

# DATA SHEET

**EP13**

**EP cores and accessories**

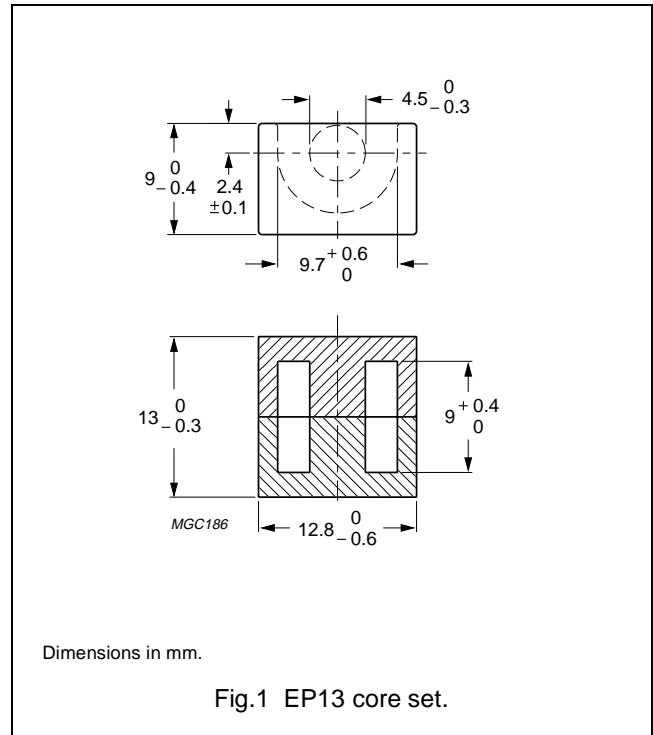
Supersedes data of February 2002

2004 Sep 01

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.24	mm <sup>-1</sup>
$V_e$	effective volume	472	mm <sup>3</sup>
$l_e$	effective length	24.2	mm
$A_e$	effective area	19.5	mm <sup>2</sup>
$A_{min}$	minimum area	14.9	mm <sup>2</sup>
$m$	mass of core set	≈ 4.7	g



**Core sets for filter applications**

Clamping force for  $A_L$  measurements, 30 ±10 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3D3	63 ±3%	≈ 62	≈ 500	EP13-3D3-A63
	100 ±3%	≈ 100	≈ 270	EP13-3D3-A100
	160 ±3%	≈ 160	≈ 140	EP13-3D3-A160
	670 ±25%	≈ 660	≈ 0	EP13-3D3
3H3	63 ±3%	≈ 62	≈ 540	EP13-3H3-A63
	100 ±3%	≈ 99	≈ 300	EP13-3H3-A100
	160 ±3%	≈ 158	≈ 170	EP13-3H3-A160
	1500 ±25%	≈ 1460	≈ 0	EP13-3H3
3B46 <small>des</small>	2150 ±25%	≈ 2090	≈ 0	EP13-3B46

