



## **Ferrites and accessories**

RM 6, RM 6 LP  
Cores and accessories

**Series/Type:** B65807, B65808, B65821, B65659

**Date:** September 2006/October 2007/January 2010

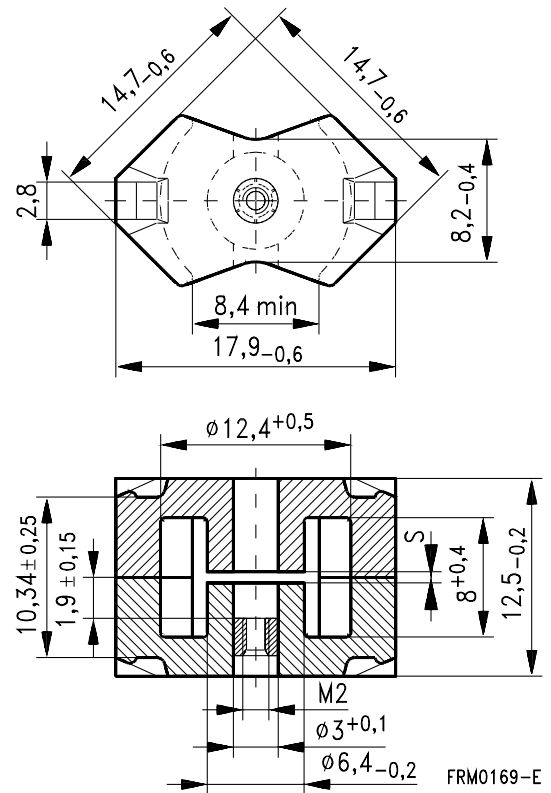
- To IEC 62317-4
- Core without center hole for transformer applications
- Delivery mode: sets

**Magnetic characteristics (per set)**

	with center hole	without center hole	
$\Sigma l/A$	0.86	0.78	mm <sup>-1</sup>
$l_e$	26.9	28.6	mm
$A_e$	31.3	36.6	mm <sup>2</sup>
$A_{min}$	—	31	mm <sup>2</sup>
$V_e$	840	1050	mm <sup>3</sup>

**Approx. weight (per set)**

m	4.9	5.1	g


**Gapped**

Material	$A_L$ value nH	s approx. mm	$\mu_e$	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%	0.60	43.2	B65807+0063A033
	100 ±3%	0.38	68.5	B65807+0100A033
N48	160 ±3%	0.22	109	B65807+0160A048
	250 ±3%	0.12	171	B65807+0250A048
	315 ±3%	0.08	215	B65807+0315A048
	400 ±3%	0.05	274	B65807+0400A048
N41	250 ±3%	0.17	155	B65807J0250A041

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

**Ungapped**

Material	A <sub>L</sub> value nH	μ <sub>e</sub>	P <sub>V</sub> W/set	Ordering code -C with center hole -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
N41	3100 +30/-20%	1930	< 0.16 (200 mT, 25 kHz, 100 °C)	B65807J0000R041

**Coil former, squared pins**

Material: GFR thermosetting plastic (UL 94 V-0, insulation class to IEC 60085:  
 $H \triangleq$  max. operating temperature 180 °C), color code black  
 Sumikon PM 9630® [E41429 (M)], SUMITOMO BAKELITE CO LTD

