

# **Ferrites and accessories**

# RM 5, RM 5 LP Cores and accessories

 Series/Type:
 B65805, B65806, B65822, B65539

 Date:
 September 2006/October 2007/January 2010/March 2010/June 2011

The following products presented in this data sheet are being withdrawn.

Ordering Code	Substitute Product		Deadline Last Orders	Last Shipments
B65806K1004D001	B65806P1004D001	2011-04-19		
B65806K1005D001	B65806P1005D001	2011-04-19		
B65806K1006D001	B65806P1006D001	2011-04-19		
B65806K1006D002	B65806P1006D002	2011-04-19		
B65806K1008D001	B65806P1008D001	2011-04-19		

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### Core

#### B65805

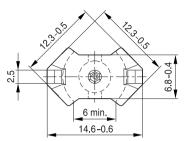
- To IEC 62317-4
- Core without center hole for transformer applications
- Delivery mode: sets

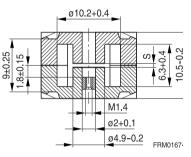
## Magnetic characteristics (per set)

	with center hole	without center hole	
ΣI/A	1.0	0.93	mm <sup>-1</sup>
l <sub>e</sub>	20.8	22.1	mm
l <sub>e</sub> A <sub>e</sub> A	20.8	23.8	mm <sup>2</sup>
A <sub>min</sub>	—	18	mm <sup>2</sup>
Ve	433	526	mm <sup>3</sup>

# Approx. weight (per set)

m 2.9 3.0 g				
	m	2.9	3.0	g





# Gapped

Material	A <sub>L</sub> value nH	s approx. mm	μ <sub>e</sub>	Ordering code <sup>1)</sup> -C with center hole -N with threaded sleeve
K1	25 ±3%	1.0	19.9	B65805+0025A001
	40 ±3%	0.40	31.8	B65805+0040A001
M33	63 ±3%	0.4	50.2	B65805+0063A033
	100 ±3%	0.2	79.6	B65805+0100A033
N48	160 ±3%	0.12	127	B65805+0160A048
	250 ±3%	0.06	199	B65805+0250A048
	315 ±3%	0.03	251	B65805+0315A048

1) Replace the + by the code letter "C" or "N" for the required version.



Core

B65805

# 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	1800 +30/-20%	1430		B65805C0000R048
N45	2600 +30/-20%	1920		B65805J0000R045
N30	3500 +30/-20%	2590		B65805J0000R030
T38	6700 +40/-30%	4950		B65805J0000Y038
T66	9600 +40/-30%	7090		B65805J0000Y066
N49	1300 +30/-20%	960	< 0.06 ( 50 mT, 500 kHz, 100 °C)	B65805J0000R049
N87	2000 +30/-20%	1480	< 0.32 (200 mT, 100 kHz, 100 °C)	B65805J0000R087
N97	2000 +30/-20%	1480	< 0.24 (200 mT, 100 kHz, 100 °C)	B65805J0000R097
N41	2600 +30/-20%	1920	< 0.10 (200 mT, 100 kHz, 100 °C)	B65805J0000R041



Accessories

### Coil former

 Material:
 GFR thermosetting plastic (UL 94 V-0, insulation class to IEC 60085: H ≙ max. operating temperature 180 °C), color code white Bakelite UP 3420® [E61040 (M)], HEXION SPECIALTY CHEMICALS GMBH

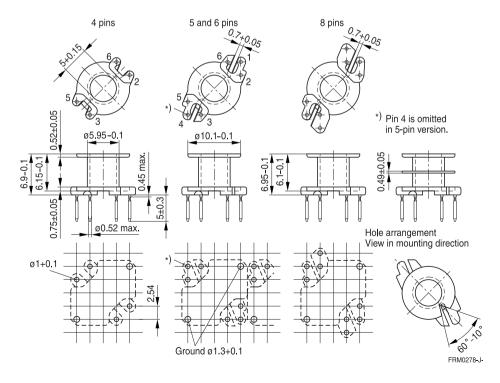
 Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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

 Winding:
 see Data Book 2007, chapter "Processing notes, 2.1"

Pins squared in the start-of-winding area. For matching clamps and insulating washers see page 5.

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	9.5	25	90	4 5 6 8	B65806P1004D001 B65806P1005D001 B65806P1006D001 B65806P1008D001
2	8.7	25	94	6	B65806P1006D002



Δ

## Accessories

#### Clamp

- With ground terminal, made of stainless spring steel (tinned), 0.3 mm thick
- Solderability to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s
- Also available as strip clamp on reels on request

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

- For tolerance compensation and for insulation
- Made of polyarylate film (UL 94 V-0, insulation class to IEC 60085: E ≙ 120 °C), 0.08 mm thick Aryphan F685, [E167358 (M)], natural color, LOFO HIGH TECH FILM GMBH

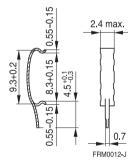
EPCOS

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

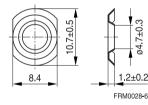
■ Made of polycarbonate (UL 94 V-0, insulation class to IEC 60085: E ≙ 120 °C), 0.25 mm thick Makrofol FR, [E118859 (M)], natural color, BAYER MATERIALSCIENCE LLC

	Ordering code
Clamp (ordering code per piece, 2 are required)	B65806B2203X000
Insulating washer 1 (reel packing, PU = 1 reel)	B65806A5000X000
Insulating washer 2 (bulk)	B65806D2005X000

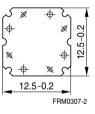
## Clamp



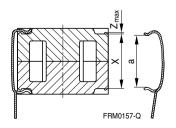
Insulating washer 1 (preliminary data)







