

# DATA SHEET

**EP7**

**EP cores and accessories**

Supersedes data of September 2004

2008 Sep 01

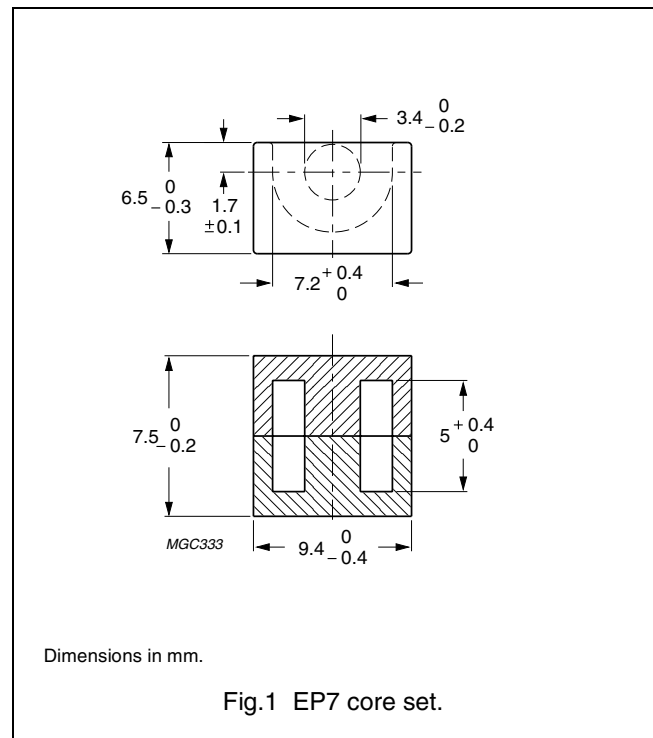


**FERROXCUBE**  
A YAGEO COMPANY

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.45	mm <sup>-1</sup>
$V_e$	effective volume	165	mm <sup>3</sup>
$l_e$	effective length	15.5	mm
$A_e$	effective area	10.7	mm <sup>2</sup>
$A_{min}$	minimum area	8.55	mm <sup>2</sup>
m	mass of core set	≈ 1.4	g



**Core sets for filter applications**

Clamping force for  $A_L$  measurements, 20 ±10 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3B46 <small>des</small>	1500 ±25%	≈ 1730	≈ 0	EP7-3B46

**Core sets for general purpose transformers and power applications**

Clamping force for  $A_L$  measurements, 20 ±10 N.

GRADE	$A_L$ (nH)	$\mu_e$	TOTAL AIR GAP (μm)	TYPE NUMBER
3C81	25 ±3%	≈ 29	≈ 880	EP7-3C81-E25
	40 ±3%	≈ 46	≈ 480	EP7-3C81-A40
	63 ±3%	≈ 73	≈ 270	EP7-3C81-A63
	100 ±3%	≈115	≈150	EP7-3C81-A100
	160 ±5%	≈184	≈ 90	EP7-3C81-A160
	1300 ±25%	≈ 1500	≈ 0	EP7-3C81
3C91 <small>des</small>	1300 ±25%	≈ 1500	≈ 0	EP7-3C91
3C94	25 ±3%	≈ 29	≈ 880	EP7-3C94-E25
	40 ±3%	≈ 46	≈ 480	EP7-3C94-A40
	63 ±3%	≈ 73	≈ 270	EP7-3C94-A63
	100 ±3%	≈115	≈150	EP7-3C94-A100
	160 ±5%	≈184	≈ 90	EP7-3C94-A160
	1200 ±25%	≈ 1380	≈ 0	EP7-3C94

