

Soft Ferrites

PT, PTS, PTS/I cores and accessories

PRODUCT OVERVIEW AND TYPE NUMBER STRUCTURE

Product overview PT, PTS, PTS/I cores

CORE TYPE	$V_e$ (mm <sup>3</sup> )	$A_e$ (mm <sup>2</sup> )	MASS (g)
PT14/8	492	23.3	2.8
PTS14/8	495	22.0	2.5
PT18/11	1110	40.6	6.0
PTS18/11	1070	37.2	5.0
PT23/11	1740	61.0	10.5
PTS23/11	1810	57.2	9.0
PT23/18	2590	62.2	14
PTS23/18	2630	58.3	13
PTS30/19/I	5940	120	31
PTS34/19/I	8140	155	46
PTS40/27/I	14400	204	66

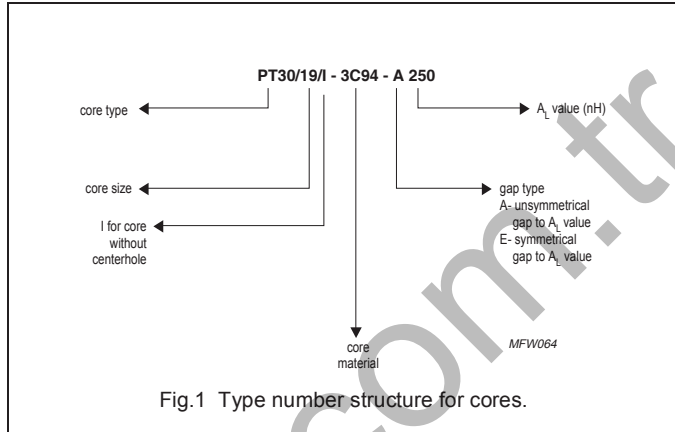


Fig.1 Type number structure for cores.

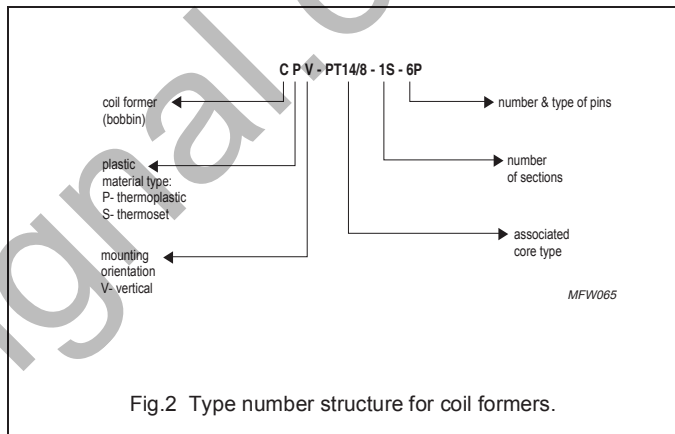
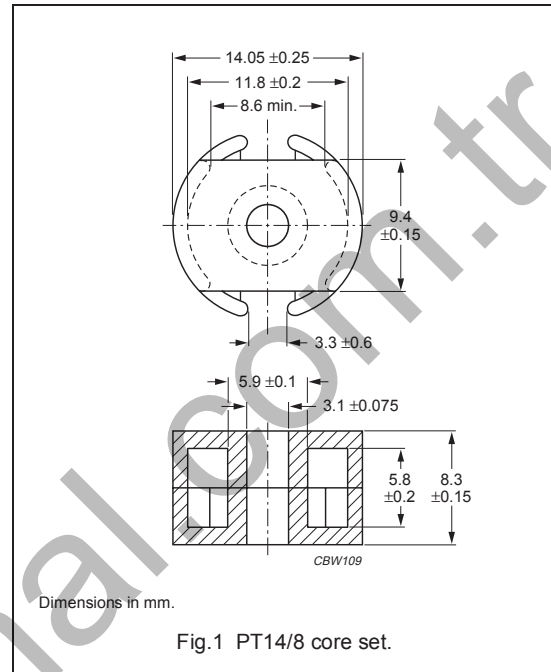


Fig.2 Type number structure for coil formers.

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.910	mm <sup>-1</sup>
$V_e$	effective volume	492	mm <sup>3</sup>
$l_e$	effective length	21.1	mm
$A_e$	effective area	23.3	mm <sup>2</sup>
$A_{min}$	minimum area	19.9	mm <sup>2</sup>
$m$	mass of set	≈ 2.8	g



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

Clamping force for  $A_L$  measurements, 15 ± 15 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C81 <sup>sup</sup>	63 ± 3%	≈ 45	≈ 630	PT14/8-3C81-A63
	100 ± 3%	≈ 72	≈ 360	PT14/8-3C81-A100
	160 ± 3%	≈ 115	≈ 210	PT14/8-3C81-A160
	250 ± 3%	≈ 180	≈ 120	PT14/8-3C81-A250
	315 ± 5%	≈ 227	≈ 90	PT14/8-3C81-A315
	2400 ± 25%	≈ 1730	≈ 0	PT14/8-3C81
3C91 <sup>sup</sup>	2400 ± 25%	≈ 1730	≈ 0	PT14/8-3C91
3F3 <sup>sup</sup>	63 ± 3%	≈ 45	≈ 630	PT14/8-3F3-A63
	100 ± 3%	≈ 72	≈ 360	PT14/8-3F3-A100
	160 ± 3%	≈ 115	≈ 210	PT14/8-3F3-A160
	250 ± 3%	≈ 180	≈ 120	PT14/8-3F3-A250
	315 ± 5%	≈ 227	≈ 90	PT14/8-3F3-A315
	1650 ± 25%	≈ 1190	≈ 0	PT14/8-3F3

## PT, PTS, PTS/I cores and accessories

PT14/8  
(1408TS)**Core sets of high permeability grades**Clamping force for  $A_L$  measurements,  $15 \pm 5$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3E27 <sup>sup</sup>	$4500 \pm 25\%$	$\approx 3240$	$\approx 0$	PT14/8-3E27

