

MFW063

Soft Ferrites

EPX cores and accessories

PRODUCT OVERVIEW AND TYPE NUMBER STRUCTURE

Product overview EPX cores

CORE TYPE	V <sub>e</sub> (mm <sup>3</sup> )	A <sub>e</sub> (mm <sup>2</sup> )	MASS (g)
EPX7	255	16.5	2.1
EPX8	279	16.4	2.3
EPX9	304	16.3	2.5
EPX10	325	15.0	2.5

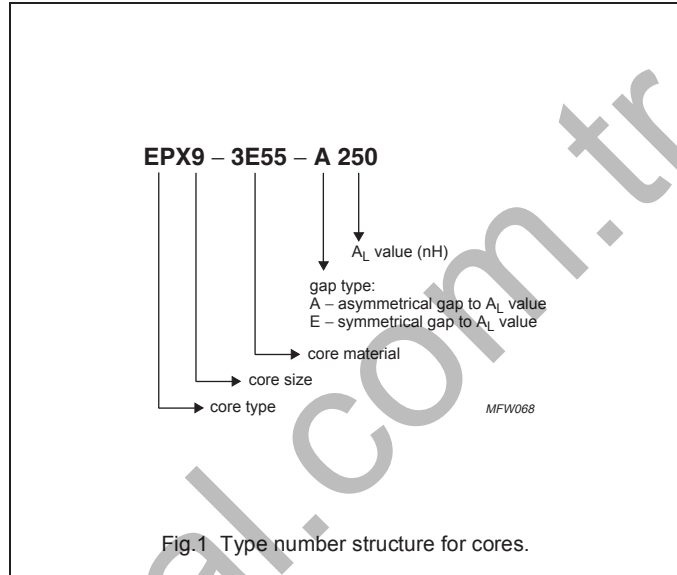


Fig.1 Type number structure for cores.

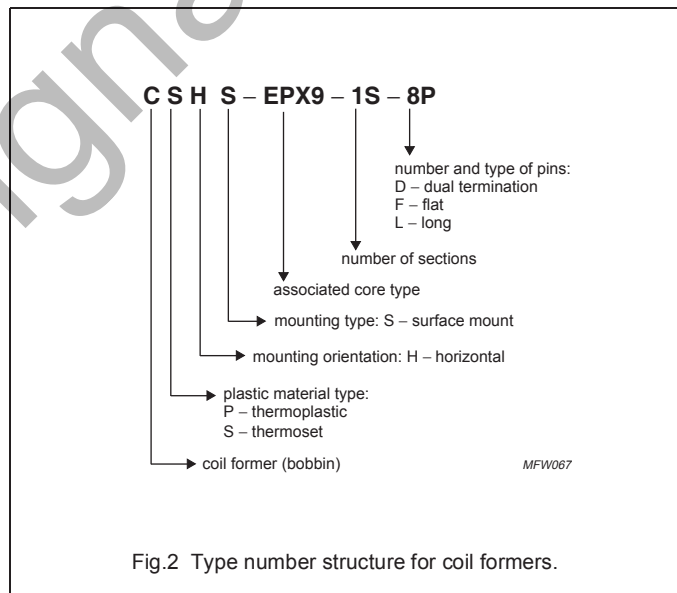


Fig.2 Type number structure for coil formers.

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.931	mm <sup>-1</sup>
$V_e$	effective volume	255	mm <sup>3</sup>
$l_e$	effective length	15.4	mm
$A_e$	effective area	16.5	mm <sup>2</sup>
$A_{min}$	minimum area	14.5	mm <sup>2</sup>
$m$	mass of core set	≈ 2.1	g

