

# DATA SHEET

**EFD25/13/9**

**EFD cores and accessories**

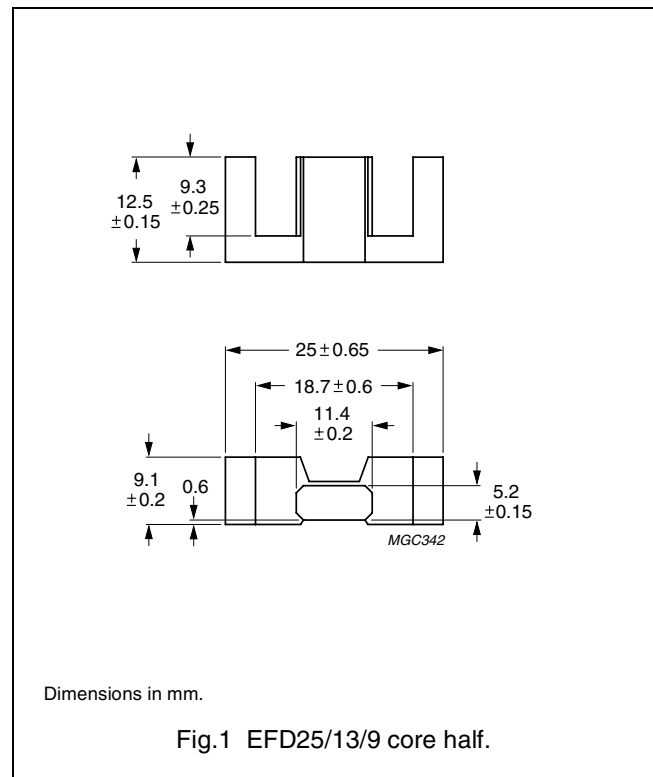
Supersedes data of September 2004

2008 Sep 01

**CORES**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.00	mm <sup>-1</sup>
$V_e$	effective volume	3300	mm <sup>3</sup>
$l_e$	effective length	57.0	mm
$A_e$	effective area	58.0	mm <sup>2</sup>
$A_{min}$	minimum area	55.0	mm <sup>2</sup>
$m$	mass of core half	≈ 8	g



**Core halves and sets**

$A_L$  measured as a set or in combination with a non-gapped core half, clamping force for  $A_L$  measurements, 40 ± 20 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C90	160 ± 3%	≈ 125	≈ 570	EFD25/13/9-3C90-A160
	250 ± 3%	≈ 196	≈ 320	EFD25/13/9-3C90-A250
	315 ± 5%	≈ 246	≈ 240	EFD25/13/9-3C90-A315
	400 ± 8%	≈ 313	≈ 180	EFD25/13/9-3C90-A400
	630 ± 10%	≈ 493	≈ 100	EFD25/13/9-3C90-A630
	2200 ± 25%	≈ 1720	≈ 0	EFD25/13/9-3C90
3C94	160 ± 3%	≈ 125	≈ 570	EFD25/13/9-3C94-A160
	250 ± 3%	≈ 196	≈ 320	EFD25/13/9-3C94-A250
	315 ± 5%	≈ 246	≈ 240	EFD25/13/9-3C94-A315
	400 ± 8%	≈ 313	≈ 180	EFD25/13/9-3C94-A400
	630 ± 10%	≈ 493	≈ 100	EFD25/13/9-3C94-A630
	2200 ± 25%	≈ 1720	≈ 0	EFD25/13/9-3C94
3C95 <span style="border: 1px solid black; padding: 0 2px;">des</span>	2660 ± 25%	≈ 2085	≈ 0	EFD25/13/9-3C95
3C96 <span style="border: 1px solid black; padding: 0 2px;">des</span>	2000 ± 25%	≈ 1560	≈ 0	EFD25/13/9-3C96