**Core sets for general purpose transformers and power applications**Clamping force for  $A_L$  measurements,  $30 \pm 10$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3C81	40 $\pm 3\%$	$\approx 40$	$\approx 1000$	EP13-3C81-E40
	63 $\pm 3\%$	$\approx 62$	$\approx 540$	EP13-3C81-A63
	100 $\pm 3\%$	$\approx 99$	$\approx 300$	EP13-3C81-A100
	160 $\pm 3\%$	$\approx 158$	$\approx 170$	EP13-3C81-A160
	250 $\pm 5\%$	$\approx 247$	$\approx 100$	EP13-3C81-A250
	1700 $\pm 25\%$	$\approx 1680$	$\approx 0$	EP13-3C81
3C91 <b>des</b>	1700 $\pm 25\%$	$\approx 1680$	$\approx 0$	EP13-3C91
3C94	40 $\pm 3\%$	$\approx 40$	$\approx 1000$	EP13-3C94-E40
	63 $\pm 3\%$	$\approx 62$	$\approx 540$	EP13-3C94-A63
	100 $\pm 3\%$	$\approx 99$	$\approx 300$	EP13-3C94-A100
	160 $\pm 3\%$	$\approx 158$	$\approx 170$	EP13-3C94-A160
	250 $\pm 5\%$	$\approx 247$	$\approx 100$	EP13-3C94-A250
	1650 $\pm 25\%$	$\approx 1630$	$\approx 0$	EP13-3C94
3C96 <b>des</b>	1500 $\pm 25\%$	$\approx 1480$	$\approx 0$	EP13-3C96
3F3	40 $\pm 3\%$	$\approx 40$	$\approx 1000$	EP13-3F3-E40
	63 $\pm 3\%$	$\approx 62$	$\approx 540$	EP13-3F3-A63
	100 $\pm 3\%$	$\approx 99$	$\approx 300$	EP13-3F3-A100
	160 $\pm 3\%$	$\approx 158$	$\approx 170$	EP13-3F3-A160
	250 $\pm 5\%$	$\approx 247$	$\approx 100$	EP13-3F3-A250
	1325 $\pm 25\%$	$\approx 1310$	$\approx 0$	EP13-3F3
3F35 <b>prot</b>	1100 $\pm 25\%$	$\approx 1090$	$\approx 0$	EP13-3F35

**Core sets of high permeability grades**Clamping force for  $A_L$  measurements,  $30 \pm 10$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3E27	4600 $\pm 25\%$	$\approx 4540$	$\approx 0$	EP13-3E27
3E5	7000 +40/-30%	$\approx 6900$	$\approx 0$	EP13-3E5
3E55 <b>des</b>	100 $\pm 3\%$	$\approx 99$	$\approx 310$	EP13-3E55-A100
	160 $\pm 3\%$	$\approx 158$	$\approx 180$	EP13-3E55-A160
	250 $\pm 5\%$	$\approx 247$	$\approx 110$	EP13-3E55-A250
	315 $\pm 5\%$	$\approx 311$	$\approx 80$	EP13-3E55-A315
	400 $\pm 8\%$	$\approx 395$	$\approx 65$	EP13-3E55-A400
	630 $\pm 15\%$	$\approx 622$	$\approx 40$	EP13-3E55-A630
	7000 +40/-30%	$\approx 6900$	$\approx 0$	EP13-3E55
3E6	8500 +40/-30%	$\approx 8400$	$\approx 0$	EP13-3E6

## 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	≥315	≤ 0.1	–	–	–
3C91	≥315	–	≤ 0.03 <sup>(1)</sup>	≤ 0.17 <sup>(1)</sup>	–
3C94	≥320	–	≤ 0.04	≤ 0.22	–
3C96	≥340	–	≤ 0.03	≤ 0.17	≤ 0.075
3F35	≥300	–	–	–	≤ 0.04
3F3	≥315	–	≤ 0.05	–	≤ 0.1

## Properties of core sets under power conditions (continued)

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 500 kHz; $\hat{B}$ = 50 mT; T = 100 °C	f = 500 kHz; $\hat{B}$ = 100 mT; T = 100 °C	f = 1 MHz; $\hat{B}$ = 30 mT; T = 100 °C	f = 3 MHz; $\hat{B}$ = 10 mT; T = 100 °C
3C81	≥315	–	–	–	–
3C91	≥315	–	–	–	–
3C94	≥320	–	–	–	–
3C96	≥340	≤ 0.15	–	–	–
3F35	≥300	≤ 0.06	≤ 0.45	–	–
3F3	≥315	–	–	–	–

