○ | | | 1400 | | | | 270 | B66303G0000X1** | | | |
| E 6.3 ²⁾ | ○ | | 700 +40/-30% | 1700 | | | | 380 | B66300G0000X1** | SMD | 1 4 | |
| | | | | | | | | | | | 1 6 | |
| E 8.8 ²⁾ | ○ | | 1000 | 2100 | | | | 550 | B66302G0000X1** | SMD | 1 8 | |
| | | | | | | | | | | | 2 8 | |
| E 10/5.5/5 | ○ | | | | | | 750 ±25% | 800 ±25% | B66322G0000X1** | | | |
| E 13/7/4 ²⁾ | ○ | 950 | 1000 | | 3600 | | | 800 | 850 | B66305G0000X1** | 1 8 | |
| | | | | | | | | | | | B66305F0000X146 | 1 6 |
| | | | | | | | | | | ● | B66305G0040X127 | SMD |
| | | | | | | | | | | 2 10 | | |
| E 14/8/4 | ○ | | 1250 | | | | 860 | 1050 | B66219G0000X1** | | | |
| E 16/6/5 | ○ | | | | | | 1100 | | B66393G0000X1** | | | |
| E 16/8/5 ²⁾ | ○ | 1400 | 1400 | | 5100 | | | 950 | 1000 | B66307G0000X1** | 1 8 | |
| | | | | | | | | | | | B66307F0000X146 | 1 8 |
| | | | | | | | | | | ● | B66307G0060X1** | |
| | | | | | | | | | | ● | B66307G0***X1** | |
| | | | | | | | 0.06 | 0.06 | | | | |
| | | | | | | | 0.1/0.5 | 0.1/0.5 | | | | |
| E 19/8/5 ¹⁾ | ○ | | 1700 | | 5800 | | 1050 | 1150 | B66379G0000X1** | | | |
| E 20/10/6 ²⁾ | ○ | | 2150 | | | | | | | B66311G0000X1** | 1 10 | |
| | | | | | | | | | | | B66311G0090X1** | 1 10 |
| | | | | | | | | | | ● | B66311G0170X1** | 1 12 |
| | | | | | | | | | | ● | B66311G0250X1** | 1 14 |
| | | | | | | | | | | ● | B66311G0500X1** | 1 6 |
| | | | | | | | | | | 2 6 | | |
| Tol. of A _L value A _L -Wert-Toleranz | | +30% -20% | +30% -20% | +40/ -30% | ±30% | | +30/ -20% | +30/ -20% | +30/ -20% | | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

*: See ordering code example
Siehe Bestellbeispiel

1) Size corresponds to U.S. lam size E cores E187.
Größe entspricht U.S. lam size E cores E187.

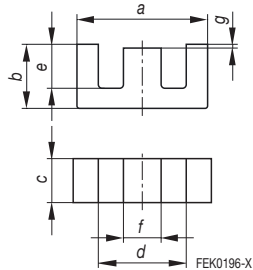
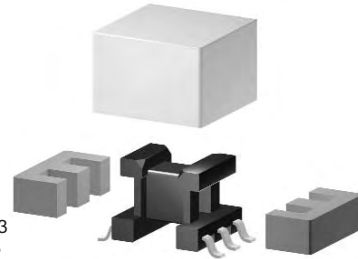
2) In accordance with IEC 61246

Conventional E cores with rectangular center leg (E 5 through E 80)

These E cores are available in a wide variety of sizes. The main areas of use are power transformers and chokes for switch-mode power supplies and also small-signal applications. The disadvantages of an unfavorable winding

form and the intensive leakage field produced by the geometry are countered by the major advantage of a simple core form that is economical to produce.

E cores are supplied in single units.


 Example: E 6.3
 Beispiel: E 6.3


| Ordering code Bestellnummer | Features Merkmale | Mounting assemblies Halterung |
|---|---|--|
| B66301B1004T001 B66301B1006T001 B66301B1006T002 | Gullwing terminals | B66301C2000X000 (Cap / Kappe) |
| B66302D1008T001 B66302D1008T002 | Gullwing terminals | B66302A2000X000 (Cap / Kappe) |
| B66202A1108T001 B66202J1106T001 | horizontal vertical | B66202A2010X000 (Yoke / Bügel) |
| B66306C1010T001 B66306C1010T002 | Gullwing terminals | B66414A7000X000 (cover plate / Abdeckplatte) |
| B66308A1108T001 B66308J1108T001 | horizontal vertical | B66308A2010X000 (Yoke / Bügel) |
| B66206A1110T001 B66206J1110T001 | horizontal vertical | B66206A2010X000 (Yoke / Bügel) |
| B66206C1012T001 B66206C1014T001 | right-angle pins Winkelstifte | |
| B66206J1106T001 B66206K1106T002 | for luminaire für Leuchten- technik | B66206A2001X000 (Yoke / Bügel) |

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| E 5 | 4.86 | 12.6 | 2.6 | 2.5 | 33 |
| E 6.3 | 3.70 | 12.2 | 3.3 | 2.6 | 40.3 |
| E 8.8 | 3.10 | 15.5 | 5.0 | 3.6 | 78 |
| E 10/5.5/5 | 2.41 | 26.3 | 10.9 | 10.4 | 287 |
| E 13/7/4 | 2.39 | 29.6 | 12.4 | 12.2 | 367 |
| E 14/8/4 | 2.19 | 33.9 | 15.5 | 13.1 | 525 |
| E 16/6/5 | 1.49 | 28.6 | 19.2 | 17.6 | 549 |
| E 16/8/5 | 1.87 | 37.6 | 20.1 | 19.4 | 756 |
| E 19/8/5 | 1.76 | 39.6 | 22.5 | 22.1 | 891 |
| E 20/10/6 | 1.44 | 46.3 | 32.1 | 31.9 | 1490 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | b | c | d | e | f |
|-------------|----------------|------------|----------|------------|------------|------------|
| E 5 | 5.25 ±0.1 | 2.65 ±0.05 | 2.0 -0.1 | 3.9 ±0.1 | 1.93 +0.15 | 1.35 ±0.05 |
| E 6.3 | 6.3 -0.25 | 2.9 -0.1 | 2.0 -0.1 | 3.6 +0.2 | 1.85 +0.15 | 1.4 -0.1 |
| E 8.8 | 9.0 ±0.25 | 4.1 -0.2 | 2.0 -0.1 | 5.2 ±0.13 | 2.03 +0.25 | 1.9 ±0.12 |
| E 10/5.5/5 | 10.2 ±0.2 | 5.5 ±0.15 | 4.8 -0.3 | 7.95 ±0.15 | 4.25 ±0.15 | 2.35 ±0.15 |
| E 13/7/4 | 12.6 +0.5/-0.4 | 6.5 -0.2 | 3.7 -0.3 | 8.9 +0.6 | 4.5 +0.3 | 3.7 -0.3 |
| E 14/8/4 | 14.3 -0.7 | 7.8 -0.3 | 4.3 -0.3 | 10.5 +0.6 | 5.2 +0.4 | 4.3 -0.3 |
| E 16/6/5 | 16.0 +0.7/-0.5 | 5.8 -0.2 | 4.7 -0.4 | 11.3 +0.6 | 3.6 +0.3 | 4.7 -0.3 |
| E 16/8/5 | 16.0 +0.7/-0.5 | 8.2 -0.3 | 4.7 -0.4 | 11.3 +0.6 | 5.7 +0.4 | 4.7 -0.3 |
| E 19/8/5 | 19.0 ±0.4 | 8.0 ±0.13 | 4.8 ±0.2 | 14.3 ±0.3 | 5.7 ±0.13 | 4.8 ±0.2 |
| E 20/10/6 | 20.4 -0.8 | 10.1 -0.3 | 5.9 -0.4 | 14.1 +0.6 | 7.0 +0.3 | 5.9 -0.3 |

Ordering code example / Bestellbeispiel
B66311G0500X127

- Type / Bauform
- Code letter for tolerated air gap / Kennzeichen für tolerierten Luftspalt
- Air gap "dim. g" in thousandths of millimeter (4 digits). "0000" for cores w/o air gap.
Luftspalt „Maß g“ in tausendstel Millimeter (4 Ziffern). „0000“ bei Kernen ohne Luftspalt.
- Filling number / Füllnummer
- Code number for material / Kennziffern für Material

Klassische E-Kerne mit eckigem Mittelschenkel (E 5 bis E 80)

Für diese E-Kernform steht eine Vielzahl von Größen zur Verfügung. Die Hauptanwendungsfelder sind Leistungsübertrager und Drosseln für SNT, jedoch auch Kleinsignalanwendungen. Dem Nachteil der ungünstigen

Wickelform und der streufeldintensiven Geometrie steht der große Vorteil einer einfachen und wirtschaftlich günstig zu fertigen Kernform gegenüber.

E-Kerne werden stückweise geliefert.

E Cores E 21 ... E 36

E-Kerne E 21 ... E 36

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) A _L values (nH) or dim. g (mm) for cores with air gap A _L -Werte (nH) bzw. Maß g (mm) für Kerne mit Luftspalt | | | | Ordering code (per piece) Bestellnummer (pro Stück) | Coil formers Spulenkörper | |
|---|------------------------------|---|----------|----------|-----------------|--|------------------------------|----------------|
| | | N30 (30) | T46 (46) | N27 (27) | N87 (87) | | Sections Kammern | Pins Stifte |
| Cores / Kerne | | | | | | | Accessories / Zubehör | |
| E 21/9/5 | ○ | 1500 | | 900 | | B66314G0000X1** | | |
| E 25/13/7 ²⁾ | ○ | 2900 | | 1750 | 1850 | B66317G0000X1** | 1 | 10 |
| | ● | | | 0.1 | 0.1 | B66317G0100X1** | 1 | 10 |
| | ● | | | 0.16 | 0.16 | B66317G0160X1** | 1 | 10 |
| | ● | | | 0.25 | 0.25 | B66317G0250X1** | 1 | 9 |
| | ● | | | 0.5 | 0.5 | B66317G0500X1** | | |
| | ● | | | 1.0 | 1.0 | B66317G1000 X1** | | |
| E 25.4/10/7 ¹⁾ | ○ | 2700 | | 1500 | 1670 | B66315G0000X1** | | |
| | ○ | | 8500 | | | B66315F0000X146 | | |
| | ● | | | 0.5 | | B66315G0500X127 | | |
| E 30/15/7 | ○ | 3100 | | 1700 | 1900 | B66319G0000X1** | 1 | 14 |
| | ● | | | 0.1 | 0.1 | B66319G0100X1** | 1 | 14 |
| | ● | | | 0.18 | 0.18 | B66319G0180X1** | 1 | 12 |
| | ● | | | 0.34 | 0.34 | B66319G0340X1** | | |
| E 32/16/9 ²⁾ | ○ | 3800 | | 2100 | 2300 | B66229G0000X1** | 1 | 14 |
| | ● | | | 0.5 | 0.5 | B66229G0500X1** | | |
| | ● | | | 1.0 | 1.0 | B66229G1000X1** | | |
| E 32/16/11 | ○ | | | 2900 | B66233G0000X187 | | | |
| E 34/14/9 ¹⁾ | ○ | | | 2300 | 2450 | B66370G0000X1** | | |
| E 36/18/11 | ○ | | | 2900 | 3100 | B66389G0000X1** | 1 | 16 |
| | ● | | | 1.0 | | B66389G1000X127 | | |
| Tol. of A _L value A _L -Wert-Toleranz | | +30/-20% | ±30 | +30/-20% | +30/-20% | | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

** : Code number for material
Kennziffer für Werkstoff

1) Size corresponds to U.S. lam size E cores
Größe entspricht U.S. lam size E cores
E25.4/10/7 Δ E2425; E34/14/9 Δ E375

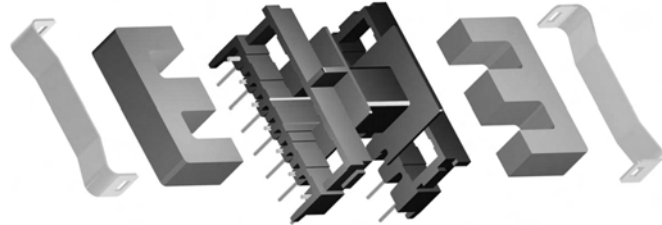
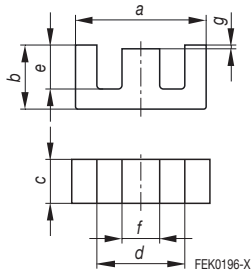
2) In accordance with IEC 61246

For power applications material with low power loss is needed.

If high saturation characteristics are required in addition to low power loss, inquire for material N92.

