

## RM 6, RM 6 LP Core and accessories

Series/Type: B65807, B65808, B65821, B65659

Date:

May 2017

The following products presented in this data sheet are being withdrawn.

Ordering Code	Substitute Product	Date of Withdrawal	Deadline Last Orders	Last Shipments
B65808A5000X000		2018-06-08	2018-09-14	2018-12-14

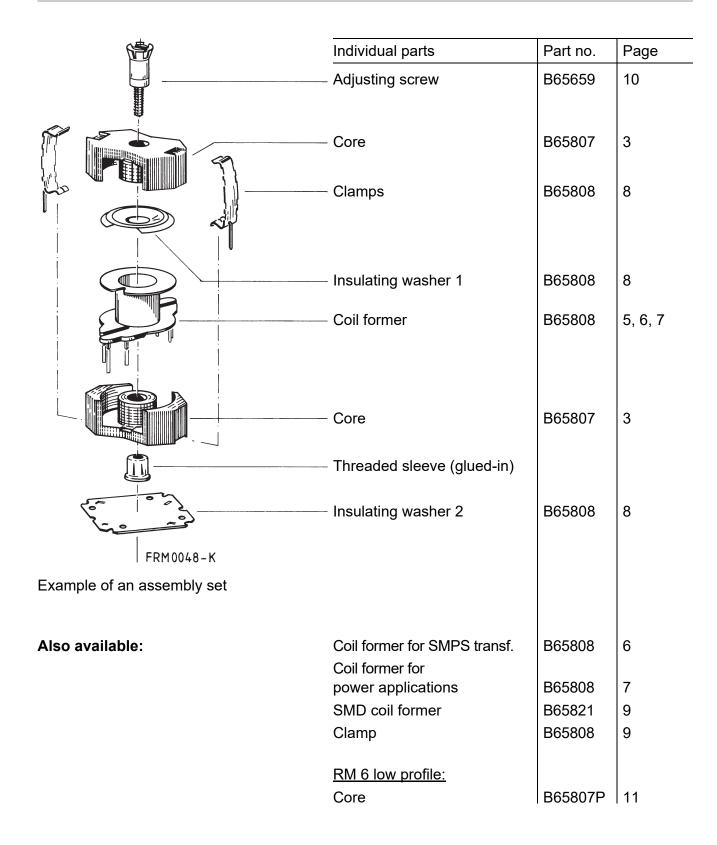
For further information please contact your nearest EPCOS sales office, which will also support you in selecting a suitable substitute. The addresses of our worldwide sales network are presented at www.epcos.com/sales.

© EPCOS AG 2017. Reproduction, publication and dissemination of this publication, enclosures hereto and the information contained therein without EPCOS' prior express consent is prohibited.

EPCOS AG is a TDK Group Company.



### Core and accessories



5/17

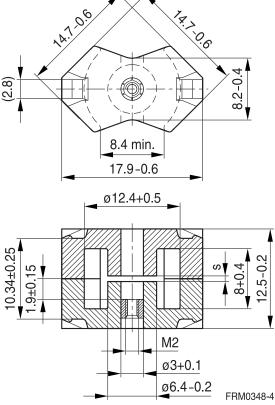
# **公TDK**

#### RM 6 B65807 Core To IEC 62317-4 Core without center hole 78.1.0.6 1A.7.0! for transformer applications Delivery mode: sets (2.8) 8.2-0. Magnetic characteristics (per set) without with 8.4 min.

	center hole	center hole	
ΣΙ/Α	0.86	0.78	mm <sup>-1</sup>
l <sub>e</sub>	26.9	28.6	mm
l <sub>e</sub> Α <sub>e</sub> Δ	31.3	36.6	mm <sup>2</sup>
A <sub>min</sub>	—	31	mm <sup>2</sup>
Ve	840	1050	mm <sup>3</sup>

