DATA SHEET

P22/13
P cores and accessories

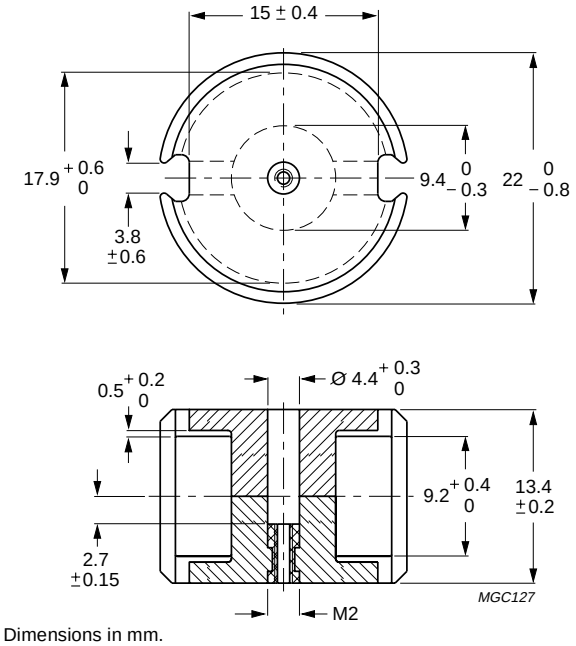
Supersedes data of February 2002 2004 Sep 01

FERROXCUBE
A YAGEO COMPANY

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.497	mm^{-1}
V_e	effective volume	2000	mm^3
l_e	effective length	31.5	mm
A_e	effective area	63.4	mm^2
A_{min}	minimum area	50.9	mm^2
m	mass of set	≈ 12	g



Dimensions in mm.

Fig.1 P22/13 core set.

Core sets for filter applications

Clamping force for A_L measurements, 140 ±30 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER (WITH NUT)	TYPE NUMBER (WITHOUT NUT)
3D3 sup	40 ±3%	≈ 16	≈ 3360	P22/13-3D3-E40/N	P22/13-3D3-E40
	63 ±3%	≈ 25	≈ 1890	P22/13-3D3-E63/N	P22/13-3D3-E63
	100 ±3%	≈ 40	≈ 1040	P22/13-3D3-E100/N	P22/13-3D3-E100
	160 ±3%	≈ 63	≈ 570	P22/13-3D3-E160/N	P22/13-3D3-E160
	1700 ±25%	≈ 670	≈ 0	–	P22/13-3D3
3H3 sup	160 ±3%	≈ 64	≈ 610	P22/13-3H3-E160/N	P22/13-3H3-E160
	250 ±3%	≈ 100	≈ 360	P22/13-3H3-E250/N	P22/13-3H3-E250
	315 ±3%	≈ 125	≈ 270	P22/13-3H3-E315/N	P22/13-3H3-E315
	400 ±3%	≈ 158	≈ 210	P22/13-3H3-A400/N	P22/13-3H3-A400
	630 ±3%	≈ 249	≈ 120	P22/13-3H3-A630/N	P22/13-3H3-A630
	3900 ±25%	≈ 1540	≈ 0	–	P22/13-3H3

Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 140 ±30 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C81	160 ±3%	≈ 63	≈ 610	P22/13-3C81-A160
	250 ±3%	≈ 99	≈ 360	P22/13-3C81-A250
	315 ±3%	≈ 125	≈ 280	P22/13-3C81-A315
	400 ±3%	≈ 158	≈ 210	P22/13-3C81-A400
	630 ±3%	≈ 249	≈ 120	P22/13-3C81-A630
	5200 ±25%	≈ 2060	≈ 0	P22/13-3C81
3C91 des	5200 ±25%	≈ 2060	≈ 0	P22/13-3C91
3F3	160 ±3%	≈ 63	≈ 610	P22/13-3F3-A160
	250 ±3%	≈ 99	≈ 360	P22/13-3F3-A250
	315 ±3%	≈ 125	≈ 280	P22/13-3F3-A315
	400 ±3%	≈ 158	≈ 210	P22/13-3F3-A400
	630 ±3%	≈ 249	≈ 120	P22/13-3F3-A630
	3550 ±25%	≈ 1410	≈ 0	P22/13-3F3