We recommend:

- N27 up to 100 kHz
- N87 up to 500 kHz



| Ordering code Bestellnummer | Features Merkmale | Yoke Bügel |
|--------------------------------|----------------------|-----------------|
| B66208A1110T001 | horizontal | B66208A2010X000 |
| B66208J1110T001 | vertical | |
| B66208W1010T001 | vertical | |
| B66208K1009T001 | for SMPS für SNT | B66208A2003X000 |
| B66232A1114T001 | horizontal | B66232A2010X000 |
| B66232B1114T001 | horizontal | |
| B66232J1112T001 | vertical | |
| B66230A1114T001 | horizontal | B66230A2010X000 |
| B66390A1016T001 | horizontal | |

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| E 21/9/5 | 2.01 | 43.4 | 21.6 | 20.2 | 937 |
| E 25/13/7 | 1.10 | 57.5 | 52.5 | 51.5 | 3020 |
| E 25.4/10/7 | 1.27 | 49.2 | 38.8 | 38.4 | 1910 |
| E 30/15/7 | 1.12 | 67 | 60 | 49.0 | 4000 |
| E 32/16/9 | 0.89 | 74 | 83 | 81.4 | 6140 |
| E 32/16/11 | 0.76 | 74 | 97 | 95.0 | 7187 |
| E 34/14/9 | 0.82 | 69.6 | 84.8 | 83.2 | 5900 |
| E 36/18/11 | 0.68 | 81 | 120 | 112 | 9670 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | b | c | d | e | f |
|-------------|----------------|-------------|-----------|-----------|-----------|------------|
| E 21/9/5 | 21.1 -1.0 | 8.7 -0.4 | 5.0 -0.4 | 16.0 +0.8 | 6.0 +0.4 | 5.0 -0.4 |
| E 25/13/7 | 25.0 +0.8/-0.7 | 12.8 -0.5 | 7.5 -0.6 | 17.5 +0.8 | 8.7 +0.5 | 7.5 -0.5 |
| E 25.4/10/7 | 25.4 ±0.7 | 9.78 -0.15 | 6.5 -0.5 | 18.8 +0.8 | 6.48+0.3 | 6.5 -0.4 |
| E 30/15/7 | 30.0 +0.8/-0.6 | 15.2 -0.4 | 7.3 -0.5 | 19.5 +0.8 | 9.7 +0.6 | 7.2 -0.5 |
| E 32/16/9 | 32.0 +0.9/-0.7 | 16.4 -0.6 | 9.5 -0.7 | 22.7 +1.0 | 11.2 +0.6 | 9.5 -0.6 |
| E 32/16/11 | 32.0 +0.7/-0.5 | 16.4 -0.6 | 11.0 -0.7 | 22.7 +1.0 | 11.2 +0.6 | 9.5 -0.6 |
| E 34/14/9 | 34.6 ±0.7 | 14.65 -0.75 | 9.7 -0.8 | 25.1 +1.0 | 9.5 +0.5 | 9.65 -0.55 |
| E 36/18/11 | 36.0 +1.0/-0.7 | 18.0 -0.4 | 11.5 -0.5 | 24.5 +1.2 | 12.0 +0.6 | 10.2 -0.5 |

Ordering code example / Bestellbeispiel

B66317G1000X127

- Type / Bauform
- Code letter for tolerated air gap / Kennzeichen für tolerierten Luftspalt
- Air gap "dim. g" in thousandths of millimeter (4 digits). "0000" for cores w/o air gap.
Luftspalt „Maß g“ in tausendstel Millimeter (4 Ziffern). „0000“ bei Kernen ohne Luftspalt.
- Filling number / Füllnummer
- Code number for material / Kennziffern für Material

Für Leistungsanwendungen werden Werkstoffe mit geringen Verlustleistungen benötigt.

- Geeignete Werkstoffe:
- N27 bis ca. 100 kHz
 - N87 bis 500 kHz

Werden zusätzlich noch hohe Sättigungseigenschaften verlangt, empfehlen wir den Werkstoff N92, der auf Anfrage erhältlich ist.

E Cores E 40 ... E 80

E-Kerne E 40 ... E 80

Technical data Technische Daten

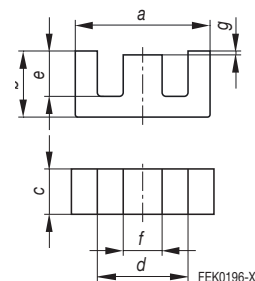


| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) A _L values (nH) or dim. g (mm) for cores with air gap A _L -Werte (nH) bzw. Maß g (mm) für Kerne mit Luftspalt | | | Ordering code (per piece) Bestellnummer (pro Stück) | Coil formers Spulenkörper | |
|---|------------------------------|---|-------------|----------|--|------------------------------|----------------|
| | | N27 (27) | N87 (87) | N72 (72) | | Sections Kammern | Pins Stifte |
| Cores / Kerne | | | | | | Accessories / Zubehör | |
| E 40/16/12 ¹⁾ | ○ | 3800 | 4150 | 4600 | B66381G0000X1** | 1 | 14 |
| | ● | 0.5 | | | B66381G0500X127 | | |
| E 42/21/15 ²⁾ | ○ | 3500 | 3950 | | B66325G0000X1** | | |
| | ● | 0.1/0.25/0.5/0.64 | | | B66325G0***X127 | | |
| | ● | 1.0/1.5 | | | B66325G***X127 | | |
| E 42/21/20 ²⁾ | ○ | 4750 | 5200 | | B66329G0000X1** | 1 | 18 |
| | ● | 0.25/0.5 | | | B66329G0***X127 | | |
| | ● | 1.0/1.5 | | | B66329G***X127 | | |
| E 47/20/16 ¹⁾ | ○ | 5100 | 5600 | | B66383G0000X1** | | |
| E 55/28/21 ²⁾ | ○ | 5800 | 6400 | | B66335G0000X1** | | |
| | ● | 0.5 | 0.5 | | B66335G0500X1** | | |
| | ● | 1.0/1.5/2.0 | 1.0/1.5/2.0 | | B66335G***X1** | | |
| E 55/28/25 | ○ | 6800 | 7300 | | B66344G0000X1** | | |
| | ● | 2.5 | | | B66344G2500X127 | | |
| E 56/24/19 ¹⁾ | ○ | 6300 | 6900 | | B66385G0000X1** | | |
| E 65/32/27 | ○ | 7200 | 7900 | | B66387G0000X1** | | |
| | ● | 0.5 | 0.5 | | B66387G0500X1** | | |
| | ● | 1.0/1.5 | 1.0/1.5 | | B66387G***X1** | | |
| E 70/33/32 | ○ | 8850 | 9700 | | B66371G0000X1** | | |
| | ● | 1.5 | | | B66371G1500X127 | | |
| E 80/38/20 | ○ | 4150 | 4500 | | B66375G0000X1** | | |
| | ● | 0.5 | | | B66375G0500X127 | | |
| Tol. of A _L value A _L -Wert-Toleranz | | +30/-20% | +30/-20% | +30/-20% | | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

- 1) Size corresponds to U.S. lam size E cores
Größe entspricht U.S. lam size E cores
E 40/16/12 Δ E 21; E 47/20/16 Δ E 625; E 56/24/19 Δ E 75
- 2) In accordance with IEC 61246

*: See ordering code example
Siehe Bestellbeispiel


Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| E 40/16/12 | 0.52 | 77 | 149 | 143 | 11500 |
| E 42/21/15 | 0.54 | 97 | 178 | 175 | 17300 |
| E 42/21/20 | 0.41 | 97 | 234 | 229 | 22700 |
| E 47/20/16 | 0.38 | 89 | 233 | 226 | 20700 |
| E 55/28/21 | 0.35 | 124 | 354 | 351 | 43900 |
| E 55/28/25 | 0.30 | 124 | 420 | 420 | 52100 |
| E 56/24/19 | 0.31 | 107 | 340 | 327 | 36400 |
| E 65/32/27 | 0.27 | 147 | 535 | 529 | 78600 |
| E 70/33/32 | 0.22 | 149 | 683 | 676 | 102000 |
| E 80/38/20 | 0.47 | 184 | 390 | 388 | 71800 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | b | c | d | e | f |
|-------------|----------------|------------|------------|-----------|-----------|------------|
| E 40/16/12 | 40.6 ±0.6 | 16.5 ±0.2 | 12.5 ±0.25 | 28.6 min | 10.5 ±0.3 | 12.5 ±0.25 |
| E 42/21/15 | 42.0 +1.0/-0.7 | 21.2 -0.4 | 15.2 -0.5 | 29.5 +1.2 | 14.8 +0.7 | 12.2 -0.5 |
| E 42/21/20 | 42.0 +1.0/-0.7 | 21.2 -0.4 | 20.0 -0.8 | 29.5 +1.2 | 14.8 +0.7 | 12.2 -0.5 |
| E 47/20/16 | 46.9 ±0.8 | 19.6 ±0.2 | 15.6 ±0.25 | 31.8 min | 12.2 ±0.3 | 15.6 ±0.25 |
| E 55/28/21 | 55.0 +1.2/-0.9 | 27.8 -0.6 | 21.0 -0.6 | 37.5 +1.2 | 18.5 +0.8 | 17.2 -0.5 |
| E 55/28/25 | 55.0 +1.2/-0.9 | 27.8 -0.6 | 25.0 -0.6 | 37.5 +1.2 | 18.5 +0.8 | 17.2 -0.5 |
| E 56/24/19 | 56.1 ±1.0 | 23.6 ±0.23 | 18.8 ±0.3 | 38.1 min | 14.6 ±0.3 | 18.8 ±0.3 |
| E 65/32/27 | 65.0 +1.5/-1.2 | 32.8 -0.6 | 27.4 -1.0 | 44.2 +1.8 | 22.2 +0.8 | 20.0 -0.7 |
| E 70/33/32 | 70.5 ±1.0 | 33.2 -0.5 | 32.0 -0.8 | 48.0 +1.5 | 21.9 +0.7 | 22.0 -0.7 |
| E 80/38/20 | 80.0 ±1.8 | 38.5 -0.8 | 20.2 -0.8 | 58.9 +2.6 | 27.9 +0.8 | 20.2 -0.8 |

Ordering code example / Bestellbeispiel

B66335G1000X127

- Type / Bauform
- Code letter for tolerated air gap / Kennzeichen für tolerierten Luftspalt
- Air gap "dim. g" in thousandths of millimeter (4 digits). "0000" for cores w/o air gap.
Luftspalt „Maß g“ in tausendstel Millimeter (4 Ziffern). „0000“ bei Kernen ohne Luftspalt.
- Filling number / Füllnummer
- Code number for material / Kennziffern für Material

ELP/I Cores

ELP-/I-Kerne

Technical data Technische Daten



| Core set Kernset | Clamp recess Klammer- vertiefung | Air gap Luft- spalt | Material (Code number / Kennziffer) A _L values (nH) A _L -Werte (nH) | | | | Ordering code (per piece) Bestellnummer (pro Stück) | |
|--|---|------------------------------|---|------------|-----------|-----------|--|-----------------|
| | | | N49 (49) | N87 (87) | N92 (92) | N97 (97) | | |
| ELP core / ELP-Kern | | | | | | | | |
| EELP 14 | without | ○ | 800 ±25% | 1100 ±25% | 850 ±25% | 1150 ±25% | B66281G0000X1** | |
| EELP 18 | with ¹⁾ | ○ | 1900 ±25% | 2600 ±25% | 2025 ±25% | 2670 ±25% | B66283G0000X1** | |
| EELP 22 | with ¹⁾ | ○ | 3100 ±25% | 4500 ±25% | 3400 ±25% | 4600 ±25% | B66285G0000X1** | |
| EELP 32 | with ¹⁾ | ○ | 3900 ±25% | 5700 ±25% | 4300 ±25% | 5700 ±25% | B66287G0000X1** | |
| EELP 38 | with ¹⁾ | ○ | 4850 ±25% | 7200 ±25% | 5400 ±25% | 7400 ±25% | B66289G0000X1** | |
| EELP 43 | with ¹⁾ | ○ | 5000 ±25% | 7300 ±25% | 5500 ±25% | 7500 ±25% | B66291G0000X1** | |
| EELP 58 | without | ○ | | 7400 ±25% | | | B66293G0000X187 | |
| EELP 64 | without | ○ | 8000 ±30% | 12500 ±25% | | | B66295G0000X1** | |
| ELP core / ELP-Kern I core / I-Kern | | | | | | | | |
| EILP 14 | without | ○ | 850 ±25% | 1250 ±25% | 900 ±25% | 1300 ±25% | B66281G0000X1** | B66281P0000X1** |
| EILP 18 | with ¹⁾ | ○ | 2100 ±25% | 2900 ±25% | 2300 ±25% | 3000 ±25% | B66283G0000X1** | B66283P0000X1** |
| EILP 22 | with ¹⁾ | ○ | 3700 ±25% | 5200 ±25% | 4000 ±25% | 5250 ±25% | B66285G0000X1** | B66285P0000X1** |
| EILP 32 | with ¹⁾ | ○ | 4400 ±25% | 6300 ±25% | 4800 ±25% | 6300 ±25% | B66287G0000 X1** | B66287P0000X1** |
| EILP 38 | with ¹⁾ | ○ | 5700 ±25% | 8300 ±25% | 6200 ±25% | 8400 ±25% | B66289G0000X1** | B66289P0000X1** |
| EILP 43 | with ¹⁾ | ○ | 5900 ±25% | 8500 ±25% | 6400 ±25% | 8700 ±25% | B66291G0000X1** | B66291P0000X1** |
| EILP 58 | without | ○ | | 8400 ±25% | | | B66293G0000X187 | B66293P0000X187 |
| EILP 64 | without | ○ | 8900 ±30% | 14000 ±25% | | | B66295G0000X1** | B66295P0000X1** |

○ = ungapped / ohne Luftspalt

1) = Without clamp recess available. / Ohne Klammervertiefung lieferbar.

** : Code number for material
Kennziffer für Werkstoff

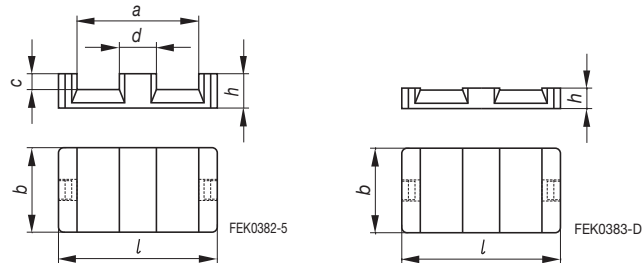
ELP and I cores for extra-low-profile transformer designs

Planar inductive components are taking on increasing importance because they present a number of advantages compared to conventional winding technology, for example

- low profile,
- excellent thermal performance thanks to large core surface,

- high power density,
- high reproducibility.

EPCOS offers matching ferrite cores for this technology. Low-profile E cores (ELP) and I cores are suitable for DC/DC and AC/DC converters for instance. Low-profile core design is specified in IEC 62317-9. ELP and I cores are supplied in single units.