## Approx. weight (per set)

	m	4.9	5.1	g
--	---	-----	-----	---



## Gapped (A<sub>L</sub> values/air gaps examples)

Material	A <sub>L</sub> value	s approx. mm	μ <sub>e</sub>	Ordering code <sup>1)</sup> -J without center hole -N with threaded sleeve -C with center hole
K1	40 ±3%	0.80	27.4	B65807+0040A001
M33	63 ±3% 100 ±3%	0.60 0.38	43.2 68.5	B65807+0063A033 B65807+0100A033
N48	$\begin{array}{c} 160 \pm 3\% \\ 250 \pm 3\% \\ 315 \pm 3\% \\ 400 \pm 3\% \end{array}$	0.22 0.12 0.08 0.05	109 171 215 274	B65807+0160A048 B65807+0250A048 B65807+0315A048 B65807+0400A048
N41	250 ±3%	0.17	155	B65807J0250A041

<sup>1)</sup> Replace the + by the code letter "C" or "N" for the required version. Standard version is "C".

# **②TDK**

RM 6	
Core	B65807

## Ungapped

Material	A <sub>L</sub> value	μ <sub>e</sub>	P <sub>V</sub>	Ordering code -C with center hole
	nH		W/set	-J without center hole
N48	2200 +30/-20%	1500		B65807C0000R048
N45	3500 +30/-20%	2180		B65807J0000R045
N30	4300 +30/-20%	2670		B65807J0000R030
T35	6200 +30/-20%	3860		B65807J0000R035
T38	8600 +40/-30%	5350		B65807J0000Y038
T66	12300 +40/-30%	7650		B65807J0000Y066
N49	1700 +30/–20%	1060	< 0.15 ( 50 mT, 500 kHz, 100 °C)	B65807J0000R049
N87	2400 +30/–20%	1490	< 0.51 (200 mT, 100 kHz, 100 °C)	B65807J0000R087
N97	2400 +30/–20%	1490	< 0.39 (200 mT, 100 kHz, 100 °C)	B65807J0000R097
N95	2800 +30/-20%	1740	< 0.45 (200 mT, 100 kHz, 100 °C)	B65807J0000R095
N41	3100 +30/–20%	1930	< 0.16 (200 mT, 25 kHz, 100 °C)	B65807J0000R041

Other  $A_L$  values/air gaps and materials available on request – see Processing remarks on page 12.

5/17



## Accessories

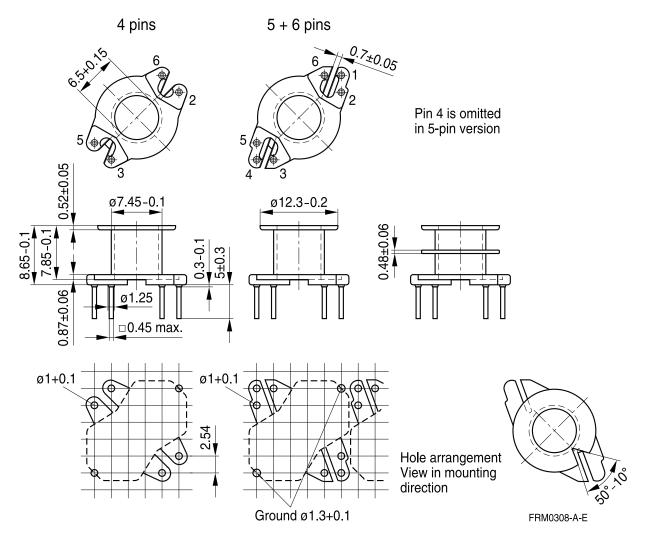
B65808

## Coil former, squared pins

Material:GFR thermosetting plastic (UL 94 V-0, insulation class to IEC 60085:<br/>F  $\triangleq$  max. operating temperature 155 °C), color code black<br/>Sumikon PM 9630® [E41429 (M)], SUMITOMO BAKELITE CO LTDSolderability:to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 sResistance to soldering heat:to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 sWinding:see Processing notes, 2.1

For matching clamp and insulating washers see page 8.

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	15	30	69	4 5 6	B65808N1004D001 B65808N1005D001 B65808N1006D001
2	14	30	73	4 6	B65808N1004D002 B65808N1006D002



Please read *Cautions and warnings* and *Important notes* at the end of this document.



#### Accessories

B65808

#### Coil former for SMPS transformers with line isolation

The creepage distances and clearances are designed such that the coil former is suitable for use in SMPS transformers with line isolation.

