



Ferrites and accessories

RM 6, RM 6 LP
Cores and accessories

Series/Type: B65807, B65808, B65821, B65659
Date: September 2006

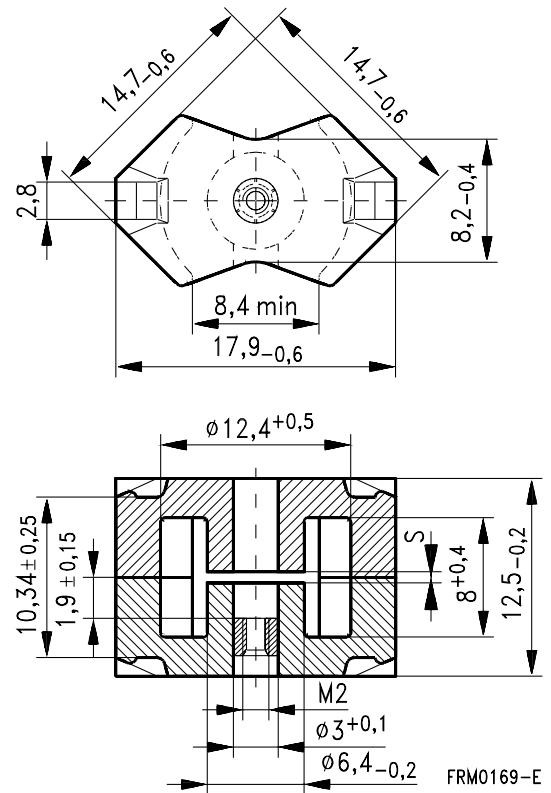
- To IEC 62317-4
- Core without center hole for transformer applications
- Delivery mode: sets

Magnetic characteristics (per set)

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

Approx. weight (per set)

m	4.9	5.1	g


Gapped

Material	A_L value nH	s approx. mm	μ_e	Ordering code ¹⁾ -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 _L value nH	μ _e	P _V 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