**Accessories
Zubehör
Clamp (2 pieces required)
Klammer (2 Stück erforderlich)**

B65804P2204X000

B65808J2204X000

B66284F2204X000

B65804P2204X000

B66288F2204X000

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Core set Kernset | Core type Kerntyp | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------------------|---------------------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| EELP (ELP + ELP) | | | | | | |
| EELP 14 | ELP 14/3.5/5 | 1.45 | 20.7 | 14.3 | 13.9 | 296 |
| EELP 18 | ELP 18/4/10 | 0.62 | 24.3 | 39.3 | 38.9 | 955 |
| EELP 22 | ELP 22/6/16 | 0.41 | 32.5 | 78.3 | 77.9 | 2540 |
| EELP 32 | ELP 32/6/20 | 0.32 | 41.4 | 130 | 128 | 5390 |
| EELP 38 | ELP 38/8/25 | 0.27 | 52.4 | 194 | 192 | 10200 |
| EELP 43 | ELP 43/10/28 | 0.27 | 61.1 | 229 | 225 | 14000 |
| EELP 58 | ELP 58/11/38 | 0.26 | 80.7 | 310 | 308 | 25000 |
| EELP 64 | ELP 64/10/50 | 0.15 | 79.9 | 519 | 518 | 41500 |
| EILP (ELP + I) | | | | | | |
| EILP 14 | I 14/1.5/5 ¹⁾ | 1.15 | 16.7 | 14.5 | 13.9 | 242 |
| EILP 18 | I 18/2/10 ¹⁾ | 0.51 | 20.3 | 39.5 | 38.9 | 802 |
| EILP 22 | I 22/2.5/16 ¹⁾ | 0.33 | 26.1 | 78.5 | 77.9 | 2050 |
| EILP 32 | I 32/3/20 ¹⁾ | 0.27 | 35.1 | 130 | 128 | 4560 |
| EILP 38 | I 38/4/25 ¹⁾ | 0.22 | 43.6 | 194 | 192 | 8440 |
| EILP 43 | I 43/4/28 ¹⁾ | 0.22 | 50.4 | 229 | 225 | 11500 |
| EILP 58 | I 58/4/38 ¹⁾ | 0.22 | 67.7 | 310 | 308 | 21000 |
| EILP 64 | I 64/5/50 ¹⁾ | 0.13 | 69.7 | 519 | 518 | 36200 |

1) ELP cores see above. / ELP-Kerne siehe oben.

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | l (ELP, I) | b (ELP, I) | h (ELP) | h (I) | a (ELP) | c (ELP) | d (ELP) |
|---------------|-----------------|-----------------|--------------|-------------|--------------|--------------|--------------|
| ELP 14 / I 14 | 14.0 ± 0.3 | 5.0 ± 0.1 | 3.5 ± 0.1 | 1.5 ± 0.1 | 11.0 ± 0.25 | 2.0 ± 0.1 | 3.0 ± 0.05 |
| ELP 18 / I 18 | 18.0 ± 0.35 | 10.0 ± 0.2 | 4.0 ± 0.1 | 2.0 ± 0.1 | 14.0 ± 0.3 | 2.0 ± 0.1 | 4.0 ± 0.1 |
| ELP 22 / I 22 | 21.8 ± 0.4 | 15.8 ± 0.3 | 5.7 ± 0.1 | 2.5 ± 0.1 | 16.8 ± 0.4 | 3.2 ± 0.1 | 5.0 ± 0.1 |
| ELP 32 / I 32 | 31.75 ± 0.65 | 20.35 ± 0.4 | 6.35 ± 0.15 | 3.15 ± 0.15 | 25.4 ± 0.5 | 3.2 ± 0.15 | 6.35 ± 0.15 |
| ELP 38 / I 38 | 38.1 ± 0.8 | 25.4 ± 0.55 | 8.25 ± 0.15 | 3.8 ± 0.15 | 30.8 ± 0.6 | 4.45 ± 0.15 | 7.6 ± 0.2 |
| ELP 43 / I 43 | 43.2 ± 0.9 | 27.9 ± 0.6 | 9.5 ± 0.15 | 4.1 ± 0.15 | 35.4 ± 0.7 | 5.4 ± 0.15 | 8.1 ± 0.2 |
| ELP 58 / I 58 | 58.4 ± 1.2 | 38.1 ± 0.8 | 10.55 ± 0.15 | 4.05 ± 0.2 | 51.1 ± 1.1 | 6.5 ± 0.15 | 8.1 ± 0.2 |
| ELP 64 / I 64 | 64.0 ± 1.3 | 50.8 ± 1.1 | 10.2 ± 0.15 | 5.1 ± 0.15 | 53.6 ± 1.1 | 5.1 ± 0.15 | 10.2 ± 0.2 |

ELP- und I-Kerne für besonders flache Übertragerbauformen

Planarinduktivitäten gewinnen zunehmend an Bedeutung, da sie gegenüber der herkömmlichen Wickeltechnik eine Reihe von Vorteilen bieten, wie

- geringe Bauhöhe,
- ausgezeichnete thermische Eigenschaften aufgrund der großen Kernoberfläche,

- hohe Leistungsdichte,
- hohe Reproduzierbarkeit.

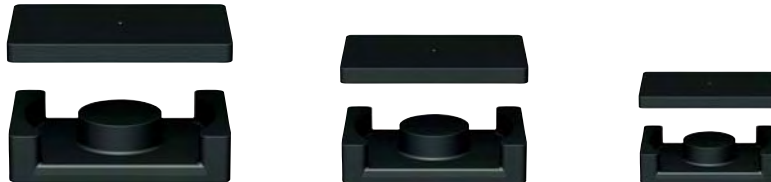
Für diese Technologie stellt EPCOS entsprechende Ferritkerne bereit. Low-Profil E-Kerne (ELP) und I-Kerne sind z. B. für DC/DC- und AC-/DC-Konverter geeignet. Das Design der Low-Profil-Kerne ist in IEC 62317-9 festgelegt. ELP- und I-Kerne werden stückweise geliefert.

Please read *Cautions and warnings* on page 53 and *Important notes* on page 54.
Bitte beachten Sie die Seite 53 *Warn- und Sicherheitshinweise* sowie
Wichtige Hinweise auf Seite 54.

EQ/I Planar Cores

EQ-/I-Planarkerne

Technical data Technische Daten



| Core set Kernset | Air gap Luftspalt | Material (Code number / Kennziffer) A _L values (nH) A _L -Werte (nH) | | | | Ordering code (per piece) Bestellnummer (pro Stück) |
|----------------------|----------------------|---|-----------|-----------|-----------|--|
| | | N49 (49) | N87 (87) | N92 (92) | N97 (97) | |
| Cores / Kerne | | | | | | EQ core / EQ-Kern |
| EEQ 13 | ○ | 1360 ±25% | 1640 ±25% | 1320 ±25% | 1700 ±25% | B66479G0000X1** |
| EEQ 20 | ○ | 2400 ±25% | 3100 ±25% | 2450 ±25% | 3200 ±25% | B66483G0000X1** |
| EEQ 25 | ○ | 3600 ±25% | 4700 ±25% | 3650 ±25% | 4800 ±25% | B66481G0000X1** |
| EEQ 30 | ○ | 3330 ±25% | 4300 ±25% | 3270 ±25% | 4500 ±25% | B66506G0000X1** |
| | | | | | | EQ core / EQ-Kern I core / I-Kern |
| EIQ 13 | ○ | 1600 ±25% | 1700 ±25% | 1550 ±25% | 1800 ±25% | B66479G0000X1** B66479P0000X1** |
| EIQ 20 | ○ | 3000 ±25% | 3680 ±25% | 2950 ±25% | 3770 ±25% | B66483G0000X1** B66483P0000X1** |
| EIQ 25 | ○ | 4200 ±25% | 5100 ±25% | 4150 ±25% | 5300 ±25% | B66481G0000X1** B66481P0000X1** |
| EIQ 30 | ○ | 4350 ±25% | 5600 ±25% | 4450 ±25% | 5750 ±25% | B66506G0000X1** B66506P0000X1** |

○ = ungapped / ohne Luftspalt

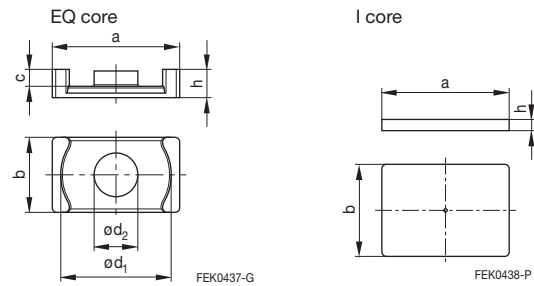
** : Code number for material
Kennziffer für Werkstoff

EQ/I cores are low profile planar cores with comparatively greater winding area having round center leg. They find applications in high frequencies power conversions with lower losses and higher saturation requirements.

The design is specified in IEC 62217-9.

EQ-/I-Kerne mit rundem Mittelschenkel sind Planarkerne mit vergleichsweise großem Wicklungsbereich. Sie finden Anwendung in Hochfrequenz-Leistungsübertragern mit geringen Verlusten und hoher Sättigung.

Das Design entspricht IEC 62217-9.


Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Core set Kernset | Core type Kerntyp | $\Sigma l/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|----------------------|---------------------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| EEQ (EQ + EQ) | | | | | | |
| EEQ 13 | EQ 13/2.85/9 | 0.9 | 17.5 | 19.8 | 19.2 | 347 |
| EEQ 20 | EQ 20/6.3/14 | 0.56 | 33.2 | 59.0 | 55.0 | 1960 |
| EEQ 25 | EQ 25/8/18 | 0.352 | 32.95 | 93.51 | 86.4 | 3082 |
| EEQ 30 | EQ 30/8/20 | 0.426 | 46.0 | 108.0 | 95.0 | 4970 |
| EIQ (EQ + I) | | | | | | |
| EIQ 13 | I 13/1/9 ¹⁾ | 0.803 | 15.9 | 19.8 | 19.2 | 315 |
| EIQ 20 | I 20/2.3/14 ¹⁾ | 0.42 | 25.1 | 59.8 | 55.0 | 1550 |
| EIQ 25 | I 25/2.3/18 ¹⁾ | 0.294 | 26.4 | 89.7 | 82.8 | 2370 |
| EIQ 30 | I 30/2.7/20 ¹⁾ | 0.29 | 31.5 | 108.0 | 95.0 | 3400 |

1) EQ cores see above. / EQ-Kerne siehe oben.

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a (EQ, I) | b (EQ, I) | h (EQ) | h (I) | $\varnothing d_1$ (EQ) | $\varnothing d_2$ (EQ) | c (EQ) |
|-------------|--------------|--------------|-------------|-----------|---------------------------|---------------------------|-------------|
| EQ 13; I 13 | 12.8 ±0.3 | 8.7 ±0.3 | 2.85 ±0.075 | 1.1 ±0.1 | 11.2 ±0.3 | 5.0 ±0.15 | 1.75 ±0.125 |
| EQ 20; I 20 | 20.0 ±0.35 | 14.0 ±0.3 | 6.3 ±0.1 | 2.3 ±0.05 | 18.0 ±0.35 | 8.8 ±0.15 | 4.1 ±0.15 |
| EQ 25; I 25 | 25.0 ±0.4 | 18.0 ±0.3 | 5.6 ±0.05 | 2.3 ±0.05 | 22.0 ±0.4 | 11.0 ±0.2 | 3.2 ±0.15 |
| EQ 30; I 30 | 30.0 ±0.4 | 20.0 ±0.3 | 8.0 ±0.15 | 2.7 ±0.1 | 26.0 ±0.4 | 11.0 ±0.2 | 5.3 ±0.2 |

ER/I Planar Cores

ER-/I-Planarkerne

Technical data Technische Daten



| Core set Kernset | Air gap Luftspalt | Material (Code number / Kennziffer) AL values (nH) / tolerance code ¹⁾ AL-Werte (nH) / Toleranzbuchstabe ¹⁾ | | | | | Ordering code (per set) Bestellnummer (pro Satz) | Coil formers Spulenkörper | | |
|---------------------|----------------------|---|----------|----------|----------|----------|---|------------------------------|----------------|--------------------------------|
| | | T38 (38) | N49 (49) | N87 (87) | N92 (92) | N97 (97) | | Sect. Kamm. | Pins Stifte | Ordering code Bestellnummer |

| Cores / Kerne | | | | | | | Accessories / Zubehör | | | | | | | | | |
|---------------|---|------|---|------|------|------|-----------------------|------|---------------------|------|-----------------|-----------------|---|----|-----------------|-----------------|
| ER 9.5/5 | ○ | 4500 | Y | | | | B65523J0000Y038 | 1 | SMD | 8 | B65527B1008T001 | | | | | |
| | ○ | | | | 800 | R | B65523J0000R087 | 1 | SMD | 8 | B65527C1008D001 | | | | | |
| ER 11/5 | ○ | 6400 | Y | | | | B65525J0000Y038 | 1 | SMD | 10 | B65526B1010T001 | | | | | |
| | ○ | | | 800 | R | | B65525J0000R049 | 1 | SMD | 10 | B65526C1010D001 | | | | | |
| | ○ | | | | 1200 | R | B65525J0000R087 | | | | | | | | | |
| | ● | | | | 160 | ±3% | B65525J0160A087 | | | | | | | | | |
| ER 14.5/6 | ○ | | | 1100 | R | 1500 | R | 1100 | R | 1500 | R | B65513J0000R0** | 1 | | 10 | B65514B1010D001 |
| | ○ | | | | | | | | | | | 1 | | 10 | B65514C1010T001 | |

| Core set Kernset | Air gap Luftspalt | Material (Code number / Kennziffer) AL values (nH) AL-Werte (nH) | | | | Ordering code (per piece) Bestellnummer (pro Stück) |
|---------------------|----------------------|--|----------|----------|----------|--|
| | | N49 (49) | N87 (87) | N92 (92) | N97 (97) | |

| ER core / ER-Kern | | | | | | |
|-------------------|---|-----------|-----------|-----------|-----------|-----------------|
| EER 18 | ○ | 1800 ±25% | 2300 ±25% | 1800 ±25% | 2300 ±25% | B66480G0000X1** |
| EER 23 | ○ | 2200 ±25% | 3000 ±25% | 2200 ±25% | 3000 ±25% | B66482G0000X1** |
| EER 25 | ○ | 3000 ±25% | 4100 ±25% | 3000 ±25% | 4100 ±25% | B66484G0000X1** |
| EER 32 | ○ | 3800 ±25% | 4900 ±25% | 3800 ±25% | 5000 ±25% | B66501G0000X1** |

| ER core / ER-Kern | | | | | | I core / I-Kern | |
|-------------------|---|-----------|-----------|-----------|-----------|-----------------|-----------------|
| EIR 23 | ○ | 2600 ±25% | 3400 ±25% | 2600 ±25% | 3400 ±25% | B66482G0000X1** | B66482P0000X1** |
| EIR 25 | ○ | 3400 ±25% | 4600 ±25% | 3400 ±25% | 4600 ±25% | B66484G0000X1** | B66484P0000X1** |

- = gapped / mit Luftspalt
- = ungapped / ohne Luftspalt

1) = Code for AL tolerance:
Kennbuchstabe für AL-Toleranz:
R Δ +30/-20%; Y Δ +40/-30%

ER planar cores are in accordance with IEC 62317-9.
ER-Planarkerne entsprechen IEC 62317-9.