**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; B = 200 mT; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C
3C81	$\geq 320$	$\leq 0.11$	–	–	–
3C91	$\geq 320$	–	$\leq 0.03^{(1)}$	$\leq 0.22^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.06$	–	$\leq 0.1$

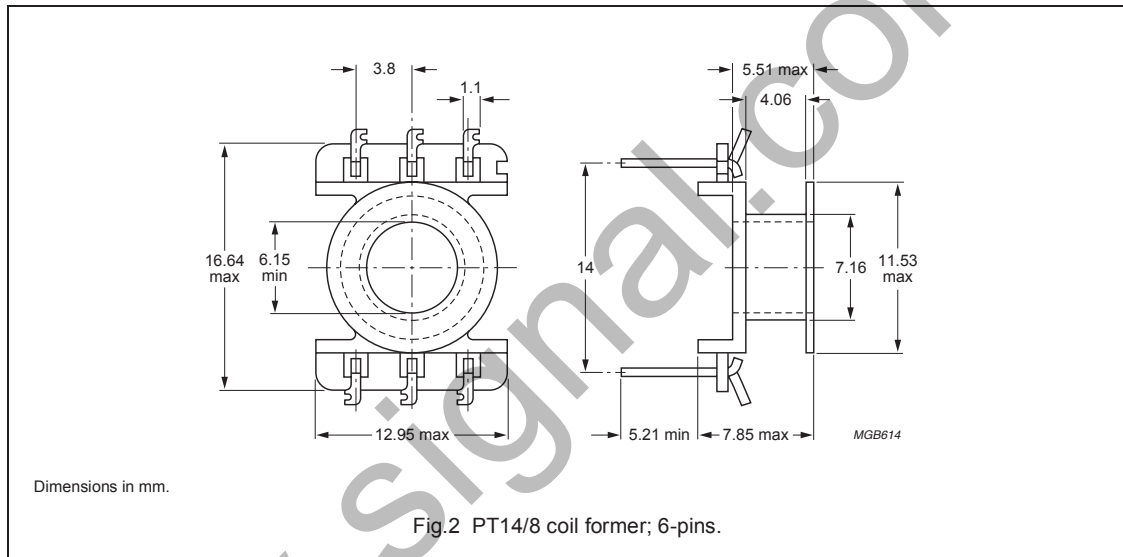
**Note**

1. Measured at 60 °C.

**COIL FORMERS**

**General data 6-pins PT14/8 coil former**

PARAMETER	SPECIFICATION
Coil former material	polyamide (PA), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41938(M)
Pin material	copper-tin alloy (CuSn), tin (Sn) plated
Maximum operating temperature	130 °C, "IEC 60085" class B
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



**Winding data and area product for 6-pins PT14/8 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	7.9	4.1	29.2	184	CPV-PT14/8-1S-6P

Additional coil formers and mounting parts are those of "P14/8", but "area product" is different.

**Winding data and area product (for PT14/8) for CP-P14/8 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	8.8	4.1	28.9	205	CP-P14/8-1S
2	2 x 4.0	2 x 1.85	28.9	2 x 93.2	CP-P14/8-2S

## PT, PTS, PTS/I cores and accessories

PT14/8  
(1408TS)

## Winding data and area product (for PT14/8) for CP-P14/8-A 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	9.4	4.5	29.0	219	CP-P14/8-1S-A
2	2 x 4.32	2 x 2.0	29.0	2 x 101	CP-P14/8-2S-A
3	3 x 2.19	3 x 1.2	29.0	3 x 51.0	CP-P14/8-3S-A

## Winding data and area product (for PT14/8) for 4-pins P14/8 coil former for PCB mounting

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	LENGTH OF PINS (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	8.65	4.4	29.0	4.4	202	CPV-P14/8-1S-4SPD
1	8.65	4.4	29.0	6.8	202	CPV-P14/8-1S-4SPDL
2	2 x 3.87	2 x 2.0	29.0	4.4	2 x 90.2	CPV-P14/8-2S-4SPD
2	2 x 3.87	2 x 2.0	29.0	6.8	2 x 90.2	CPV-P14/8-2S-4SPDL

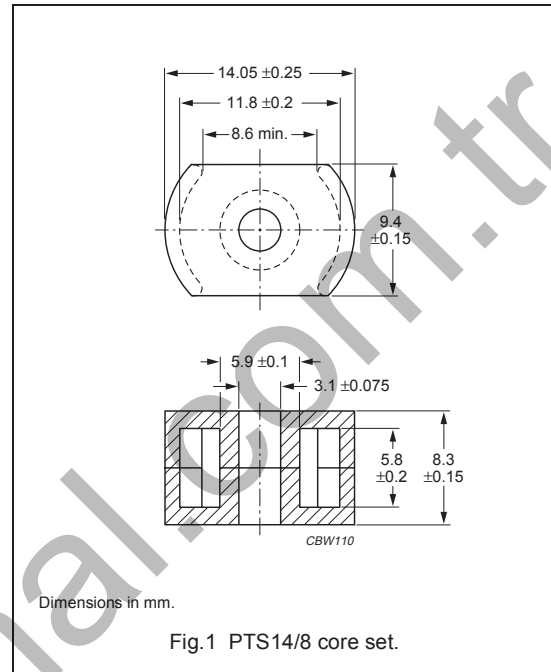
## Winding data and area product (for PT14/8) for 6-pins P14/8 coil former for PCB mounting

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	LENGTH OF PINS (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	8.65	4.4	29.0	4.4	202	CPV-P14/8-1S-6PD
1	8.65	4.4	29.0	6.8	202	CPV-P14/8-1S-6PDL
2	2 x 3.87	2 x 2.0	29.0	4.4	2 x 90.2	CPV-P14/8-2S-6PD
2	2 x 3.87	2 x 2.0	29.0	6.8	2 x 90.2	CPV-P14/8-2S-6PDL