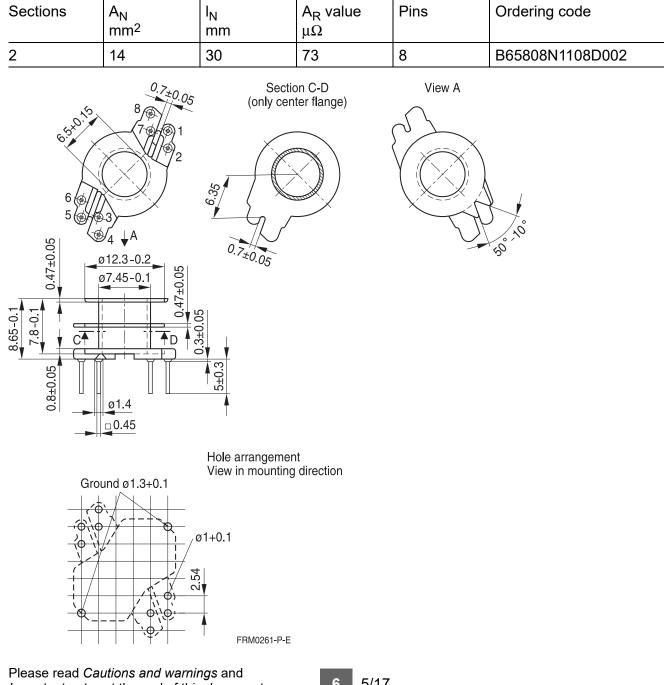
- Closed center flange with external wire guide
- Optimized for use with automatic winding machines

Material: GFR thermosetting plastic (UL 94 V-0, insulation class to IEC 60085:  $F \triangleq max$ . operating temperature 155 °C), color code black Sumikon PM 9630<sup>®</sup> [E41429 (M)], SUMITOMO BAKELITE CO LTD

Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 s see Processing notes, 2.1 Winding:

For matching clamp and insulating washers see page 8.



Important notes at the end of this document.

5/17



Accessories

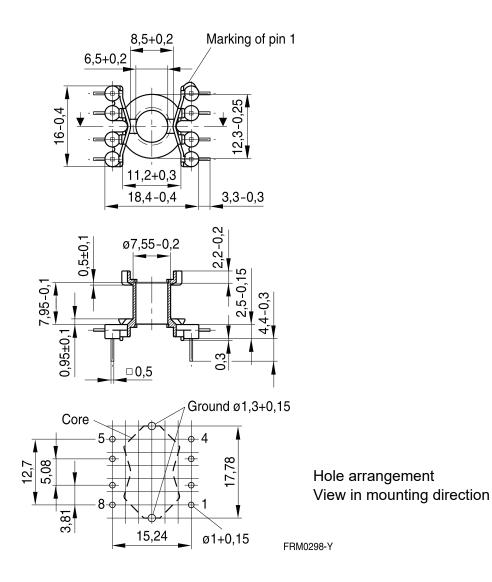
B65808

#### Coil former for power applications with angled pins

Optimized for automatic winding

For matching clamp and insulating washer 1 see page 8.

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	15	30	69	8	B65808E1508T001



## **②TDK**

#### RM 6

#### Accessories

#### B65808

#### Clamp

- With ground terminal, made of stainless spring steel (tinned), 0.4 mm thick
- Solderability to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

#### Insulating washer 1 between core and coil former

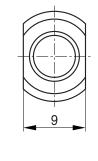
- For tolerance compensation and for insulation

#### Insulating washer 2 for double-clad PCBs

	Ordering code
Clamp (ordering code per piece, 2 are required)	B65808B2203X000
Insulating washer 1 (reel packing, PU = 1 reel)	B65808A5000X000
Insulating washer 2 (bulk)	B65808C2005X000

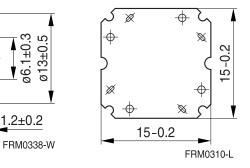
#### Clamp

## 2.6 max. 2.6 max. 2.6 max. 0.82-0.25 0.82-0.25 0.6 FBM0187-C

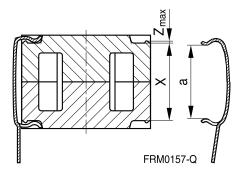




Insulating washer 2



#### **Clamping forces for RM 6**



 $F_{min}$ : Extension of clamp from a to  $a_2 = X_{min}$  $F_{max}$ : Extension of clamp from a to  $a_1 = X_{max}$ 