** : Code number for material
Kennziffer für Werkstoff

ER cores with round center leg

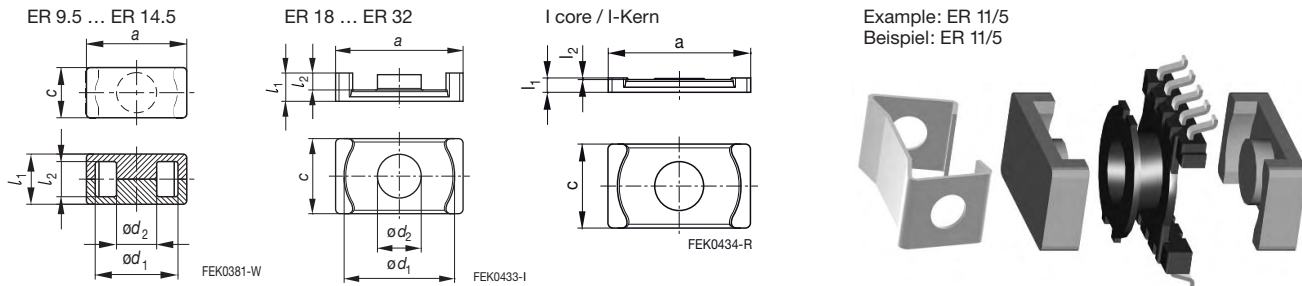
ER 9.5 and ER 11/5 are especially suitable for transformer designs with low total height and high inductance. Also available are accessories for surface mounting.

ER 9.5 ... ER 14.5 are supplied in sets.
ER 18 ... ER 32 are supplied in pieces.

ER-Kerne mit rundem Mittelschenkel

ER 9.5 and ER 11/5 eignen sich besonders für den Aufbau von Übertragern mit niedriger Bauhöhe und hoher Induktivität. Hier steht auch ein Zubehör für Oberflächenmontage zur Verfügung.

ER 9.5 ... ER 14.5 werden satzweise geliefert.
ER 18 ... ER 32 werden stückweise geliefert.



| Yoke Bügel | |
|-----------------------|-----------------|
| Features Merkmale | |
| Gullwing terminals | B65527A2000X000 |
| Gullwing terminals | B65526A2000X000 |
| Gullwing terminals | B65514A2000X000 |

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Core set Kernset | Core type Kerntyp | $\Sigma I/A$ mm^{-1} | l_e mm | A_e mm^2 | A_{min} mm^2 | V_e mm^3 |
|---------------------|----------------------|----------------------------------|-------------|------------------------|-----------------------------------|------------------------|
| ER 9.5/5 | – | 1.54 | 13.6 | 8.81 | – | 120 |
| ER 11/5 | – | 1.10 | 14.1 | 12.4 | – | 174 |
| ER 14.5/6 | – | 1.10 | 19.0 | 17.6 | – | 333 |

ER + ER

| | | | | | | |
|-------------|------------|-------|------|-------|------|------|
| EER 18 | ER 18/3/10 | 0.732 | 22.1 | 30.2 | 30.1 | 667 |
| EER 23 | ER 23/5/13 | 0.648 | 32.6 | 50.3 | 50.0 | 1640 |
| EER 25 | ER 25/6/15 | 0.482 | 34.1 | 70.8 | 69.4 | 2414 |
| EER 32/5/21 | ER 32/5/21 | 0.346 | 38.0 | 109.8 | 98.5 | 4172 |

ER + I

| | | | | | | |
|--------------|-------------------------|-------|------|------|------|------|
| ER 23 / I 23 | I 23/2/13 ¹⁾ | 0.53 | 26.6 | 50.3 | 50.0 | 1335 |
| ER 25 / I 25 | I 25/3/15 ¹⁾ | 0.399 | 28.1 | 70.4 | 69.4 | 1978 |

1) ER cores see above. / ER-Kerne siehe oben.

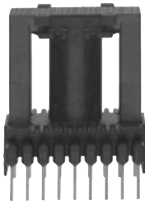
Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | c | d ₁ | d ₂ | h ₁ | h ₂ |
|-------------|------------|------------|----------------|----------------|----------------|----------------|
| ER 9.5/5 | 9.5 –0.3 | 5 –0.2 | 7.5 +0.25 | 3.5 –0.2 | 5 –0.2 | 3.2 +0.3 |
| ER 11/5 | 11 –0.35 | 6 –0.2 | 8.7 +0.3 | 4.25 –0.2 | 5 –0.2 | 3.0 +0.3 |
| ER 14.5/6 | 14.5 ±0.2 | 6.7 ±0.1 | 11.8 ±0.2 | 4.7 ±0.1 | 5.9 ±0.1 | 3.3 ±0.2 |
| ER 18 | 18 ±0.35 | 9.7 ±0.2 | 15.6 ±0.3 | 6.2 ±0.15 | 3.15 ±0.1 | 1.6 ±0.1 |
| ER 23 | 23.2 ±0.45 | 12.5 ±0.25 | 20.2 ±0.4 | 8.0 ±0.2 | 5.1 ±0.1 | 3.1 ±0.1 |
| I 23 | | | | | 2.1 ±0.1 | 0.2 max. |
| ER 25 | 25 ±0.5 | 14.8 ±0.3 | 21.7 ±0.4 | 9.4 ±0.2 | 5.5 ±0.1 | 3.1 ±0.1 |
| I 25 | | | | | 2.5 ±0.1 | 0.2 max. |
| ER 32 | 32 ±0.6 | 21.0 ±0.4 | 29.7 ±0.5 | 11.2 ±0.2 | 5.1 ±0.1 | 2.7 ±0.1 |

ER Cores

ER-Kerne

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material A _L values (nH) or dim. g (mm) for cores with air gap A _L -Werte (nH) bzw. Maß g (mm) für Kerne mit Luftspalt | | | Ordering code (per piece) Bestellnummer (pro Stück) | Coil formers Spulenkörper | |
|----------------------|------------------------------|--|----------------|----------------|--|-------------------------------------|-----------------------|
| | | N27 | N72 | N87 | | Sections / Pins Kammern / Stifte | Accessories / Zubehör |
| Cores / Kerne | | | | | | Accessories / Zubehör | |
| ER 28/17/11 | ○ | | 2700 +30/-20 % | | B66433G0000X172 | | |
| ER 35/20/11 | ○ | 2500 +30/-20 % | | | B66350G0000X127 | 1/18 | |
| | ○ | | | 2700 +30/-20 % | B66350G0000X187 | | |
| | ● | 0.5 ±0.05 | | | B66350G0500X127 | | |
| | ● | 1.0 ±0.05 | | | B66350G1000X127 | | |
| ER 42/22/15 | ● | 1.5 ±0.05 | | | B66350G1500X127 | | |
| | ○ | 3200 +30/-20 % | | | B66347G0000X127 | | |
| | ○ | | | 3700 +30/-20 % | B66347G0000X187 | | |
| ER 46/17/18 | ● | 1.0 ±0.05 | | | B66347G1000X127 | | |
| | ○ | 5700 +30/-20 % | | | B66377G0000X127 | | |
| ER 49/27/17 | ● | 1.0 ±0.05 | | | B66377G1000X127 | | |
| | ○ | 3500 +30/-20 % | | | B66391G0000X127 | | |
| ER 54/18/18 | ○ | 5600 +30/-20 % | | | B66357G0000X127 | | |
| | ○ | | | 5800 +30/-20 % | B66357G0000X187 | | |
| | ● | 0.5 ±0.05 | | | B66357G0500X127 | | |

- = gapped / mit Luftspalt
- = ungapped / ohne Luftspalt

ER cores with round center leg

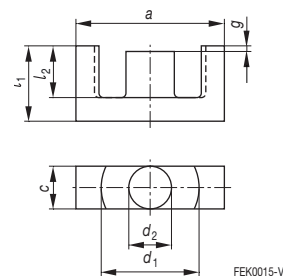
ER cores are the ideal answer when compact winding structures with low leakage inductance are needed. The round center leg is an advantage together with thick wires or bands. This kind of core is used in flyback converters for TVs and monitors.

ER 28 through ER 54 are supplied in single units.

ER-Kerne mit rundem Mittelschenkel

ER-Kerne sind ideal, wenn kompakte Wickelaufbauten mit kleiner Streuinduktivität gefordert werden. Der runde Mittelschenkel ist vorteilhaft bei Verwendung dicker Drähte oder Bänder. Diese Kernform findet Anwendung in Sperrwandlern (Flyback) bei TV und Monitoren.

ER 28 bis ER 54 werden stückweise geliefert.


Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | I_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| ER 28 | 0.88 | 75.0 | 85.4 | 77.0 | 6400 |
| ER 35 | 0.81 | 89.6 | 111 | 101 | 9930 |
| ER 42 | 0.58 | 99 | 170 | 170 | 16800 |
| ER 46 | 0.34 | 79 | 233 | 226 | 18400 |
| ER 49 | 0.49 | 118 | 243 | 225 | 28700 |
| ER 54 | 0.35 | 90 | 256 | 252 | 23000 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | c | $\varnothing d_1$ | $\varnothing d_2$ | l_1 | l_2 |
|-------------|-------------|------------|-------------------|-------------------|-----------|-----------|
| ER 28 | 28.55 ±0.55 | 11.4 ±0.25 | 21.75 ±0.5 | 9.9 ±0.25 | 16.9 ±0.2 | 12.6 ±0.3 |
| ER 35 | 35 ±0.6 | 11.3 ±0.2 | 25.6 min | 11.3 +0.2/-0.25 | 20.7 ±0.3 | 14.7 ±0.3 |
| ER 42 | 42 +1/-0.7 | 15.0 -0.6 | 30.4 +1.2 | 15.0 -0.6 | 21.8 -0.4 | 15.6 +0.7 |
| ER 46 | 46 -2 | 18.0 -0.8 | 33.0 +1.6 | 18.0 -0.8 | 17.5 -0.4 | 10.5 +0.5 |
| ER 49 | 49 ±1 | 17.2 ±0.4 | 37.3 ±0.9 | 17.2 ±0.4 | 27.0 ±0.3 | 18.5 ±0.4 |
| ER 54 | 53.5 ±1 | 18.3 -0.7 | 39.8 +1.7 | 18.3 -0.8 | 18.5 -0.4 | 10.8 +0.6 |

PQ Cores

PQ-Kerne

Technical data Technische Daten

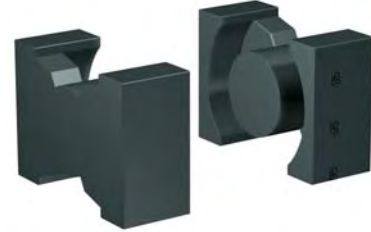
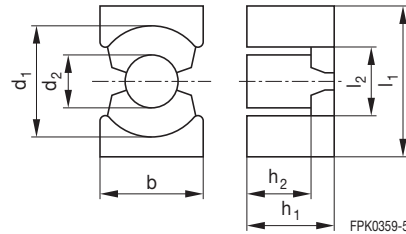


| Type Typ | Material A _L values (nH), tolerance +30/-20% A _L -Werte (nH), Toleranz +30/-20% | | | | | Ordering code (per set) Bestellnummer (pro Satz) | Coil formers Spulenkörper | | |
|--|---|------|------|------|-----------------|---|------------------------------|----------------|-----------------|
| | N87 | N97 | N49 | N95 | N92 | | Sections Kammern | Pins Stifte | |
| Cores / Kerne (ungapped / ohne Luftspalt) | | | | | | | Accessories / Zubehör | | |
| PQ 16/11.6 | 2350 | | | | | B65885A0000R087 | | | |
| | | 2450 | | | | B65885A0000R097 | | | |
| | | | 1900 | | | B65885A0000R049 | | | |
| PQ 20/16 | 3100 | | | | 2750 | B65885A0000R095 | 1 | 14 | |
| | | | 3200 | | | B65885A0000R092 | | | |
| | | | | 2400 | | | | | B65875B0000R087 |
| | | | | | 3750 | | | | B65875B0000R097 |
| | | | | | | 1900 | | | B65875B0000R049 |
| PQ 20/20 | 2650 | | | | | B65875B0000R095 | 1 | 14 | |
| | | | 2750 | | | | | | B65875B0000R092 |
| | | | | 2000 | | | | | B65875A0000R087 |
| PQ 26/20 | 5000 | | | | 3300 | B65875A0000R097 | 1 | 12 | |
| | | | 5150 | | | | | | B65875A0000R049 |
| | | | | 3850 | | | | | B65875A0000R095 |
| | | | | | 6300 | | | | B65877B0000R087 |
| PQ 26/25 | 4500 | | | | | B65877B0000R097 | 1 | 12 | |
| | | | 4650 | | | | | | B65877B0000R049 |
| | | | | 3300 | | | | | B65877B0000R095 |
| PQ 32/20 | 6300 | | | | | B65877A0000R087 | 1 | 12 | |
| | | | 6500 | | | | | | B65877A0000R097 |
| | | | | 4600 | | | | | B65877A0000R049 |
| | | | | | 7600 | | | | B65877A0000R095 |
| PQ 32/30 | 4800 | | | | | B65879A0000R087 | 1 | 12 | |
| | | | 5000 | | | | | | B65879A0000R097 |
| | | | | 3450 | | | | | B65879A0000R049 |
| PQ 35/35 | 4500 | | | | | B65879B0000R087 | 1 | 4 | |
| | | | | | | | | | B65879B0000R097 |
| | | | | 6100 | | | | | B65879B0000R049 |
| | | | | | 5700 | | | | B65879B0000R095 |
| | | | 4700 | | | 3300 | | | B65881A0000R087 |
| | | 3300 | | | B65881A0000R097 | | | | |
| | | | | | B65881A0000R049 | | | | |
| | | | | | B65881A0000R095 | | | | |
| | | | | | B65881A0000R092 | | | | |

PQ cores for switch-mode power supplies

These cores are a preferred shape for power conversion. The main advantages compared to the conventional round/rectangular E type cores are its optimized round leg and wider outer surface. The round leg reduces winding

length and hence copper cost in the manufacturing and the wider surface area lowers the thermal resistance by offering a larger area for heat dissipation. The shape also provides better shielding to the winding.