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.02	mm <sup>-1</sup>
$V_e$	effective volume	495	mm <sup>3</sup>
$l_e$	effective length	22.5	mm
$A_e$	effective area	22.0	mm <sup>2</sup>
$A_{min}$	minimum area	19.9	mm <sup>2</sup>
$m$	mass of set	≈ 2.5	g



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

Clamping force for  $A_L$  measurements, 15 ± 15 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3C81	63 ± 3%	≈ 51	≈ 590	PTS14/8-3C81-A63
	100 ± 3%	≈ 81	≈ 340	PTS14/8-3C81-A100
	160 ± 3%	≈ 130	≈ 190	PTS14/8-3C81-A160
	250 ± 3%	≈ 204	≈ 110	PTS14/8-3C81-A250
	315 ± 5%	≈ 257	≈ 90	PTS14/8-3C81-A315
	2330 ± 25%	≈ 1900	≈ 0	PTS14/8-3C81
3C91 <small>des</small>	2330 ± 25%	≈ 1900	≈ 0	PTS14/8-3C91
3F3	63 ± 3%	≈ 51	≈ 590	PTS14/8-3F3-A63
	100 ± 3%	≈ 81	≈ 340	PTS14/8-3F3-A100
	160 ± 3%	≈ 130	≈ 190	PTS14/8-3F3-A160
	250 ± 3%	≈ 204	≈ 110	PTS14/8-3F3-A250
	315 ± 5%	≈ 257	≈ 90	PTS14/8-3F3-A315
	1625 ± 25%	≈ 1320	≈ 0	PTS14/8-3F3

## PT, PTS, PTS/I cores and accessories

PTS14/8  
(1408THS)

## Core sets of high permeability grades

Clamping force for  $A_L$  measurements,  $15 \pm 5$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3E27	$4370 \pm 25\%$	$\approx 3540$	$\approx 0$	PTS14/8-3E27

## 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	$\geq 320$	$\leq 0.1$	–	–	–
3C91	$\geq 320$	–	$\leq 0.026^{(1)}$	$\leq 0.19^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.054$	–	$\leq 0.94$

## Note

1. Measured at 60 °C.

## BOBBINS AND ACCESSORIES

For coil formers, winding data and mounting parts, see data sheet, "P14/8" and "PT14/8", but "area product" is different.

## Winding data and area product (for PTS14/8) for 6-pins PT14/8 coil former

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	7.9	4.1	29.2	174	CPV-PT14/8-1S-6P

## Winding data and area product (for PTS14/8) for CP-P14/8 coil former

NUMBER OF SECTIONS	WINDING AREA (mm <sup>2</sup> )	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	8.8	4.1	28.9	194	CP-P14/8-1S
2	$2 \times 4.0$	$2 \times 1.85$	28.9	$2 \times 88.0$	CP-P14/8-2S



## PT, PTS, PTS/I cores and accessories

PTS14/8  
(1408THS)

## Winding data and area product (for PTS14/8) for CP-P14/8-A 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	9.4	4.5	29.0	207	CP-P14/8-1S-A
2	2 x 4.32	2 x 2.0	29.0	2 x 95.0	CP-P14/8-2S-A
3	3 x 2.19	3 x 1.2	29.0	3 x 48.2	CP-P14/8-3S-A

## Winding data and area product (for PTS14/8) for 4-pins P14/8 coil former for PCB mounting

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	LENGTH OF PINS (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	8.65	4.4	29.0	4.4	190	CPV-P14/8-1S-4SPD
1	8.65	4.4	29.0	6.8	190	CPV-P14/8-1S-4SPDL
2	2 x 3.87	2 x 2.0	29.0	4.4	2 x 85.1	CPV-P14/8-2S-4SPD
2	2 x 3.87	2 x 2.0	29.0	6.8	2 x 85.1	CPV-P14/8-2S-4SPDL

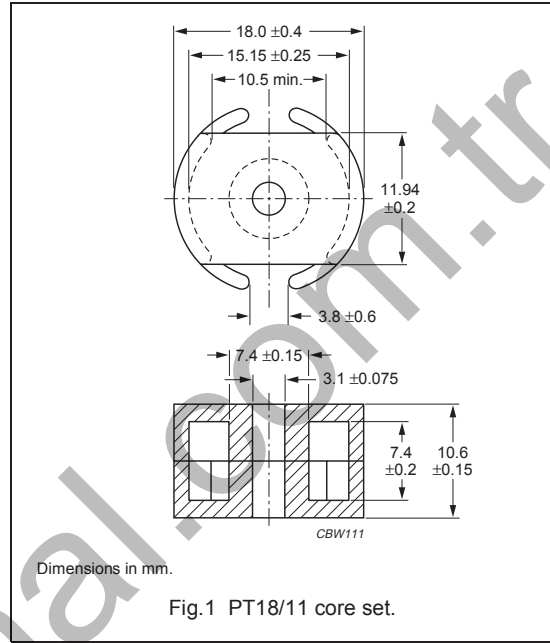
## Winding data and area product (for PTS14/8) for 6-pins P14/8 coil former for PCB mounting

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	LENGTH OF PINS (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	8.65	4.4	29.0	4.4	190	CPV-P14/8-1S-6PD
1	8.65	4.4	29.0	6.8	190	CPV-P14/8-1S-6PDL
2	2 x 3.87	2 x 2.0	29.0	4.4	2 x 85.1	CPV-P14/8-2S-6PD
2	2 x 3.87	2 x 2.0	29.0	6.8	2 x 85.1	CPV-P14/8-2S-6PDL

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.670	mm <sup>-1</sup>
$V_e$	effective volume	1110	mm <sup>3</sup>
$l_e$	effective length	27.2	mm
$A_e$	effective area	40.6	mm <sup>2</sup>
$A_{min}$	minimum area	32.9	mm <sup>2</sup>
m	mass of set	≈ 6.0	g