Core sets of high permeability grades

Clamping force for A_L measurements, 140 ± 30 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3E27	9250 ±25%	≈ 3660	≈ 0	P22/13-3E27

Properties of core sets under power conditions

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 25 kHz; $\hat{B}$ = 200 mT; T = 100 °C	f = 100 kHz; $\hat{B}$ = 100 mT; T = 100 °C	f = 100 kHz; $\hat{B}$ = 200 mT; T = 100 °C	f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C
3C81	≥320	≤ 0.46	–	–	–
3C91	≥315	–	≤ 0.12[1]	≤ 0.9[1]	–
3F3	≥315	–	≤ 0.22	–	≤ 0.4

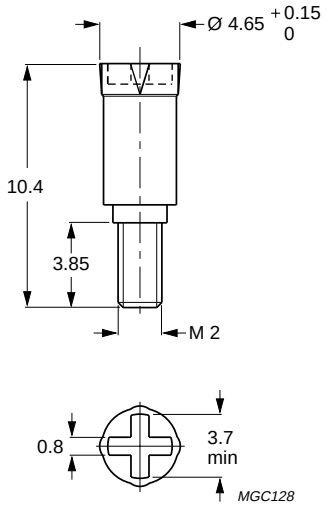
Note

1. Measured at 60 °C.

INDUCTANCE ADJUSTERS

General data

PARAMETER	SPECIFICATION
Material of head and thread	polypropylene (PP), glass fibre reinforced
Maximum operating temperature	125 °C



Dimensions in mm.

Fig.2 P22/13 inductance adjuster.

Inductance adjuster selection chart sup(applies to all types)

GRADE	A_L (nH)	TYPES FOR LOW ADJUSTMENT	ΔL/L (1)	TYPES FOR MEDIUM ADJUSTMENT	ΔL/L (1)	TYPES FOR HIGH ADJUSTMENT	ΔL/L (1)
3H3	100	–	–	ADJ-P22/RM8-RED	16	ADJ-P22/RM8-ORANGE	21
	160	ADJ-P22/RM8-RED	11	ADJ-P22/RM8-YELLOW	18	ADJ-P22/RM8-WHITE	27
	250	ADJ-P22/RM8-YELLOW	12	ADJ-P22/RM8-WHITE	18	–	–
	315	ADJ-P22/RM8-YELLOW	9	–	–	ADJ-P22/RM8-BROWN	22
	400	ADJ-P22/RM8-WHITE	11	ADJ-P22/RM8-BROWN	17	ADJ-P22/RM8-BLACK	30
	630	ADJ-P22/RM8-BROWN	10	ADJ-P22/RM8-BLACK	18	–	–
	1000	ADJ-P22/RM8-BROWN	6	ADJ-P22/RM8-BLACK	12	–	–
	1250	ADJ-P22/RM8-BROWN	4	ADJ-P22/RM8-BLACK	7	–	–
3D3	40	–	–	–	–	ADJ-P22/RM8-ORANGE	27
	63	–	–	–	–	ADJ-P22/RM8-ORANGE	26
	100	–	–	ADJ-P22/RM8RED	16	ADJ-P22/RM8-YELLOW	27
	160	ADJ-P22/RM8-RED	10	ADJ-P22/RM8-YELLOW	17	–	–
	250	ADJ-P22/RM8-YELLOW	–	–	–	–	–

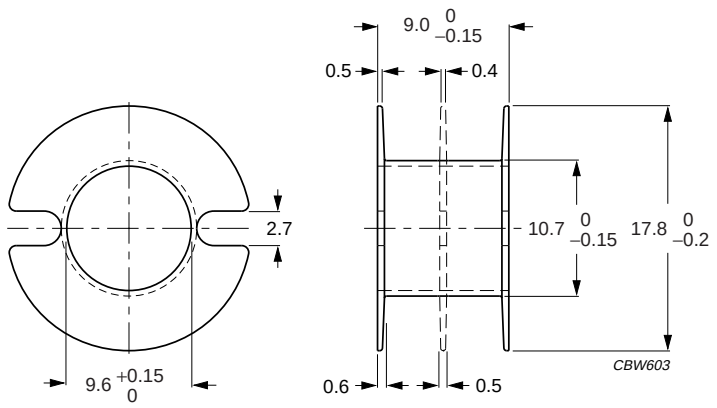
Note

1. Maximum adjustment range.

COIL FORMERS

General data CP-P22/13 coil former

PARAMETER	SPECIFICATION
Coil former material	polybutyleneterephtalate (PBT), glass reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E45329 (R)
Maximum operating temperature	155 °C, *"IEC 60085"*, class F



Dimensions in mm.

