



## Ferrites and accessories

RM 10, RM 10 LP  
Cores and accessories

**Series/Type:** B65813, B65814, B65679

**Date:** September 2006/January 2010/March 2010/June 2011

The following products presented in this data sheet are being withdrawn.

Ordering Code	Substitute Product	Date of Withdrawal	Deadline Last Orders	Last Shipments
B65814K1012D001	B65814P1012D001	2011-04-19		

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<b>RM 10</b>	
<b>Core</b>	<b>B65813</b>

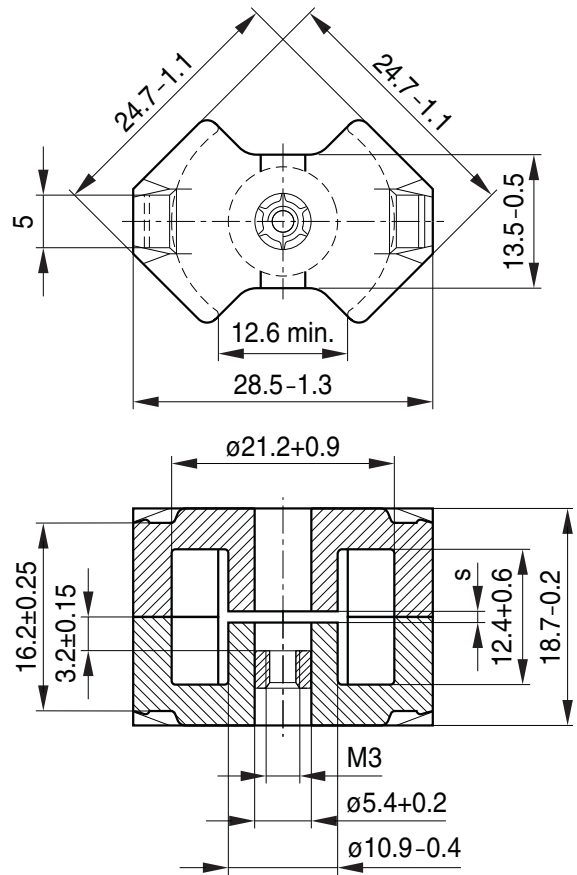
- To IEC 62317-4
- Cores without center hole for transformer applications
- Delivery mode: sets

**Magnetic characteristics (per set)**

	with center hole	without center hole	
$\Sigma l/A$	0.5	0.45	mm <sup>-1</sup>
$l_e$	42	44	mm
$A_e$	83	98	mm <sup>2</sup>
$A_{min}$	—	90	mm <sup>2</sup>
$V_e$	3490	4310	mm <sup>3</sup>

**Approx. weight (per set)**

m	20.7	22	g
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FRM0316-

**Gapped**

Material	$A_L$ value nH	s approx. mm	$\mu_e$	Ordering code <sup>1)</sup> -D with center hole -N with threaded sleeve -J without center hole
N48	400 ± 3%	0.21	161	B65813+0400A048
	630 ± 3%	0.13	254	B65813+0630A048
N41	250 ± 3%	0.44	89	B65813J0250A041
	630 ± 5%	0.13	225	B65813J0630J041
	1600 ± 10%	0.04	572	B65813J1600K041

1) Replace the + by the code letter “D” or “N” for the required version.

**RM 10**
**Core**
**B65813**
**Ungapped**

Material	A <sub>L</sub> value nH	μ <sub>e</sub>	P <sub>V</sub> W/set	Ordering code -J without center hole
N30	7600 +30/-20%	2720		B65813J0000R030
T38	16000 +40/-30%	5720		B65813J0000Y038
N49	2900 +30/-20%	1040	< 0.75 ( 50 mT, 500 kHz, 100 °C)	B65813J0000R049
N87	4200 +30/-20%	1500	< 2.30 (200 mT, 100 kHz, 100 °C)	B65813J0000R087
N97	4200 +30/-20%	1500	< 2.00 (200 mT, 100 kHz, 100 °C)	B65813J0000R097
N41	5500 +30/-20%	1960	< 0.80 (200 mT, 25 kHz, 100 °C)	B65813J0000R041