FPK0359-5

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| PQ 16/11.6 | 0.641 | 27.0 | 42.1 | 38.5 | 1136 |
| PQ 20/16 | 0.579 | 37.0 | 64.0 | 57.6 | 2367 |
| PQ 20/20 | 0.718 | 45.2 | 62.9 | 54.4 | 2843 |
| PQ 26/20 | 0.363 | 44.4 | 122.3 | 108.8 | 5435 |
| PQ 26/25 | 0.440 | 53.6 | 122.0 | 108.7 | 6530 |
| PQ 32/20 | 0.314 | 48.4 | 154.2 | 127.5 | 7460 |
| PQ 32/30 | 0.441 | 67.8 | 153.8 | 127.5 | 10440 |
| PQ 35/35 | 0.467 | 79.2 | 169.7 | 146.5 | 13440 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | l_1 | l_2 | b | h_1 | h_2 | $\varnothing d_1$ | $\varnothing d_2$ |
|------------|------------|-----------|------------|------------------|-------------|-------------------|-------------------|
| PQ 16/11.6 | 16.4 ±0.3 | 9.6 +0.8 | 11.2 ±0.3 | 5.8 ±0.1 | 3.35 ±0.15 | 14.4 ±0.3 | 7 ±0.2 |
| PQ 20/16 | 20.5 ±0.4 | 12.5 min. | 14.0 ±0.4 | 8.1 ±0.1 | 5.15 ±0.15 | 18.0 ±0.4 | 8.8 ±0.2 |
| PQ 20/20 | 20.5 ±0.4 | 12.5 min. | 14.0 ±0.4 | 10.1 ±0.1 | 7.15 ±0.15 | 18.0 ±0.4 | 8.8 ±0.2 |
| PQ 26/20 | 26.5 ±0.45 | 15.5 +0.8 | 19.0 ±0.45 | 10.08 ±0.12 | 5.75 ±0.15 | 22.5 ±0.45 | 12.0 ±0.2 |
| PQ 26/25 | 26.5 ±0.45 | 15.5 +0.8 | 19.0 ±0.45 | 12.38 ±0.12 | 8.05 ±0.15 | 22.5 ±0.45 | 12.0 ±0.2 |
| PQ 32/20 | 32.0 ±0.5 | 19.0 +0.8 | 22.0 ±0.5 | 10.25 +0.15/-0.1 | 5.75 ±0.15 | 27.5 ±0.5 | 13.45 ±0.25 |
| PQ 32/30 | 32.0 ±0.5 | 19.0 +0.8 | 22.0 ±0.5 | 15.175 ±0.125 | 10.65 ±0.15 | 27.5 ±0.5 | 13.45 ±0.25 |
| PQ 35/35 | 35.1 ±0.6 | 23.5 min. | 26.0 ±0.5 | 17.4 +0.1/-0.15 | 12.50 ±0.15 | 32.0 ±0.5 | 14.35 ±0.25 |

PQ-Kerne für Schaltnetzteile

PQ-Kerne werden bevorzugt zur Energieumwandlung eingesetzt. Der Hauptvorteil gegenüber den konventionellen ETD-/ER- und E-Baureihen ist der stabile runde Schenkel und die breitere Außenfläche. Der runde Schen-

kel minimiert den Kupferverbrauch bei der Wicklung und reduziert damit Kosten. Die größeren Außenflächen erleichtern die Wärmeableitung. Diese Kernform bietet auch eine gute Abschirmung der Wicklung.

ETD Cores

ETD-Kerne

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) A _L values (nH) ¹⁾ or dim. g (mm) for cores with air gap A _L -Werte (nH) ¹⁾ bzw. Maß g (mm) für Kerne mit Luftspalt | | | Ordering code (per piece) Bestellnummer (pro Stück) | Coil formers Spulenkörper | | | |
|----------------------|------------------------------|---|-------------|----------|--|------------------------------|----------------|--------------------------------|--|
| | | N27 (27) | N87 (87) | N97 (97) | | Sections Kammern | Pins Stifte | Ordering code Bestellnummer | |
| Cores / Kerne | | | | | | Accessories / Zubehör | | | |
| ETD 29/16/10 | ○ | 2000 | 2200 | 2250 | B66358G0000X1** | 1 | 13 | B66359B1013T001 | |
| | ● | 0.1/0.2/0.5 | 0.1/0.2/0.5 | | B66358G0***X1** | 1 | 13 | B66359A1013T001 | |
| | ● | 1.0 | 1.0 | | B66358G1000X1** | 1 | 13 | B66359W1013T001 | |
| ETD 34/17/11 | ○ | 2400 | 2600 | 2650 | B66361G0000X1** | 1 | 14 | B66362B1014T001 | |
| | ● | 0.1/0.2/0.5 | 0.1/0.2/0.5 | | B66361G0***X1** | 1 | 14 | B66362W1014T001 | |
| | ● | 1.0 | 1.0 | | B66361G0000X1** | 1 | 14 | B66362X1014T001 | |
| ETD 39/20/13 | ○ | 2550 | 2700 | 2800 | B66363G0000X1** | 1 | 16 | B66364B1016T001 | |
| | ● | 0.1/0.2/0.5 | 0.1/0.2/0.5 | | B66363G0***X1** | 1 | 16 | B66364W1016T001 | |
| | ● | 1.0 | 1.0 | | B66363G1000X1** | | | | |
| ETD 44/22/15 | ○ | 3300 | 3500 | 3600 | B66365G0000X1** | 1 | 18 | B66366B1018T001 | |
| | ● | 0.2/0.5 | 0.2/0.5 | | B66365G0***X1** | 1 | 18 | B66366W1018T001 | |
| | ● | 1.0/1.5 | 1.0/1.5 | | B66365G***X1** | | | | |
| ETD 49/25/16 | ○ | 3700 | 3800 | 3900 | B66367G0000X1** | 1 | 20 | B66368B1020T001 | |
| | ● | 0.2/0.5 | 0.2/0.5 | | B66367G0***X1** | 1 | 20 | B66368W1020T001 | |
| | ● | 1.0/2.0 | 1.0/2.0 | | B66367G***X1** | | | | |
| ETD 54/28/19 | ○ | 4200 | 4450 | 4600 | B66395G0000X1** | 1 | 22 | B66396W1022T001 | |
| | ● | 0.2 | 0.2 | | B66395G0200X1** | | | | |
| | ● | 1.0/1.5/2.0 | 1.0/1.5/2.0 | | B66395G***X1** | | | | |
| ETD 59/31/22 | ○ | 5000 | 5300 | 5500 | B66397G0000X1** | 1 | 24 | B66398W1024T001 | |
| | ● | 0.2 | 0.2 | | B66397G0200X1** | | | | |
| | ● | 1.0/1.5/2.0 | 1.0/1.5/2.0 | | B66397G***X1** | | | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

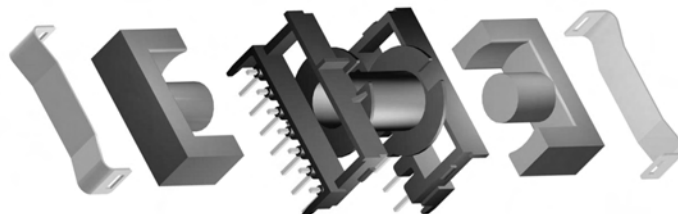
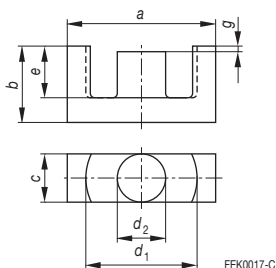
1) Tolerance of A_L value: +30/-20%
A_L-Wert-Toleranz: +30/-20%

*: See ordering code example
Siehe Bestellbeispiel

ETD cores to IEC 61185 (Economic Transformer Design)

ETD cores are an excellent solution for designing switch-mode power supply transformers with optimum power/weight ratio for low volume. The round center leg is an

advantage together with thick wires or bands. ETD cores are characterized by an wide opening for winding. Optimized accessories are available. ETD cores are in accordance with IEC 61185. They are supplied in single units.



FEK0017-C

| Magnetic axis (material) Magn. Achse (Material) | Yokes (2 pieces required) Bügel (2 Stück erforderlich) |
|--|---|
| horizontal (Valox 420 SE0) horizontal (Valox 420 SE0) horizontal (Rynite FR 530) vertical (Rynite FR 530) | B66359A2000X000 |
| horizontal (Valox 420 SE0) horizontal (Rynite FR 530) vertical (Rynite FR 530) | B66362A2000X000 |
| horizontal (Valox 420 SE0) horizontal (Rynite FR 530) | B66364A2000X000 |
| horizontal (Valox 420 SE0) horizontal (Rynite FR 530) | B66366A2000X000 |
| horizontal (Valox 420 SE0) horizontal (Rynite FR 530) | B66368A2000X000 |
| horizontal (Rynite FR 530) | B66396A2000X000 |
| horizontal (Rynite FR 530) | B66398A2000X000 |

Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| ETD 29 | 0.93 | 70.4 | 76.0 | 71.0 | 5350 |
| ETD 34 | 0.81 | 78.6 | 97.1 | 91.6 | 7630 |
| ETD 39 | 0.74 | 92.2 | 125 | 123 | 11500 |
| ETD 44 | 0.60 | 103 | 173 | 172 | 17800 |
| ETD 49 | 0.54 | 114 | 211 | 209 | 24100 |
| ETD 54 | 0.45 | 127 | 280 | 280 | 35600 |
| ETD 59 | 0.38 | 139 | 368 | 368 | 51200 |

Main dimensions (mm) / Hauptmaße (mm)

| Type Typ | a | b | c | d ₁ | d ₂ | e |
|-------------|----------------|-----------|-----------|----------------|----------------|-----------|
| ETD 29 | 30.6 -1.6 | 16.0 -0.4 | 9.8 -0.6 | 22.0 +1.4 | 9.8 -0.6 | 10.7 +0.6 |
| ETD 34 | 34.0 +1/-0.6 | 17.5 -0.4 | 11.1 -0.6 | 25.6 +1.4 | 11.1 -0.6 | 11.8 +0.6 |
| ETD 39 | 38.9 +1.1/-0.7 | 20.0 -0.4 | 12.8 -0.6 | 29.3 +1.6 | 12.8 -0.6 | 14.2 +0.8 |
| ETD 44 | 43.8 +1.2/-0.8 | 22.5 -0.4 | 15.2 -0.8 | 32.5 +1.6 | 15.2 -0.8 | 16.1 +0.8 |
| ETD 49 | 48.5 +1.3/-0.9 | 24.9 -0.4 | 16.7 -0.8 | 36.1 +1.8 | 16.7 -0.8 | 17.7 +0.8 |
| ETD 54 | 54.5 ±1.3 | 27.8 -0.4 | 19.3 -0.8 | 40.1 +2.2 | 19.3 -0.8 | 19.8 +0.8 |
| ETD 59 | 59.8 ±1.4 | 31.2 -0.4 | 22.1 -0.9 | 43.6 +2.2 | 22.1 -0.9 | 22.0 +0.9 |

Ordering code example / Bestellbeispiel
B66358G1000X127

- Type / Bauform
- Code letter for tolerated air gap / Kennzeichen für tolerierten Luftspalt
- Air gap "dim. g" in thousandths of millimeter (4 digits). "0000" for cores w/o air gap.
Luftspalt „Maß g“ in tausendstel Millimeter (4 Ziffern). „0000“ bei Kernen ohne Luftspalt.
- Filling number / Füllnummer
- Code number for material / Kennziffern für Material

**ETD-Kerne nach IEC 61185
(Economic Transformer Design)**

ETD-Kerne eignen sich hervorragend für den Aufbau von Schaltnetzteilübertragern mit optimaler gewichtsbezogener Leistung bei kleinem Volumen. Der runde Mittel-

schenkel ist vorteilhaft bei Verwendung dicker Drähte oder Bänder. ETD-Kerne zeichnen sich durch einen besonders großen Wickelraum aus. Es steht ein optimiertes Zubehör zur Verfügung. ETD-Kerne entsprechen IEC 61185. Sie werden stückweise geliefert.