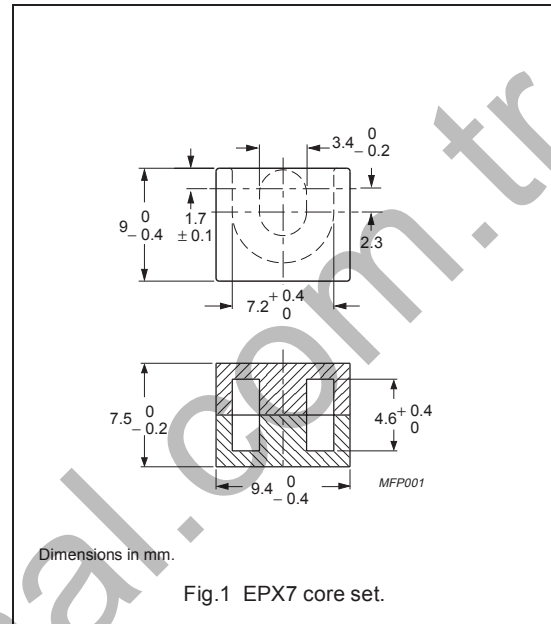


Fig.1 EPX7 core set.

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

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C94	1950 ± 25 %	≈ 1440	≈ 0	EPX7-3C94
3C96 <small>des</small>	1750 ± 25 %	≈ 1300	≈ 0	EPX7-3C96
3F35 <small>des</small>	1400 ± 25 %	≈ 1040	≈ 0	EPX7-3F35

**Core sets for filter applications**

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3B46 <small>des</small>	2500 ± 25 %	≈ 1850	≈ 0	EPX7-3B46

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**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
3E55 <small>des</small>	$63 \pm 3 \%$	$\approx 47$	$\approx 450$	EPX7-3E55-A63
	$100 \pm 3 \%$	$\approx 74$	$\approx 250$	EPX7-3E55-A100
	$160 \pm 3 \%$	$\approx 119$	$\approx 150$	EPX7-3E55-A160
	$250 \pm 5 \%$	$\approx 185$	$\approx 90$	EPX7-3E55-A250
	$315 \pm 5 \%$	$\approx 233$	$\approx 70$	EPX7-3E55-A315
	$400 \pm 8 \%$	$\approx 296$	$\approx 50$	EPX7-3E55-A400
	$8400 + 40 / - 30 \%$	$\approx 6220$	$\approx 0$	EPX7-3E55
3E6	$9300 + 40 / - 30 \%$	$\approx 6890$	$\approx 0$	EPX7-3E6