Clamp opening a (mm)	9.5 +0.2	
Core nose Z <sub>max</sub> (mm)	0.22	
Height of core pair X (m	10.1 10.6	
Clamping force F (N)	F <sub>min</sub> F <sub>max</sub>	7 50



B65821, B65808

RM 6

Accessories

#### SMD

#### SMD coil former with gullwing terminals

Material: GFR liquid crystal polymer (UL 94 V-0, insulation class to IEC 60085: F ≙ max. operating temperature 155 °C), color code black Vectra E 130i [E106764 (M)], POLYPLASTICS CO LTD Vectra E 130i [E83005 (M)], CELANESE INTERNATIONAL CORP.
Solderability: to IEC 60068-2-58, test Td, method 6 (Group 3): 245 °C, 3 s
Resistance to soldering heat: to IEC 60068-2-58, test Td, method 6 (Group 3): 255 °C, 10 s
permissible soldering temperature for wire-wrap connection on coil former: 400 °C, 1 s

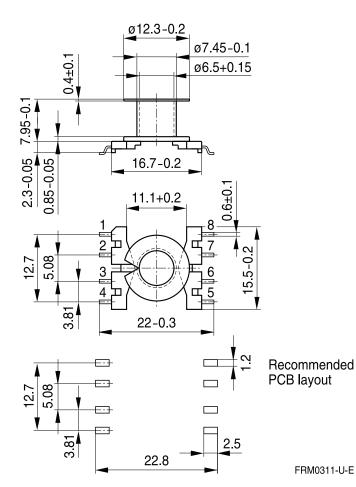
Winding: see Processing notes, 2.1

#### Clamp

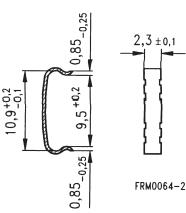
■ Without ground terminal, made of stainless spring steel, 0.435 mm thick

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	$A_R$ value $\mu\Omega$	Terminals	Ordering code
1	16.2	31	66	8	B65821C1008T001
Clamp(ordering code per piece, 2 are required)					B65808J2204X000

#### **Coil former**



Clamp



Please read *Cautions and warnings* and *Important notes* at the end of this document.

# **②TDK**

## RM 6

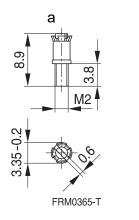
## Accessories

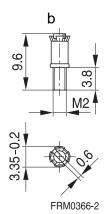
B65659

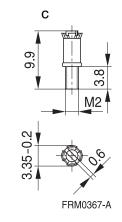
### Adjusting screw

Tube core with thread and core brake made of GFR polyterephthalate Pocan B3235<sup>®</sup> [E245249 (M)], LANXESS AG

Figure	Tube core			Ordering code
	$\varnothing \times \text{length (mm)}$	Material	Color code	
а	2.62  imes 3.6	N22	red	B65659F0001X023
b	$2.75 \times 4.4$	N22	black	B65659F0003X023
С	$2.82 \times 4.4$	N22	yellow	B65659F0004X023

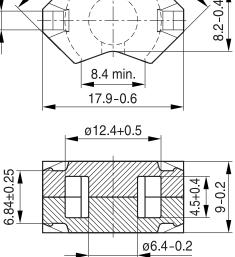






# **公TDK**

#### **RM 6 »Low Profile«** B65807P Core To IEC 62317-4 For compact transformers Q , A.1 0.0 Without center hole Delivery mode: sets (2.8) q 82 Magnetic characteristics (per set) $\Sigma I/A = 0.58 \text{ mm}^{-1}$ 8.4 min. = 21.8 mm $I_{e}$ 17.9-0.6 $A_e = 37.5 \text{ mm}^2$ $A_{min}^{\circ} = 31.2 \text{ mm}^2$ $V_e^{\circ} = 820 \text{ mm}^3$ ø12.4+0.5 Approx. weight 4.0 g/set