EFD cores and accessories

EFD25/13/9

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3F3	160 $\pm$ 3%	$\approx$ 125	$\approx$ 570	EFD25/13/9-3F3-A160
	250 $\pm$ 3%	$\approx$ 196	$\approx$ 320	EFD25/13/9-3F3-A250
	315 $\pm$ 5%	$\approx$ 246	$\approx$ 240	EFD25/13/9-3F3-A315
	400 $\pm$ 8%	$\approx$ 313	$\approx$ 180	EFD25/13/9-3F3-A400
	630 $\pm$ 10%	$\approx$ 493	$\approx$ 100	EFD25/13/9-3F3-A630
	2000 $\pm$ 25%	$\approx$ 1560	$\approx$ 0	EFD25/13/9-3F3
3F35 <span style="border: 1px solid black; padding: 0 2px;">des</span>	1500 $\pm$ 25%	$\approx$ 1170	$\approx$ 0	EFD25/13/9-3F35
3F4 <span style="border: 1px solid black; padding: 0 2px;">des</span>	160 $\pm$ 3%	$\approx$ 125	$\approx$ 500	EFD25/13/9-3F4-A160
	250 $\pm$ 3%	$\approx$ 196	$\approx$ 270	EFD25/13/9-3F4-A250
	315 $\pm$ 5%	$\approx$ 246	$\approx$ 290	EFD25/13/9-3F4-A315
	400 $\pm$ 8%	$\approx$ 313	$\approx$ 130	EFD25/13/9-3F4-A400
	630 $\pm$ 10%	$\approx$ 493	$\approx$ 60	EFD25/13/9-3F4-A630
	1000 $\pm$ 25%	$\approx$ 780	$\approx$ 0	EFD25/13/9-3F4
3F45 <span style="border: 1px solid black; padding: 0 2px;">prot</span>	1000 $\pm$ 25%	$\approx$ 780	$\approx$ 0	EFD25/13/9-3F45

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 = 25 °C	f = 100 kHz; $\hat{B}$ = 200 mT; T = 100 °C	f = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C
3C90	$\geq$ 330	$\leq$ 0.35	$\leq$ 0.38	–	–	–
3C94	$\geq$ 330	–	$\leq$ 0.30	–	$\leq$ 1.8	–
3C95	$\geq$ 330	–	–	$\leq$ 1.95	$\leq$ 1.85	–
3C96	$\geq$ 330	–	$\leq$ 0.22	–	$\leq$ 1.4	$\leq$ 0.6
3F35	$\geq$ 300	–	–	–	–	$\leq$ 0.28
3F3	$\geq$ 315	–	$\leq$ 0.38	–	–	$\leq$ 0.66
3F4	$\geq$ 300	–	–	–	–	–

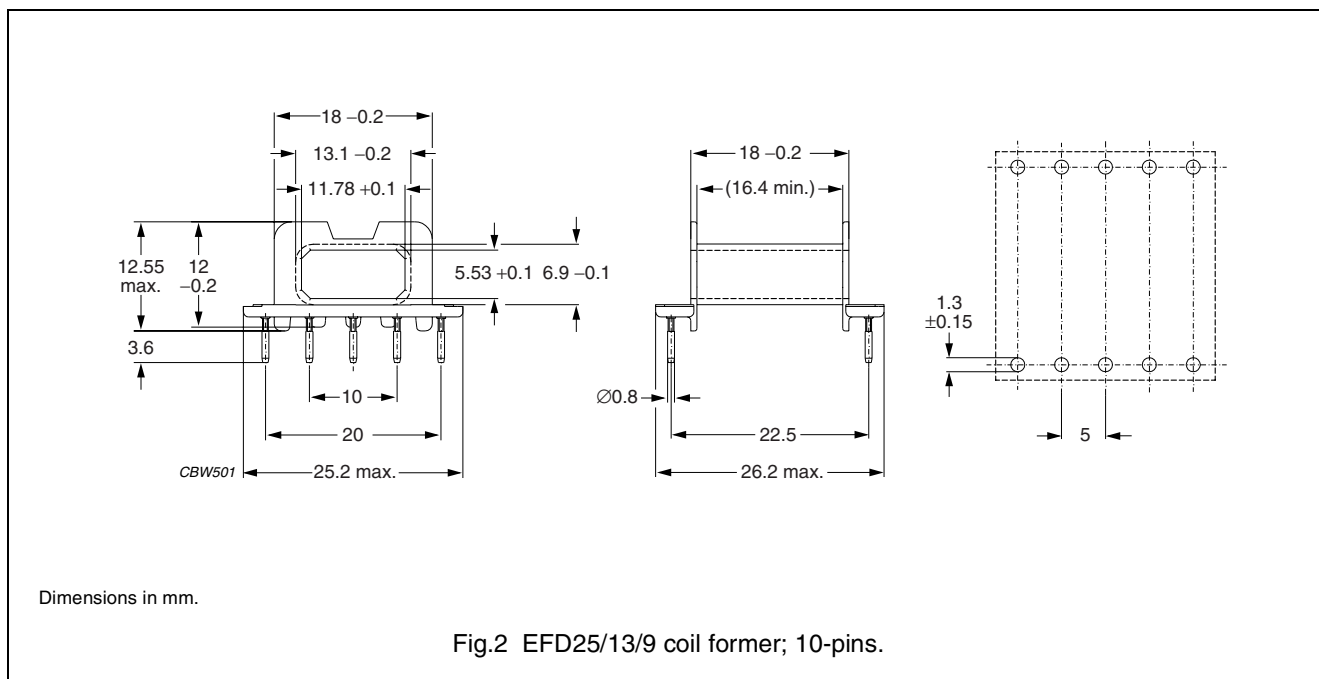
Properties of core sets under power conditions (continued)