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

Clamping force for  $A_L$  measurements, 20 ± 5 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C81 <sup>sup</sup>	100 ± 3%	≈ 53	≈ 660	PT18/11-3C81-A100
	160 ± 3%	≈ 85	≈ 380	PT18/11-3C81-A160
	250 ± 3%	≈ 133	≈ 220	PT18/11-3C81-A250
	315 ± 3%	≈ 168	≈ 170	PT18/11-3C81-A315
	400 ± 5%	≈ 213	≈ 130	PT18/11-3C81-A400
	3130 ± 25%	≈ 1670	≈ 0	PT18/11-3C81
3C91 <sup>sup</sup>	3130 ± 25%	≈ 1670	≈ 0	PT18/11-3C91
3F3 <sup>sup</sup>	100 ± 3%	≈ 53	≈ 660	PT18/11-3F3-A100
	160 ± 3%	≈ 85	≈ 380	PT18/11-3F3-A160
	250 ± 3%	≈ 133	≈ 220	PT18/11-3F3-A250
	315 ± 3%	≈ 168	≈ 170	PT18/11-3F3-A315
	400 ± 5%	≈ 213	≈ 130	PT18/11-3F3-A400
	2500 ± 25%	≈ 1340	≈ 0	PT18/11-3F3

## PT, PTS, PTS/I cores and accessories

PT18/11  
(1811TS)

## Core sets of high permeability grades

Clamping force for  $A_L$  measurements,  $15 \pm 5$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3E27 <sup>sup</sup>	$5760 \pm 25\%$	$\approx 3075$	$\approx 0$	PT18/11-3E27

## 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; B = 200 mT; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C
3C81	$\geq 320$	$\leq 0.23$	–	–	–
3C91	$\geq 320$	–	$\leq 0.06^{(1)}$	$\leq 0.5^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.12$	–	$\leq 0.21$

## Note

1. Measured at 60 °C.

## BOBBINS AND ACCESSORIES

Coil formers, winding data and mounting parts are equal to those of "P18/11", but "area product" is different.

## Winding data and area product (for PT18/11) for CP-P18/11 coil former

NUMBER OF SECTIONS	WINDING AREA (mm <sup>2</sup> )	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	17.1	5.7	36.6	694	CP-P18/11-1S
2	$2 \times 7.95$	$2 \times 2.65$	36.6	$2 \times 323$	CP-P18/11-2S
3	$3 \times 4.95$	$3 \times 1.6$	36.6	$3 \times 201$	CP-P18/11-3S

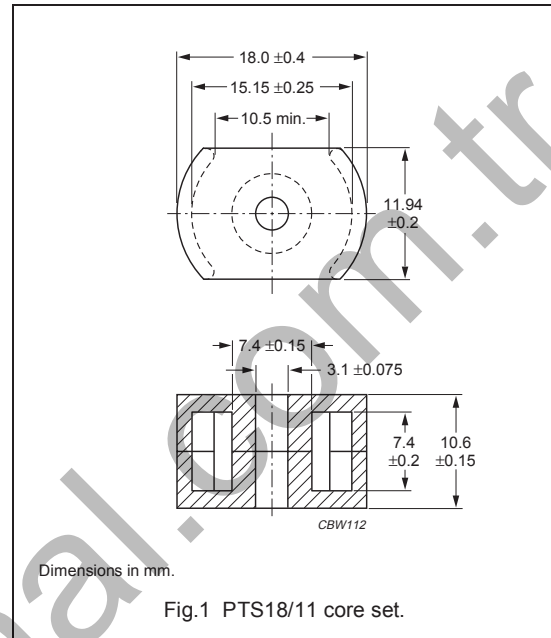
## Winding data and area product (for PT18/11) for 6-pins P18/11 coil former for PCB mounting

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	LENGTH OF PINS (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	16.8	6.0	36.7	4.4	682	CPV-P18/11-1S-6PD
1	16.8	6.0	36.7	6.8	682	CPV-P18/11-1S-6PDL
2	$2 \times 7.61$	$2 \times 2.8$	36.7	4.4	$2 \times 309$	CPV-P18/11-2S-6PD
2	$2 \times 7.61$	$2 \times 2.8$	36.7	6.8	$2 \times 309$	CPV-P18/11-2S-6PDL
3	$3 \times 4.58$	$3 \times 1.7$	36.7	4.4	$3 \times 186$	CPV-P18/11-3S-6PD
3	$3 \times 4.58$	$3 \times 1.7$	36.7	6.8	$3 \times 186$	CPV-P18/11-3S-6PDL

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.770	mm <sup>-1</sup>
$V_e$	effective volume	1070	mm <sup>3</sup>
$l_e$	effective length	28,7	mm
$A_e$	effective area	37.2	mm <sup>2</sup>
$A_{min}$	minimum area	31.0	mm <sup>2</sup>
$m$	mass of set	≈ 5.0	g



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

Clamping force for  $A_L$  measurements, 20 ± 5 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C81	100 ± 3%	≈ 61	≈ 600	PTS18/11-3C81-A100
	160 ± 3%	≈ 98	≈ 340	PTS18/11-3C81-A160
	250 ± 3%	≈ 153	≈ 200	PTS18/11-3C81-A250
	315 ± 3%	≈ 193	≈ 150	PTS18/11-3C81-A315
	400 ± 5%	≈ 245	≈ 120	PTS18/11-3C81-A400
	3000 ± 25%	≈ 1830	≈ 0	PTS18/11-3C81
3C91 <small>des</small>	3000 ± 25%	≈ 1830	≈ 0	PTS18/11-3C91
3F3	100 ± 3%	≈ 61	≈ 600	PTS18/11-3F3-A100
	160 ± 3%	≈ 98	≈ 340	PTS18/11-3F3-A160
	250 ± 3%	≈ 153	≈ 200	PTS18/11-3F3-A250
	315 ± 3%	≈ 193	≈ 150	PTS18/11-3F3-A315
	400 ± 5%	≈ 245	≈ 120	PTS18/11-3F3-A400
	2225 ± 25%	≈ 1365	≈ 0	PTS18/11-3F3

