

# RM 5 Core and Accessories

Individual parts	Part no.	Page
Adjusting screwdriver (for assembly only)	B63399	204
Matching handle	B63399	204
Adjusting screw	B65539 B65806	204
Core	B65805	198
Clamps	B65806	201
Insulating washer 1	B65806	201
Coil former	B65806	200
Core	B65805	198
Threaded sleeve (glued-in)		
Insulating washer 2	B65806	201

FRM0005-2

Example of an assembly set

**Also available:**

SMD coil former	B65822	202, 203
RM 5 low profile:		
Core	B65805-P	209
SMD coil former	B65822	210
Clamp	B65804	210

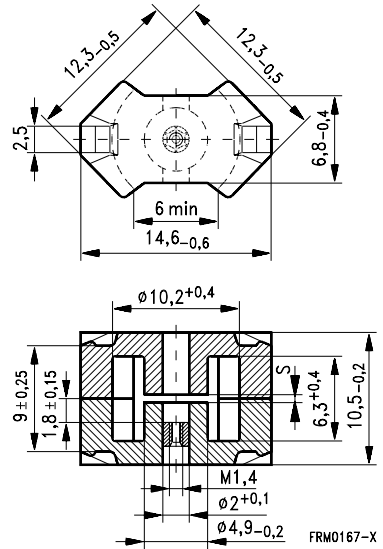
- In accordance with IEC 60431
- Core without center hole for transformer applications
- RM cores are supplied in sets

**Magnetic characteristics** (per set)

	with center hole	without center hole	
$\Sigma l/A$	1,0	0,93	mm <sup>-1</sup>
$l_e$	20,8	22,1	mm
$A_e$	20,8	23,8	mm <sup>2</sup>
$A_{min}$	15	18	mm <sup>2</sup>
$V_e$	430	526	mm <sup>3</sup>

**Approx. weight** (per set)

$m$	2,9	3,0	g



**Gapped**

Material	$A_L$ value	$s$ approx. mm	$\mu_e$	Ordering code <sup>1)</sup> -C with center hole -N with threaded sleeve
	nH			
K1	25 ± 3 %	1,0	19,9	B65805-+25-A1
	40 ± 3 %	0,40	31,8	B65805-+40-A1
M33	63 ± 3 %	0,4	50,2	B65805-+63-A33
	100 ± 3 %	0,2	79,6	B65805-+100-A33
N48	125 ± 2 %	0,16	100	B65805-+125-G48
	160 ± 3 %	0,12	128	B65805-+160-A48
	250 ± 3 %	0,06	200	B65805-+250-A48
	315 ± 3 %	0,03	255	B65805-+315-A48

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

**Ungapped**

Material	$A_L$ value	$\mu_e$	$A_{L1min}$	$P_V$	Ordering code <sup>1)</sup> -C with center hole -J w/o center hole
	nH		nH		
N26	1800 + 30/- 20 %	1430			B65805-C-R26
N30	3500 + 30/- 20 %	2590			B65805-J-R30
T35	5200 + 30/- 20 %	3850			B65805-J-R35
T38	6700 + 40/- 30 %	4960			B65805-J-Y38
T42	9600 + 40/- 30 %	7090			B65805-J-Y42
N49	1300 + 30/- 20 %	960	810	0,06 (50 mT, 500 kHz, 100 °C)	B65805-J-R49
N67	1800 + 30/- 20 %	1330	1200	0,40 (200 mT, 100 kHz, 100 °C)	B65805-J-R67
N87	2000 + 30/- 20 %	1470	1200	0,32 (200 mT, 100 kHz, 100 °C)	B65805-J-R87
N41	2600 + 30/- 20 %	1920	1200	0,10 (200 mT, 100 kHz, 100 °C)	B65805-J-R41

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

**Coil former**

Material: GFR thermosetting plastic (UL 94 V-0, insulation class to IEC 60085: H  $\geq$  max. operating temperature 180 °C), color code black