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 = 1 MHz; $\hat{B}$ = 50 mT; T = 100 °C	f = 3 MHz; $\hat{B}$ = 10 mT; T = 100 °C
3C90	$\geq$ 330	–	–	–	–	–
3C94	$\geq$ 330	–	–	–	–	–
3C95	$\geq$ 330	–	–	–	–	–
3C96	$\geq$ 330	$\leq$ 1.2	–	–	–	–
3F35	$\geq$ 300	$\leq$ 0.42	$\leq$ 3.4	–	–	–
3F3	$\geq$ 315	–	–	–	–	–
3F4	$\geq$ 300	–	–	$\leq$ 1.0	–	$\leq$ 1.6
3F45	$\geq$ 300	–	–	$\leq$ 0.75	$\leq$ 2.8	$\leq$ 1.25

**COIL FORMERS**

**General data**

PARAMETER	SPECIFICATION
Coil former material	phenolformaldehyde (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E167521(M)
Pin material	copper-tin alloy (CuSn), tin (Sn) plated, see note 1
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 EFD25/13/9 coil former with 10-pins**

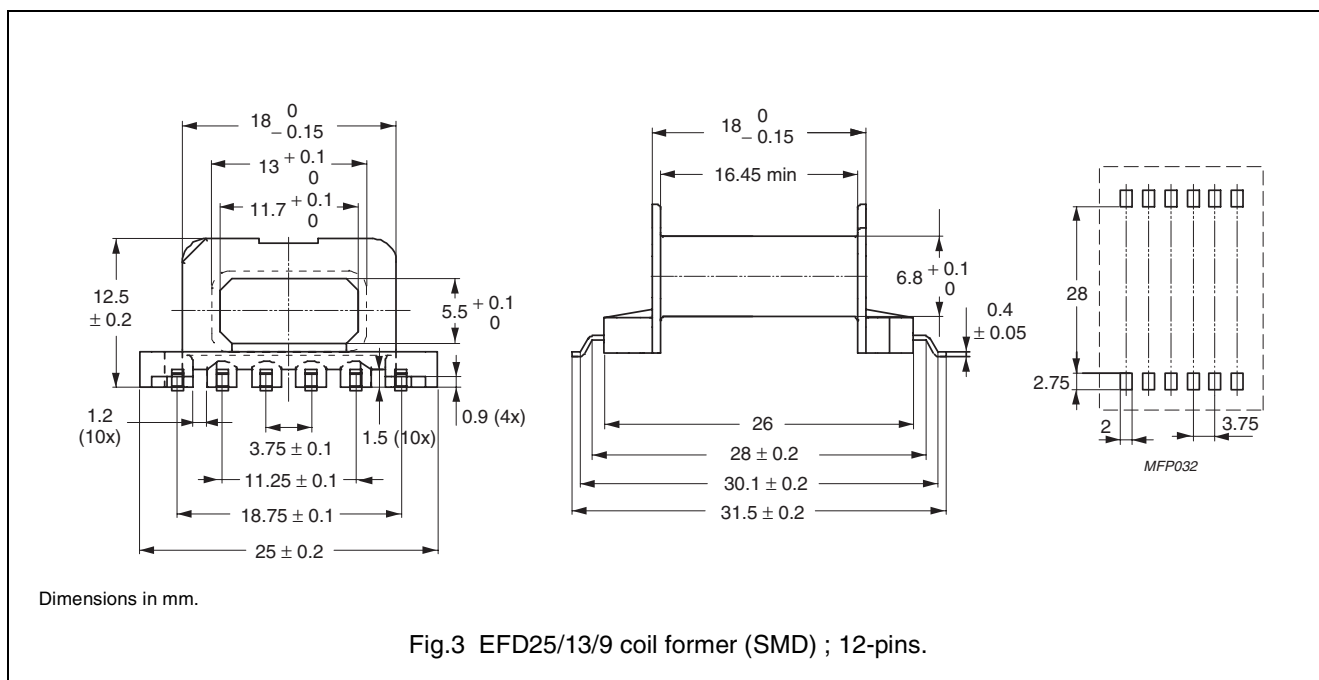
NUMBER OF SECTIONS	WINDING AREA (mm <sup>2</sup> )	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	40.2	16.4	46.4	2330	CSH-EFD25-1S-10P <sup>(1)</sup>