## PT, PTS, PTS/I cores and accessories

PTS18/11  
(1811THS)

## Core sets of high permeability grades

Clamping force for  $A_L$  measurements,  $15 \pm 5$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu\text{m}$ )	TYPE NUMBER
3E27	$5140 \pm 25\%$	$\approx 3150$	$\approx 0$	PTS18/11-3E27

## 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; B = 200 mT; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C
3C81	$\geq 320$	$\leq 0.22$	–	–	–
3C91	$\geq 320$	–	$\leq 0.055^{(1)}$	$\leq 0.4^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.12$	–	$\leq 0.2$

## Note

1. Measured at 60 °C.

## BOBBINS AND ACCESSORIES

Coil formers, winding data and mounting parts are equal to those of "P18/11", but "area product" is different.

## Winding data and area product (for PTS18/11) for CP-P18/11 coil former

NUMBER OF SECTIONS	WINDING AREA (mm <sup>2</sup> )	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	17.1	5.7	36.6	636	CP-P18/11-1S
2	$2 \times 7.95$	$2 \times 2.65$	36.6	$2 \times 296$	CP-P18/11-2S
3	$3 \times 4.95$	$3 \times 1.6$	36.6	$3 \times 184$	CP-P18/11-3S

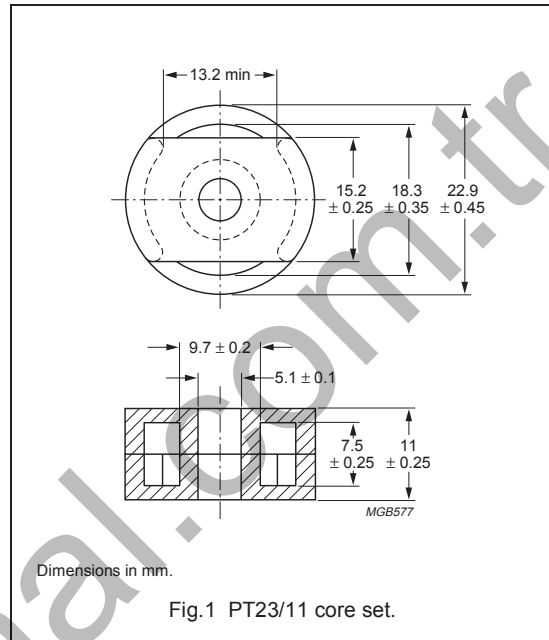
## Winding data and area product (for PTS18/11) for 6-pins P18/11 coil former for PCB mounting

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	LENGTH OF PINS (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	16.8	6.0	36.7	4.4	625	CPV-P18/11-1S-6PD
1	16.8	6.0	36.7	6.8	625	CPV-P18/11-1S-6PDL
2	$2 \times 7.61$	$2 \times 2.8$	36.7	4.4	$2 \times 283$	CPV-P18/11-2S-6PD
2	$2 \times 7.61$	$2 \times 2.8$	36.7	6.8	$2 \times 283$	CPV-P18/11-2S-6PDL
3	$3 \times 4.58$	$3 \times 1.7$	36.7	4.4	$3 \times 170$	CPV-P18/11-3S-6PD
3	$3 \times 4.58$	$3 \times 1.7$	36.7	6.8	$3 \times 170$	CPV-P18/11-3S-6PDL

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.470	mm <sup>-1</sup>
$V_e$	effective volume	1740	mm <sup>3</sup>
$l_e$	effective length	28.6	mm
$A_e$	effective area	61.0	mm <sup>2</sup>
$A_{min}$	minimum area	53.6	mm <sup>2</sup>
$m$	mass of set	≈ 10.5	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 ( $\mu$ m)	TYPE NUMBER
3C81 <sup>sup</sup>	160 ± 3%	≈ 60	≈ 580	PT23/11-3C81-A160
	250 ± 3%	≈ 93	≈ 350	PT23/11-3C81-A250
	315 ± 3%	≈ 118	≈ 270	PT23/11-3C81-A315
	400 ± 3%	≈ 149	≈ 200	PT23/11-3C81-A400
	630 ± 5%	≈ 235	≈ 120	PT23/11-3C81-A630
	5500 ± 25%	≈ 2050	≈ 0	PT23/11-3C81
3C91 <sup>sup</sup>	5500 ± 25%	≈ 2050	≈ 0	PT23/11-3C91
3F3 <sup>sup</sup>	160 ± 3%	≈ 60	≈ 580	PT23/11-3F3-A160
	250 ± 3%	≈ 93	≈ 350	PT23/11-3F3-A250
	315 ± 3%	≈ 118	≈ 270	PT23/11-3F3-A315
	400 ± 3%	≈ 149	≈ 200	PT23/11-3F3-A400
	630 ± 5%	≈ 235	≈ 120	PT23/11-3F3-A630
	3700 ± 25%	≈ 1380	≈ 0	PT23/11-3F3

## PT, PTS, PTS/I cores and accessories

PT23/11  
(2311TS)**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 <sup>sup</sup>	$8400 \pm 25\%$	$\approx 3130$	$\approx 0$	PT23/11-3E27