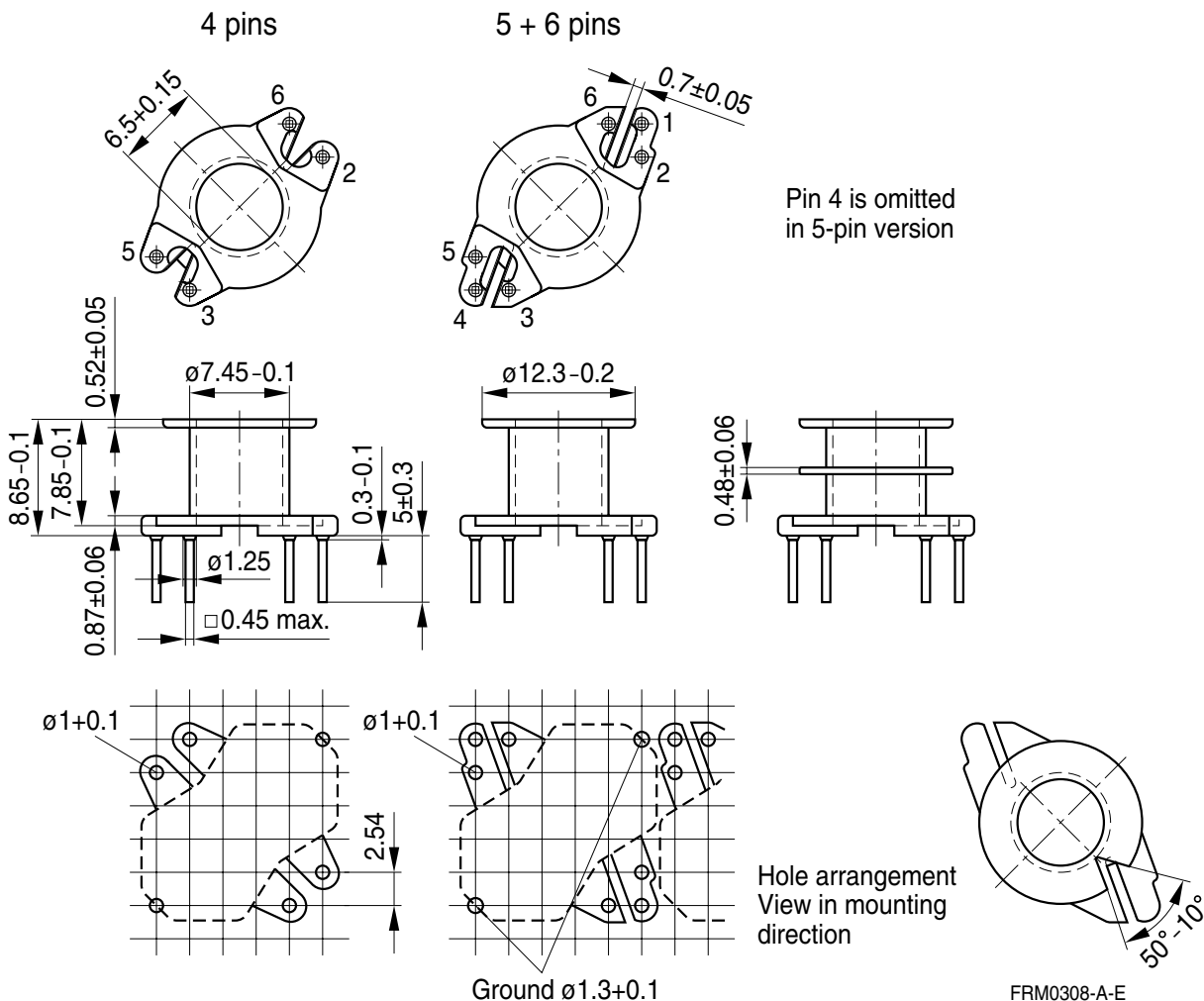
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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

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

For matching clamp and insulating washers see page 8.

Sections	$A_N$ mm <sup>2</sup>	$l_N$ 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