#### Clamping forces for RM 5



 $F_{min}$ : 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)	8.3 +0.15	
Core nose Z <sub>max</sub> (mm)	0.15	
Height of core pair X (mi	8.75 9.25	
Clamping force F (N)	F <sub>min</sub> F <sub>max</sub>	5 40

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

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Accessories

B65822, B65806

SMD

## SMD coil former with gullwing terminals

Material: GFR liquid crystal polymer (UL 94 V-0, insulation class to IEC 60085:  $F \triangleq max.$  operating temperature 155 °C), color code black Vectra C 130 [E83005 (M)], TICONA

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

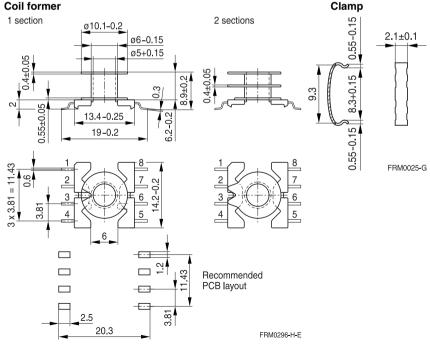
Windina: see Data Book 2007. chapter "Processing notes. 2.1"

## Clamp

- Without ground terminal, made of stainless spring steel, 0.335 mm thick
- Also available as strip clamp (each carton containing 2 reels) on request

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	$A_{R}$ value $\mu\Omega$	Terminals	Ordering code
1	11.1	25	77	8	B65822F1008T001
2	10.2	25	85	8	B65822F1008T002
Clamp	B65806J2204X000				

# Coil former



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

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Accessories

B65822, B65806

SMD

## SMD coil former with J terminals

Material: GFR liquid crystal polymer (UL 94 V-0, insulation class to IEC 60085:  $F \triangleq max.$  operating temperature 155 °C), color code black Vectra C 130 [E83005 (M)], TICONA

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

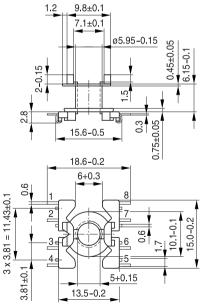
Windina: see Data Book 2007. chapter "Processing notes. 2.1"

## Clamp

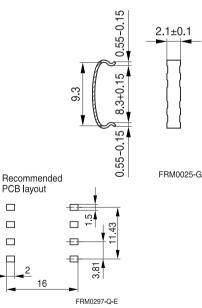
- Without ground terminal, made of stainless spring steel, 0.335 mm thick
- Also available as strip clamp (each carton containing 2 reels) on request

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	$A_{R}$ value $\mu\Omega$	Terminals	Ordering code
1	11.1	25	73	8	B65822J1008T001
Clamp	B65806J2204X000				

## Coil former



Clamp





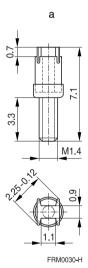
Accessories

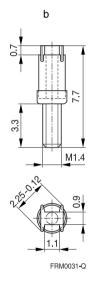
B65539, B65806

# 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	1.81 × 2.0	K1	yellow	B65539C1003X001
а	1.81 × 2.7	K1	gray	B65539C1002X001
а	1.81 × 2.7	N22	red	B65539C1002X022
b	1.81 × 3.4	N22	green	B65806C3001X022







RM 5 »Low Profile«

# Core

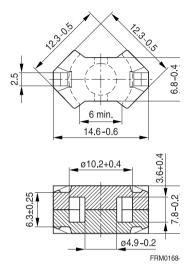
B65805P

- To IEC 62317-4
- For compact transformers
- Without center hole
- Delivery mode: sets

# Magnetic characteristics (per set)

$$\begin{split} \Sigma I/A &= 0.71 \text{ mm}^{-1} \\ I_e &= 17.5 \text{ mm} \\ A_e &= 24.5 \text{ mm}^2 \\ A_{min} &= 18 \text{ mm}^2 \\ V_e &= 430 \text{ mm}^3 \end{split}$$

Approx. weight 2.6 g/set



#### Ungapped

Material	A <sub>L</sub> value	μ <sub>e</sub>	P <sub>V</sub>	Ordering code
	nH		W/set	
T38 <sup>1)</sup>	7700 +40/-30%	4380		B65805P0000Y038
N49	1700 +30/-20%	970	< 0.09( 50 mT, 500 kHz, 100 °C)	B65805P0000R049
N92	1900 +30/-20%	1080	< 0.29 (200 mT, 100 kHz, 100 °C)	B65805P0000R092
N87	2400 +30/-20%	1360	< 0.26 (200 mT, 100 kHz, 100 °C)	B65805P0000R087

<sup>1)</sup> Preliminary data



Ferrites and accessories

### 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 their special behavior under mechanical load.

Just like any ceramic material, ferrite cores are brittle and sensitive to any shock, fast changing or tensile load. Especially fast cooling rates under ultrasonic cleaning, high static and 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<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 the value for the initial permeability. Thus, the embedding medium should offer 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 irreversibly when exposed to strong magnetic fields.

#### **Processing notes**

- The start of the winding process should be soft. Otherwise, the flanges may be destroyed.
- Excessive winding forces may damage the flanges or squeeze the tube so that the cores can no longer be mounted.
- Excessive soldering time at high temperature (>300 °C) may affect 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 contamination with tin oxide (SnO) from the tin bath or burned insulation from the wire. For detailed information see Data Book 2007, chapter "Processing notes, 2.2".
- The dimensions of the pin hole arrangement are fixed and should be understood as an ideal recommendation for drilling the printed circuit board. In order to avoid problems when mounting the transformer, customers should make allowances for manufacturing tolerances in the drilling and pick-and-place processes by increasing the diameter of the pin holes.



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