



Ferrites and accessories

RM 5, RM 5 LP
Cores and accessories

Series/Type: B65805, B65806, B65822, B65539

Date: September 2006/October 2007

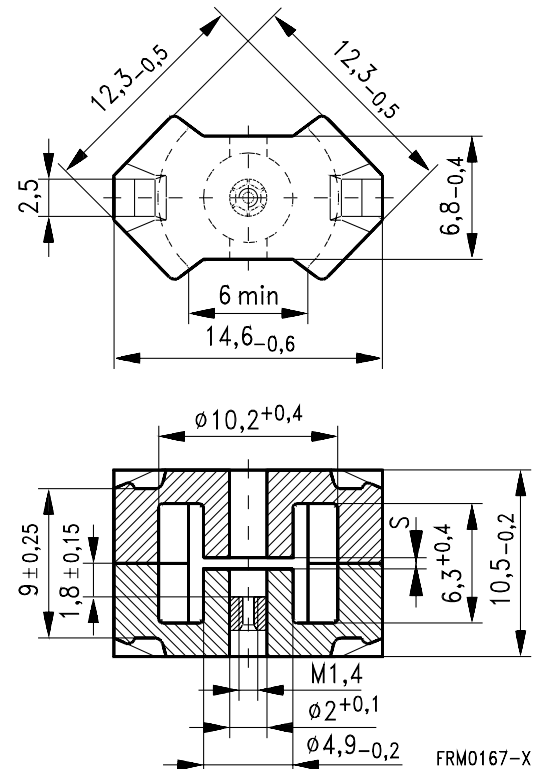
- To IEC 62317-4
- Core without center hole
for transformer applications
- Delivery mode: sets

Magnetic characteristics (per set)

	with center hole	without center hole	
$\Sigma l/A$	1.0	0.93	mm^{-1}
l_e	20.8	22.1	mm
A_e	20.8	23.8	mm^2
$A_{\min}$	—	18	mm^2
V_e	433	526	mm^3

Approx. weight (per set)

m	2.9	3.0	g
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Gapped

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

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

Ungapped

Material	A _L value	μ_e	P _V	Ordering code
	nH		W/set	-C with center hole -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

Coil former

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

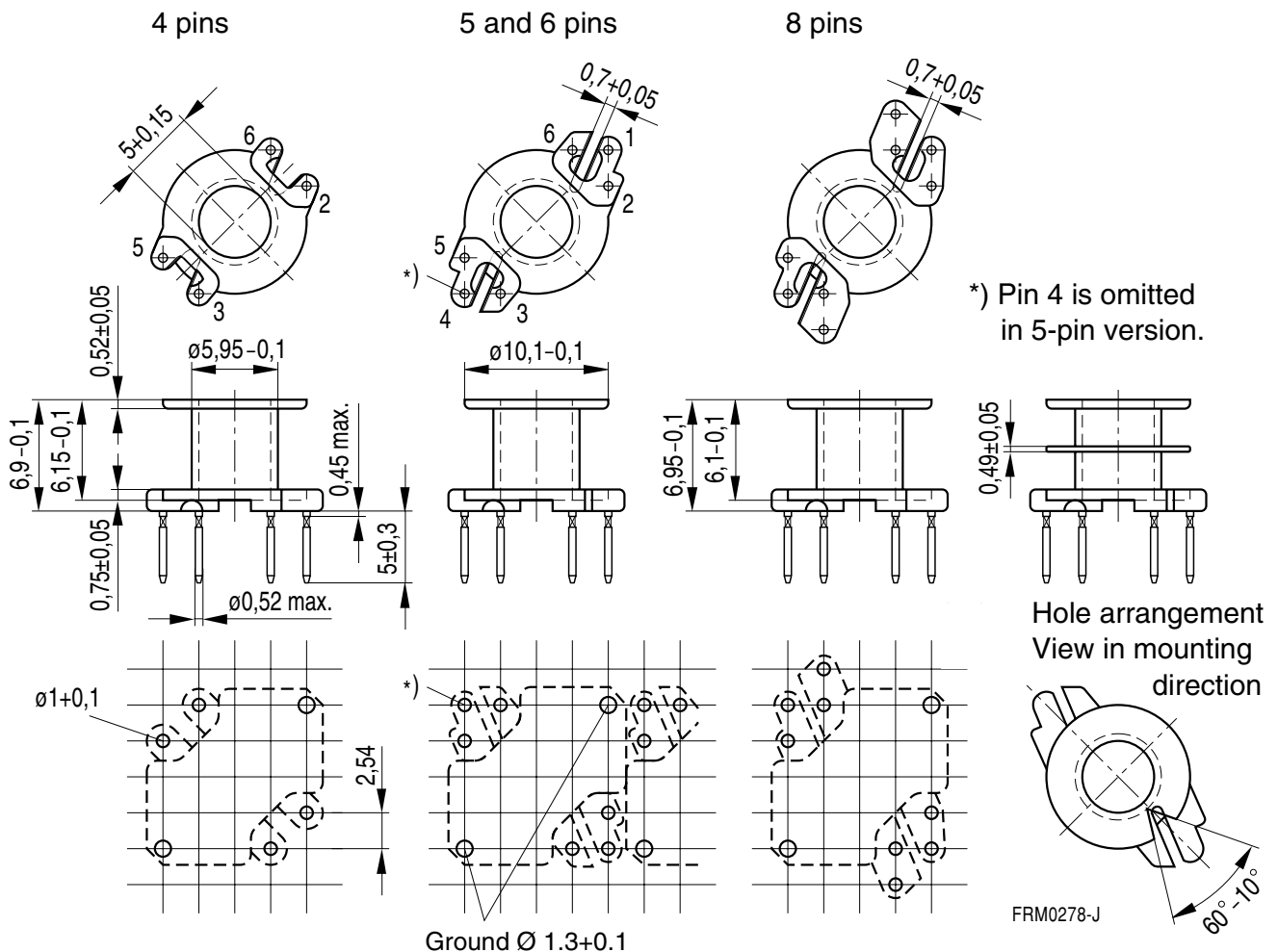
Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 s