GRADE	$A_L$ (nH)	$\mu_e$	TOTAL AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3C96 <b>des</b>	1 120 $\pm 25\%$	$\approx 1290$	$\approx 0$	EP7-3C96
3F3	25 $\pm 3\%$	$\approx 29$	$\approx 880$	EP7-3F3-E25
	40 $\pm 3\%$	$\approx 46$	$\approx 480$	EP7-3F3-A40
	63 $\pm 3\%$	$\approx 73$	$\approx 270$	EP7-3F3-A63
	100 $\pm 3\%$	$\approx 115$	$\approx 150$	EP7-3F3-A100
	160 $\pm 5\%$	$\approx 184$	$\approx 90$	EP7-3F3-A160
	1000 $\pm 25\%$	$\approx 1150$	$\approx 0$	EP7-3F3
3F35 <b>des</b>	850 $\pm 25\%$	$\approx 980$	$\approx 0$	EP7-3F35

**Core sets of high permeability grades**Clamping force for  $A_L$  measurements, 20  $\pm 10$  N.

GRADE	$A_L$ (nH)	$\mu_e$	TYPE NUMBER
3E27	3400 $\pm 25\%$	$\approx 3920$	EP7-3E27
3E5	5200 +40/-30%	$\approx 5990$	EP7-3E5
3E55 <b>des</b>	5200 +40/-30%	$\approx 5990$	EP7-3E55
3E6	5800 +40/-30%	$\approx 6680$	EP7-3E6

## 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	≥320	≤ 0.04	–	–	–
3C91	≥320	–	≤ 0.11 <sup>(1)</sup>	≤ 0.06 <sup>(1)</sup>	–
3C94	≥320	–	≤ 0.014	≤ 0.08	–
3C96	≥340	–	≤ 0.011	≤ 0.06	≤ 0.025
3F35	≥320	–	–	–	≤ 0.015
3F3	≥315	–	≤ 0.02	–	≤ 0.035

## 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	≥320	–	–	–	–
3C91	≥320	–	–	–	–
3C94	≥320	–	–	–	–
3C96	≥340	≤ 0.055	–	–	–
3F35	≥320	≤ 0.02	≤ 0.15	–	–
3F3	≥315	–	–	–	–

