

# DATA SHEET

**EP10**

**EP cores and accessories**

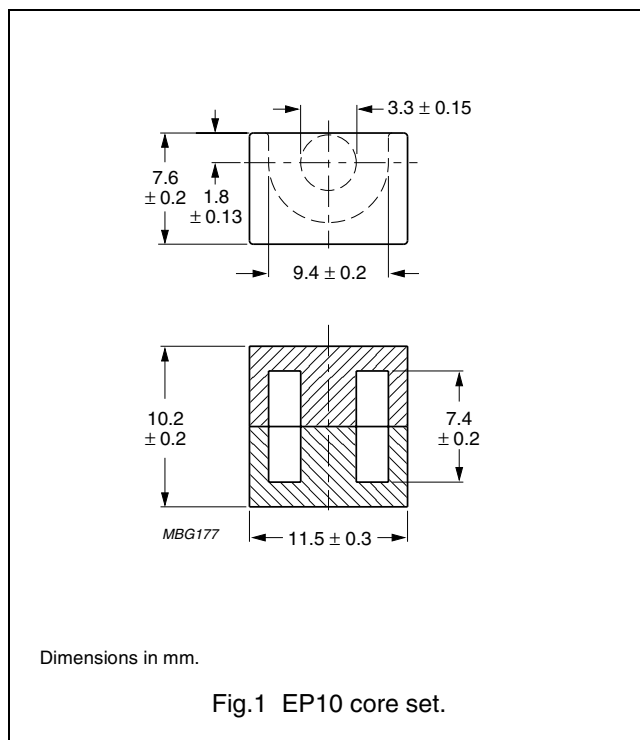
Supersedes data of September 2004

2008 Sep 01

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.70	mm <sup>-1</sup>
$V_e$	effective volume	215	mm <sup>3</sup>
$l_e$	effective length	19.3	mm
$A_e$	effective area	11.3	mm <sup>2</sup>
$A_{min}$	minimum area	8.55	mm <sup>2</sup>
m	mass of core set	≈ 2.8	g



**Core sets for filter applications**

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3B46 <small>des</small>	1400 ± 25%	≈ 1890	≈ 0	EP10-3B46

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

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

GRADE	$A_L$ (nH)	$\mu_e$	TOTAL AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3C81	25 ± 3%	≈ 34	≈ 1010	EP10-3C81-E25
	40 ± 3%	≈ 54	≈ 530	EP10-3C81-A40
	63 ± 3%	≈ 86	≈ 290	EP10-3C81-A63
	100 ± 3%	≈ 136	≈ 160	EP10-3C81-A100
	160 ± 5%	≈ 217	≈ 90	EP10-3C81-A160
	1200 ± 25%	≈ 1630	≈ 0	EP10-3C81
3C91 <small>des</small>	1200 ± 25%	≈ 1630	≈ 0	EP10-3C91
3C94	25 ± 3%	≈ 34	≈ 1010	EP10-3C94-E25
	40 ± 3%	≈ 54	≈ 530	EP10-3C94-A40
	63 ± 3%	≈ 86	≈ 290	EP10-3C94-A63
	100 ± 3%	≈ 136	≈ 160	EP10-3C94-A100
	160 ± 5%	≈ 217	≈ 90	EP10-3C94-A160
	1140 ± 25%	≈ 1550	≈ 0	EP10-3C94

GRADE	$A_L$ (nH)	$\mu_e$	TOTAL AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3C96 <small>des</small>	1000 $\pm$ 25%	$\approx$ 1350	$\approx$ 0	EP10-3C96
3F3	25 $\pm$ 3%	$\approx$ 34	$\approx$ 1010	EP10-3F3-E25
	40 $\pm$ 3%	$\approx$ 54	$\approx$ 530	EP10-3F3-A40
	63 $\pm$ 3%	$\approx$ 86	$\approx$ 290	EP10-3F3-A63
	100 $\pm$ 3%	$\approx$ 136	$\approx$ 160	EP10-3F3-A100
	160 $\pm$ 5%	$\approx$ 217	$\approx$ 90	EP10-3F3-A160
	1000 $\pm$ 25%	$\approx$ 1360	$\approx$ 0	EP10-3F3
3F35 <small>des</small>	800 $\pm$ 25%	$\approx$ 1090	$\approx$ 0	EP10-3F35