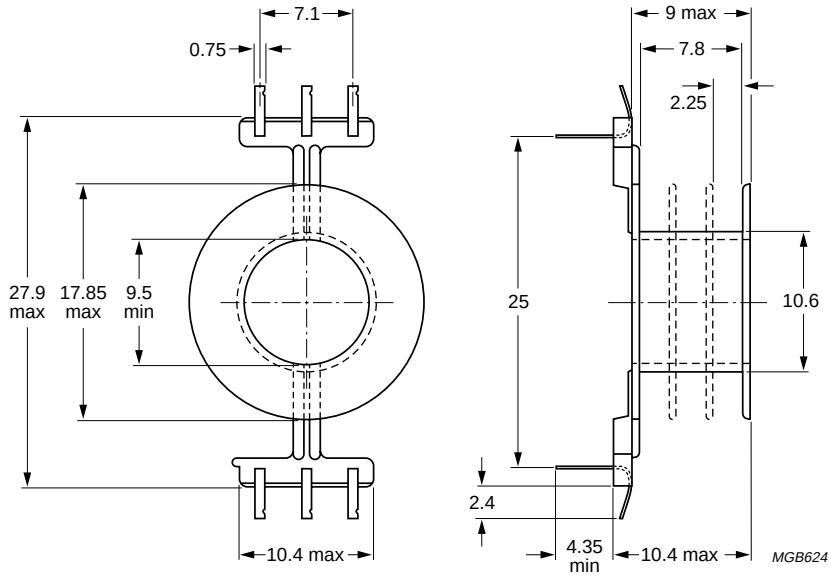
Fig.3 Coil former: CP-P22/13.

Winding data for CP-P22/13 coil former

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm^2)	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	TYPE NUMBER
1	26.2	7.5	44.5	CP-P22/13-1S
2	2×12.2	2×3.45	44.5	CP-P22/13-2S
3	3×7.6	3×2.1	44.5	CP-P22/13-3S

General data 6-pins P22/13 coil former for PCB mounting

PARAMETER	SPECIFICATION
Coil former material	polyamide (PA6.6), glass reinforced, flame retardant in accordance with *"UL 94V-0"*; UL file number E41938(M)
Maximum operating temperature	130 °C, *"IEC 60085"*, class B
Pin material	copper-zinc alloy (CuZn), tin-lead alloy (SnPb) plated, transition to lead-free (Sn) ongoing
Resistance to soldering heat	*"IEC 60068-2-20"*, Part 2, Test Tb, method 1B, 350 °C, 3.5 s
Solderability	*"IEC 60068-2-20"*, Part 2, Test Ta, method 1, 235 °C, 2 s



Dimensions in mm.

Fig.4 P22/13 coil former for PCB mounting; 6-pins.

Data for 6-pins P22/13 coil former for PCB mounting

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm^2)	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	MINIMUM LENGTH OF PINS (mm)	TYPE NUMBER
1	25.2	7.8	44.5	4.4	CPV-P22/13-1S-6PD
1	25.2	7.8	44.5	6.8	CPV-P22/13-1S-6PDL
2	2×11.7	2×3.6	44.5	4.4	CPV-P22/13-2S-6PD
2	2×11.7	2×3.6	44.5	6.8	CPV-P22/13-2S-6PDL
3	3×7.03	3×2.2	44.5	4.4	CPV-P22/13-3S-6PD(1)
3	3×7.03	3×2.2	44.5	6.8	CPV-P22/13-3S-6PDL(1)