EFD/EV Cores

EFD-/EV-Kerne

Technical data Technische Daten



| Type Typ | Air gap Luft- spalt | Material (Code number / Kennziffer) A _L values (nH) A _L -Werte (nH) | | | | Ordering code (per piece) Bestellnummer (pro Stück) | Coil formers ¹⁾ Spulenkörper ¹⁾ | |
|-------------|------------------------------|---|--------------|---------------|---------------|--|--|----------------|
| | | N27 (27) | N49 (49) | N87 (87) | N97 (97) | | Sections Kammern | Pins Stifte |
| EFD 10 | ○ | | 370 +30/-20% | 450 +30/-20% | 470 +30/-20% | B66411G0000X1** | | |
| EFD 15 | ○ | | 600 +30/-20% | 780 +30/-20% | 820 +30/-20% | B66413G0000X1** | | 1 8 |
| | ● | | | 100 ±10% | | B66413U0100K187 | | |
| | ● | | | 160 ±15% | | B66413U0160L187 | SMD | 1 8 |
| EFD 20 | ○ | | 910 +30/-20% | 1200 +30/-20% | 1250 +30/-20% | B66417G0000X1** | | 1 8 |
| | ● | | | 100 ±10% | | B66417U0100K187 | | |
| | ● | | | 160 ±10% | | B66417U0160K187 | | |
| EFD 25 | ○ | | | 2000 +30/-20% | 2100 +30/-20% | B66421G0000X1** | | 1 10 |
| | ● | | | 160 ±10% | | B66421U0160K187 | | |
| | ● | | | 250 ±10% | | B66421U0250K187 | | |
| | ● | | | 315 ±10% | | B66421U0315K187 | | |
| EFD 30 | ○ | | | 2050 +30/-20% | 2150 +30/-20% | B66423G0000X1** | | 1 12 |
| | ● | | | 160 ±10% | | B66423U0160K187 | | 1 13 |
| | ● | | | 250 ±10% | | B66423U0250K187 | | |
| | ● | | | 315 ±10% | | B66423U0315K187 | | |
| EV 15/9/7 | ○ | 1150 ±25% | | 1250 ±25% | 1300 ±25% | B66434G0000X1** | SMD | 1 12 |
| EV 25/13/13 | ○ | 2400 +30/-20% | | 2500 +30/-20% | 2600 +30/-20% | B66408G0000X1** | | |
| EV 30/16/13 | ○ | 2600 +30/-20% | | 2800 +30/-20% | 2900 +30/-20% | B66432G0000X1** | | |

● = gapped / mit Luftspalt
○ = ungapped / ohne Luftspalt

1) Pin versions for EFD coil formers upon request.
Stiftvarianten für EFD-Spulenkörper auf Anfrage.

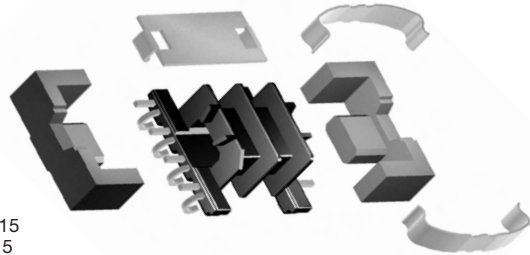
** : Code number for material
Kennziffer für Werkstoff

E cores for extra-low-profile transformer designs

EFD and EV cores are optimized in cross-section and feature a flattened, lowered center leg. That allows implementation of very flat, compact transformers for RF

applications. EFD and EV cores are used for DC/DC converters, EV cores are additionally suitable for storage chokes and EMI suppression chokes.

These cores are supplied in single units.



Example: EFD 15
Beispiel: EFD 15

| Ordering code Bestellnummer | Features Merkmale | Yokes (2 pieces required) Bügel (2 Stck. erforderl.) |
|------------------------------------|------------------------------|---|
| B66414W1008D001 | PTH / Stifte | B66414B2000X000 |
| B66414B6008T001 | J terminals | B66414B2000X000 B66414A7000X000 (Cover plate / Abdeckplatte) |
| B66418W1008D001 | PTH / Stifte | B66418B2000X000 |
| B66422W1010D001 | PTH / Stifte | B66422B2000X000 |
| B66424W1012D001 B66424C1013D001 | PTH / Stifte PTH / Stifte | B66424B2000X000 |
| B66456A1012T001 | U terminals | |

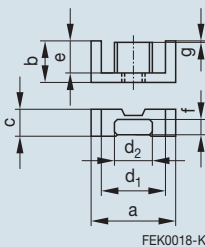
Magnetic characteristics (per set) / Magnetische Formkenngrößen (pro Satz)

| Type Typ | $\Sigma I/A$ mm ⁻¹ | l_e mm | A_e mm ² | A_{min} mm ² | V_e mm ³ |
|-------------|----------------------------------|-------------|--------------------------|------------------------------|--------------------------|
| EFD 10 | 3.21 | 23.1 | 7.2 | 6.5 | 166 |
| EFD 15 | 2.27 | 34 | 15 | 12.2 | 510 |
| EFD 20 | 1.52 | 47 | 31 | 31 | 1460 |
| EFD 25 | 0.98 | 57 | 58 | 57 | 3310 |
| EFD 30 | 0.99 | 68 | 69 | 69 | 4690 |
| EV 15 | 1.4 | 38.7 | 27.7 | 25.8 | 1070 |
| EV 25 | 0.8 | 59 | 74 | 73 | 4370 |
| EV 30 | 0.76 | 74.8 | 99 | 95 | 7410 |

Main dimensions (mm) / Hauptmaße (mm)

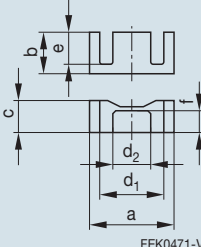
| Type Typ | a | b | c | d ₁ | d ₂ | e | f |
|-------------|----------------|------------|------------|----------------|----------------|------------|------------|
| EFD 10 | 10.5 ±0.3 | 5.2 ±0.1 | 2.7 ±0.1 | 7.65 ±0.25 | 4.55 ±0.15 | 3.75 ±0.15 | 1.45 ±0.05 |
| EFD 15 | 15.0 ±0.4 | 7.5 ±0.15 | 4.65 ±0.15 | 11.0 ±0.35 | 5.3 ±0.15 | 5.5 ±0.25 | 2.4 ±0.10 |
| EFD 20 | 20.0 ±0.55 | 10.0 ±0.15 | 6.65 ±0.15 | 15.4 ±0.5 | 8.9 ±0.2 | 7.7 ±0.25 | 3.6 ±0.15 |
| EFD 25 | 25.0 ±0.65 | 12.5 ±0.15 | 9.1 ±0.2 | 18.7 ±0.6 | 11.4 ±0.2 | 9.3 ±0.25 | 5.2 ±0.15 |
| EFD 30 | 30.0 ±0.8 | 15.0 ±0.15 | 9.1 ±0.2 | 22.4 ±0.75 | 14.6 ±0.25 | 11.2 ±0.3 | 4.9 ±0.15 |
| EV 15 | 14.8 +0.7/-0.5 | 9.0 -0.3 | 7.0 -0.4 | 10.8 ±0.6 | 5.8 -0.4 | 6.0 +0.4 | 4.8 -0.4 |
| EV 30 | 29.7 ±0.8 | 16.4 ±0.3 | 12.5 ±0.4 | 22.1 ±0.5 | 11.6 ±0.3 | 11.9 ±0.3 | 8.2 ±0.3 |

EFD



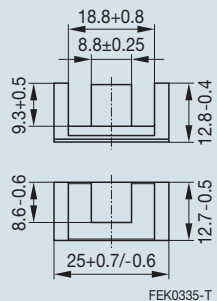
FEK0018-K

EV 15; 30



FEK0471-V

EV 25



FEK0335-T

E-Kerne für besonders flache Übertrager-Bauformen

Die querschnittsoptimierten EFD- und EV-Kerne besitzen einen abgeflachten, tiefer gelegten Mittelschenkel. Damit lassen sich sehr flache und kompakte Trafos für hoch-

frequente Anwendungen realisieren. EFD- und EV-Kerne werden für DC/DC-Konverter verwendet, EV-Kerne sind auch für Speicher- und Entstördrosseln geeignet.

Alle Kerne werden stückweise geliefert.

Toroids R 2.5 ... R 20

Ringkerne R 2.5 ... R 20

Technical data Technische Daten



| Type / Typ Toroid size (d _o x d _i x h) Ringkerngröße (d _o x d _i x h) (Outer diameter x inner diameter x height) mm | | Material (Code number for ord. code, Block 3) / Werkstoff (Kennziffer für Bestellnr. Block 3) A _L values (nH) / approx. initial permeability μ _i / A _L -Werte (nH) / Anfangspermeabilität μ _i | | | | | | | | | | | |
|--|-------------------------|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | | K10 (X010) | | N30 (X830) | | T57 (X057) | | T65 (X065) | | T35 (X035) | | T37 (X037) | |
| | | A _L | μ _i | A _L | μ _i | A _L | μ _i | A _L | μ _i | A _L | μ _i | A _L | μ _i |
| R 2.50 x 1.50 x 1.00 | R 0.098 x 0.059 x 0.039 | 70 | 700 | | | 410 | 4000 | 470 | 4600 | | | | |
| R 2.54 x 1.27 x 1.27 | R 0.100 x 0.050 x 0.050 | 120 | 700 | | | 690 | 3900 | 800 | 4500 | | | | |
| R 3.05 x 1.27 x 1.27 | R 0.120 x 0.050 x 0.050 | 160 | 700 | | | 830 | 3700 | 1000 | 4500 | | | | |
| R 3.05 x 1.27 x 2.54 | R 0.120 x 0.050 x 0.100 | 330 | 700 | | | 1700 | 3800 | 2000 | 4500 | | | | |
| R 3.05 x 1.78 x 2.03 | R 0.120 x 0.070 x 0.080 | 160 | 700 | | | 870 | 4000 | 1000 | 4600 | | | | |
| R 3.43 x 1.78 x 1.78 | R 0.135 x 0.070 x 0.070 | 160 | 700 | | | 930 | 4000 | 1050 | 4500 | | | | |
| R 3.43 x 1.78 x 2.03 | R 0.135 x 0.070 x 0.080 | 190 | 700 | | | 1060 | 4000 | 1200 | 4500 | | | | |
| R 3.43 x 1.78 x 2.11 | R 0.135 x 0.070 x 0.083 | 200 | 700 | | | 1100 | 4000 | 1300 | 4700 | | | | |
| R 3.94 x 1.78 x 1.78 | R 0.155 x 0.070 x 0.070 | 200 | 700 | | | 1100 | 3900 | 1350 | 4800 | | | | |
| R 3.94 x 2.24 x 1.30 | R 0.155 x 0.088 x 0.051 | 100 | 700 | | | 550 | 3800 | 700 | 4800 | | | | |
| R 4.00 x 2.40 x 1.60 | R 0.157 x 0.094 x 0.063 | | | 700 | 4300 | | | 750 | 4600 | | | | |
| R 5.84 x 3.05 x 3.00 | R 0.230 x 0.120 x 0.118 | | | 1680 | 4300 | | | 1800 | 4600 | | | | |
| R 6.30 x 3.80 x 2.50 | R 0.248 x 0.150 x 0.098 | | | 1090 | 4300 | | | 1160 | 4600 | | | | |
| R 8.00 x 4.00 x 4.00 | R 0.315 x 0.158 x 0.158 | | | 2400 | 4300 | | | 2550 | 4600 | | | | |
| R 9.53 x 4.75 x 3.17 | R 0.375 x 0.187 x 0.125 | | | 1900 | 4300 | | | 2050 | 4600 | 2650 | 6000 | | |
| R 10.0 x 6.00 x 4.00 | R 0.394 x 0.236 x 0.157 | | | 1760 | 4300 | | | 1900 | 4700 | 2460 | 6000 | 2660 | 6500 |
| R 12.5 x 7.50 x 5.00 | R 0.492 x 0.295 x 0.197 | | | 2200 | 4300 | | | 2400 | 4700 | 3060 | 6000 | 3320 | 6500 |
| R 12.7 x 7.90 x 6.35 | R 0.500 x 0.311 x 0.250 | | | 2600 | 4300 | | | 2850 | 4700 | 3620 | 6000 | 3920 | 6500 |
| R 13.3 x 8.30 x 5.00 | R 0.524 x 0.327 x 0.197 | | | 2030 | 4300 | | | 2300 | 4900 | 2830 | 6000 | 3060 | 6500 |
| R 14.0 x 9.00 x 5.00 | R 0.551 x 0.354 x 0.197 | | | 1900 | 4300 | | | 2300 | 5200 | 2650 | 6000 | 2880 | 6500 |
| R 15.0 x 10.4 x 5.30 | R 0.591 x 0.409 x 0.209 | | | 1670 | 4300 | | | 2020 | 5200 | 2330 | 6000 | 2520 | 6500 |
| R 15.8 x 8.90 x 4.70 | R 0.622 x 0.350 x 0.185 | | | 2320 | 4300 | | | 2800 | 5200 | 3240 | 6000 | 3500 | 6500 |
| R 16.0 x 9.60 x 6.30 | R 0.630 x 0.378 x 0.248 | | | 2770 | 4300 | | | 3350 | 5200 | 3870 | 6000 | 4190 | 6500 |
| R 17.0 x 10.7 x 6.80 | R 0.669 x 0.421 x 0.268 | | | 2710 | 4300 | | | 3250 | 5200 | 3770 | 6000 | 4080 | 6500 |
| R 18.4 x 5.90 x 5.90 | R 0.724 x 0.232 x 0.232 | | | 5770 | 4300 | | | 6680 | 5000 | 8020 | 6000 | 8690 | 6500 |
| R 20.0 x 10.0 x 7.00 | R 0.787 x 0.394 x 0.276 | | | 4160 | 4300 | | | 5050 | 5200 | 5000 | 5100 | 6280 | 6500 |
| Tolerance of A _L value / A _L -Wert-Toleranz | | ± 25% | | ± 25% | | ± 25% | | ± 30% | | ± 25% | | ± 25% | |

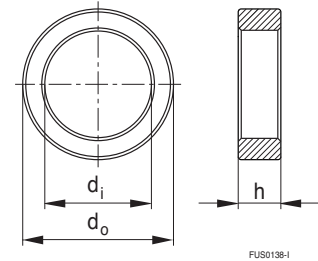
Toroidal cores for EMC and LAN applications

Toroidal cores are primarily used as EMC chokes for suppressing RF interference in the MHz region and in signal transformers.