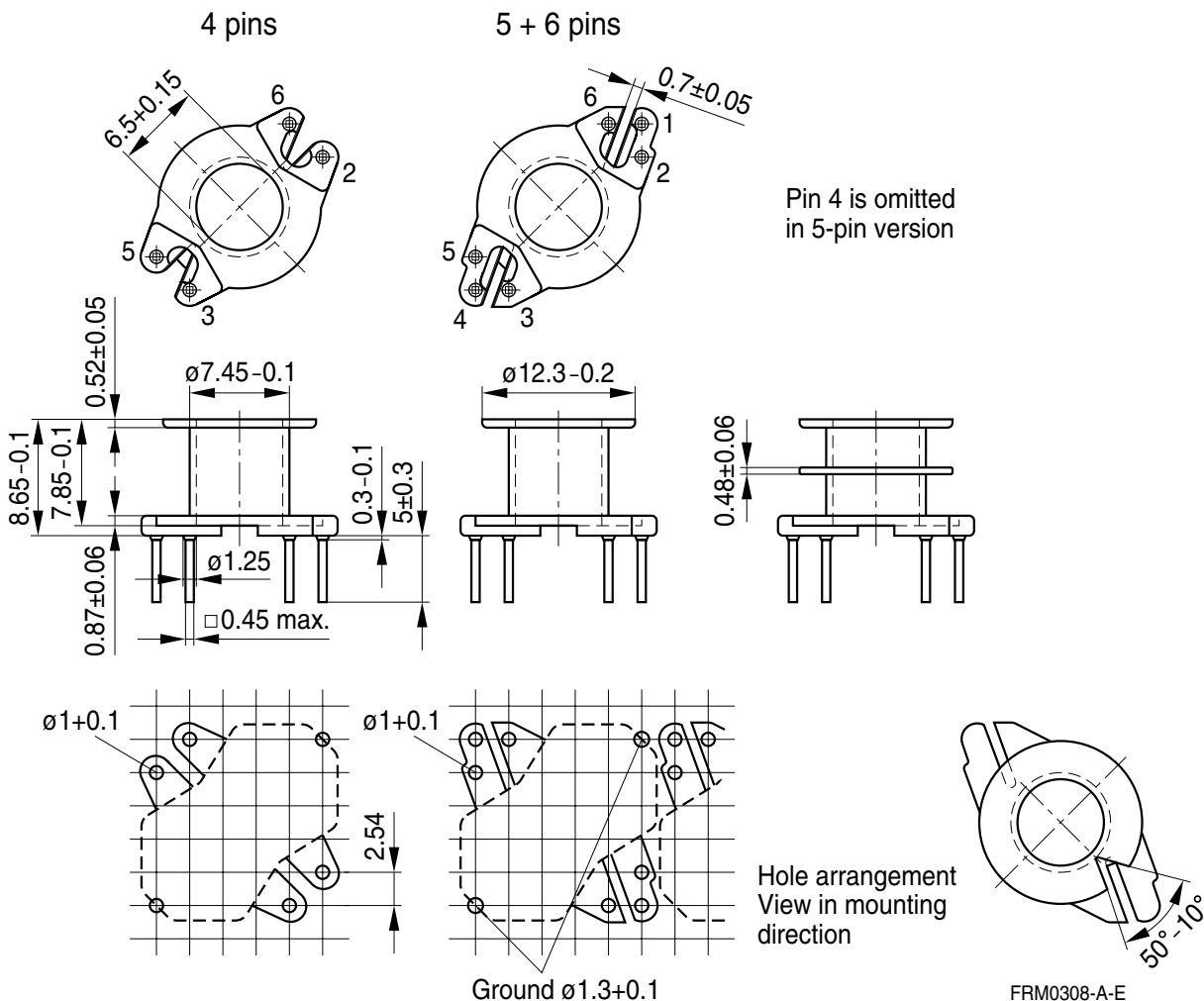
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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 ²	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