**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	3400 $\pm$ 25%	$\approx$ 4630	$\approx$ 0	EP10-3E27
3E5	4800 +40/-30%	$\approx$ 6530	$\approx$ 0	EP10-3E5
3E55 <small>des</small>	4800 +40/-30%	$\approx$ 6530	$\approx$ 0	EP10-3E55
3E6	5400 +40/-30%	$\approx$ 7340	$\approx$ 0	EP10-3E6

**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	$\geq$ 315	$\leq$ 0.043	–	–	–
3C91	$\geq$ 315	–	$\leq$ 0.014 <sup>(1)</sup>	$\leq$ 0.08 <sup>(1)</sup>	–
3C94	$\geq$ 320	–	$\leq$ 0.019	$\leq$ 0.1	–
3C96	$\geq$ 340	–	$\leq$ 0.014	$\leq$ 0.08	$\leq$ 0.035
3F3	$\geq$ 315	–	$\leq$ 0.025	–	$\leq$ 0.045
3F35	$\geq$ 300	–	–	–	$\leq$ 0.02

**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	$\geq$ 315	–	–	–	–
3C91	$\geq$ 315	–	–	–	–
3C94	$\geq$ 320	–	–	–	–

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
3C96	≥340	≤ 0.07	–	–	–
3F35	≥300	≤ 0.025	≤ 0.2	–	–
3F3	≥315	–	–	–	–