Typical applications for toroids of NiZn ferrites are LAN chokes. One of the materials available for this purpose is K10; other materials upon request.

High-permeability MnZn materials for interference suppression:

- R 2.5 through R 12.5 for telecommunications, e.g. ISDN (N30, T38, T46)
- R 2.5 through R 3.94 for LAN (T57)
- R 13.3 through R 25.3 for power line chokes (N30, T65, T35 to T46)
- > R 34 for chokes and filters in industrial use (T65)



FUS0138-1

| | | | | | | Ordering code Bestellnummer | | | Magnetic characteristics Magnetische Formkenngrößen | | | | Approx. weight Ca. Gewicht |
|------------|---------|------------|---------|------------|---------|--------------------------------|---------|---------|--|-------------|--------------------------|--------------------------|-------------------------------|
| T38 (X038) | | T46 (X046) | | N87 (X087) | | Block 1 | Block 2 | Block 3 | $\Sigma l/A$ mm ⁻¹ | l_e mm | A_e mm ² | V_e mm ³ | g |
| A_L | μ_i | A_L | μ_i | A_L | μ_i | | | | | | | | |
| 1020 | 10000 | 1530 | 15000 | | | B64290 | P0035 | X*** | 12.30 | 6.02 | 0.49 | 3.0 | 0.02 |
| 1760 | 10000 | 2640 | 15000 | | | B64290 | P0734 | X*** | 7.14 | 5.53 | 0.77 | 4.29 | 0.03 |
| 2200 | 9900 | 3340 | 15000 | | | B64290 | P0683 | X*** | 5.65 | 5.99 | 1.06 | 6.4 | 0.04 |
| 4200 | 9400 | 6500 | 15000 | | | B64290 | P0739 | X*** | 2.82 | 5.99 | 2.12 | 12.7 | 0.08 |
| 2150 | 9900 | 3250 | 15000 | | | B64290 | P0733 | X*** | 5.75 | 7.23 | 1.26 | 9.1 | 0.06 |
| 2300 | 10000 | 3400 | 15000 | | | B64290 | P0731 | X*** | 5.38 | 7.63 | 1.42 | 10.7 | 0.06 |
| 2650 | 10000 | 4000 | 15000 | | | B64290 | P0745 | X*** | 4.72 | 7.63 | 1.62 | 12.2 | 0.07 |
| 2770 | 10000 | 4000 | 15000 | | | B64290 | P0709 | X*** | 4.54 | 7.63 | 1.68 | 12.7 | 0.07 |
| 2830 | 10000 | 4200 | 15000 | | | B64290 | P0732 | X*** | 4.44 | 8.10 | 1.82 | 14.8 | 0.08 |
| 1470 | 10000 | 2200 | 15000 | | | B64290 | P0061 | X*** | 8.56 | 9.21 | 1.08 | 9.9 | 0.05 |
| 1630 | 10000 | 2450 | 15000 | | | B64290 | P0036 | X*** | 7.96 | 9.63 | 1.25 | 12.0 | 0.05 |
| 3900 | 10000 | 5850 | 15000 | | | B64290 | P0687 | X*** | 3.22 | 13.03 | 4.04 | 52.6 | 0.3 |
| 2530 | 10000 | 3600 | 14000 | 560 | 2200 | B64290 | P0037 | X*** | 4.97 | 15.21 | 3.06 | 46.5 | 0.2 |
| 5500 | 10000 | 8000 | 15000 | 1200 | 2200 | B64290 | P0751 | X*** | 2.26 | 17.42 | 7.70 | 134 | 0.7 |
| 4410 | 10000 | 6400 | 15000 | 970 | 2200 | B64290 | L0062 | X*** | 2.85 | 20.72 | 7.28 | 151 | 0.8 |
| 4090 | 10000 | 6000 | 15000 | 900 | 2200 | B64290 | L0038 | X*** | 3.07 | 24.07 | 7.83 | 188 | 0.9 |
| 5110 | 10000 | | | 1120 | 2200 | B64290 | L0044 | X*** | 2.46 | 30.09 | 12.23 | 368 | 1.8 |
| 6030 | 10000 | | | 1330 | 2200 | B64290 | L0742 | X*** | 2.08 | 31.17 | 14.96 | 466 | 2.4 |
| 4700 | 10000 | | | 1040 | 2200 | B64290 | L0644 | X*** | 2.67 | 32.70 | 12.27 | 401 | 1.8 |
| 4420 | 10000 | | | 970 | 2200 | B64290 | L0658 | X*** | 2.84 | 34.98 | 12.30 | 430 | 2.0 |
| 3880 | 10000 | | | 850 | 2200 | B64290 | L0623 | X*** | 3.24 | 39.02 | 12.05 | 470 | 2.4 |
| 5400 | 10000 | | | 1190 | 2200 | B64290 | L0743 | X*** | 2.33 | 36.75 | 15.78 | 580 | 3.0 |
| 6440 | 10000 | | | 1420 | 2200 | B64290 | L0045 | X*** | 1.95 | 38.52 | 19.73 | 760 | 3.7 |
| 6280 | 10000 | | | 1390 | 2200 | B64290 | L0652 | X*** | 2.00 | 42.00 | 21.04 | 884 | 4.4 |
| 13400 | 10000 | | | 2950 | 2200 | B64290 | L0697 | X*** | 0.94 | 31.03 | 33.14 | 1029 | 6.9 |
| 9740 | 10000 | | | 2130 | 2200 | B64290 | L0632 | X*** | 1.30 | 43.55 | 33.63 | 1465 | 7.6 |
| ± 30% | | ± 30% | | ± 25% | | | | | | | | | |

Ordering code example / Bestellbeispiel

B64290L0668X065

Block 1
Ferrite toroid / Ferrit-Ringkern

Block 2
Coating material / Beschichtung:
Parylene: P, Epoxy: L, no coating: A
Type coded / Typ codiert

Block 3
X = Dummy character / Füllstelle
Code number for material
Kennziffern für Material

Ringkerne für EMV- und LAN-Anwendungen

Ringkerne werden schwerpunktmäßig als EMV-Drosseln zur Unterdrückung von HF-Störungen im MHz-Bereich und für Signalübertrager verwendet.

Typische Applikationen für Ringkerne aus NiZn-Ferriten sind LAN-Drosseln. Hier eignet sich besonders K10. Weitere Werkstoffe sind auf Anfrage erhältlich.

Auswahl an hochpermeablen MnZn-Werkstoffen im Bereich Störschutz:

- R 2.5 bis R 12.5 für Telekommunikation, z.B. ISDN (N30, T38, T46)
- R 2.5 bis R 3.94 für LAN (T57)
- R 13.3 bis R 25.3 für Netzleitungs-drosseln (N30, T65, T35 bis T46)
- > R 34 für Drosseln und Filter in Industrieanwendungen (T65)

Toroids R 22.1 ... R 202

Ringkerne R 22.1 ... R 202

Technical data Technische Daten



| Type / Typ Toroid size (d _o x d _i x h) Ringkerngröße (d _o x d _i x h) (Outer diameter x inner diameter x height) mm inch | Material (Code number for ord. code, Block 3) / Werkstoff (Kennziffer für Bestellnr. Block 3) A _L values (nH) / approx. initial permeability μ _i / A _L -Werte (nH) / Anfangspermeabilität μ _i | | | | | | | | | | | |
|---|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| | K10 (X010) | | N30 (X830) | | T57 (X057) | | T65 (X065) | | T35 (X035) | | T37 (X037) | |
| | A _L | μ _i | A _L | μ _i | A _L | μ _i | A _L | μ _i | A _L | μ _i | A _L | μ _i |
| R 22.1 x 13.7 x 6.35 | | | 2610 | 4300 | | | 3160 | 5200 | 3200 | 5300 | 3950 | 6500 |
| R 22.1 x 13.7 x 7.90 | | | 3250 | 4300 | | | 3930 | 5200 | 4000 | 5300 | 4900 | 6500 |
| R 22.1 x 13.7 x 12.5 | | | 5140 | 4300 | | | 6200 | 5200 | 6000 | 5000 | 7770 | 6500 |
| R 22.6 x 14.7 x 9.20 | | | 3420 | 4300 | | | 4100 | 5200 | 4200 | 5300 | 5170 | 6500 |
| R 25.3 x 14.8 x 10.0 | | | 4620 | 4300 | | | 5350 | 5000 | 5400 | 5000 | 6970 | 6500 |
| R 25.3 x 14.8 x 15.0 | | | 6930 | 4300 | | | 8000 | 5000 | | | 10460 | 6500 |
| R 25.3 x 14.8 x 20.0 | | | 9160 | 4300 | | | 10600 | 5000 | 10700 | 5000 | 13800 | 6400 |
| R 29.5 x 19.0 x 14.9 | | | 5630 | 4300 | | | 6800 | 5200 | | | 8500 | 6500 |
| R 30.5 x 20.0 x 12.5 | | | 4540 | 4300 | | | 5400 | 5100 | | | 6400 | 6100 |
| R 34.0 x 20.5 x 10.0 | | | 4360 | 4300 | | | 5100 | 5000 | | | 6100 | 6000 |
| R 34.0 x 20.5 x 12.5 | | | 5460 | 4300 | | | 6400 | 5000 | | | 7600 | 6000 |
| R 36.0 x 23.0 x 15.0 | | | 5750 | 4300 | | | 6700 | 5000 | | | 8000 | 6000 |
| R 38.1 x 19.05 x 12.7 | | | 7570 | 4300 | | | 8800 | 5000 | | | 10500 | 6000 |
| R 40.0 x 24.0 x 16.0 | | | 7000 | 4300 | | | 8200 | 5000 | | | 9800 | 6000 |
| R 41.8 x 26.2 x 12.5 | | | 5000 | 4300 | | | 5800 | 5000 | | | 7000 | 6000 |
| R 50.0 x 30.0 x 20.0 | | | 8700 | 4300 | | | 10000 | 4900 | | | 12000 | 6000 |
| R 58.3 x 32.0 x 18.0 | | | 9300 | 4300 | | | | | | | 13000 | 6000 |
| R 58.3 x 40.8 x 17.6 | | | 5400 | 4300 | | | 6250 | 5000 | | | 7160 | 5700 |
| R 58.3 x 40.8 x 20.2 | | | 6200 | 4300 | | | 7200 | 5000 | | | 8000 | 5600 |
| R 63.0 x 38.0 x 25.0 | | | 10800 | 4300 | | | 12600 | 5000 | | | 13900 | 5500 |
| R 68.0 x 48.0 x 13.0 | | | 3890 | 4300 | | | 4500 | 5000 | | | 5000 | 5500 |
| R 87.0 x 54.3 x 13.5 | | | 5400 | 4300 | | | 6280 | 5000 | | | 7000 | 5500 |
| R 102 x 65.8 x 15.0 | | | 5500 | 4200 | | | 6500 | 5000 | | | | |
| R 140 x 103 x 25.0 | | | 6200 | 4000 | | | | | | | | |
| R 202 x 153 x 25.0 | | | 5200 | 3700 | | | | | | | | |
| Tolerance of A _L value / A _L -Wert-Toleranz | ± 25% | | ± 25% | | ± 25% | | ± 30% | | ± 25% | | ± 25% | |

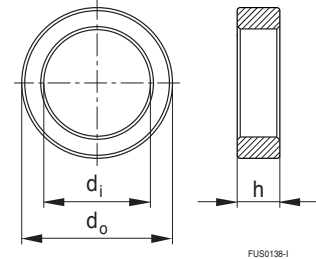
Coatings of ring cores / Beschichtung von Ringkernen

| Version / Ausführung | Epoxy (blue): B64290L... | Galxyl (Parylene): B64290P... |
|---|--|---|
| Layer thickness / Schichtdicke | < 0.4 mm | 0.012 or / oder 0.025 mm |
| Breakdown voltage / Durchbruchspannung | > 2 kV (> R 20) | > 1 kV (standard value / Standardwert) |
| Mechanical voltage / Mechan. Beschaffenheit | High firmness / Hohe Festigkeit | Smooth surface / Glatte Oberfläche |
| Max. temp. (short-time) / Max. Temp. (kurzzeitig) | approx. 180 °C / ca. 180 °C | approx. 130 °C / ca. 130 °C |
| Advantage / Vorteil | Low influence on A _L value / Ger. Einfluss auf A _L -Wert | Very low thickness / Geringe Schichtdicke |
| UL rating / UL-Zulassung (UL 94 V-0) | UL file no. E194412 Czech production, UL file no. E257941 Indian production | |

Chamfer

Large toroidal cores use thick wires that are partially subjected to high mechanical stress during winding. This can damage the wire insulation as well as the coating of the cores, thus reducing the breakdown voltage.

To avoid this, EPCOS ring cores with diameters of more than 10 mm have a chamfer. This prevents any insulation damage, and produces uniform coating thickness at the same time.