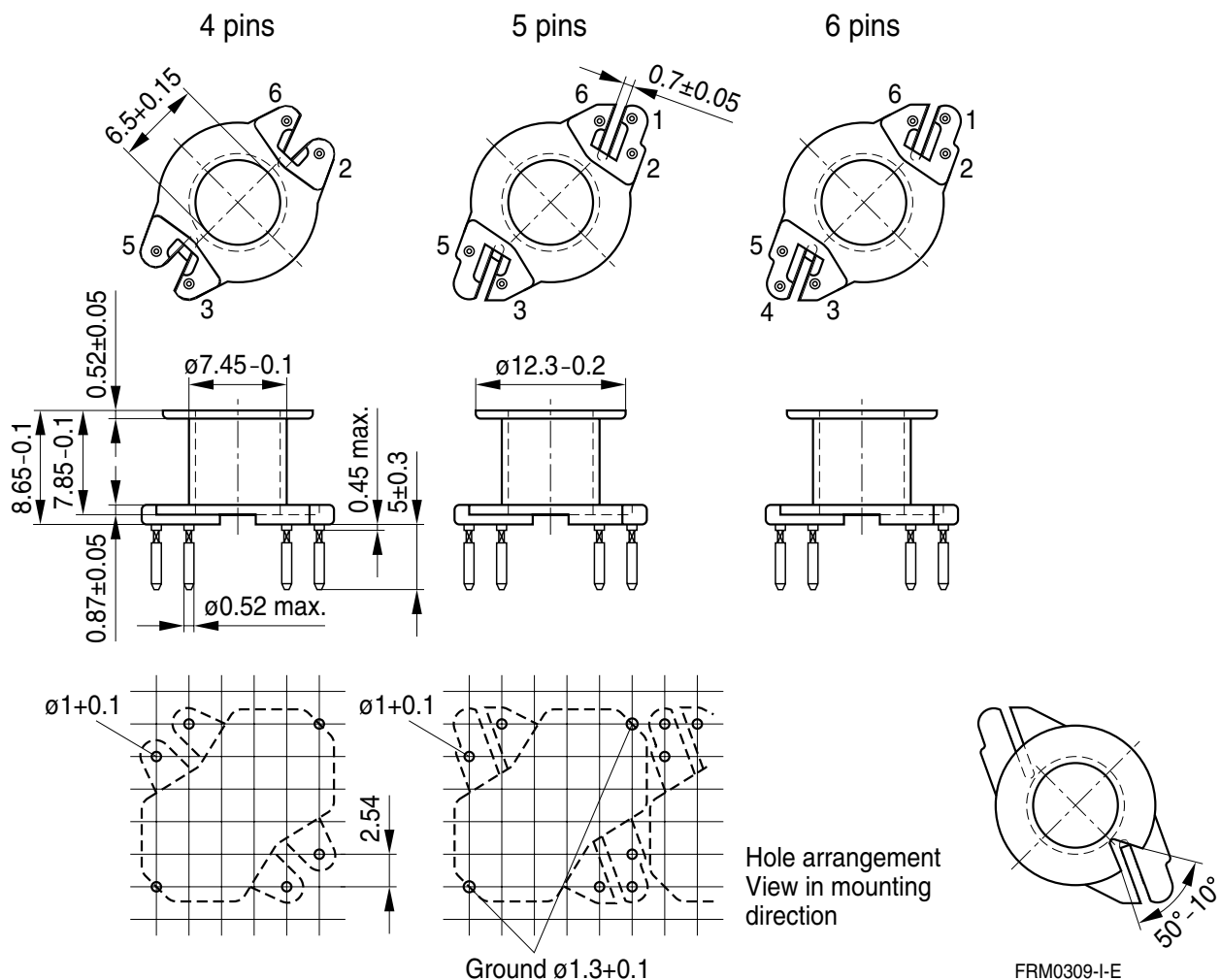
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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 ²	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

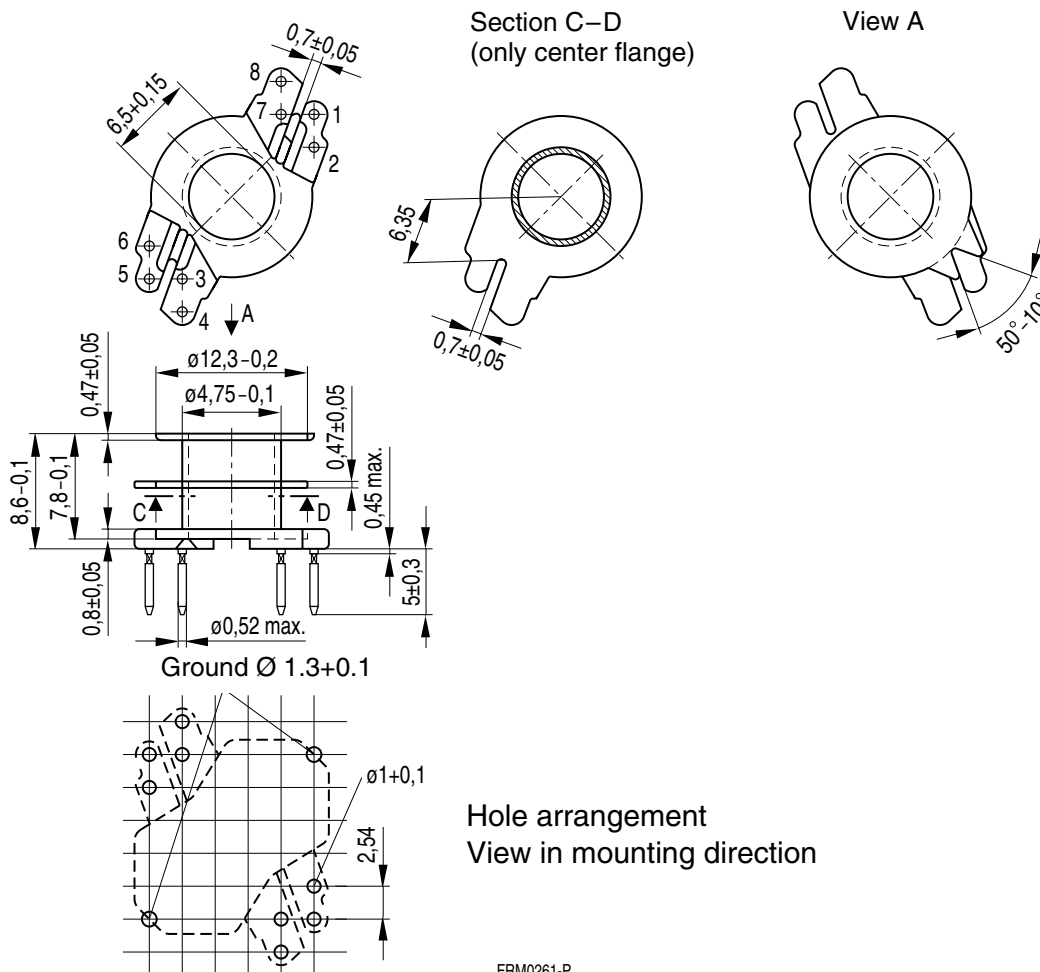
Material: GFR thermosetting plastic (UL 94 V-0, insulation class to IEC 60085: F \triangleq max. operating temperature 155 °C), color code green
 Vyncolit/X611® [E167521 (M)], VYNCOLIT NV