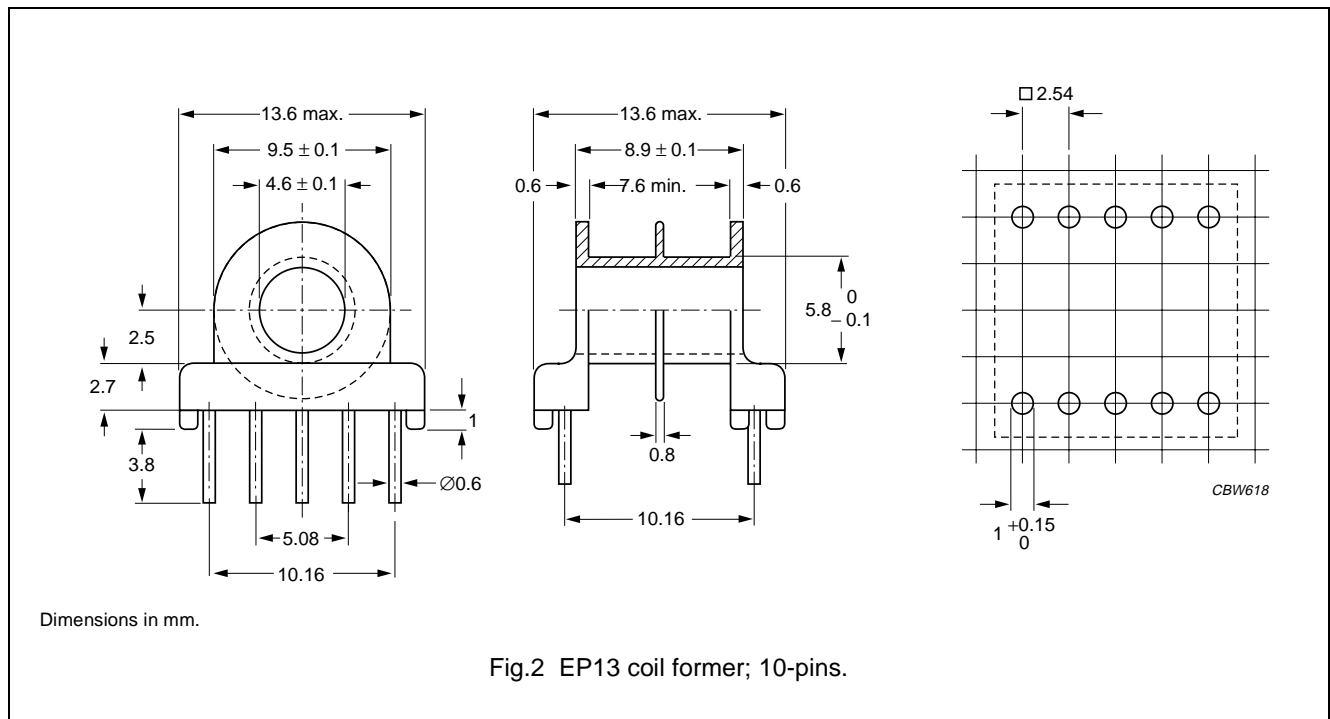
## Note

1. Measured at 60 °C.

**COIL FORMERS**

**General data**

PARAMETER	SPECIFICATION
Coil former material	phenolformaldehyde (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number: E41429(M)
Pin material	copper clad steel, tin (Sn) plated
Maximum operating temperature	180 °C, "IEC 60085", class H
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