**Coil former, pins squared in the start-of-winding area**

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

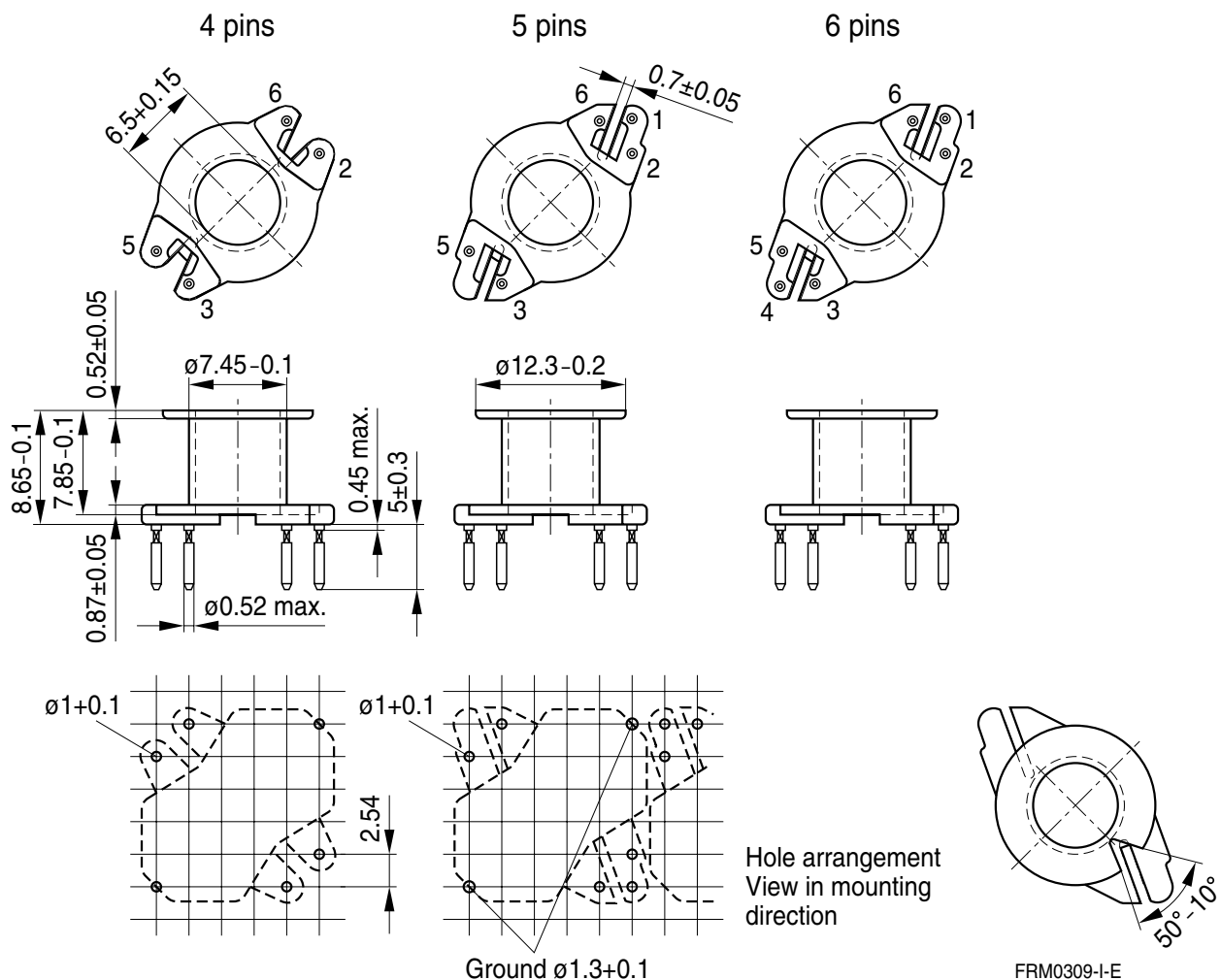
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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"

For matching clamp and insulating washers see page 8.

Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	15	30	69	4 5 6	B65808K1004D001 B65808K1005D001 B65808K1006D001



**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
- Pins squared in the start-of-winding area
- Optimized for use with automatic winding machines