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

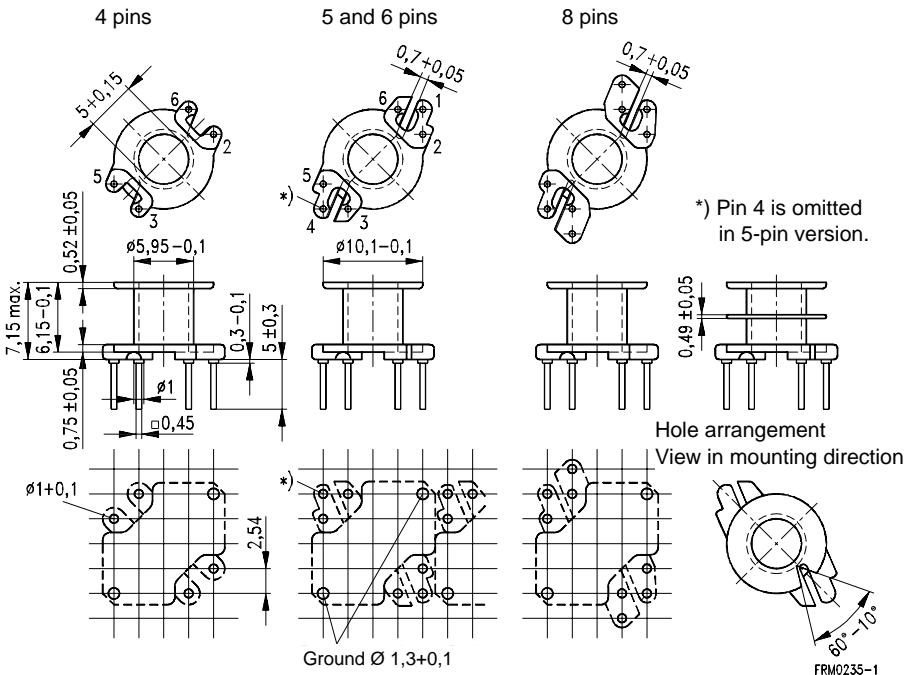
Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3,5 s

Winding: see page 152

Squared pins

For matching clamps and insulating washers see page 201

Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Pins	Ordering code
1	9,5	25	90	4	B65806-N1004-D1
				5	B65806-N1005-D1
				6	B65806-N1006-D1
				8	B65806-N1008-D1
2	8,7	25	94	4	B65806-N1004-D2
				5	B65806-N1005-D2
				6	B65806-N1006-D2



**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

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

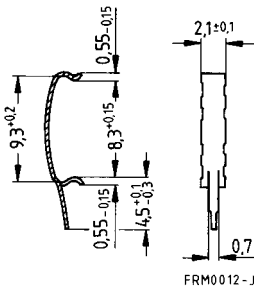
- For tolerance compensation and for insulation
- Made of polycarbonate (UL 94 V-0, insulation class to IEC 60085: E  $\geq$  120 °C), 0,06 mm thick

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

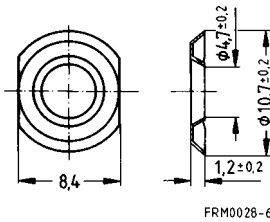
- Made of polycarbonate (UL 94 V-0, insulation class to IEC 60085: E  $\geq$  120 °C), 0,3 mm thick

	Ordering code
Clamp (ordering code per piece, 2 are required)	B65806-A2203
Insulating washer 1 (reel packing, PU = 1 reel)	B65806-A5000
Insulating washer 2 (bulk)	B65806-D2005

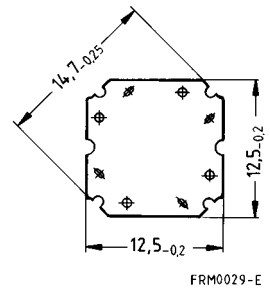
**Clamp**



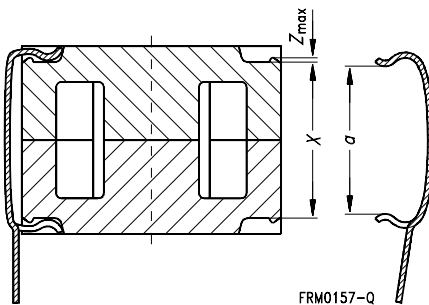
**Insulating washer 1**



**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

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  
permissible soldering temperature for wire-wrap connection on coil former: 400 °C, 1 s