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

Pins squared in the start-of-winding area.

For matching clamps and insulating washers see page 5.

Sections	A_N mm ²	l_N mm	A_R value $\mu\Omega$	Pins	Ordering code
1	9.5	25	90	4 5 6 8	B65806K1004D001 B65806K1005D001 B65806K1006D001 B65806K1008D001
2	8.7	25	94	6	B65806K1006D002



Clamp

- With ground terminal, made of stainless spring steel (tinned), 0.335 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

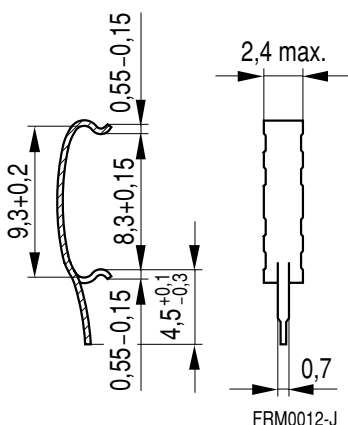
- For tolerance compensation and for insulation
- Made of polycarbonate (UL 94 V-0, insulation class to IEC 60085: E $\geq$ 120 °C), 0.08 mm thick Aryphan F685, [E167358 (M)], natural color, LOFO HIGH TECH FILM GMBH

Insulating washer 2 for double-clad PCBs

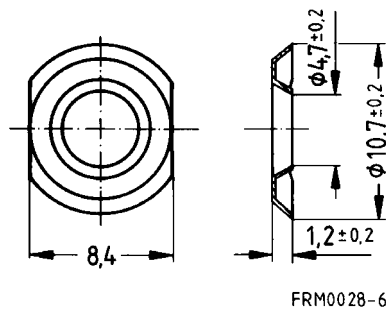
- Made of polycarbonate (UL 94 V-0, insulation class to IEC 60085: E $\geq$ 120 °C), 0.3 mm thick Makrofol FR, [E118859(M)], natural color, BAYER MATERIALSCIENCE L L C

	Ordering code
Clamp (ordering code per piece, 2 are required)	B65806A2203X000
Insulating washer 1 (reel packing, PU = 1 reel)	B65806A5000X000
Insulating washer 2 (bulk)	B65806D2005X000

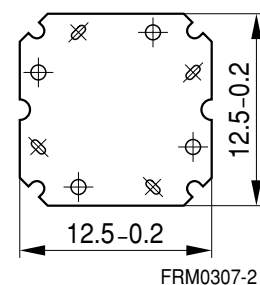
Clamp



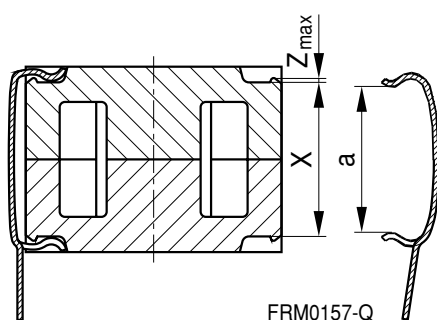
Insulating washer 1 (preliminary data)