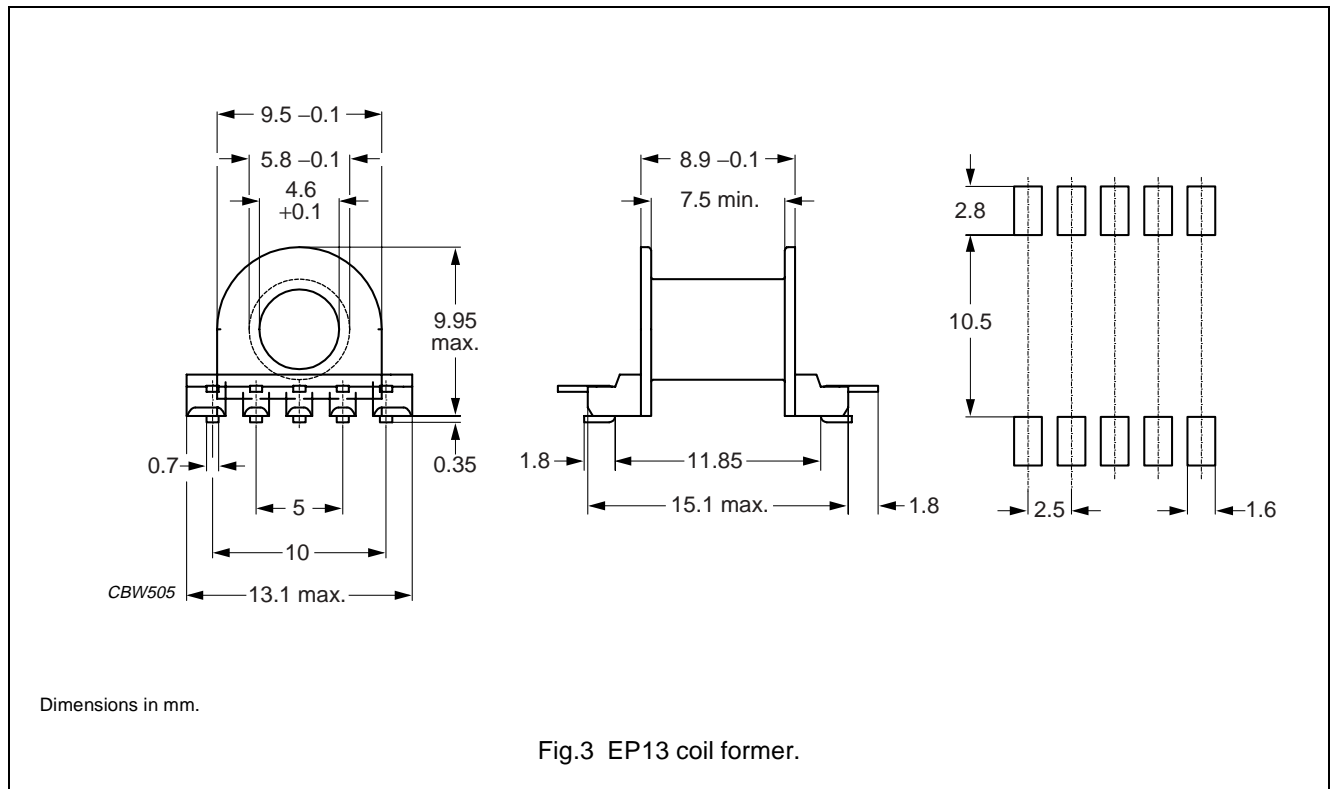


**Winding data for 10-pins EP13 coil former**

NUMBER OF SECTIONS	WINDING AREA (mm <sup>2</sup> )	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	TYPE NUMBER
1	13.6	7.6	23.8	CSH-EP13-1S-10P
2	2 × 6.1	2 × 3.4	23.8	CSH-EP13-2S-10P

General data CSHS-EP13-1S-10P-T

PARAMETER	SPECIFICATION
Coil former material	phenolformaldehyde (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41429 (M)
Pin material	copper-clad steel, tin-lead alloy (SnPb) plated, transition to lead-free (Sn) ongoing.
Maximum operating temperature	155 °C, "IEC 60085", class F
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