**Coil former**

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

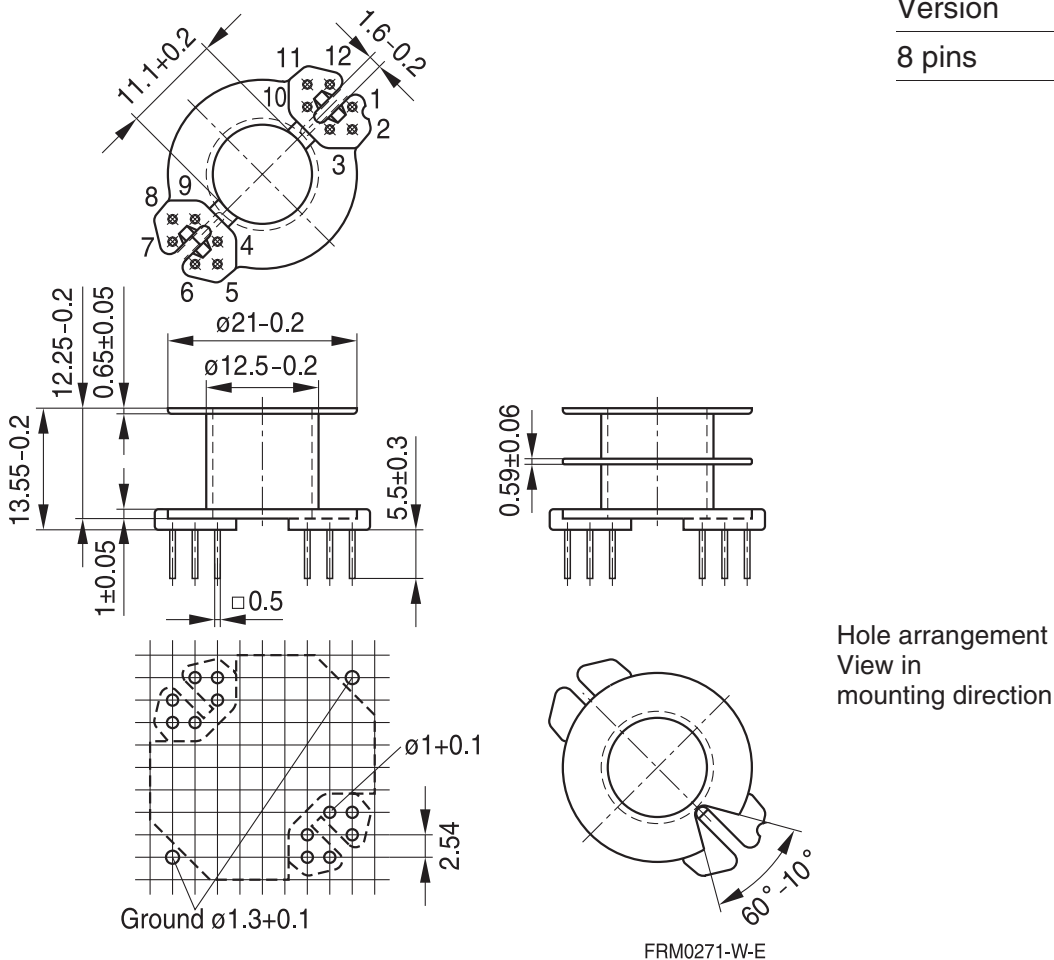
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s  
 Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 s  
 Winding: see Data Book 2007, chapter "Processing notes, 2.1"

Squared pins.  
 For matching clamp and insulating washers see page 7.