Insulating washer 2



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_{max} (mm)	0.15
Height of core pair X (mm)	X_{min} 8.75 X_{max} 9.25
Clamping force F (N)	F_{min} 5 F_{max} 40



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"

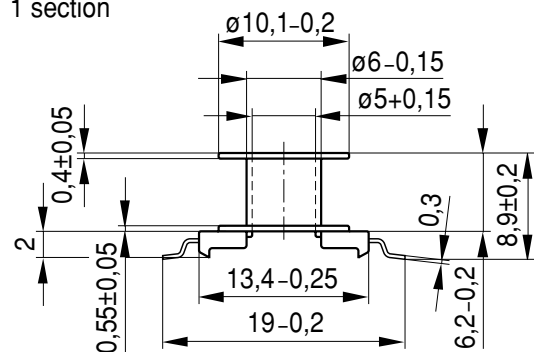
Clamp

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

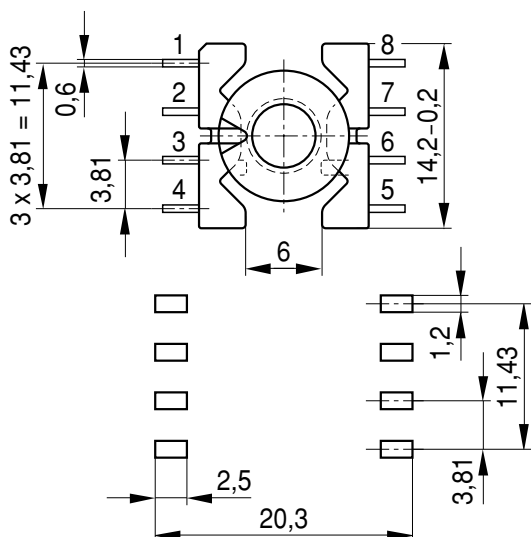
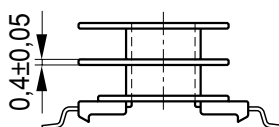
Sections	A_N mm ²	l_N mm	A_R value $\mu\Omega$	Terminals	Ordering code
1	11.1	25	77	8	B65822F1008T001
2	10.2	25	85	8	B65822F1008T002
Clamp(ordering code per piece, 2 are required)					B65806J2204X000

Coil former

1 section



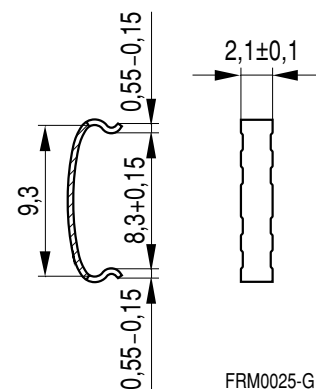
2 sections



Recommended
PCB layout

FRM0296-H

Clamp



FRM0025-G



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

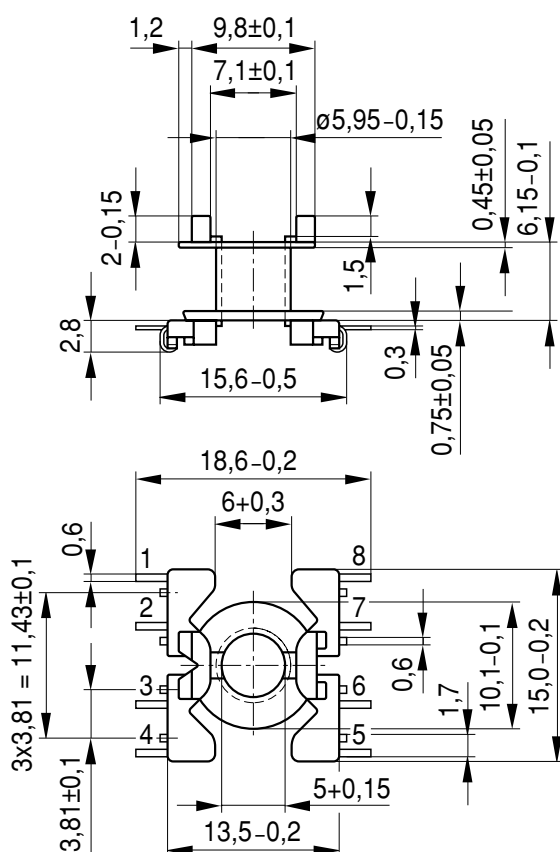
Winding: see Data Book 2007, chapter “Processing notes, 2.1”