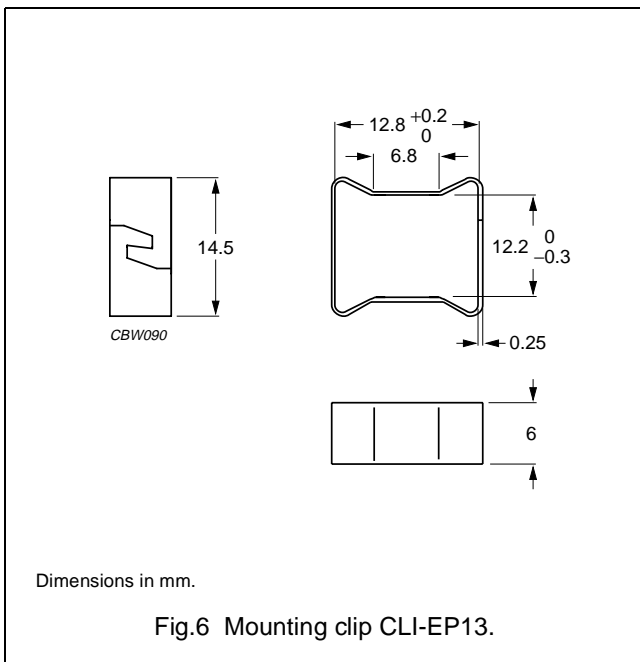
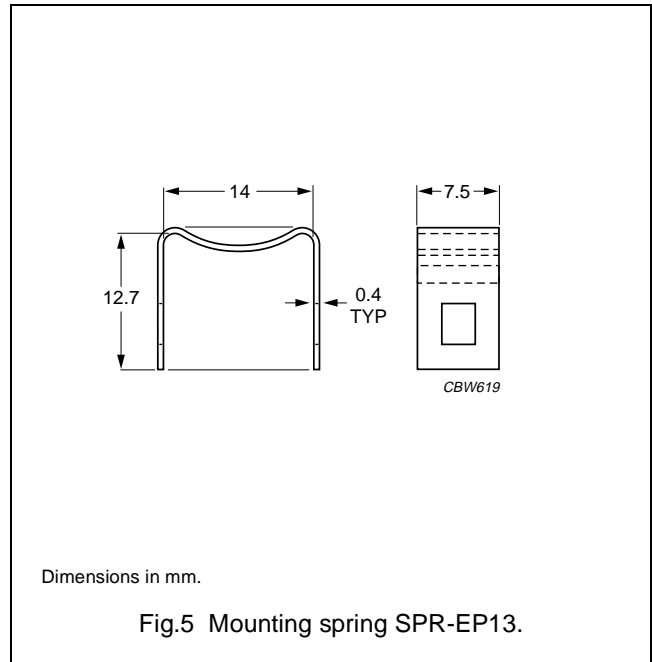
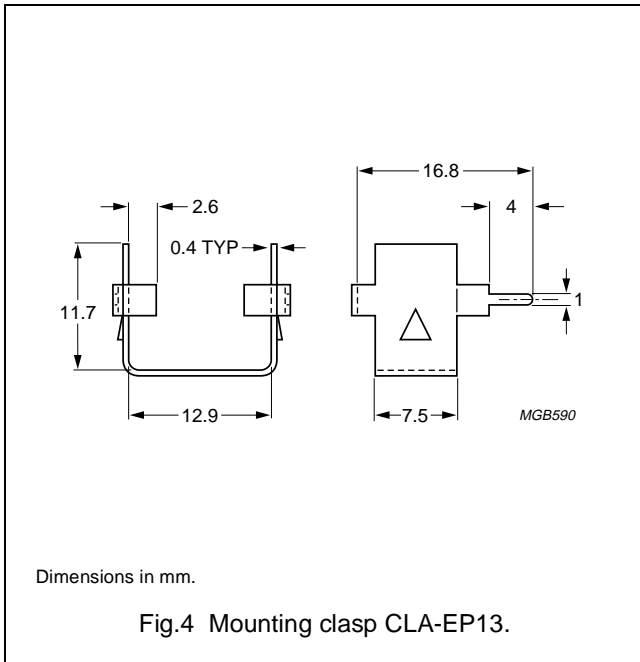
Winding data for EP13 coil former

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	TYPE NUMBER
1	13.5	7.5	23.8	CSHS-EP13-1S-10P-T

**MOUNTING PARTS**

**General data**

ITEM	REMARKS	FIGURE	TYPE NUMBER
Clasp	copper-nickel-zinc alloy (nickel silver)	4	CLA-EP13
Spring	copper-nickel-zinc alloy (nickel silver)	5	SPR-EP13
Clip	stainless steel (CrNi); clamping force $\approx 32$ N	6	CLI-EP13






**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
<b>Prototype</b>		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.
<b>Design-in</b>		These products are recommended for new designs.
<b>Preferred</b>		These products are recommended for use in current designs and are available via our sales channels.
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