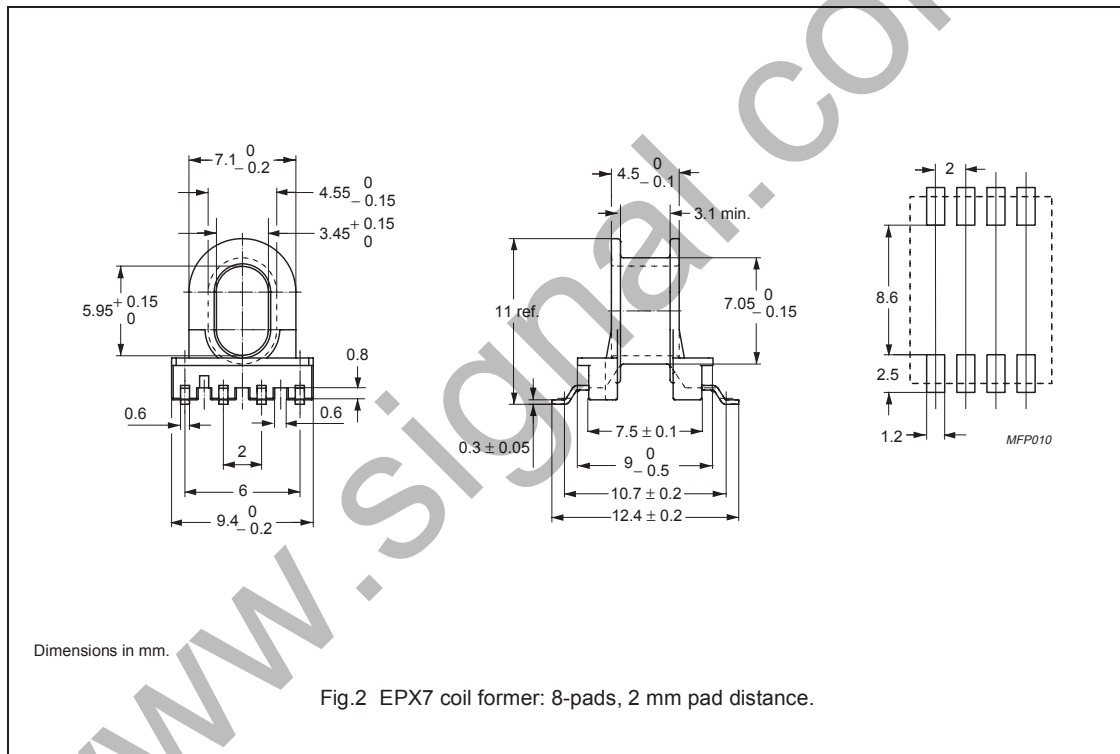
**Properties under power conditions**

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 10 kHz; T = 100 °C	f = 100 kHz; $\hat{B} = 100$ mT; T = 100 °C	f = 100 kHz; $\hat{B} = 200$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 50$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 100$ mT; T = 100 °C
3C94	$\geq 320$	$\leq 0.02$	$\leq 0.13$	–	–
3C96	$\geq 340$	$\leq 0.015$	$\leq 0.1$	$\leq 0.08$	–
3F35	$\geq 300$	–	–	$\leq 0.03$	$\leq 0.25$

**COIL FORMERS**

**General data**

PARAMETER	SPECIFICATION
Coil former material	Sumikon PM9630 (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41429(M)
Pin material	copper-tin alloy (CuSn), nickel flash, gold 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