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	A <sub>R</sub> value μΩ	Pins	Ordering code
1	41.5	52	43	8 12	B65814N1008D001 B65814N1012D001
2	39	52	46	8	B65814N1008D002

12 pins

Version	Pins omitted
8 pins	2, 5, 8, 11



**Coil former**

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

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

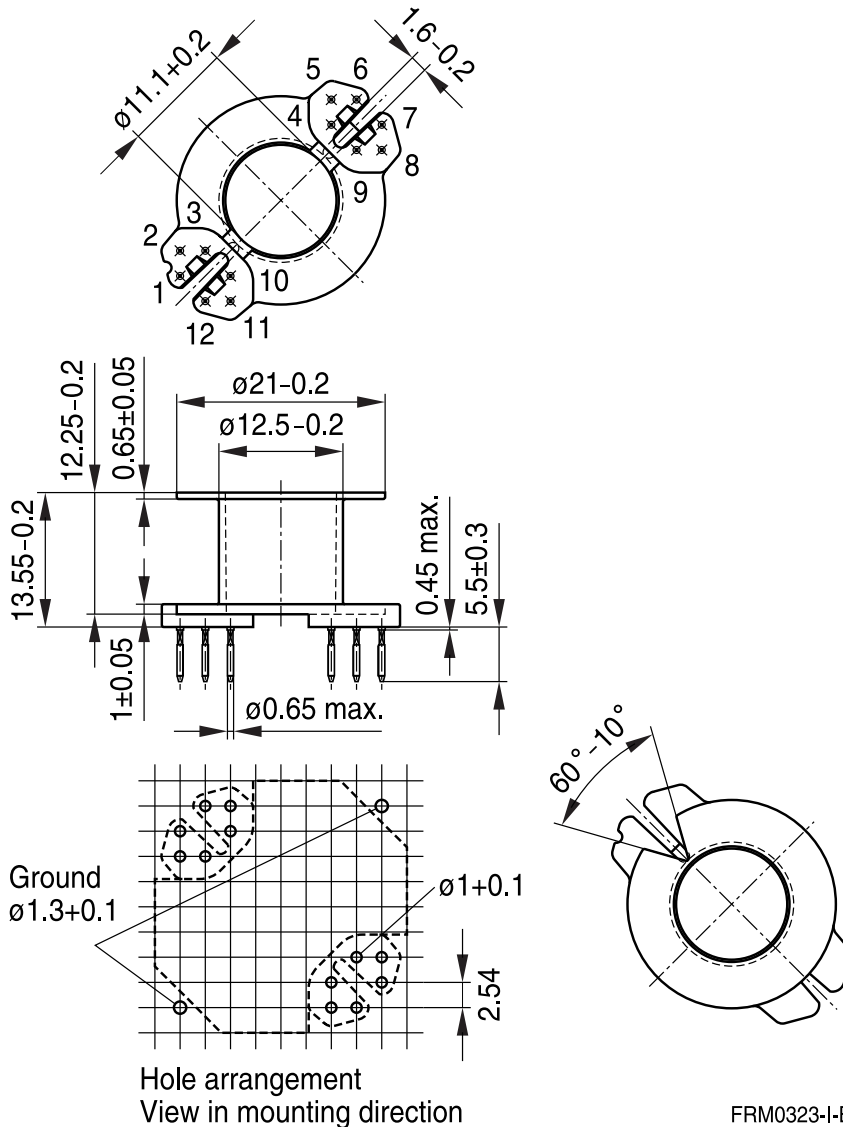
Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 s

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

Squared pins.

For matching clamp and insulating washers see page 7.

Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	41.5	52	43	12	B65814P1012D001



**Coil former for power applications**

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

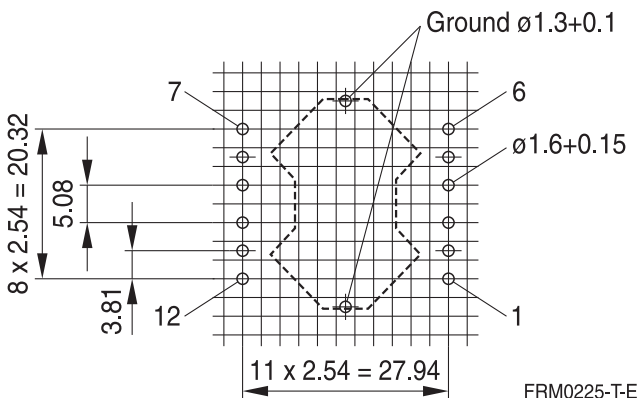
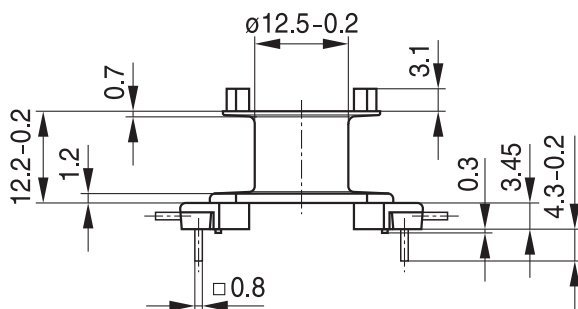
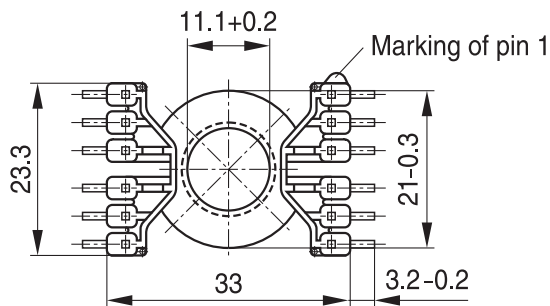
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

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 7.

Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	41.5	52	43	12	B65814C1512T001



Hole arrangement  
View in mounting direction  
(Note half pitch!)

FRM0225-T-E

<b>RM 10</b>	
<b>Core</b>	<b>B65679</b>

### 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

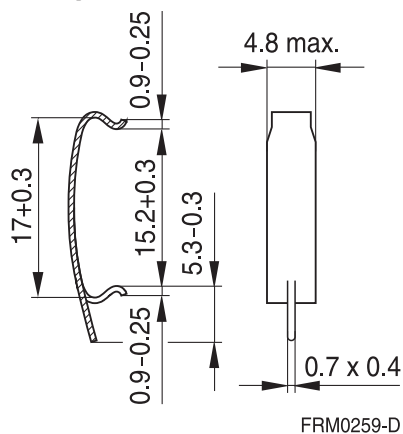
- For tolerance compensation and for insulation
- Made of polyarylate (UL 94 V-0, insulation class to IEC 60085: E  $\geq$  120 °C), 0.08 mm thick Aryphan F685, [E167358 (M)], natural color, LOFO HIGH TECH FILM GMBH

### Insulating washer 2 for double-clad PCBs

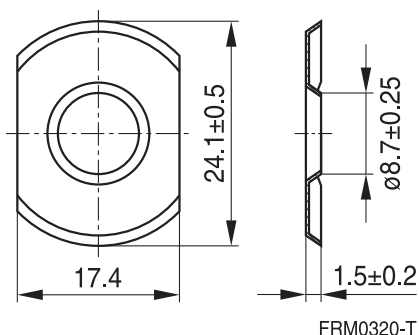
- Made of polycarbonate film (UL 94 V-0, insulation class to IEC 60085: E  $\geq$  120 °C), 0.25 mm thick Makrofol FR, [E118859 (M)], natural color, BAYER MATERIALSCIENCE LLC

	Ordering code
Clamp (ordering code per piece, 2 are required)	B65814B2203X000
Insulating washer 1 (reel packing, PU = 1 reel)	B65814B5000X000
Insulating washer 2 (bulk)	B65814B2005X000