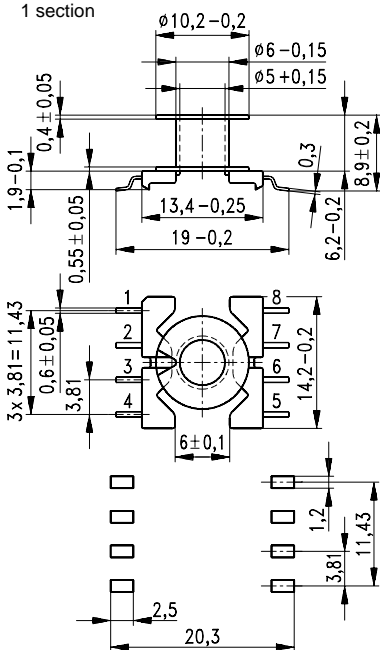
Winding: see page 160

**Clamp**

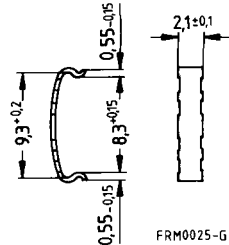
- Without ground terminal, made of stainless spring steel, 0,3 mm thick
- Also available as strip clamp (each carton containing 2 reels), also on a reel on request

Sections	$A_N$ mm <sup>2</sup>	$l_N$ mm	$A_R$ value $\mu\Omega$	Terminals	Ordering code
1	11,1	25	77	8	B65822-F1008-T1
2	10,2	25	85	8	B65822-F1008-T2
Clamp	(ordering code per piece, 2 are required)				B65806-J2204

**Coil former**



**Clamp**



**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

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  
permissible soldering temperature for wire-wrap connection on coil former: 400 °C, 1 s

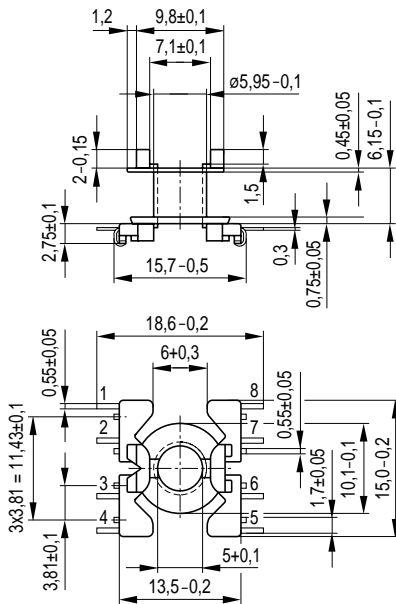
Winding: see page 160

**Clamp**

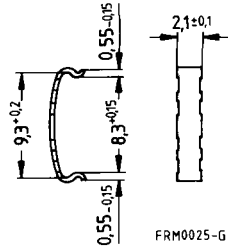
- Without ground terminal, made of stainless spring steel, 0,3 mm thick
- Also available as strip clamp (each carton containing 2 reels)
- Also available on a reel on request

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	A <sub>R</sub> value μΩ	Terminals	Ordering code
1	11,1	25	73	8	B65822-J1008-T1
Clamp	(ordering code per piece, 2 are required)				B65806-J2204

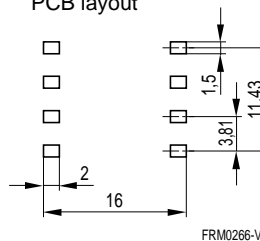
**Coil former**



**Clamp**



**Recommended PCB layout**



**Adjusting screw**

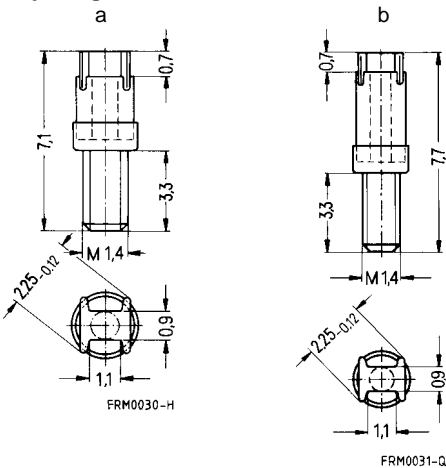
● Tube core with thread and core brake made of GFR polyterephthalate