Clamp

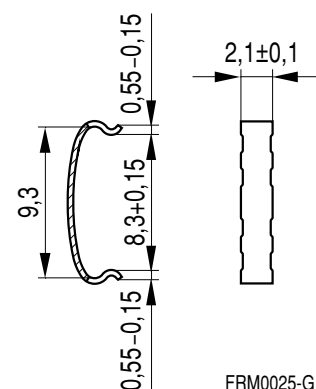
- Without ground terminal, made of stainless spring steel, 0.335 mm thick
- Also available as strip clamp (each carton containing 2 reels) on request

Sections	A _N mm ²	l _N mm	A _R value μΩ	Terminals	Ordering code
1	11.1	25	73	8	B65822J1008T001
Clamp(ordering code per piece, 2 are required)					B65806J2204X000

Coil former

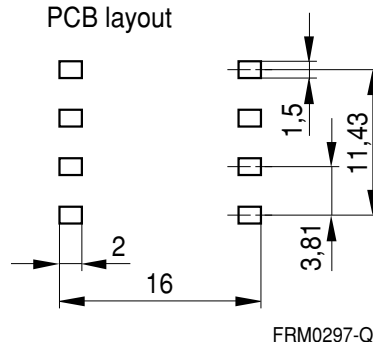


Clamp



FRM0025-G

Recommended PCB layout

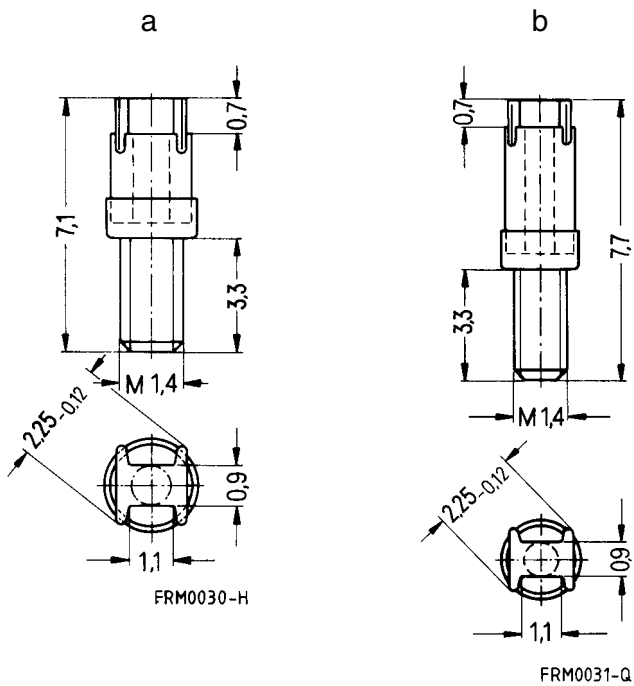


FRM0297-Q

Adjusting screw

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

Figure	Tube core $\varnothing \times \text{length (mm)}$	Material	Color code	Ordering code
a	1.81 × 2.0	K1	yellow	B65539C1003X001
a	1.81 × 2.7	K1	gray	B65539C1002X001
a	1.81 × 2.7	N22	red	B65539C1002X022
b	1.81 × 3.4	N22	green	B65806C3001X022



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

Magnetic characteristics (per set)

$$\Sigma l/A = 0.71 \text{ mm}^{-1}$$

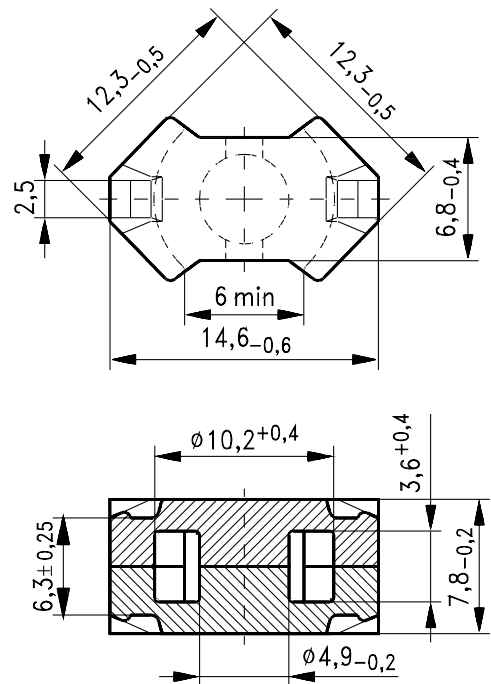
$$l_e = 17.5 \text{ mm}$$

$$A_e = 24.5 \text{ mm}^2$$

$$A_{\min} = 18 \text{ mm}^2$$

$$V_e = 430 \text{ mm}^3$$

Approx. weight 2.6 g/set



FRM0168-6

Ungapped

Material	A_L value nH	μ_e	P_V W/set	Ordering code
T38 ¹⁾	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

1) Preliminary data

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 ($>300\text{ °C}$) 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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