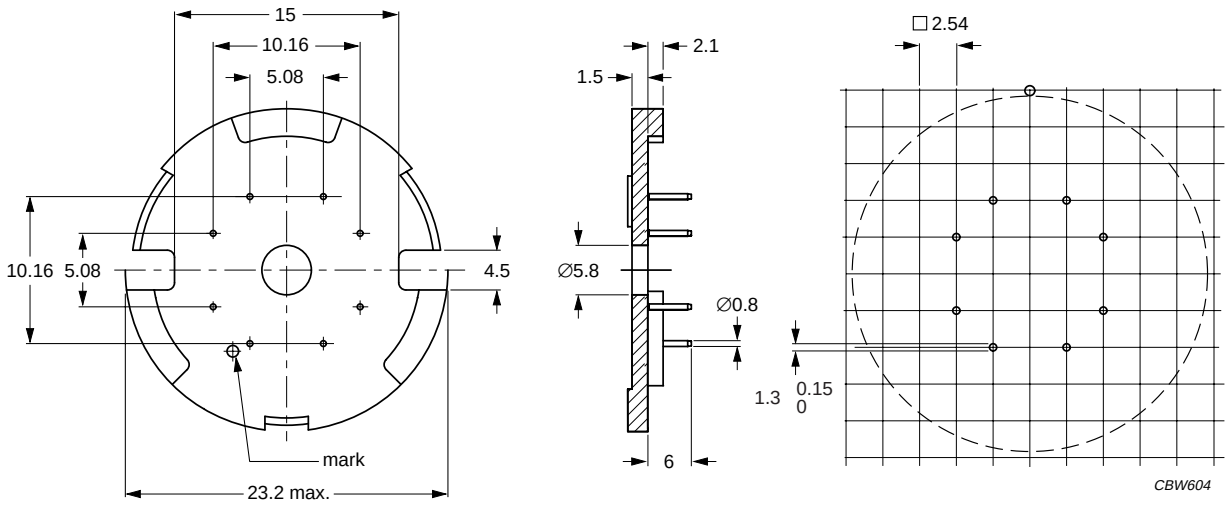
Note

1. In accordance with *"UL 94-HB"*.

MOUNTING PARTS

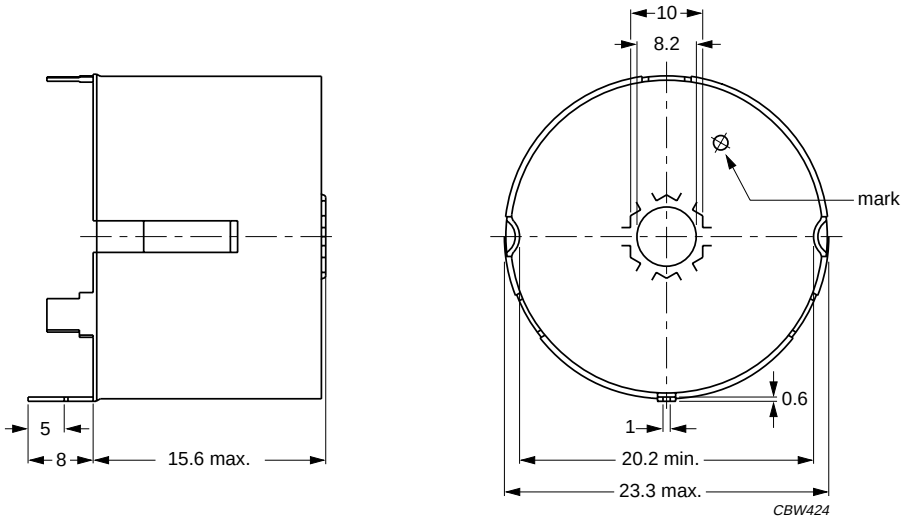
General data and ordering information

ITEM	REMARKS	FIGURE	TYPE NUMBER
Tag plate	material: phenolformaldehyde (PF), glass reinforced	5	TGP-P22/13-8P
	flame retardant: in accordance with *"UL 94V-0"*; UL file number E167521(M)		
	maximum operating temperature: 180 °C, *"IEC 60085"*, class H		
	pins: copper-tin alloy (CuSn), tin-lead alloy (SnPb) plated		
	resistance to soldering heat in accordance with *"IEC 60068-2-20"*, Part 2, Test Tb, method 1B: 350 °C, 3.5 s		
	solderability in accordance with *"IEC 60068-2-20"*, Part 2, Test Ta, method 1: 235 °C, 2 s		
Container	copper-zinc alloy (CuZn), SnPb-plated, transition to lead-free (Sn) ongoing	6	CON-P22/13
	earth pins: presoldered		
Spring	CrNi-steel	7	SPR-P22/13
	spring force: ≈140 N when mounted		
Nut	copper-zinc alloy, nickel-plated	8	NUT
Bush	copper-zinc alloy, nickel-plated	9	FIB
Clamp	spring steel, tin-plated	10	CLM/TS-P22/13
Washer	phenolformaldehyde (PF)	11	WAS-CLM/TS-P22/13