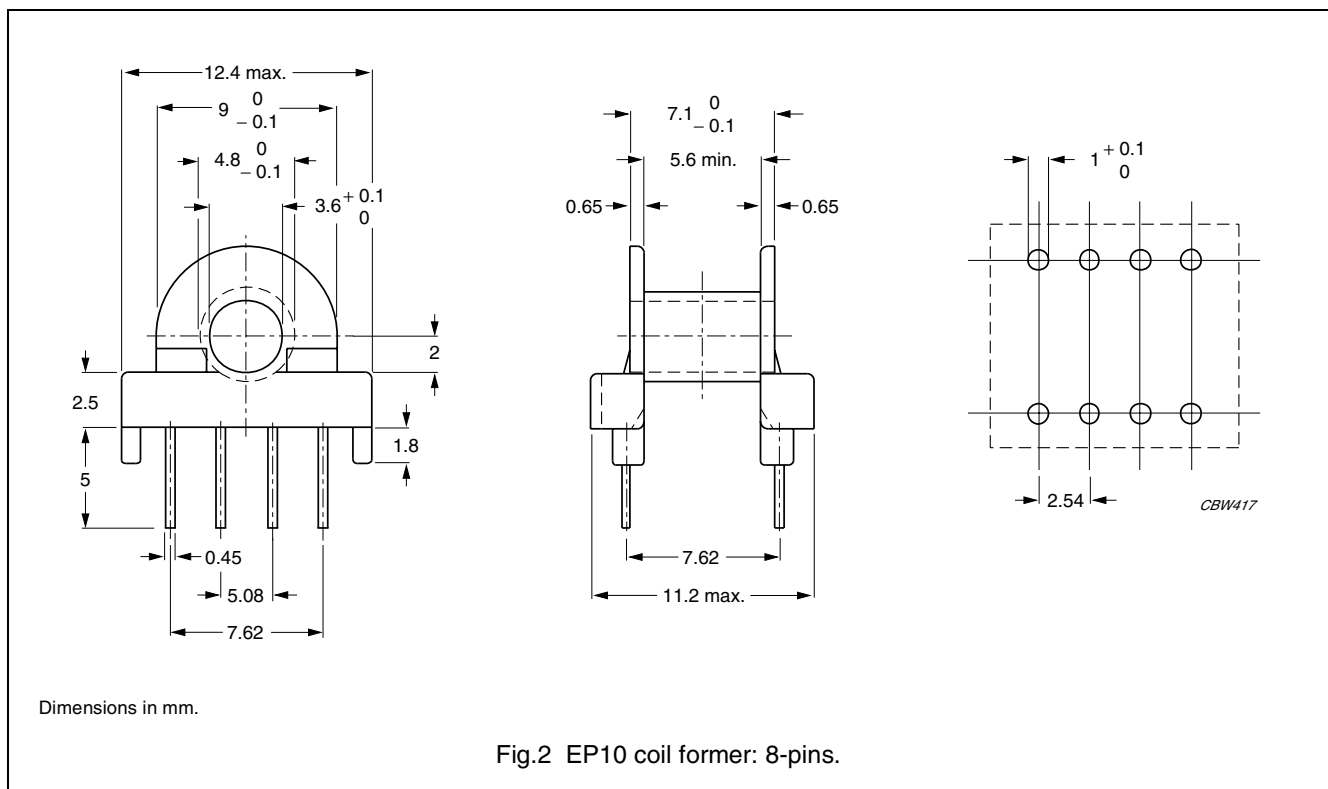
**Note**

1. Measured at 60 °C.

**COIL FORMER**

**General data CSH-EP10-1S-8P**

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

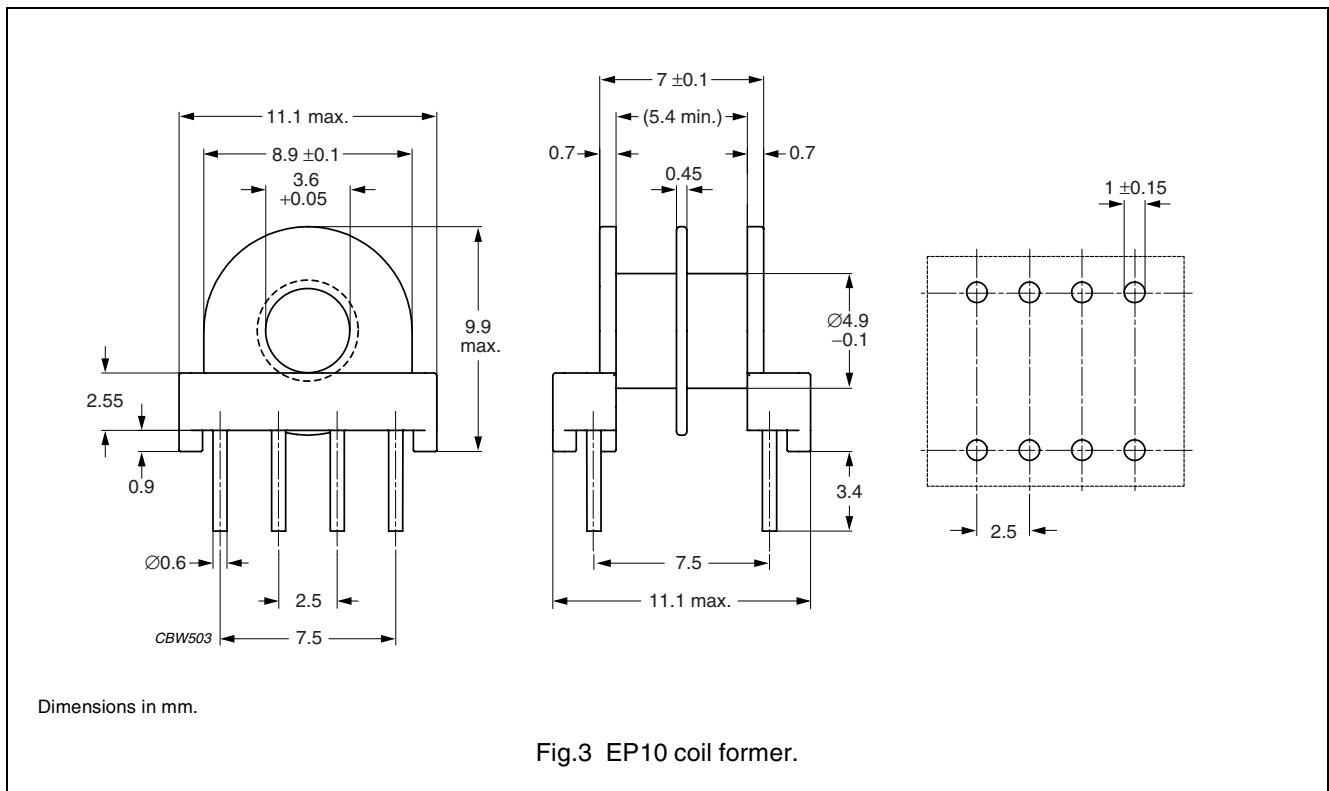


**Winding data and area product for 8-pins EP10 coil former**

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	11.4	5.6	21.5	129	CSH-EP10-1S-8P