Plastic **adjusting screwdriver** (not shown)

Plastic **handle** for adjusting screwdriver (not shown)

Core RM 5		Adjusting screw				Min. adjusting range %	Ordering code
Material	A <sub>L</sub> value nH	Fig.	Tube core ∅ × length mm	Material	Color code		
K 1	25	a	1,81 × 2,0	Si 1	black	13	B65539-C1003-X101
	40	a	1,81 × 2,0	K 1	yellow	16	B65539-C1003-X1
M 33	63	a	1,81 × 2,7	Si 1	white	11	B65539-C1002-X101
	100	a	1,81 × 2,0	K 1	yellow	14	B65539-C1003-X1
N 48	125	a	1,81 × 2,0	K 1	yellow	13	B65539-C1003-X1
	160	a	1,81 × 2,7	N 22	red	15	B65539-C1002-X22
	200					11	
	250	b	1,81 × 3,4	N 22	green	13	B65806-C3001-X22
	315					9	
315	12					B65806-A3002-X22	
<b>Adjusting screwdriver</b>							B63399-B4
<b>Handle</b>							B63399-B5

**Adjusting screws**





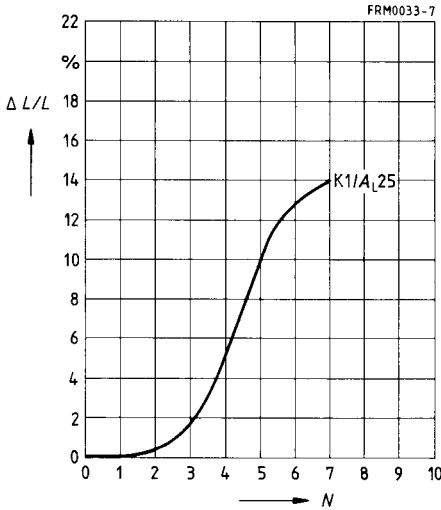
# RM 5

## Inductance adjustment curves (nominal values)

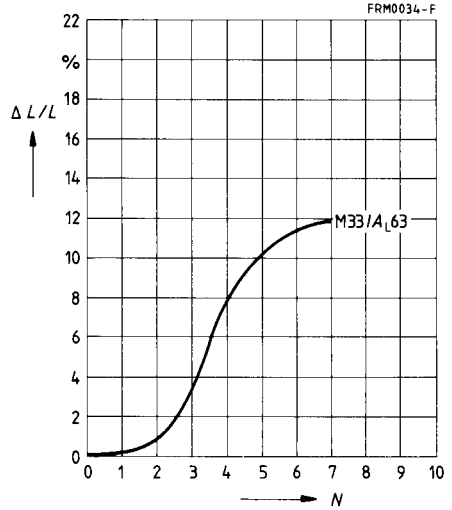
Relative inductance change  $\Delta L/L$  versus turns  $N$  of adjusting screw.

0  $\cong$  at least 1 turn engaged.

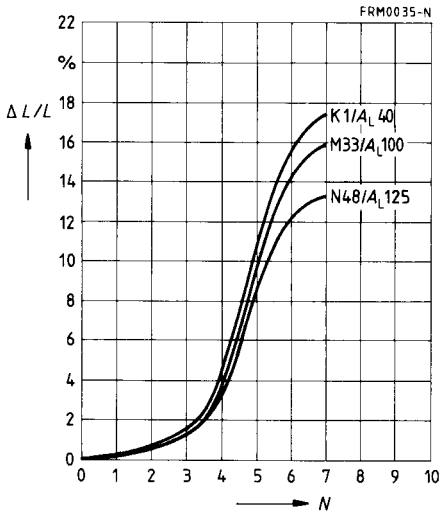
Adjusting screw B65539-C1003-X101  
Color code black