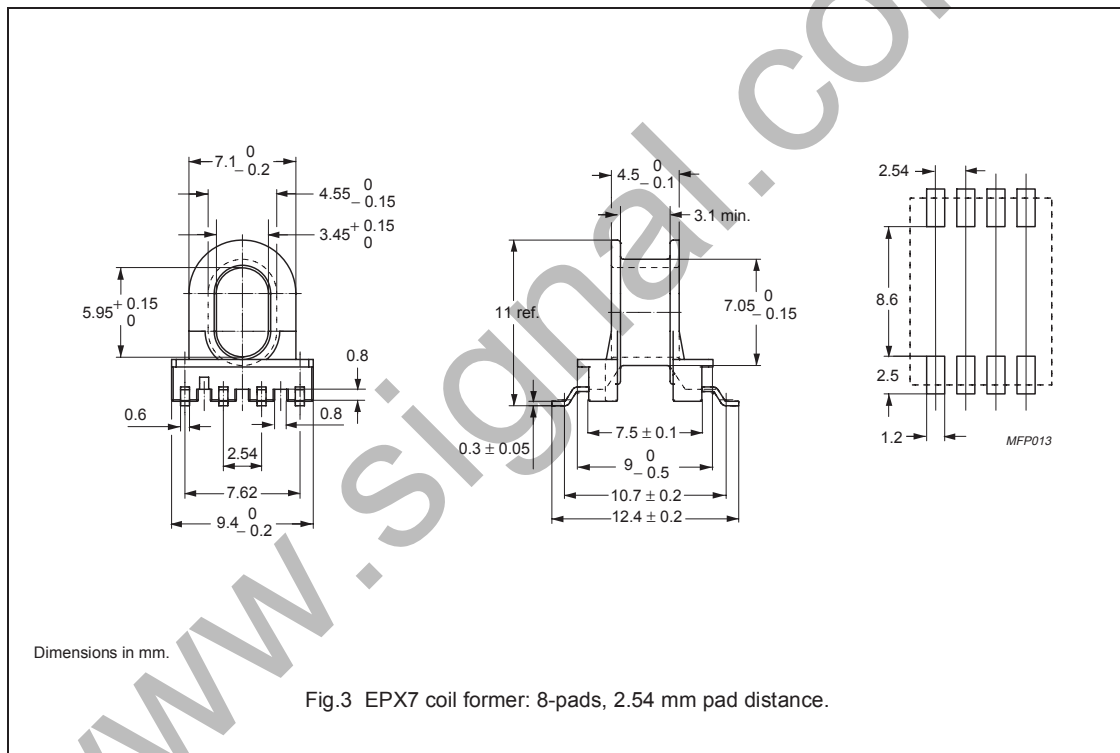


**Winding data and area product for 8-pads EPX7 coil former**

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
1	3.64	3.4	23.3	60.1	CSHS-EPX7-1S-8P-T

General data CSHS-EPX7-1S-8P

PARAMETER	SPECIFICATION
Coil former material	Sumikon PM9630 (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41429(M)
Pin material	copper-tin alloy (CuSn), nickel flash, gold 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



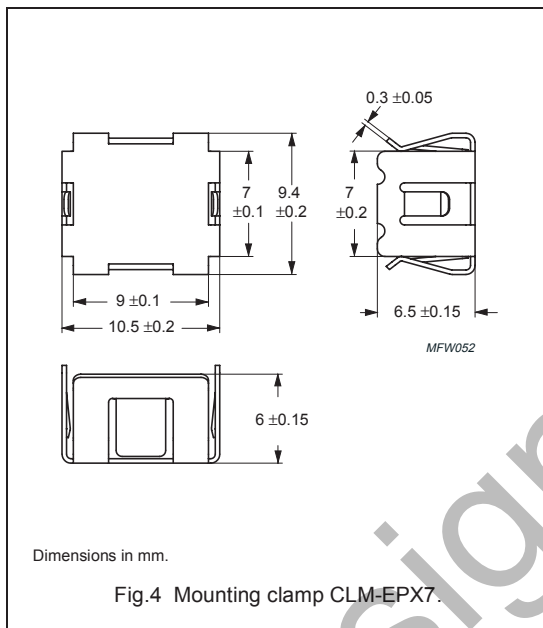
Winding data and area product for 8-pads EPX7 coil former

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	3.64	3.4	23.3	60.1	CSHS-EPX7-1S-8P

**MOUNTING PARTS**

**General data**

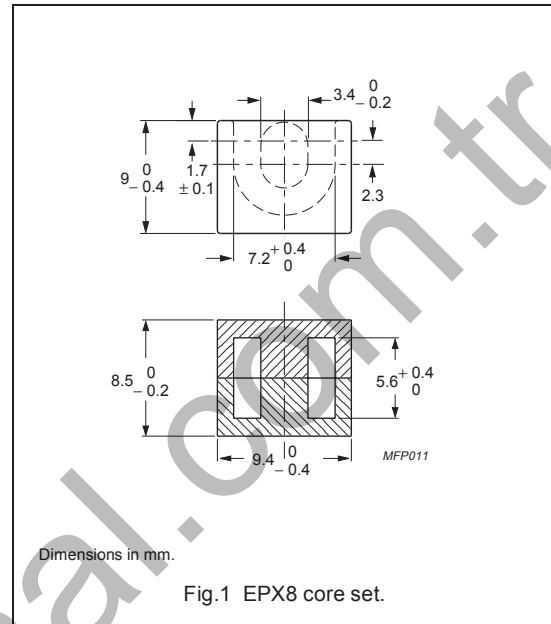
ITEM	REMARKS	FIGURE	TYPE NUMBER
Mounting clamp	stainless steel (CrNi); to be used in combination with CSHS-EPX7-1S-8P or CSHS-EPX7-1S-8P-T	4	CLM-EPX7