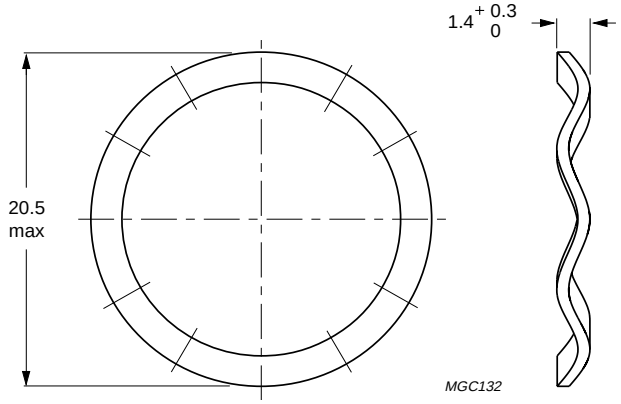
Dimensions in mm.

Fig.5 Tag plate: TGP-P22/13-8P.



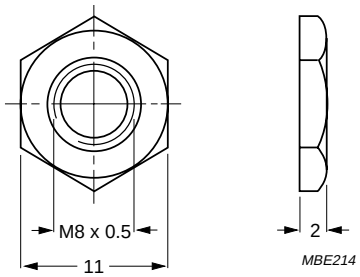
Dimensions in mm.

Fig.6 Container: CON-P22/13.



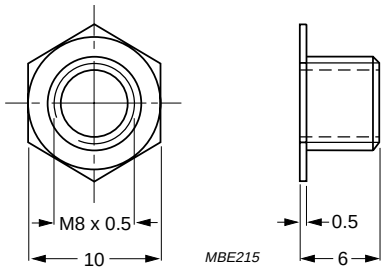
Dimensions in mm.

Fig.7 Spring: SPR-P22/13.



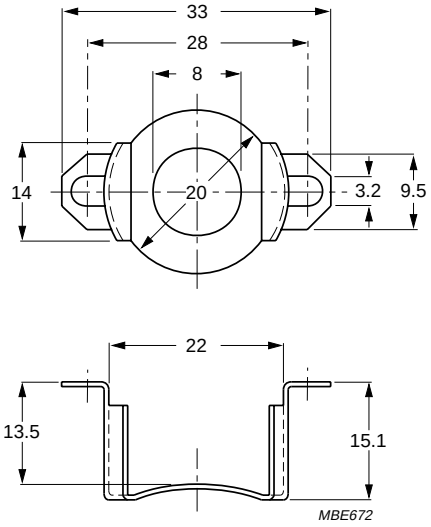
Dimensions in mm.

Fig.8 Fixing nut.



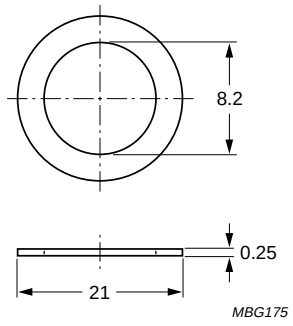
Dimensions in mm.

Fig.9 Fixing bush.



Dimensions in mm.

Fig.10 Clamp: CLM/S-P22/13.



Dimensions in mm.

Fig.11 Washer: WAS-CLM/TS-P22/13.

DATA SHEET STATUS DEFINITIONS

DATA SHEET STATUS	PRODUCT STATUS	DEFINITIONS
Preliminary specification	Development	This data sheet contains preliminary data. Ferroxcube reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product specification	Production	This data sheet contains final specifications. Ferroxcube reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.

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PRODUCT STATUS DEFINITIONS

STATUS	INDICATION	DEFINITION
Prototype	prot	These are products that have been made as development samples for the purposes of technical evaluation only. The data for these types is provisional and is subject to change.
Design-in	des	These products are recommended for new designs.
Preferred		These products are recommended for use in current designs and are available via our sales channels.
Support	sup	These products are **not** recommended for new designs and may not be available through all of our sales channels. Customers are advised to check for availability.