**General data CSH-EP10-2S-8P**

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	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

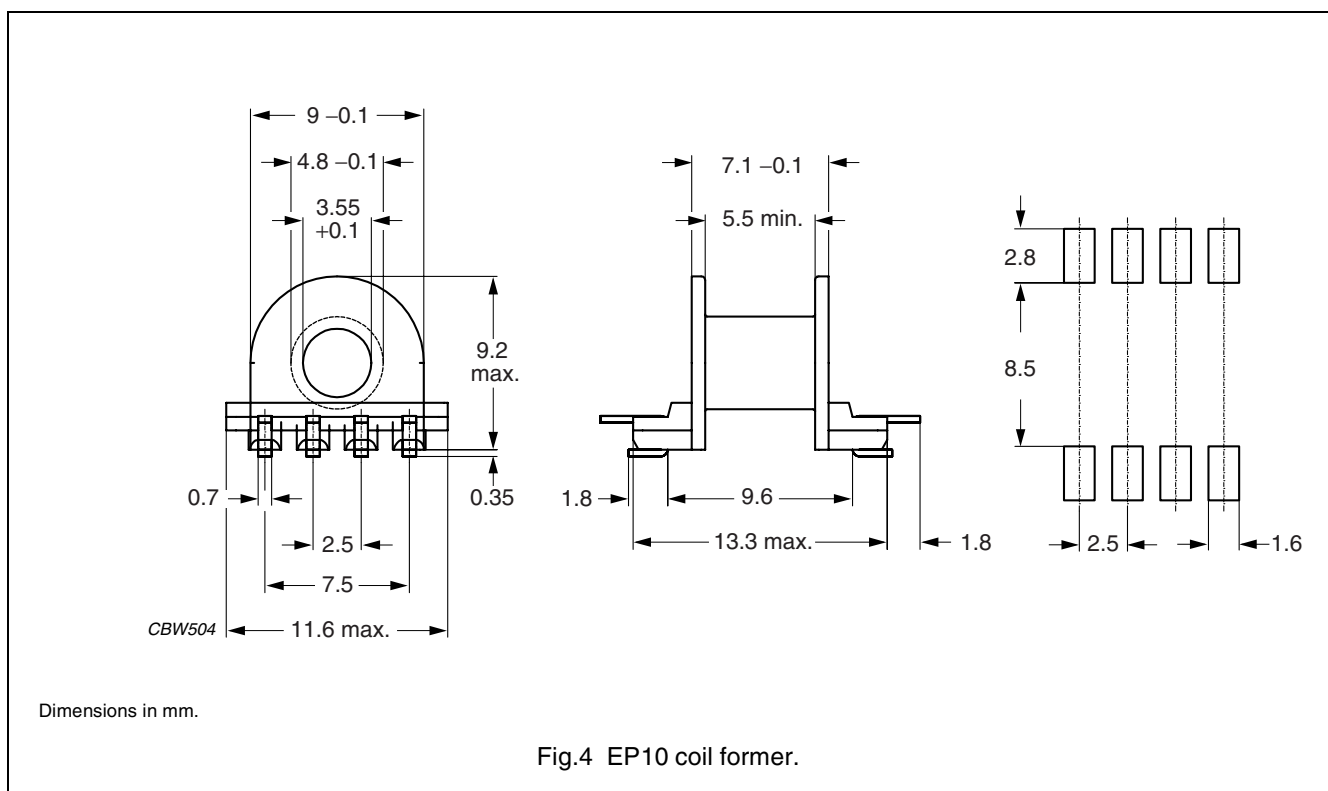


**Winding data and area product for EP10 coil former**

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
2	2 x 4.8	2 x 2.6	21.6	2 x 54.2	CSH-EP10-2S-8P

**General data CSHS-EP10-1S-8P-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 (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