FRM0349-C

#### Ungapped

Material	A <sub>L</sub> value	μ <sub>e</sub>	P <sub>V</sub>	Ordering code
	nH		W/set	
T38	10500 +40/-30%	4860		B65807P0000Y038
N49	2200 +30/-20%	1020	< 0.14( 50 mT, 500 kHz, 100 °C)	B65807P0000R049
N92	2300 +30/-20%	1060	< 0.44 (200 mT, 100 kHz, 100 °C)	B65807P0000R092
N87	3000 +30/-20%	1390	< 0.40 (200 mT, 100 kHz, 100 °C)	B65807P0000R087

Other A<sub>L</sub> values/air gaps and materials available on request – see Processing remarks on page 12.



#### **Cautions and warnings**

#### 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 temperature 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, chapter "General - Definitions, 8.1".

#### Effects of core combination on A<sub>L</sub> 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, chapter "General - Definitions, 8.1".

#### 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.

#### **Ferrite Accessories**

EPCOS ferrite accessories have been designed and evaluated only in combination with EPCOS ferrite cores. EPCOS explicitly points out that EPCOS ferrite accessories or EPCOS ferrite cores may not be compatible with those of other manufacturers. Any such combination requires prior testing by the customer and will be at the customer's own risk.

EPCOS assumes no warranty or reliability for the combination of EPCOS ferrite accessories with cores and other accessories from any other manufacturer.

#### **Processing remarks**

The start of the winding process should be soft. Else the flanges may be destroyed.

- Too strong winding forces may blast the flanges or squeeze the tube that the cores can not be mounted any more.
- Too 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 oxyde of the tin bath or burned insulation of the wire. For detailed information see chapter *"Processing notes"*, section 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.

5/17



#### **Cautions and warnings**

#### **Display of ordering codes for EPCOS products**

The ordering code for one and the same product can be represented differently in data sheets, data books, other publications and the website of EPCOS, or in order-related documents such as shipping notes, order confirmations and product labels. The varying representations of the ordering codes are due to different processes employed and do not affect the specifications of the respective products. Detailed information can be found on the Internet under www.epcos.com/orderingcodes.



## Symbols and terms

Symbol	Meaning	Unit
A	Cross section of coil	mm <sup>2</sup>
A <sub>e</sub>	Effective magnetic cross section	mm <sup>2</sup>
AL	Inductance factor; $A_L = L/N^2$	nH
A <sub>L1</sub>	Minimum inductance at defined high saturation ( $\triangleq \mu_a$ )	nH
A <sub>min</sub>	Minimum core cross section	mm <sup>2</sup>
A <sub>N</sub>	Winding cross section	mm <sup>2</sup>
A <sub>R</sub>	Resistance factor; A <sub>R</sub> = R <sub>Cu</sub> /N <sup>2</sup>	μΩ = 10 <sup>-6</sup> Ω
В	RMS value of magnetic flux density	Vs/m², mT
ΔB	Flux density deviation	Vs/m², mT
Ê	Peak value of magnetic flux density	Vs/m², mT
ΔÂ	Peak value of flux density deviation	Vs/m², mT
B <sub>DC</sub>	DC magnetic flux density	Vs/m², mT
B <sub>R</sub>	Remanent flux density	Vs/m², mT
B <sub>S</sub>	Saturation magnetization	Vs/m², mT
C <sub>0</sub>	Winding capacitance	F = As/V
CDF	Core distortion factor	mm <sup>-4.5</sup>
DF	Relative disaccommodation coefficient DF = $d/\mu_i$	
d	Disaccommodation coefficient	
E <sub>a</sub>	Activation energy	J
f	Frequency	s <sup>−1</sup> , Hz
f <sub>cutoff</sub>	Cut-off frequency	s−1, Hz
f <sub>max</sub>	Upper frequency limit	s <sup>−1</sup> , Hz
f <sub>min</sub>	Lower frequency limit	s <sup>−1</sup> , Hz
f <sub>r</sub>	Resonance frequency	s <sup>−1</sup> , Hz
f <sub>Cu</sub>	Copper filling factor	
g	Air gap	mm
Н	RMS value of magnetic field strength	A/m
Ĥ	Peak value of magnetic field strength	A/m
H <sub>DC</sub>	DC field strength	A/m
H <sub>c</sub>	Coercive field strength	A/m
h	Hysteresis coefficient of material	10 <sup>–6</sup> cm/A
h/μ <sub>i</sub> ²	Relative hysteresis coefficient	10 <sup>–6</sup> cm/A
l	RMS value of current	А
рс	Direct current	А
Ì	Peak value of current	А
J	Polarization	Vs/m <sup>2</sup>
k	Boltzmann constant	J/K
k <sub>3</sub>	Third harmonic distortion	
k <sub>3c</sub>	Circuit third harmonic distortion	
L	Inductance	H = Vs/A