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 ²	l_N mm	A_R value $\mu\Omega$	Pins	Ordering code
2	14	30	73	8	B65808X1108D002



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

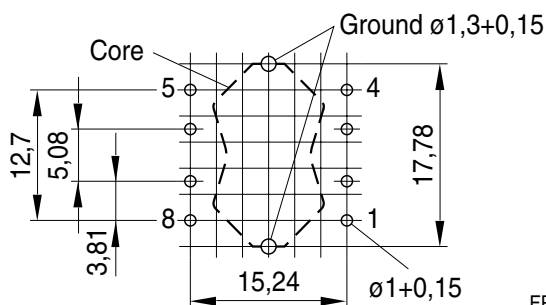
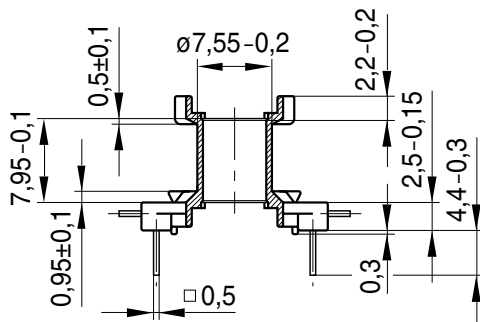
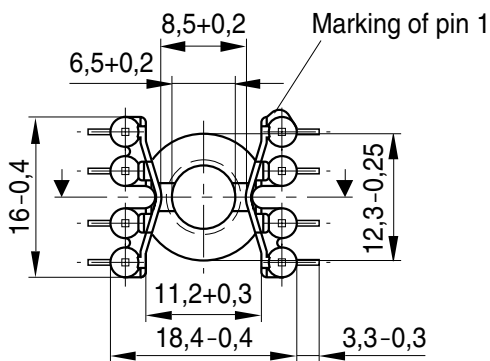
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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 ²	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), 0.435 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