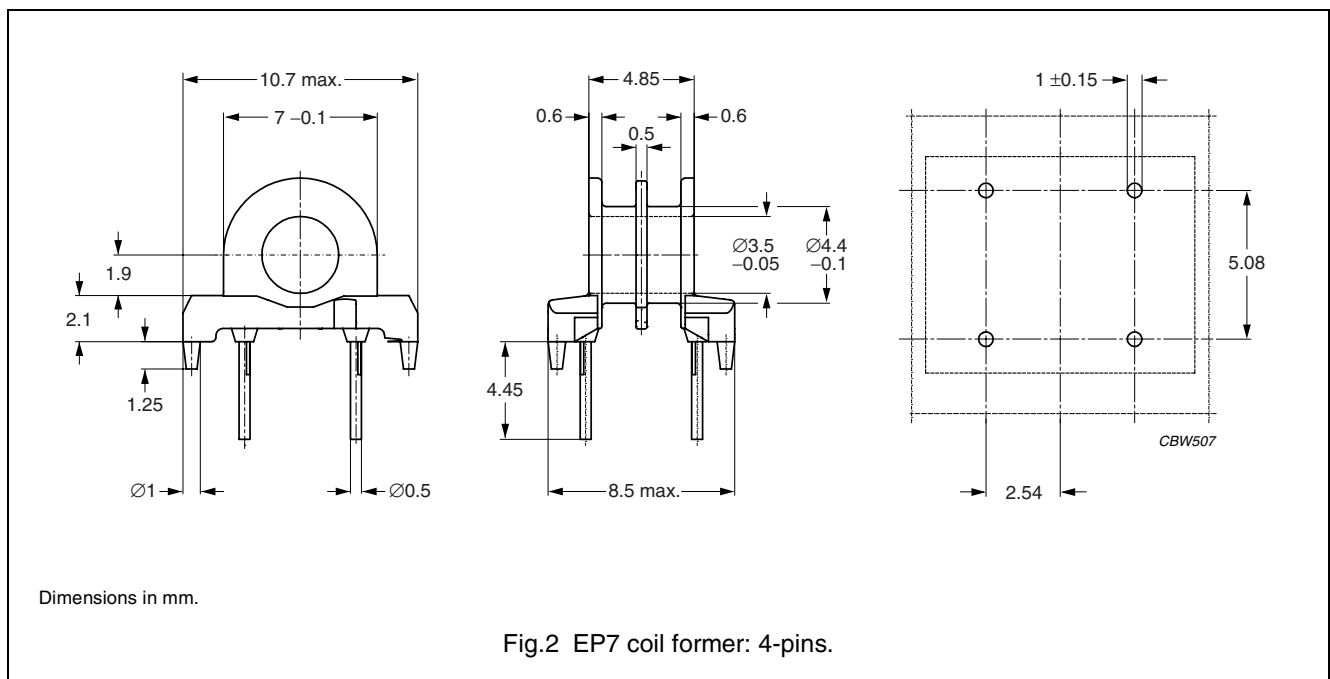
## Note

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

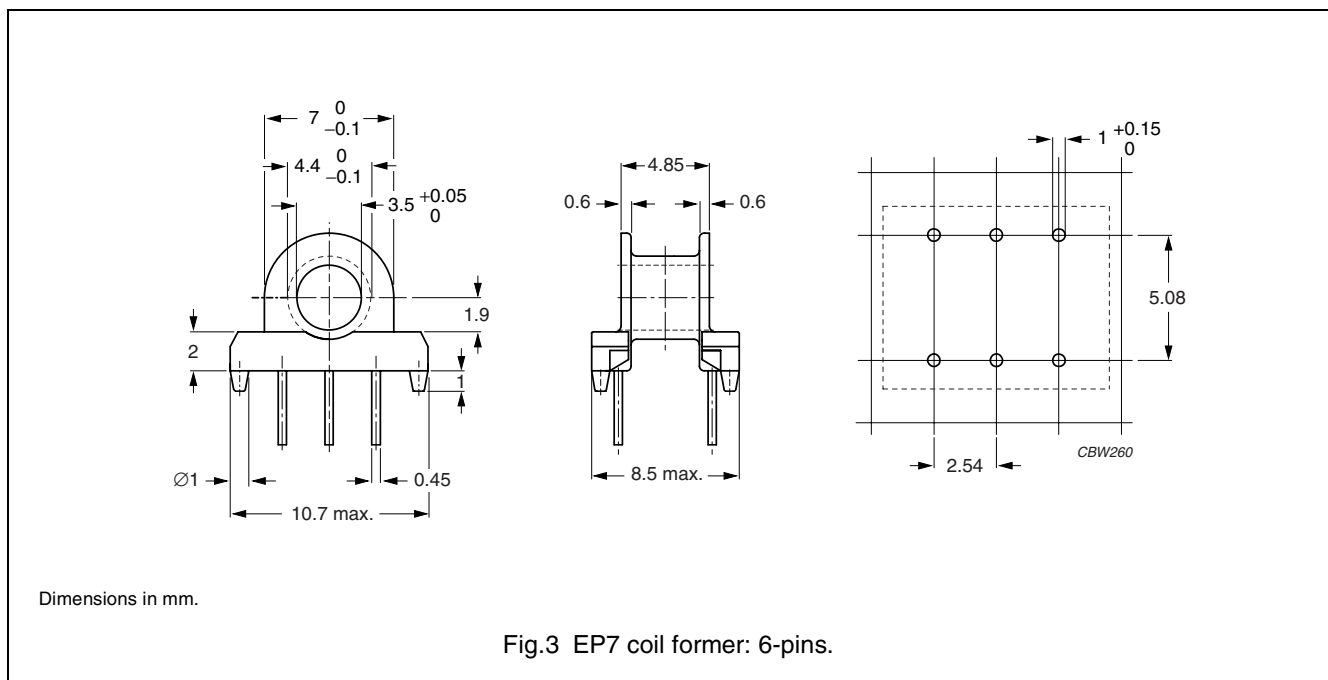


**Winding data and area product for 4-pins EP7 coil former**

NUMBER OF SECTIONS	WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
2	2 × 1.75	2 × 1.45	17.9	2 x 18.7	CSH-EP7-2S-4P-TA