**Properties of core sets under power conditions**

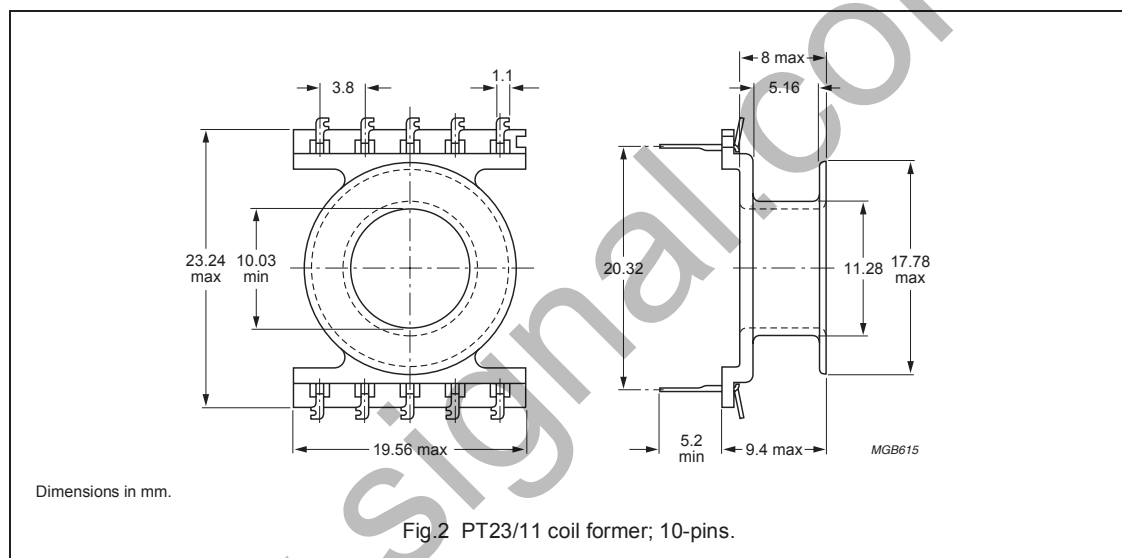
GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 25 kHz; B = 200 mT; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C
3C81	$\geq 320$	$\leq 0.4$	–	–	–
3C91	$\geq 320$	–	$\leq 0.09^{(1)}$	$\leq 0.7^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.19$	–	$\leq 0.33$

**Note**

1. Measured at 60 °C.

**COIL FORMERS****General data 10-pins PT23/11 coil former**

PARAMETER	SPECIFICATION
Coil former material	polyamide (PA), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41938(M)
Pin material	copper-tin alloy (CuSn), tin (Sn) plated
Maximum operating temperature	130 °C, "IEC 60085" class B
Resistance to soldering heat	"IEC 68-2-20", Part 2, Test Tb, method 1B, 350 °C, 3.5 s
Solderability	"IEC 68-2-20", Part 2, Test Ta, method 1

**Winding data and area product for 10-pins PT23/11 coil former**

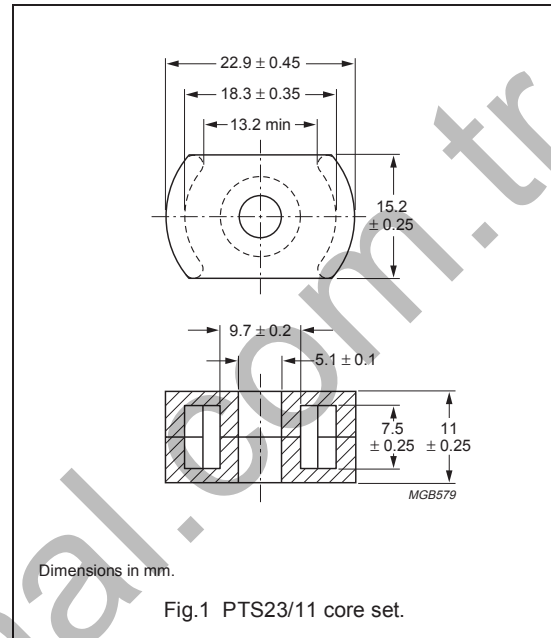
NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm <sup>4</sup> )	TYPE NUMBER
1	15.1	5.2	45.2	921	CPV-PT23/11-1S-10P



**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.550	mm <sup>-1</sup>
$V_e$	effective volume	1810	mm <sup>3</sup>
$l_e$	effective length	31.6	mm
$A_e$	effective area	57.2	mm <sup>2</sup>
$A_{min}$	minimum area	53.6	mm <sup>2</sup>
$m$	mass of set	≈ 9.0	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 ( $\mu\text{m}$ )	TYPE NUMBER
3C81	160 ± 3%	≈ 70	≈ 540	PTS23/11-3C81-A160
	250 ± 3%	≈ 110	≈ 320	PTS23/11-3C81-A250
	315 ± 3%	≈ 138	≈ 250	PTS23/11-3C81-A315
	400 ± 3%	≈ 175	≈ 190	PTS23/11-3C81-A400
	630 ± 5%	≈ 276	≈ 110	PTS23/11-3C81-A630
	4890 ± 25%	≈ 2150	≈ 0	PTS23/11-3C81
3C91 <small>des</small>	4890 ± 25%	≈ 2150	≈ 0	PTS23/11-3C91
3F3	160 ± 3%	≈ 70	≈ 540	PTS23/11-3F3-A160
	250 ± 3%	≈ 110	≈ 320	PTS23/11-3F3-A250
	315 ± 3%	≈ 138	≈ 250	PTS23/11-3F3-A315
	400 ± 3%	≈ 175	≈ 190	PTS23/11-3F3-A400
	630 ± 5%	≈ 276	≈ 110	PTS23/11-3F3-A630
	3280 ± 25%	≈ 1510	≈ 0	PTS23/11-3F3

## PT, PTS, PTS/I cores and accessories

PTS23/11  
(2311THS)**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	$7250 \pm 25\%$	$\approx 3190$	$\approx 0$	PTS23/11-3E27

**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; B = 200 mT; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C
3C81	$\geq 320$	$\leq 0.37$	–	–	–
3C91	$\geq 320$	–	$\leq 0.09^{(1)}$	$\leq 0.7^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.2$	–	$\leq 0.35$

**Note**

1. Measured at 60 °C.

**BOBBINS AND ACCESSORIES**

Coil formers, winding data and mounting parts are equal to those of "PT23/11", but "area product" is different.