## Symbols and terms

Symbol	Meaning	Unit
ΔL/L	Relative inductance change	Н
L <sub>0</sub>	Inductance of coil without core	Н
L <sub>H</sub>	Main inductance	Н
Lp	Parallel inductance	Н
L <sub>rev</sub>	Reversible inductance	Н
L <sub>s</sub>	Series inductance	Н
l <sub>e</sub>	Effective magnetic path length	mm
I <sub>N</sub>	Average length of turn	mm
N	Number of turns	
P <sub>Cu</sub>	Copper (winding) losses	W
P <sub>trans</sub>	Transferrable power	W
P <sub>V</sub>	Relative core losses	mW/g
PF	Performance factor	
Q	Quality factor (Q = $\omega L/R_s$ = 1/tan $\delta_l$ )	
R	Resistance	Ω
R <sub>Cu</sub>	Copper (winding) resistance (f = 0)	Ω
R <sub>h</sub>	Hysteresis loss resistance of a core	Ω
$\Delta R_{h}$	R <sub>h</sub> change	Ω
R <sub>i</sub>	Internal resistance	Ω
R <sub>p</sub>	Parallel loss resistance of a core	Ω
R <sub>s</sub>	Series loss resistance of a core	Ω
R <sub>th</sub>	Thermal resistance	K/W
R <sub>V</sub>	Effective loss resistance of a core	Ω
S	Total air gap	mm
Т	Temperature	°C
$\Delta T$	Temperature difference	К
Т <sub>С</sub>	Curie temperature	C°
t	Time	S
t <sub>v</sub>	Pulse duty factor	
tan δ	Loss factor	
tan $\delta_L$	Loss factor of coil	
tan δ <sub>r</sub>	(Residual) loss factor at $H \rightarrow 0$	
tan $\delta_e$	Relative loss factor	
tan $\delta_h$	Hysteresis loss factor	
tan δ/μ <sub>i</sub>	Relative loss factor of material at $H \rightarrow 0$	
U	RMS value of voltage	V
Û	Peak value of voltage	V
Ve	Effective magnetic volume	mm <sup>3</sup>
z	Complex impedance	Ω
Z <sub>n</sub>	Normalized impedance $ Z _n =  Z  / N^2 \times \varepsilon (I_e / A_e)$	Ω/mm



## Symbols and terms

Symbol	Meaning		
α	Temperature coefficient (TK)		
$\alpha_{F}$	Relative temperature coefficient of material		
α <sub>e</sub>	Temperature coefficient of effective permeability		
ε <sub>r</sub>	Relative permittivity		
Φ	Magnetic flux		
1	Efficiency of a transformer		
JB	Hysteresis material constant		
۱i	Hysteresis core constant		
λ <sub>s</sub>	Magnetostriction at saturation magnetization		
ı	Relative complex permeability		
ι <sub>0</sub>	Magnetic field constant		
la	Relative amplitude permeability		
l <sub>app</sub>	Relative apparent permeability		
ι <sub>e</sub>	Relative effective permeability		
1 <sub>i</sub>	Relative initial permeability		
ι <sub>p</sub> '	Relative real (inductive) component of $\overline{\mu}$ (for parallel components)		
ι <sub>p</sub> "	Relative imaginary (loss) component of $\overline{\mu}$ (for parallel components)		
ι <sub>r</sub>	Relative permeability		
1 <sub>rev</sub>	Relative reversible permeability		
ι <sub>s</sub> '	Relative real (inductive) component of $\overline{\mu}$ (for series components)		
ι <sub>s</sub> "	Relative imaginary (loss) component of $\overline{\mu}$ (for series components)		
u <sub>tot</sub>	Relative total permeability		
	derived from the static magnetization curve		
)	Resistivity	$\Omega m^{-1}$	
εl/A	Magnetic form factor	mm <sup>-1</sup>	
t <sub>Cu</sub>	DC time constant $\tau_{Cu}$ = L/R <sub>Cu</sub> = A <sub>L</sub> /A <sub>R</sub>	S	
ω	Angular frequency; $\omega$ = 2 $\Pi$ f	s <sup>-1</sup>	

All dimensions are given in mm.