1. Also available with post-inserted pins.

**COIL FORMERS**

**General data**

PARAMETER	SPECIFICATION
Coil former material	Sumikon PM-9630 (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41429
Pin material	copper-tin alloy (CuSn), Gold (Au) 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 EFD25/13/9 coil former with 12-pins**

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	39.0	16.45	46.4	2260	CSHS-EFD25-1S-12P

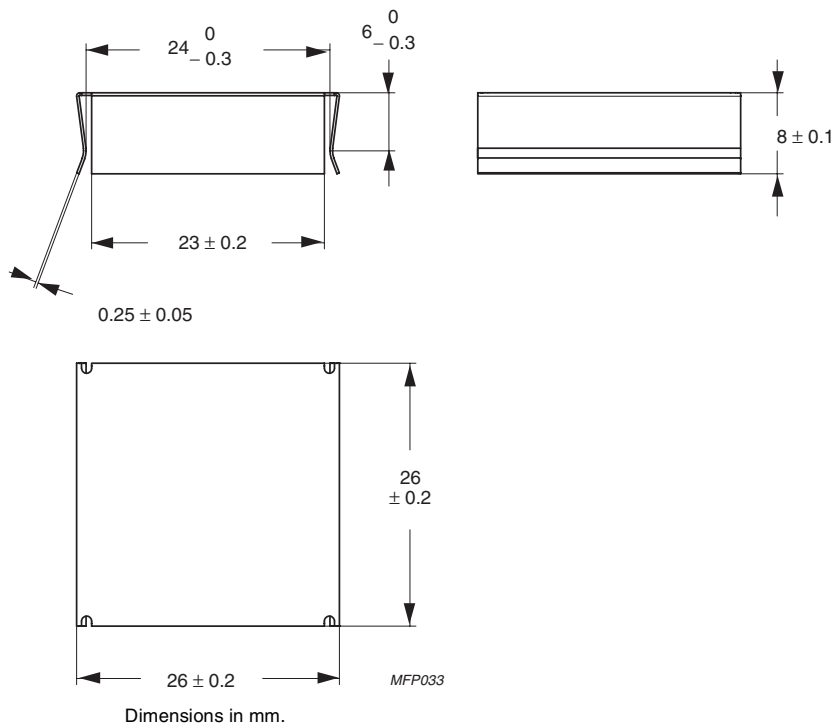


Fig.4 CLM-EFD25 mounting clamp.

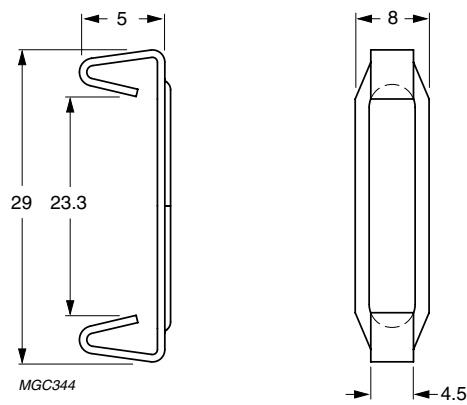


Fig.5 CLI-EFD25 mounting clip.

**MOUNTING PARTS**

**General data**

ITEM	REMARKS	FIGURE	TYPE NUMBER
Clip	stainless steel (CrNi); clamping force $\approx$ 30 N	4	CLI-EFD25
Clamp	stainless steel (CrNi); clamping force $\approx$ 30 N	5	CLM-EFD25




**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.