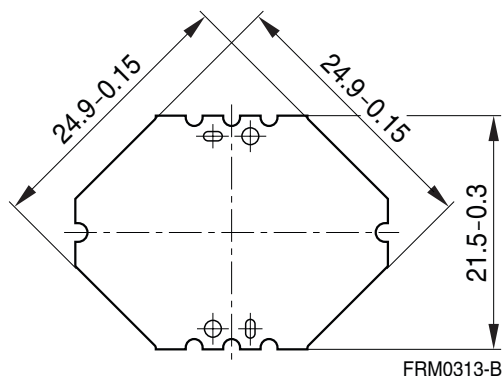
### Clamp



### Insulating washer 1 (preliminary data)



### Insulating washer 2



**RM 10 »Low Profile«**

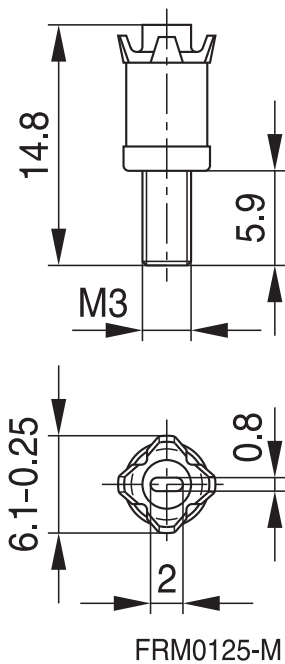
**Core**

**B65813P**

**Adjusting screw**

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

Tube core			Ordering code
∅ × length (mm)	Material	Color code	
4.55 × 6.3	N22	red	B65679E0003X022
4.98 × 6.3	N22	black	B65679E0002X022





**RM 10 »Low Profile«**
**Core**
**B65813P**

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

**Magnetic characteristics (per set)**

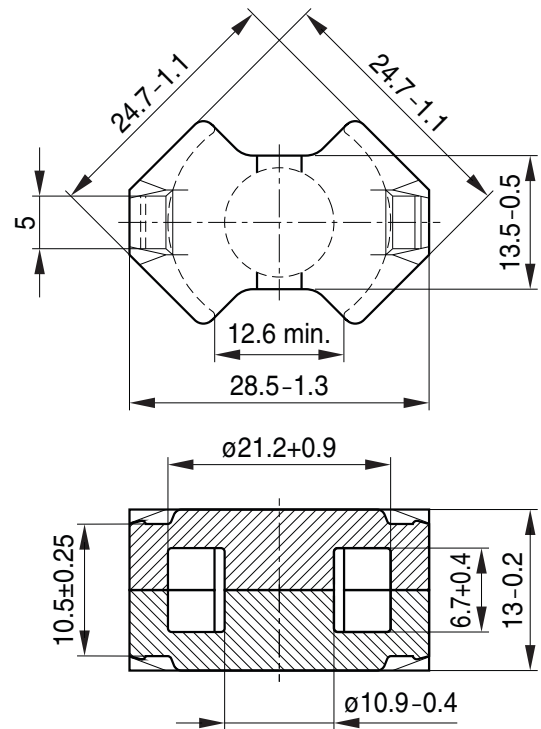
$$\Sigma l/A = 0.34 \text{ mm}^{-1}$$

$$l_e = 33.9 \text{ mm}$$

$$A_e = 99.1 \text{ mm}^2$$

$$A_{\min} = 90.0 \text{ mm}^2$$

$$V_e = 3360 \text{ mm}^3$$

**Approx. weight 17.2 g/set**


FRM0317-9

**Ungapped**

Material	$A_L$ value	$\mu_e$	$P_V$	Ordering code
	nH		W/set	
N49	3700 +30/-20%	1000	< 0.62 ( 50 mT, 500 kHz, 100 °C)	B65813P0000R049
N92	4000 +30/-20%	1090	< 1.90 (200 mT, 100 kHz, 100 °C)	B65813P0000R092
N87	5200 +30/-20%	1410	< 1.72 (200 mT, 100 kHz, 100 °C)	B65813P0000R087

### **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 $A_L$ 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 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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