General data CSH-EP7-1S-6P-B

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

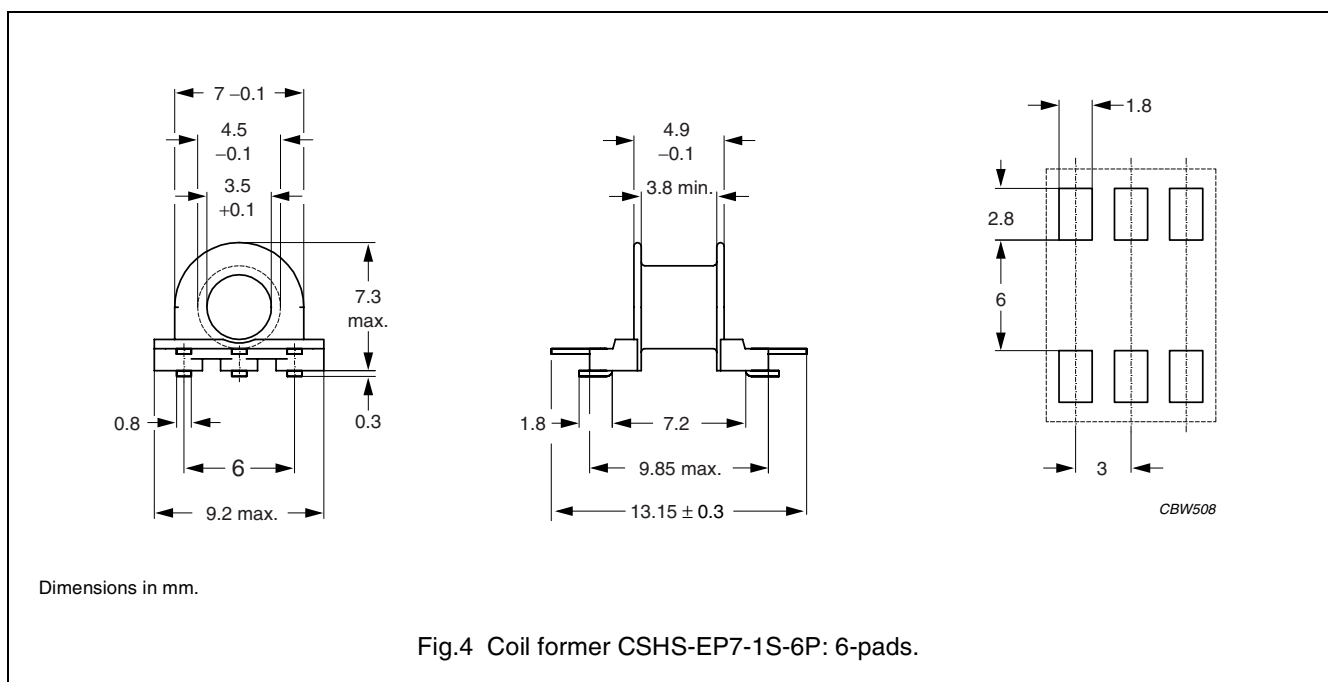


Winding data and area product for 4 and 6-pins EP7 coil former

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	4.3	3.4	17.7	46.0	CSH-EP7-1S-6P-BZ
1	4.3	3.4	17.7	46.0	CSH-EP7-1S-4P-BZ

General data for 6-pads EP7 SMD coil former

PARAMETER	SPECIFICATION
Coil former material	phenolformaldehyde (PF), glass reinforced, flame retardant in accordance with "UL 94V-0"; UL file number: E41429 (M)
Solder pad material	copper-clad steel , tin (Sn) plated
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