FUS0138-I

| | | | | | | Ordering code Bestellnummer | | | Magnetic characteristics Magnetische Formkenngrößen | | | | Approx. weight Ca. Gewicht |
|------------|---------|------------|---------|------------|---------|--------------------------------|---------|---------|--|-------------|--------------------------|--------------------------|-------------------------------|
| T38 (X038) | | T46 (X046) | | N87 (X087) | | Block 1 | Block 2 | Block 3 | $\Sigma l/A$ mm ⁻¹ | l_e mm | A_e mm ² | V_e mm ³ | g |
| A_L | μ_i | A_L | μ_i | A_L | μ_i | | | | | | | | |
| 6070 | 10000 | | | 1340 | 2200 | B64290 | L0638 | X*** | 2.07 | 54.15 | 26.17 | 1417 | 6.8 |
| 7570 | 10000 | | | 1660 | 2200 | B64290 | L0719 | X*** | 1.66 | 54.15 | 32.55 | 1763 | 8.4 |
| 12000 | 10000 | | | 2630 | 2200 | B64290 | L0651 | X*** | 1.05 | 54.15 | 51.15 | 2789 | 14 |
| 7900 | 10000 | | | 1740 | 2200 | B64290 | L0626 | X*** | 1.59 | 56.82 | 35.78 | 2033 | 9.8 |
| 10700 | 10000 | | | 2360 | 2200 | B64290 | L0618 | X*** | 1.17 | 60.07 | 51.26 | 3079 | 16 |
| 16100 | 10000 | | | 3500 | 2200 | B64290 | L0615 | X*** | 0.78 | 60.07 | 76.89 | 4619 | 24 |
| 21300 | 10000 | | | 4680 | 2200 | B64290 | L0616 | X*** | 0.59 | 60.07 | 102.5 | 6157 | 33 |
| 13100 | 10000 | | | 2880 | 2200 | B64290 | L0647 | X*** | 0.96 | 73.78 | 76.98 | 5680 | 27 |
| 10600 | 10000 | | | 2320 | 2200 | B64290 | L0657 | X*** | 1.19 | 77.02 | 64.66 | 4980 | 25 |
| 10100 | 10000 | | | 2230 | 2200 | B64290 | L0058 | X*** | 1.24 | 82.06 | 66.08 | 5423 | 27 |
| 12700 | 10000 | | | 2790 | 2200 | B64290 | L0048 | X*** | 0.99 | 82.06 | 82.60 | 6778 | 33 |
| 13500 | 10000 | | | 2940 | 2200 | B64290 | L0674 | X*** | 0.94 | 89.65 | 95.89 | 8597 | 43 |
| 17600 | 10000 | | | 3870 | 2200 | B64290 | L0668 | X*** | 0.71 | 82.97 | 116.2 | 9644 | 52 |
| | | | | 3590 | 2200 | B64290 | L0659 | X*** | 0.77 | 96.29 | 125.3 | 12070 | 61 |
| | | | | 2560 | 2200 | B64290 | L0022 | X*** | 1.08 | 103.0 | 95.75 | 9862 | 50 |
| | | | | 4460 | 2200 | B64290 | L0082 | X*** | 0.62 | 120.4 | 195.7 | 23560 | 120 |
| | | | | 4800 | 2200 | B64290 | L0043 | X*** | 0.58 | 134.0 | 230.0 | 30710 | 160 |
| | | | | 2760 | 2200 | B64290 | L0040 | X*** | 1.00 | 152.4 | 152.4 | 23230 | 115 |
| | | | | 3200 | 2200 | B64290 | L0042 | X*** | 0.87 | 152.4 | 174.9 | 26660 | 130 |
| | | | | 5000 | 2200 | B64290 | L0699 | X*** | 0.50 | 152.1 | 305.9 | 46530 | 240 |
| | | | | 1990 | 2200 | B64290 | L0696 | X*** | 1.39 | 178.6 | 128.7 | 22980 | 115 |
| | | | | 2790 | 2200 | B64290 | L0730 | X*** | 0.99 | 213.9 | 216.7 | 46360 | 235 |
| | | | | 2880 | 2200 | B64290 | L0084 | X*** | 0.96 | 255.3 | 267.2 | 68220 | 330 |
| | | | | | | B64290 | A0705 | X830 | 0.82 | 375.8 | 458.9 | 172440 | 860 |
| | | | | | | B64290 | A0711 | X830 | 0.90 | 550.5 | 608.6 | 335030 | 1600 |
| ± 30% | | ± 30% | | ± 25% | | | | | | | | | |

Ordering code example / Bestellbeispiel

B64290L0668X065

Block 1

Ferrite toroid / Ferrit-Ringkern

Block 2

Coating material / Beschichtung:
 Parylene: P, Epoxy: L, no coating: A
 Type coded / Typ codiert

Block 3

X = Dummy character / Füllstelle
 Code number for material
 Kennziffern für Material

Angepresste Phase

Für große Ringkerne werden dicke Drähte verwendet, die bei der Bewicklung teilweise hoher mechanischer Belastung ausgesetzt sind. Dadurch kann die Isolierung der Drähte und die Beschichtung der Kerne beschädigt aber

auch die Durchbruchspannung verringert werden. Um dies zu vermeiden, haben Ringkerne von EPCOS mit Durchmesser >10 mm eine angepresste Phase. Diese vermeidet Isolationsschäden und ermöglicht zudem eine gleichmäßige Beschichtungsdicke.

Symbols and Terms

Symbole und Begriffe

| Symbol | Term | Bezeichnung | Unit / Einheit |
|---------------------|---|---|------------------------|
| A_e | Effective magnetic cross section | Effektiver magnetischer Querschnitt | mm ² |
| A_L | Inductance factor: $A_L = L/N^2$ | Induktivitätsfaktor: $A_L = L/N^2$ | nH |
| A_{min} | Minimum core cross section | Min. Kernquerschnitt | mm ² |
| \hat{B} | Peak value of magnetic flux density | Scheitelwert der magnetischen Flussdichte | Vs/m ² , mT |
| ΔB | Flux density deviation | Hub der Flussdichte | Vs/m ² , mT |
| B_s | Saturation magnetization | Sättigungsmagnetisierung | Vs/m ² , mT |
| f | Frequency | Frequenz | Hz |
| f_{max} | Upper frequency limit | Obere Grenzfrequenz | Hz |
| g | Air gap | Luftspalt | mm |
| \hat{H} | Peak value of magnetic field strength | Scheitelwert der magnetischen Feldstärke | A/m |
| L | Inductance | Induktivität | H = Vs/A |
| L_{DC} | Inductance with DC bias | Induktivität bei Gleichstromvormagnetisierung | H |
| l_e | Effective magnetic path length | Effektive magnetische Weglänge | mm |
| N | Number of turns | Windungszahl | |
| P_v | Relative core losses | Bezogene Kernverlustleistung | kW/m ³ |
| Q | Quality factor ($Q = \omega L/R_S = 1/\tan \delta_L$) | Gütefaktor ($Q = \omega L/R_S = 1/\tan \delta_L$) | |
| R_S | Series loss resistance of a core | Serien-Verlustwiderstand eines Kerns | Ω |
| T | Temperature | Temperatur | °C |
| T_C | Curie temperature | Curietemperatur | °C |
| $\tan \delta$ | Loss factor | Verlustfaktor | |
| $\tan \delta/\mu_i$ | Relative loss factor of material at $H \rightarrow 0$ | Bezogener Verlustfaktor des Werkstoffes bei $H \rightarrow 0$ | |
| V_e | Effective magnetic volume | Effektives magnetisches Volumen | mm ³ |
| η_B | Hysteresis material constant | Hysteresematerialkonstante | mT ⁻¹ |
| μ_i | Relative initial permeability | Relative Anfangspermeabilität | |
| Σ/A | Magnetic form factor | Magnetischer Formfaktor | mm ⁻¹ |
| ω | Angular frequency; $\omega = 2 \pi f$ | Kreisfrequenz; $\omega = 2 \pi f$ | 1/s |

The commas used in numerical values denote decimal points.
All dimensions are given in mm, otherwise specified.

SMD Surface-mount device

Maße in mm, soweit nicht anders angegeben.

SMD Oberflächenmontierbares Bauelement

Cautions and Warnings

Warn- und Sicherheitshinweise

Mechanical stress and mounting

Ferrite cores have to meet mechanical requirements during assembling and for a growing number of applications. Since ferrites are ceramic materials one has to be aware of the special behavior under mechanical load.

As valid for any ceramic material, ferrite cores are brittle and sensitive to any shock, fast changing or tensile load. Especially high cooling rates under ultrasonic cleaning and high static or cyclic loads can cause cracks or failure of the ferrite cores.

For detailed information see Data Book 2007, chapter "General – Definitions, 8.1".

Effects of core combination on A_L value

Stresses in the core affect not only the mechanical but also the magnetic properties. It is apparent that the initial permeability is dependent on the stress state of the core. The higher the stresses are in the core, the lower is the value for the initial permeability. Thus the embedding medium should have the greatest possible elasticity.

For detailed information see Data Book 2007, chapter "General – Definitions, 8.2".

Heating up

Ferrites can run hot during operation at higher flux densities and higher frequencies.

NiZn-materials

The magnetic properties of NiZn-materials can change irreversible in high magnetic fields.

Processing notes

- The start of the winding process should be soft. Else the flanges may be destroyed.
- To strong winding forces may blast the flanges or squeeze the tube that the cores can no more be mount.
- To long soldering time at high temperature (> 300 °C) may effect coplanarity or pin arrangement.
- Not following the processing notes for soldering of the J-leg terminals may cause solderability problems at the transformer because of pollution with Sn oxyd of the tin bath or burned insulation of the wire.
For detailed information see Data Book 2007, chapter "Processing notes, 2.2".
- The dimensions of the hole arrangement have fixed values and should be understood as a recommendation for drilling the printed circuit board. For dimensioning the pins, the group of holes can only be seen under certain conditions, as they fit into the given hole arrangement. To avoid problems when mounting the transformer, the manufacturing tolerances for positioning the customers' drilling process must be considered by increasing the hole diameter.

Mechanische Belastungen und Montage

Ferritkerne müssen den Belastungen bei der Montage und den verschiedenen Anwendungen standhalten. Ferrite sind ein keramischer Werkstoff und daher ist das besondere Verhalten bei mechanischer Belastung zu berücksichtigen.

Wie jede Keramik sind auch Ferritkerne spröde und empfindlich gegenüber Schock sowie sich schnell ändernden oder Zug-Belastungen. Insbesondere das beschleunigte Kühlen bei der Ultraschallreinigung sowie eine hohe statische oder zyklische Belastung kann zu Rissen oder Ausfällen der Ferritkerne führen.

Siehe hierzu auch das englischsprachige Ferrite-Datenbuch 2007, Kapitel „General – Definitions, 8.1“.

Auswirkungen von Kernkombinationen auf den A_L -Wert

Spannungen im Kern beeinflussen nicht nur die mechanischen, sondern auch die magnetischen Eigenschaften. Es zeigt sich eine Abhängigkeit der Anfangspermeabilität vom Spannungszustand des Kerns.

Der Wert der Anfangspermeabilität ist umso niedriger, je höher die Spannungen im Kern sind. Daher sollten Vergussmassen eine möglichst große Elastizität aufweisen.

Siehe hierzu auch das englischsprachige Ferrite-Datenbuch 2007, Kapitel „General – Definitions, 8.2“.

Erwärmung

Ferrite können sich während des Betriebs bei höherer magnetischer Flussdichte und höheren Frequenzen erwärmen.

NiZn-Werkstoff

Die magnetischen Eigenschaften von NiZn-Werkstoffen können sich in hohen magnetischen Feldern irreversibel ändern.

Verarbeitungshinweise

- Der Wicklungsprozess sollte sanft anlaufen, da sonst der Flansch beschädigt werden kann.
- Zu große Wickelkräfte können den Flansch sprengen oder den Wickelkörper quetschen, so dass der Kern nicht mehr montiert werden kann.
- Eine zu lange Lötdauer bei hohen Temperaturen (> 300 °C) kann sich nachteilig auf die Koplanarität oder die Lage der Stifte auswirken.
- Die Nichtbeachtung der Löttempfehlungen für J-Anschlüsse kann Lötprobleme beim Übertrager verursachen. Diese können auftreten wegen Verunreinigung des Zinnbades mit Sn-Oxiden oder Resten der verbrannten Isolierung des Drahtes.
Siehe hierzu auch das englischsprachige Ferrite-Datenbuch 2007, Kapitel "Processing notes, 2.2".
- Die Maße der Lochgruppe sind feste Werte und eine Empfehlung für die Bohrung der Leiterplatte. Für die Bemaßung der Stifte kann die Lochgruppe nur bedingt gesehen werden, dass sie in die gegebene Lochgruppe passen. Um Probleme bei der Montage des Übertragers zu vermeiden, müssen bei der Bohrung der Lochgruppe die Fertigungstoleranzen des Kunden berücksichtigt werden, indem die Lochdurchmesser um die Fertigungstoleranzen erweitert werden.

Important Notes

Wichtige Hinweise

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2. We also point out that **in individual cases, a malfunction of electronic components or failure before the end of their usual service life cannot be completely ruled out in the current state of the art, even if they are operated as specified**. In customer applications requiring a very high level of operational safety and especially in customer applications in which the malfunction or failure of an electronic component could endanger human life or health (e.g. in accident prevention or life-saving systems), it must therefore be ensured by means of suitable design of the customer application or other action taken by the customer (e.g. installation of protective circuitry or redundancy) that no injury or damage is sustained by third parties in the event of malfunction or failure of an electronic component.
3. **The warnings, cautions and product-specific notes must be observed.**

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6. Unless otherwise agreed in individual contracts, **all orders are subject to the current version of the "General Terms of Delivery for Products and Services in the Electrical Industry" published by the German Electrical and Electronics Industry Association (ZVEI)**.
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