**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.04	mm <sup>-1</sup>
$V_e$	effective volume	279	mm <sup>3</sup>
$l_e$	effective length	17.0	mm
$A_e$	effective area	16.4	mm <sup>2</sup>
$A_{min}$	minimum area	14.5	mm <sup>2</sup>
$m$	mass of core set	≈ 2.3	g



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

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C94	1800 ± 25 %	≈ 1490	≈ 0	EPX8-3C94
3C96 <small>des</small>	1650 ± 25 %	≈ 1365	≈ 0	EPX8-3C96
3F35 <small>des</small>	1300 ± 25 %	≈ 1075	≈ 0	EPX8-3F35

**Core sets for filter applications**

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3B46 <small>des</small>	2400 ± 25 %	≈ 1990	≈ 0	EPX8-3B46



**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
3E55 <small>des</small>	$63 \pm 3 \%$	$\approx 52$	$\approx 440$	EPX8-3E55-A63
	$100 \pm 3 \%$	$\approx 83$	$\approx 250$	EPX8-3E55-A100
	$160 \pm 3 \%$	$\approx 132$	$\approx 150$	EPX8-3E55-A160
	$250 \pm 5 \%$	$\approx 207$	$\approx 90$	EPX8-3E55-A250
	$315 \pm 5 \%$	$\approx 261$	$\approx 70$	EPX8-3E55-A315
	$400 \pm 8 \%$	$\approx 331$	$\approx 50$	EPX8-3E55-A400
	$7800 + 40 / - 30 \%$	$\approx 6455$	$\approx 0$	EPX8-3E55
3E6	$8700 + 40 / - 30 \%$	$\approx 7200$	$\approx 0$	EPX8-3E6

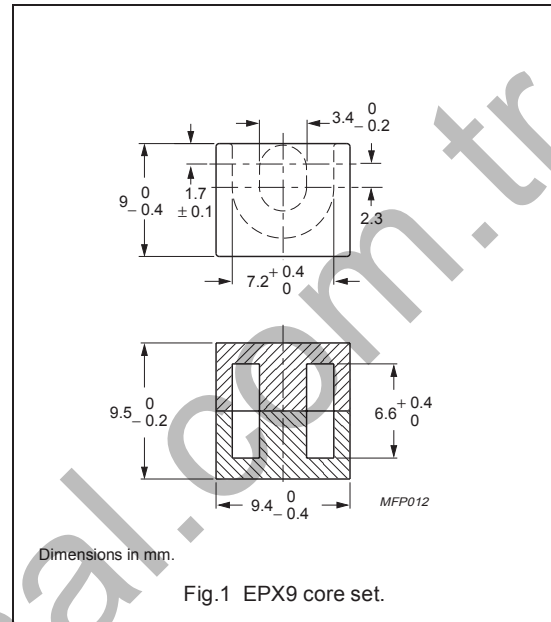
**Properties under power conditions**

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 10 kHz; T = 100 °C	f = 100 kHz; $\hat{B} = 100$ mT; T = 100 °C	f = 100 kHz; $\hat{B} = 200$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 50$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 100$ mT; T = 100 °C
3C94	$\geq 320$	$\leq 0.022$	$\leq 0.14$	–	–
3C96	$\geq 340$	$\leq 0.017$	$\leq 0.11$	$\leq 0.09$	–
3F35	$\geq 300$	–	–	$\leq 0.032$	$\leq 0.27$

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.15	mm <sup>-1</sup>
$V_e$	effective volume	304	mm <sup>3</sup>
$l_e$	effective length	18.7	mm
$A_e$	effective area	16.3	mm <sup>2</sup>
$A_{min}$	minimum area	14.5	mm <sup>2</sup>
$m$	mass of core set	≈ 2.5	g