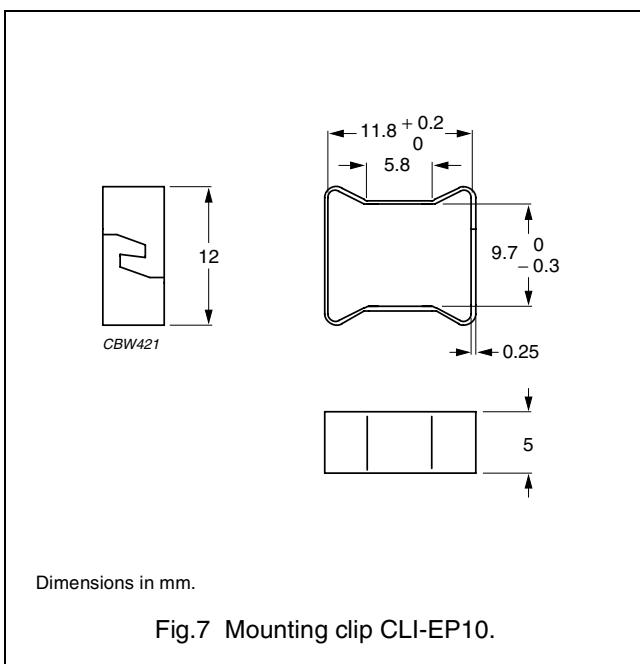
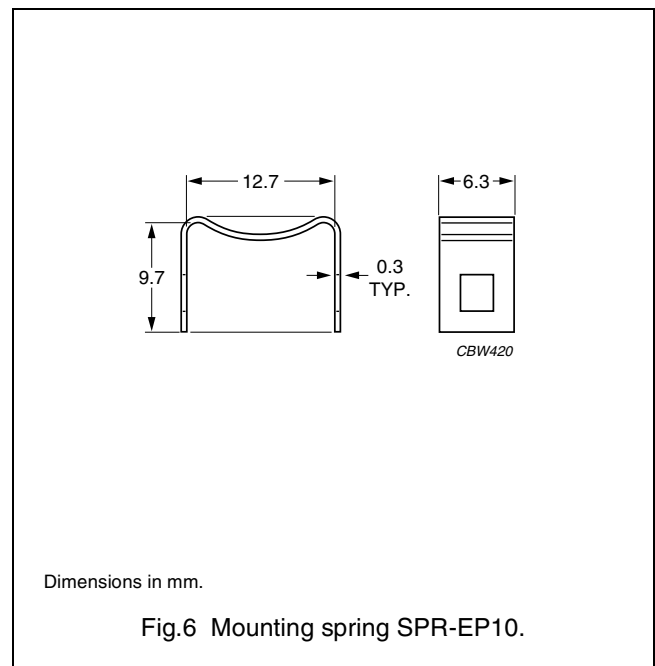
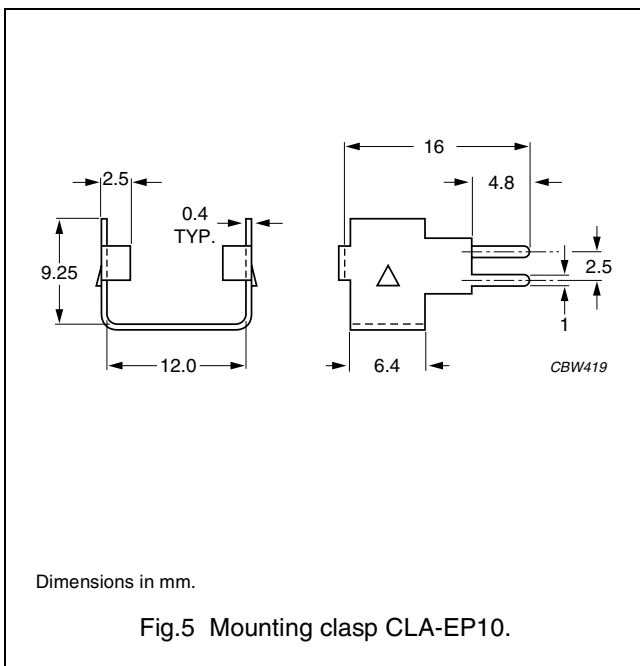
**Winding data and area product for EP10 coil former**

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	11.3	5.5	21.5	128	CSHS-EP10-1S-8P-T

**MOUNTING PARTS**

**General data**

ITEM	REMARKS	FIGURE	TYPE NUMBER
Clasp	copper-nickel-zinc alloy (nickel silver)	5	CLA-EP10
Spring	copper-nickel-zinc alloy (nickel silver)	6	SPR-EP10
Clip	stainless steel (CrNi); clamping force $\approx 27$ N	7	CLI-EP10








**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.