Adjusting screw B65539-C1002-X101  
Color code white



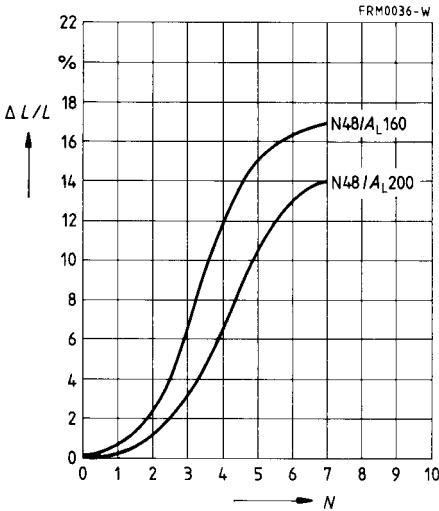
Adjusting screw B65539-C1003-X1  
Color code yellow



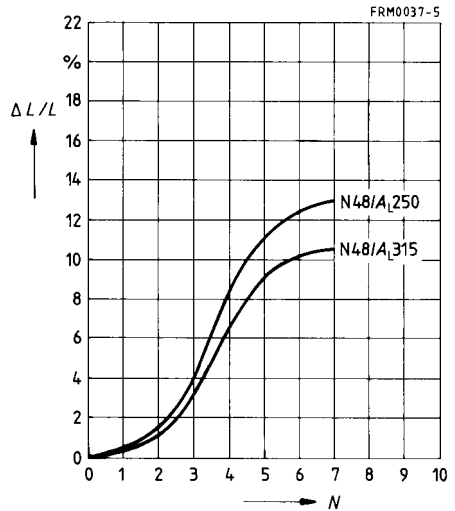
**Inductance adjustment curves** (nominal values)

Relative inductance change  $\Delta L/L$  versus turns  $N$  of adjusting screw.  
 $0 \cong$  at least 1 turn engaged.

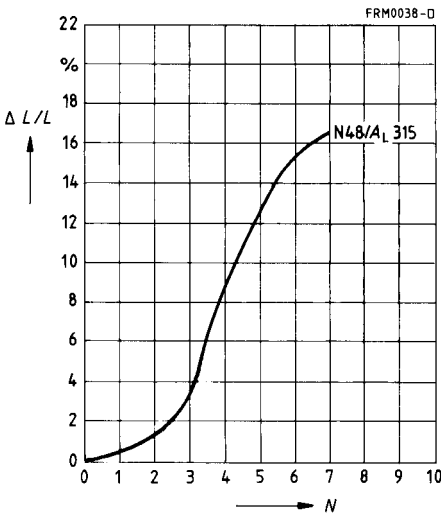
Adjusting screw B65539-C1002-X22  
 Color code red



Adjusting screw B65806-C3001-X22  
 Color code green



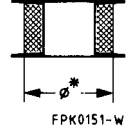
Adjusting screw B65806-A3002-X22  
 Color code blue