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

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C94	1700 ± 25 %	≈ 1560	≈ 0	EPX9-3C94
3C96 <small>des</small>	1550 ± 25 %	≈ 1420	≈ 0	EPX9-3C96
3F35 <small>des</small>	1200 ± 25 %	≈ 1100	≈ 0	EPX9-3F35

**Core sets for filter applications**

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3B46 <small>des</small>	2300 ± 25 %	≈ 2110	≈ 0	EPX9-3B46

**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
3E55 <small>des</small>	$63 \pm 3 \%$	$\approx 58$	$\approx 440$	EPX9-3E55-A63
	$100 \pm 3 \%$	$\approx 92$	$\approx 250$	EPX9-3E55-A100
	$160 \pm 3 \%$	$\approx 146$	$\approx 150$	EPX9-3E55-A160
	$250 \pm 5 \%$	$\approx 229$	$\approx 90$	EPX9-3E55-A250
	$315 \pm 5 \%$	$\approx 288$	$\approx 70$	EPX9-3E55-A315
	$400 \pm 8 \%$	$\approx 366$	$\approx 50$	EPX9-3E55-A400
	$7300 + 40 / - 30 \%$	$\approx 6680$	$\approx 0$	EPX9-3E55
3E6	$8200 + 40 / - 30 \%$	$\approx 7500$	$\approx 0$	EPX9-3E6