**Winding data and area product (for PTS23/11) for 10-pins PT23/11 coil former**

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	15.1	5.2	45.2	864	CPV-PT23/11-1S-10P

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.670	mm <sup>-1</sup>
$V_e$	effective volume	2590	mm <sup>3</sup>
$l_e$	effective length	41.6	mm
$A_e$	effective area	62.2	mm <sup>2</sup>
$A_{min}$	minimum area	53.6	mm <sup>2</sup>
$m$	mass of set	≈ 14	g

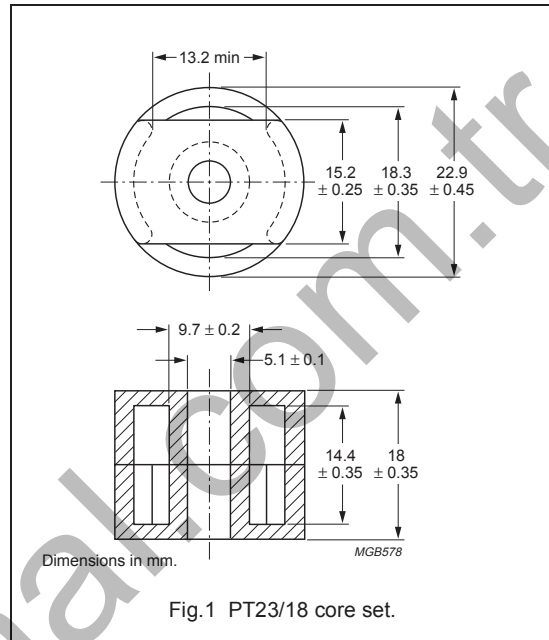


Fig.1 PT23/18 core set.

**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 ( $\mu$ m)	TYPE NUMBER
3C81 <sup>sup</sup>	160 ± 3%	≈ 85	≈ 620	PT23/18-3C81-A160
	250 ± 3%	≈ 133	≈ 360	PT23/18-3C81-A250
	315 ± 3%	≈ 168	≈ 270	PT23/18-3C81-A315
	400 ± 3%	≈ 213	≈ 200	PT23/18-3C81-A400
	630 ± 5%	≈ 335	≈ 120	PT23/18-3C81-A630
	4100 ± 25%	≈ 2180	≈ 0	PT23/18-3C81
3C91 <sup>sup</sup>	4100 ± 25%	≈ 2180	≈ 0	PT23/18-3C91
3F3 <sup>sup</sup>	160 ± 3%	≈ 85	≈ 620	PT23/18-3F3-A160
	250 ± 3%	≈ 133	≈ 360	PT23/18-3F3-A250
	315 ± 3%	≈ 168	≈ 270	PT23/18-3F3-A315
	400 ± 3%	≈ 213	≈ 200	PT23/18-3F3-A400
	630 ± 5%	≈ 335	≈ 120	PT23/18-3F3-A630
	2750 ± 25%	≈ 1460	≈ 0	PT23/18-3F3

## PT, PTS, PTS/I cores and accessories

PT23/18  
(2318TS)**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 <sup>sup</sup>	$6400 \pm 25\%$	$\approx 3410$	$\approx 0$	PT23/18-3E27

**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; B = 200 mT; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C
3C81	$\geq 320$	$\leq 0.6$	–	–	–
3C91	$\geq 320$	–	$\leq 0.13^{(1)}$	$\leq 1.0^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.29$	–	$\leq 0.49$

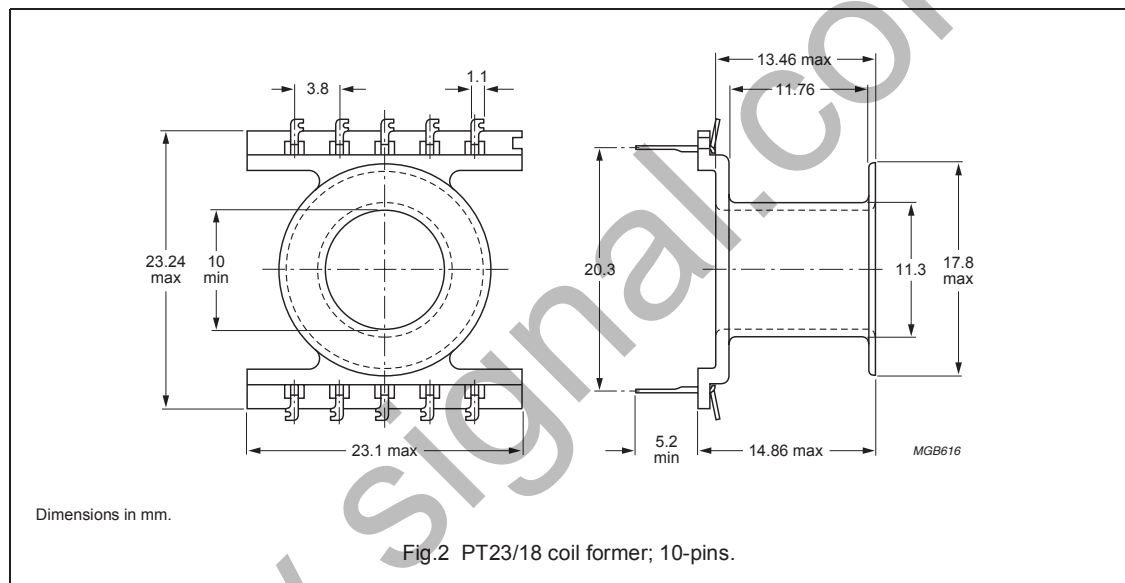
**Note**

1. Measured at 60 °C.

**COIL FORMER**

**General data 10-pins PT23/18 coil former**

PARAMETER	SPECIFICATION
Coil former material	polyamide (PA), glass-reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E41938(M)
Pin material	copper-tin alloy (CuSn), tin (Sn) plated
Maximum operating temperature	130 °C, "IEC 60085", class B
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