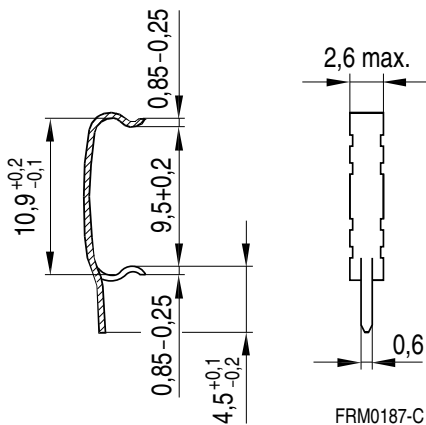
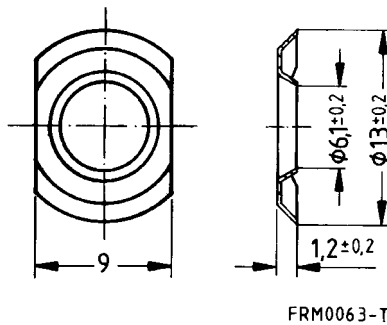
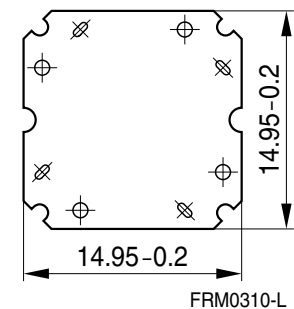
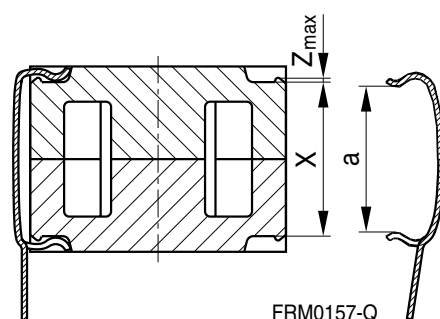
Insulating washer 1 between core and coil former

- For tolerance compensation and for insulation
- Made of polycarbonate (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), 0.3 mm thick Makrofol DPF 5026, [E41613 (M)], natural color, BAYER MATERIALSCIENCE AG

	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 (preliminary data)

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

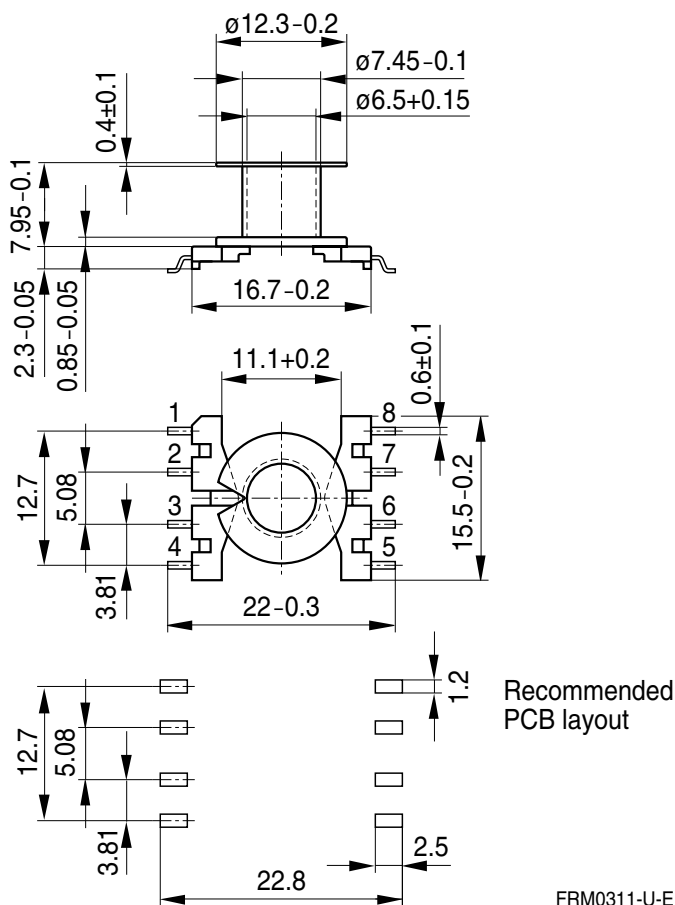
Resistance to soldering heat: to IEC 60068-2-58, test Td, method 6 (Group 3): 255 °C, 10 s
 permissible soldering temperature for wire-wrap connection on coil former: 400 °C, 1 s