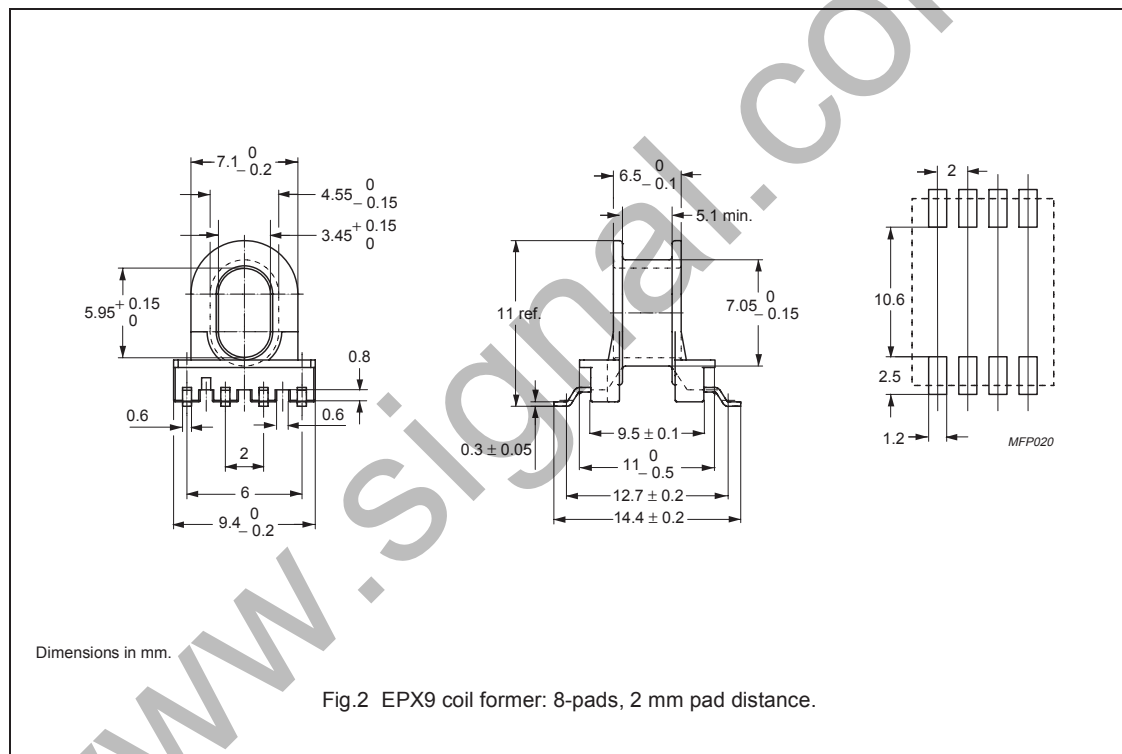
**Properties under power conditions**

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 10 kHz; T = 100 °C	f = 100 kHz; $\hat{B} = 100$ mT; T = 100 °C	f = 100 kHz; $\hat{B} = 200$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 50$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 100$ mT; T = 100 °C
3C94	$\geq 320$	$\leq 0.023$	$\leq 0.15$	–	–
3C96	$\geq 340$	$\leq 0.018$	$\leq 0.12$	$\leq 0.1$	–
3F35	$\geq 300$	–	–	$\leq 0.035$	$\leq 0.3$

**COIL FORMERS**

**General data**

PARAMETER	SPECIFICATION
Coil former material	Sumikon PM9630 (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41429(M)
Pin material	copper-tin alloy (CuSn), nickel flash, gold 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

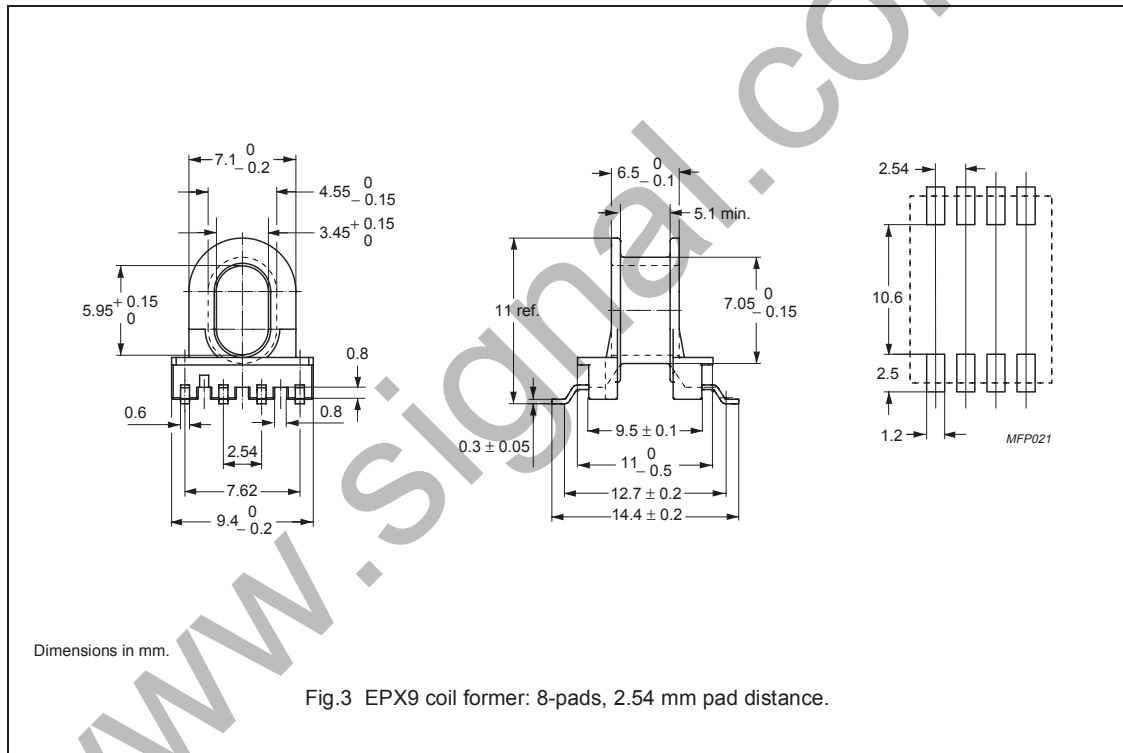


**Winding data and area product for 8-pads EPX9 coil former**

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
1	5.99	5.4	23.3	97.6	CSHS-EPX9-1S-8P-T