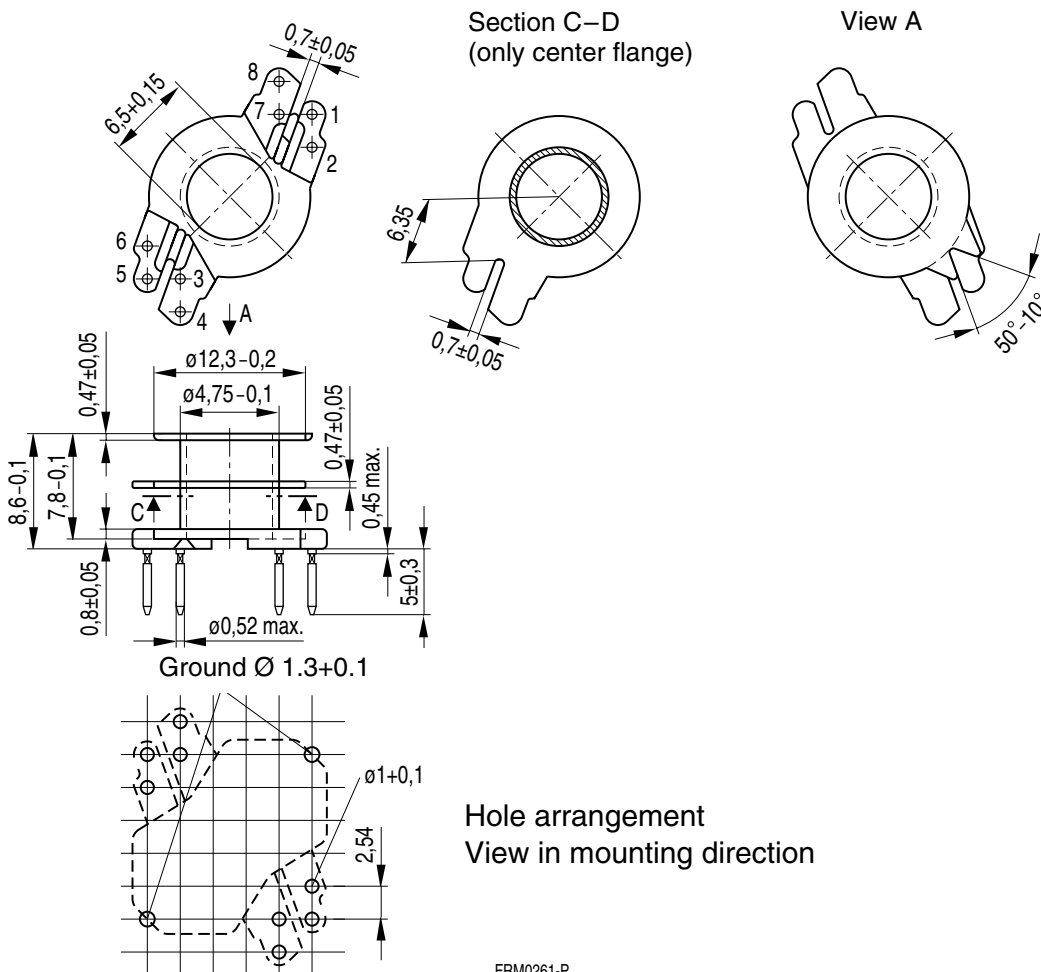
Material: GFR thermosetting plastic (UL 94 V-0, insulation class to IEC 60085: H  $\geq$  max. operating temperature 180 °C), color code black  
Sumikon PM 9630® [E41429 (M)], SUMITOMO BAKELITE CO LTD

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

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

Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
2	14	30	73	8	B65808S1108D002



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

Optimized for automatic winding

 Material: GFR polyterephthalate (UL 94 V-0, insulation class to IEC 60085:  
 $F \triangleq$  max. operating temperature 155 °C), color code black  
 Valox 420-SE0® [E45329 (M)], GE PLASTICS B V

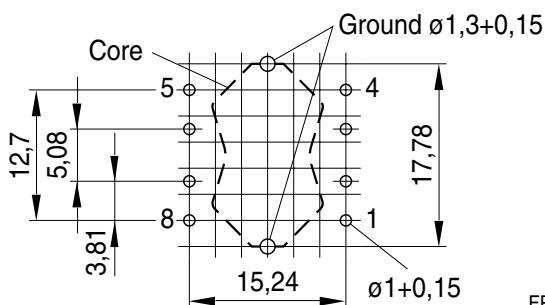
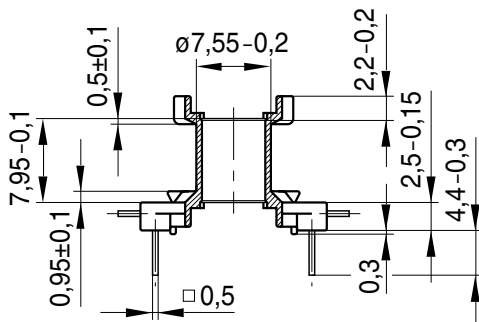
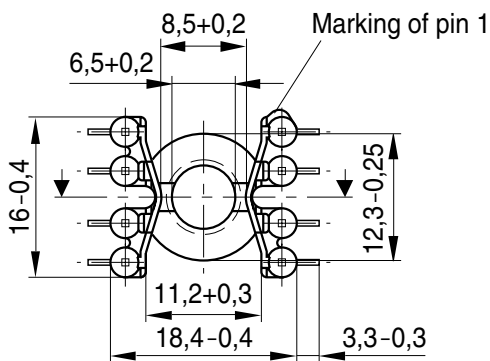
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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"

For matching clamp and insulating washer 1 see page 8.

Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	15	30	69	8	B65808E1508T001


 Hole arrangement  
 View in mounting direction

FRM0298-Y

**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
- Also available as strip clamp on reels on request

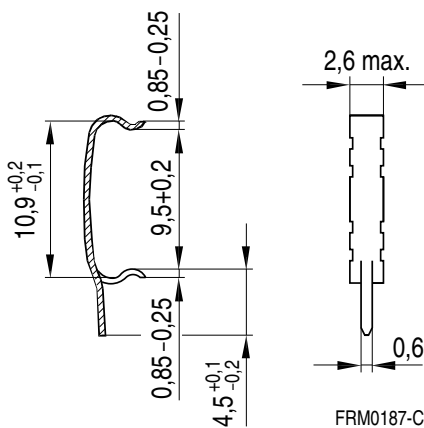
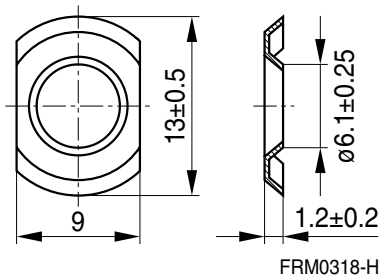
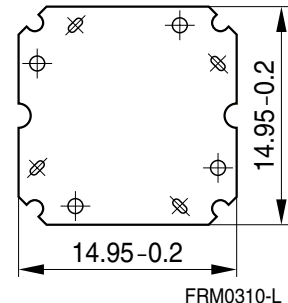
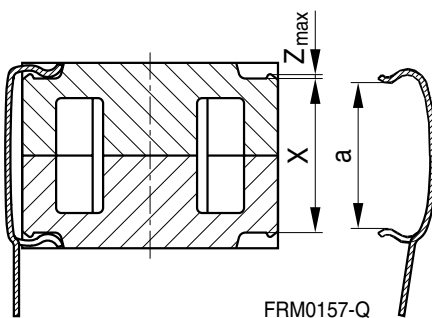
**Insulating washer 1** between core and coil former

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

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

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

	Ordering code
Clamp (ordering code per piece, 2 are required)	B65808A2203X000
Insulating washer 1 (reel packing, PU = 1 reel)	B65808A5000X000
Insulating washer 2 (bulk)	B65808C2005X000

**Clamp**

**Insulating washer 1**

**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 $Z_{max}$ (mm)		0.22
Height of core pair X (mm)	$X_{min}$	10.1
	$X_{max}$	10.6
Clamping force F (N)	$F_{min}$	7
	$F_{max}$	50



**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

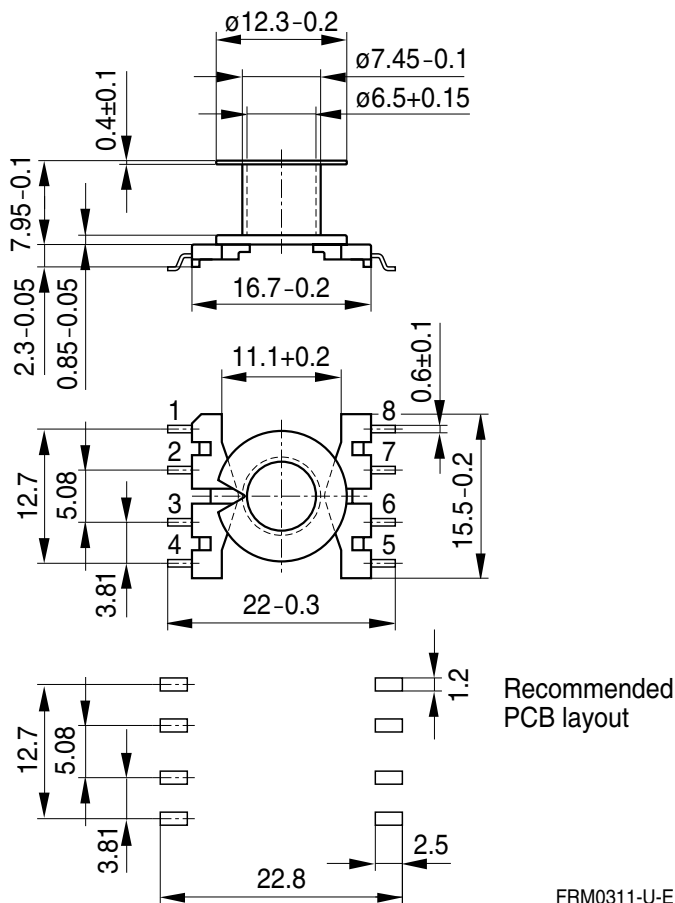
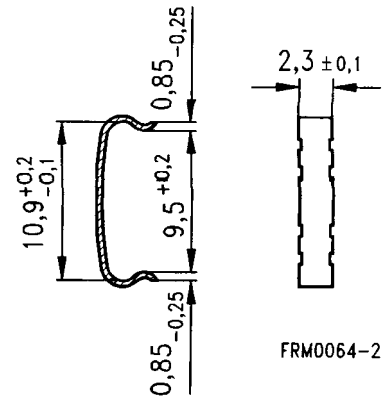
Resistance to soldering heat: to IEC 60068-2-58, test Td, method 6 (Group 3): 255 °C, 10 s  
 permissible soldering temperature for wire-wrap connection on coil former: 400 °C, 1 s