Surface-mount device



The following applies to all products named in this publication:

- 1. Some parts of this publication contain statements about the suitability of our products for certain areas of application. These statements are based on our knowledge of typical requirements that are often placed on our products in the areas of application concerned. We nevertheless expressly point out that such statements cannot be regarded as binding statements about the suitability of our products for a particular customer application. As a rule, EP-COS is either unfamiliar with individual customer applications or less familiar with them than the customers themselves. For these reasons, it is always ultimately incumbent on the customer to check and decide whether an EPCOS product with the properties described in the product specification is suitable for use in a particular customer application.
- 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.
- 4. In order to satisfy certain technical requirements, some of the products described in this publication may contain substances subject to restrictions in certain jurisdictions (e.g. because they are classed as hazardous). Useful information on this will be found in our Material Data Sheets on the Internet (www.epcos.com/material). Should you have any more detailed questions, please contact our sales offices.
- 5. We constantly strive to improve our products. Consequently, **the products described in this publication may change from time to time**. The same is true of the corresponding product specifications. Please check therefore to what extent product descriptions and specifications contained in this publication are still applicable before or when you place an order.

We also **reserve the right to discontinue production and delivery of products**. Consequently, we cannot guarantee that all products named in this publication will always be available. The aforementioned does not apply in the case of individual agreements deviating from the foregoing for customer-specific products.

- 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).
- 7. The trade names EPCOS, CeraCharge, CeraDiode, CeraLink, CeraPad, CeraPlas, CSMP, CTVS, DeltaCap, DigiSiMic, ExoCore, FilterCap, FormFit, LeaXield, MiniBlue, MiniCell, MKD, MKK, MotorCap, PCC, PhaseCap, PhaseCube, PhaseMod, PhiCap, PowerHap, PQSine, PQvar, SIFERRIT, SIFI, SIKOREL, SilverCap, SIMDAD, SiMic, SIMID, SineFormer, SIOV, ThermoFuse, WindCap are trademarks registered or pending in Europe and in other countries. Further information will be found on the Internet at www.epcos.com/trademarks.



## **X-ON Electronics**

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Ferrite Cores & Accessories category:

Click to view products by EPCOS manufacturer:

Other Similar products are found below :

 B65512C0000T001
 B65522B0000T001
 B65549E4X23
 B65615B0001X000
 B65659F0001X023
 B65659F0003X023
 B65659F4X23

 B65665C0004X000
 B65679E3X22
 B65705B0003X000
 B65804C2005X000
 B65812B3003X22
 B65814B2005X000
 B65840B1006D001

 B65840B1006D002
 B65878E0012D001
 B66206A2001X000
 B66206J1106T1
 B66208K1009T1
 B66252BM1
 B66288F2204X000

 B66306C1010T2
 B66341G0000X127
 B66390A1016T001
 B67348A1X27
 B65512C2001X000
 B65518D2001X000
 B65535B0003X000

 B65539C1003X1
 B65542A5000X
 B65655B0009X000
 B65687A1000T001
 B65714K1020T001
 B65734B1000T001
 B65734B1000T01

 B65804B6010T1
 B65814N1008D002
 B65816N1011D1
 B65820D2005X
 B65822F1008T001
 B65844W1010D001
 B65848BD1010D1

 B65848S2000X
 B658884E0012D001
 B65887H4300X041
 B66202A2010X000
 B66202B1106T001
 B66206B1110T001
 B66208K1009T001

 B66208X1010T001
 B658884E0012D001
 B65887H4300X041
 B66202A2010X000
 B66202B1106T001
 B66206B1110T001
 B66208K1009T001