General data CSHS-EPX9-1S-8P

PARAMETER	SPECIFICATION
Coil former material	Sumikon PM9630 (PF), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41429(M)
Pin material	copper-tin alloy (CuSn), nickel flash, gold 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



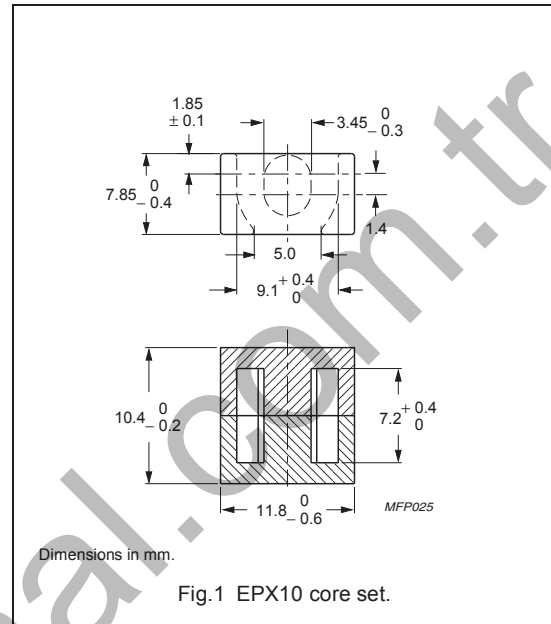
Winding data and area product for 8-pads EPX9 coil former

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	5.99	5.4	23.3	97.6	CSHS-EPX9-1S-8P

**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	325	mm <sup>3</sup>
$l_e$	effective length	21.7	mm
$A_e$	effective area	15.0	mm <sup>2</sup>
$A_{min}$	minimum area	12.5	mm <sup>2</sup>
$m$	mass of core set	≈ 2.5	g



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

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C94	1400 ± 25 %	≈ 1620	≈ 0	EPX10-3C94
3C96 <small>des</small>	1250 ± 25 %	≈ 1440	≈ 0	EPX10-3C96
3F35 <small>des</small>	950 ± 25 %	≈ 1100	≈ 0	EPX10-3F35

**Core sets for filter applications**

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

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3B46 <small>des</small>	1900 ± 25 %	≈ 2200	≈ 0	EPX10-3B46

**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
3E55 <small>des</small>	$63 \pm 3 \%$	$\approx 73$	$\approx 410$	EPX10-3E55-A63
	$100 \pm 3 \%$	$\approx 115$	$\approx 230$	EPX10-3E55-A100
	$160 \pm 3 \%$	$\approx 185$	$\approx 135$	EPX10-3E55-A160
	$250 \pm 5 \%$	$\approx 288$	$\approx 80$	EPX10-3E55-A250
	$315 \pm 5 \%$	$\approx 363$	$\approx 60$	EPX10-3E55-A315
	$400 \pm 8 \%$	$\approx 462$	$\approx 50$	EPX10-3E55-A400
	$6000 + 40 / - 30 \%$	$\approx 6920$	$\approx 0$	EPX10-3E55
3E6	$6600 + 40 / - 30 \%$	$\approx 7620$	$\approx 0$	EPX10-3E6

**Properties of core sets under power conditions**

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 10 kHz; T = 100 °C	f = 100 kHz; $\hat{B} = 100$ mT; T = 100 °C	f = 100 kHz; $\hat{B} = 200$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 50$ mT; T = 100 °C	f = 500 kHz; $\hat{B} = 100$ mT; T = 100 °C
3C94	$\geq 320$	$\leq 0.025$	$\leq 0.16$	–	–
3C96	$\geq 340$	$\leq 0.018$	$\leq 0.13$	$\leq 0.1$	–
3F35	$\geq 300$	–	–	$\leq 0.04$	$\leq 0.3$