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

**Clamp**

- Without ground terminal, made of stainless spring steel, 0.435 mm thick
- Also available as strip clamp on request

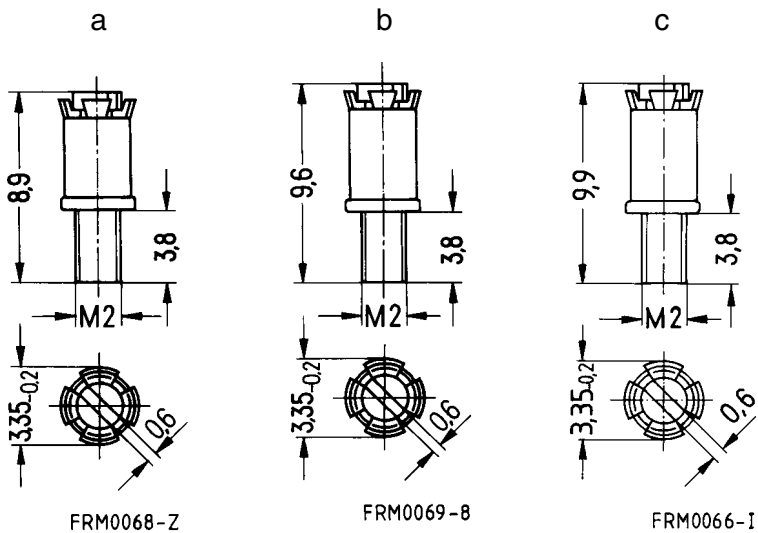
Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Terminals	Ordering code
1	16.2	31	66	8	B65821C1008T001
Clamp(ordering code per piece, 2 are required)					B65808J2204X000

**Coil former**

**Clamp**


**Adjusting screw**

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

Figure	Tube core			Ordering code
	Ø × length (mm)	Material	Color code	
a	2.62 × 3.6	N22	red	B65659F0001X023
b	2.75 × 4.4	N22	black	B65659F0003X023
c	2.82 × 4.4	N22	yellow	B65659F0004X023



**RM 6 »Low Profile«**
**Core**
**B65807P**

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

**Magnetic characteristics (per set)**

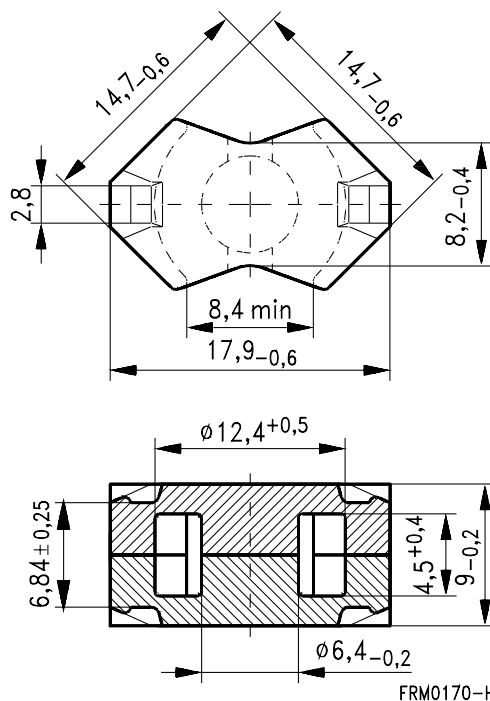
$$\Sigma l/A = 0.58 \text{ mm}^{-1}$$

$$l_e = 21.8 \text{ mm}$$

$$A_e = 37.5 \text{ mm}^2$$

$$A_{\text{min}} = 31.2 \text{ mm}^2$$

$$V_e = 820 \text{ mm}^3$$

**Approx. weight 4.0 g/set**

**Ungapped**

Material	$A_L$ value nH	$\mu_e$	$P_V$ W/set	Ordering code
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

### **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.

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