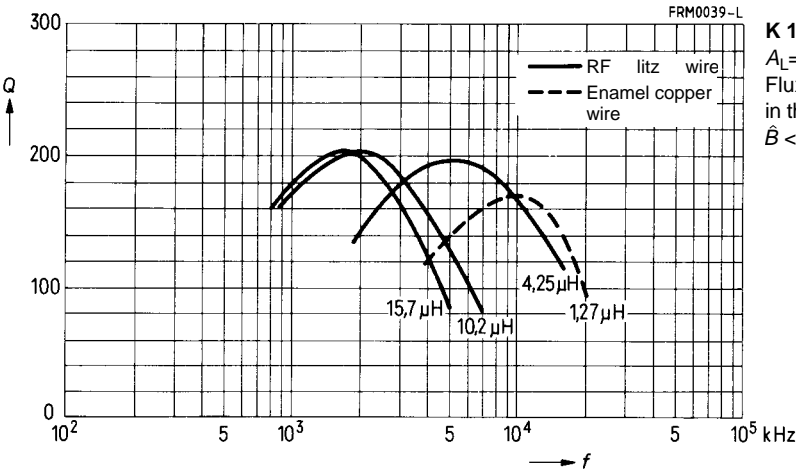
# RM 5

## Q factor characteristics (typical values)

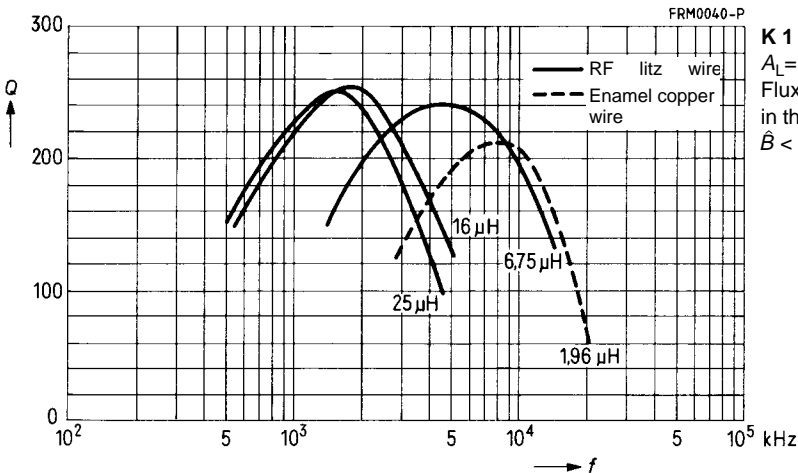
Material	$L$ ( $\mu\text{H}$ ) for		Turns	Wire; RF litz wire	Sections	$\varnothing^*$ mm
	$A_L = 25 \text{ nH}$	$A_L = 40 \text{ nH}$				
K 1	1,27	1,96	7	0,6 CuL	1	8,5
	4,25	6,75	13	$30 \times 0,04$ CuLS	1	9,0
	15,7	25	25	$30 \times 0,04$ CuLS	1	8,4
	10,2	16	20	$40 \times 0,04$ CuLS	1	8,2



\* Pad of polystyrene tape up to diameter  $\varnothing$



**K 1**  
 $A_L = 25 \text{ nH}$   
Flux density in the core  
 $\hat{B} < 0,5 \text{ mT}$



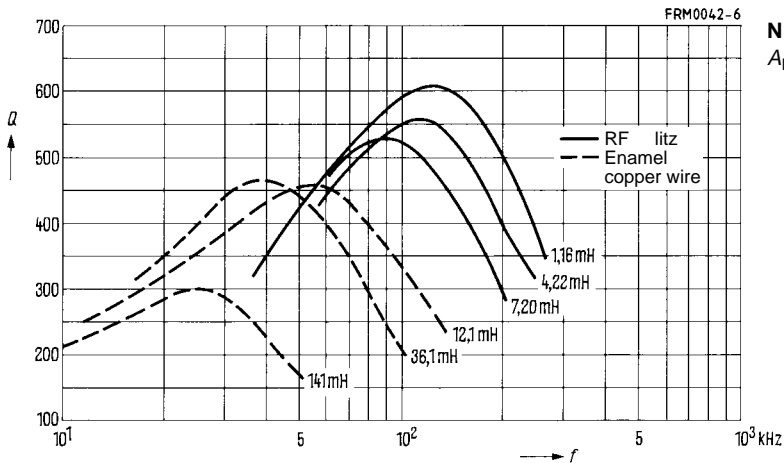
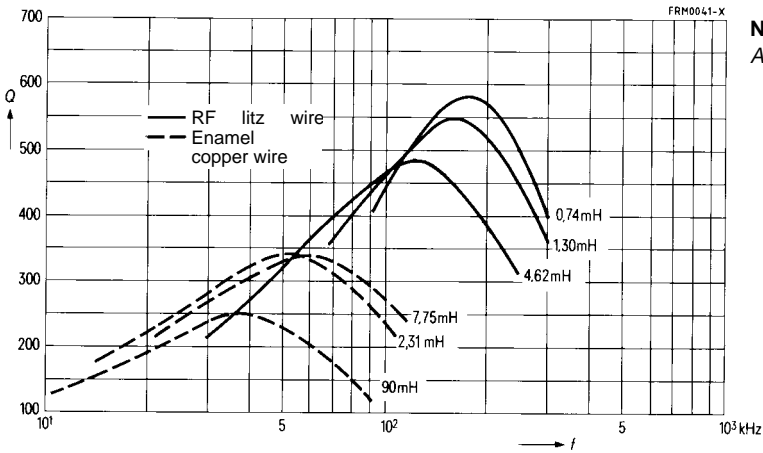
**K 1**  
 $A_L = 40 \text{ nH}$   
Flux density in the core  
 $\hat{B} < 0,6 \text{ mT}$