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

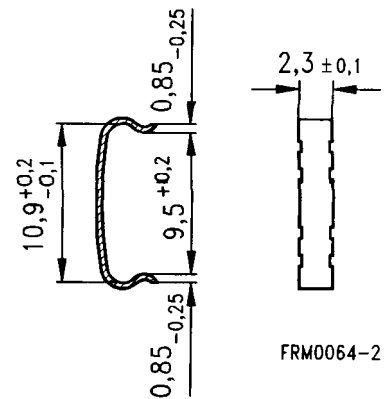
Clamp

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

Sections	A_N mm ²	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


FRM0311-U-E

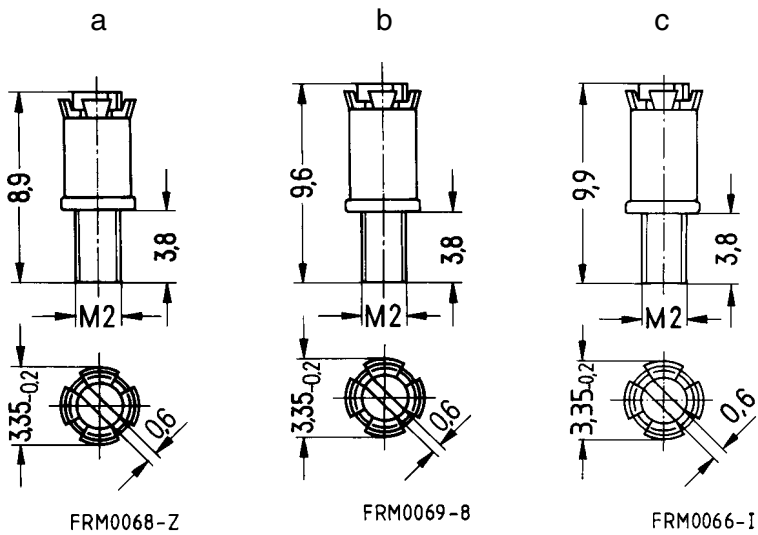
Clamp


FRM0064-2

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)

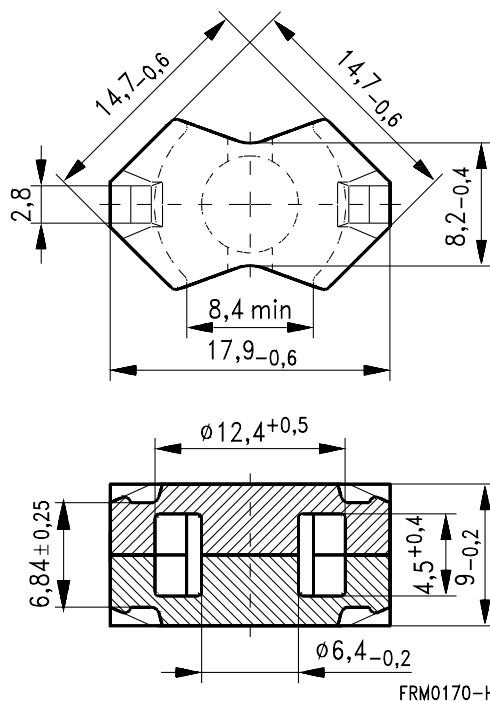
$$\Sigma l/A = 0.58 \text{ mm}^{-1}$$

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

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

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

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

Approx. weight 4.0 g/set

Ungapped

Material	A_L value nH	μ_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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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, EPCOS 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 passive 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 a passive 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 a passive electronic component.
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