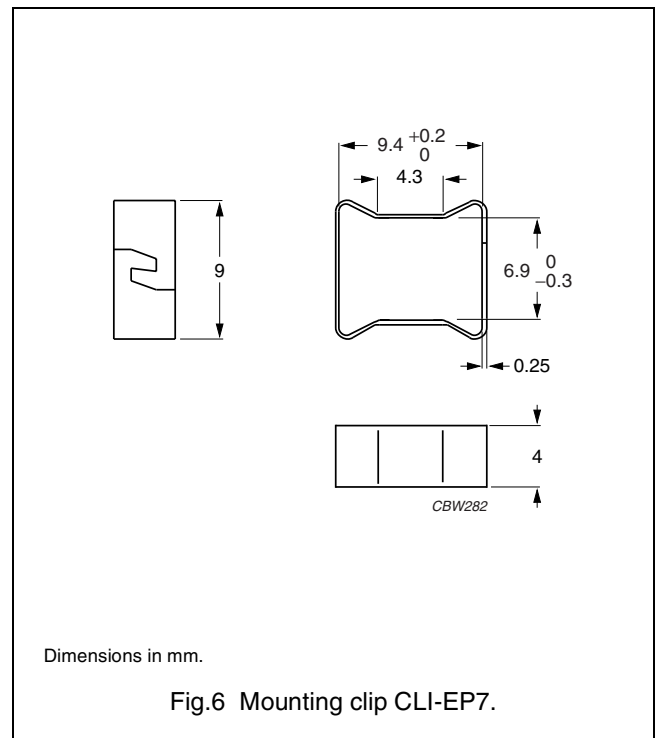
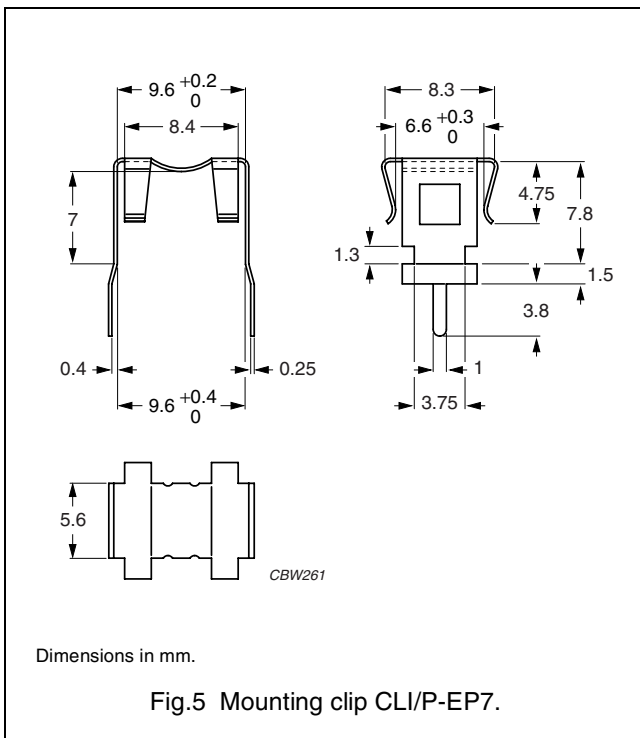
Winding data and area product for 6-pads EP7 SMD coil former

NUMBER OF SECTIONS	WINDING AREA (mm <sup>2</sup> )	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	4.7	3.9	17.9	50.3	CSHS-EP7-1S-6P-Z
1	4.7	3.9	17.9	50.3	CSHS-EP7-1S-5P-Z

**MOUNTING PARTS**

**General data**

ITEM	REMARKS	FIGURE	TYPE NUMBER
Mounting clip	stainless steel (CrNi), tin (Sn) plated ; to be used in combination with CSH-EP7-1S-6P-BZ	5	CLI/P-EP7
Mounting clip	stainless steel (CrNi); clamping force $\approx 22$ N	6	CLI-EP7








**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.
<b>Support</b>		These products are <b>not</b> recommended for new designs and may not be available through all of our sales channels. Customers are advised to check for availability.