# RM 5

## Q factor characteristics (typical values)

Flux density in the core  $\hat{B} < 1 \text{ mT}$

Material	L (mH) for		Turns	Wire; RF litz wire	Sections
	$A_L = 100 \text{ nH}$	$A_L = 160 \text{ nH}$			
N 48	90	141	750	0,1 CuL	1
	23,1	36,1	380	0,14 CuL	1
	7,75	12,1	220	0,18 CuL	1
	4,62	7,20	170	10 × 0,05 CuLS	1
	—	4,22	130	20 × 0,04 CuLS	1
	1,30	—	90	30 × 0,04 CuLS	1
	0,74	1,16	68	45 × 0,04 CuLS	1



- For compact transformers
- Without center hole
- RM cores are supplied in sets

**Magnetic characteristics** (per set)

$\Sigma l/A = 0,71 \text{ mm}^{-1}$

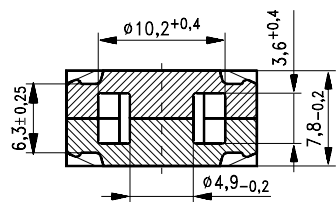
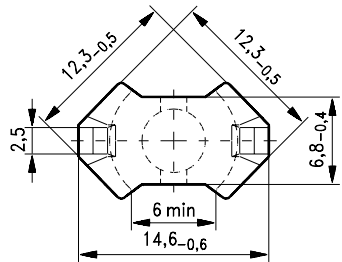
$l_e = 17,5 \text{ mm}$

$A_e = 24,5 \text{ mm}^2$

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

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

**Approx. weight** 2,6 g/set



FRM0168-6

**Ungapped**

Material	$A_L$ value nH	$\mu_e$	$A_{L1}$	$P_V$ W/set	Ordering code
N49	1700 + 30/- 20 %	960	800	0,09 (50 mT, 500 kHz, 100 °C)	B65805-P-R49
N87	2400 + 30/- 20 %	1360	2590	0,26 (200 mT, 100 kHz, 100 °C)	B65805-P-R87

**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

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  
permissible soldering temperature for wire-wrap connection on coil former: 400 °C, 1 s

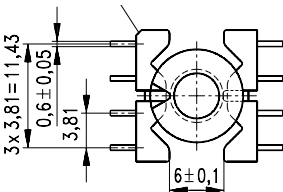
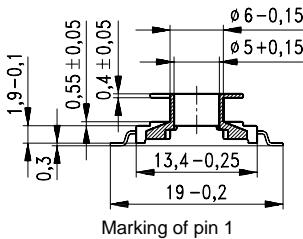
Winding: see page 160

**Clamp**

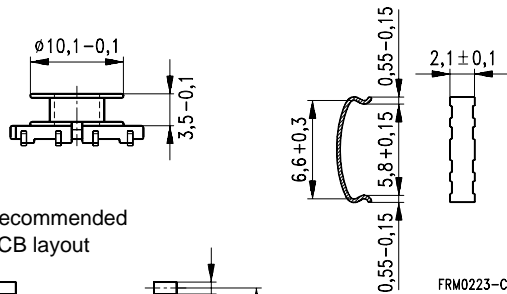
- Without ground terminal, made of stainless spring steel, 0,3 mm thick
- Also available as strip clamp (each carton containing 2 reels)
- Also available on a reel on request

Sections	A <sub>N</sub> mm <sup>2</sup>	l <sub>N</sub> mm	A <sub>R</sub> value μΩ	Terminals	Ordering code
1	5,1	25	169	8	B65822-A6008-T1
Clamp	(ordering code per piece, 2 are required)				B65804-P2204

**Coil former**



**Clamp**



**Recommended PCB layout**