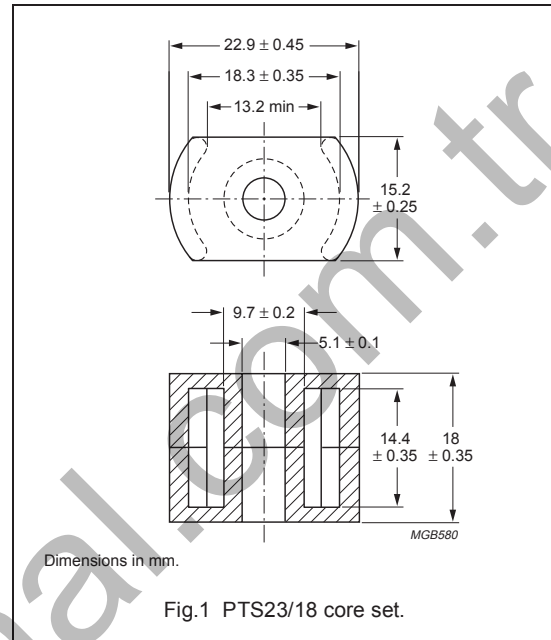
**Winding data and area product for 10-pins PT23/18 coil former**

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	36.0	11.8	45.2	2240	CPV-PT23/18-1S-10P

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.770	mm <sup>-1</sup>
$V_e$	effective volume	2630	mm <sup>3</sup>
$l_e$	effective length	45.1	mm
$A_e$	effective area	58.3	mm <sup>2</sup>
$A_{min}$	minimum area	53.6	mm <sup>2</sup>
$m$	mass of set	≈ 13	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 ( $\mu$ m)	TYPE NUMBER
3C81	160 ± 3%	≈ 98	≈ 570	PTS23/18-3C81-A160
	250 ± 3%	≈ 154	≈ 330	PTS23/18-3C81-A250
	315 ± 3%	≈ 194	≈ 250	PTS23/18-3C81-A315
	400 ± 3%	≈ 246	≈ 190	PTS23/18-3C81-A400
	630 ± 5%	≈ 387	≈ 110	PTS23/18-3C81-A630
	3800 ± 25%	≈ 2320	≈ 0	PTS23/18-3C81
3C91 <small>des</small>	3800 ± 25%	≈ 2320	≈ 0	PTS23/18-3C91
3F3	160 ± 3%	≈ 98	≈ 570	PTS23/18-3F3-A160
	250 ± 3%	≈ 154	≈ 330	PTS23/18-3F3-A250
	315 ± 3%	≈ 194	≈ 250	PTS23/18-3F3-A315
	400 ± 3%	≈ 246	≈ 190	PTS23/18-3F3-A400
	630 ± 5%	≈ 387	≈ 110	PTS23/18-3F3-A630
	2500 ± 25%	≈ 1500	≈ 0	PTS23/18-3F3

## PT, PTS, PTS/I cores and accessories

PTS23/18  
(2318THS)**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	$5945 \pm 25\%$	$\approx 3630$	$\approx 0$	PTS23/18-3E27

**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; B = 200 mT; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C
3C81	$\geq 320$	$\leq 0.54$	–	–	–
3C91	$\geq 320$	–	$\leq 0.14^{(1)}$	$\leq 1.0^{(1)}$	–
3F3	$\geq 315$	–	$\leq 0.29$	–	$\leq 0.5$

**Note**

1. Measured at 60 °C.

**BOBBINS AND ACCESSORIES**

Coil formers, winding data and mounting parts are equal to those of "PT23/18", but "area product" is different.

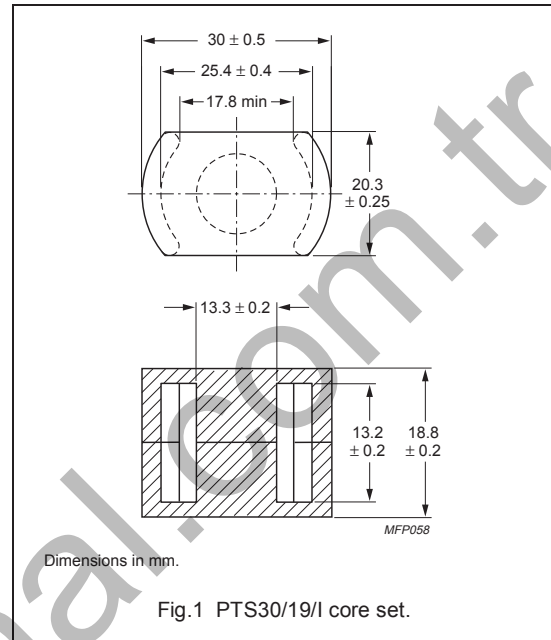
**Winding data and area product (for PTS23/18) for 10-pins PT23/18 coil former**

NUMBER OF SECTIONS	MINIMUM WINDING AREA (mm <sup>2</sup> )	NOMINAL WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT $A_e \times A_w$ (mm <sup>4</sup> )	TYPE NUMBER
1	36.0	11.8	45.2	2100	CPV-PT23/18-1S-10P

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.412	mm <sup>-1</sup>
$V_e$	effective volume	5940	mm <sup>3</sup>
$l_e$	effective length	49.5	mm
$A_e$	effective area	120	mm <sup>2</sup>
$A_{min}$	minimum area	111	mm <sup>2</sup>
$m$	mass of set	≈ 31	g



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

Clamping force for  $A_L$  measurements, 60 ± 20 N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C92 <small>des</small>	3830 ± 25 %	≈ 1260	≈ 0	PTS30/19/I-3C92
3C94	5400 ± 25 %	≈ 1770	≈ 0	PTS30/19/I-3C94
3C96 <small>des</small>	4840 ± 25 %	≈ 1590	≈ 0	PTS30/19/I-3C96

**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 = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 500 kHz; B = 50 mT; T = 100 °C
3C92	≥ 320	≤ 0.53	≤ 3.5	–
3C94	≥ 320	≤ 0.53	≤ 3.5	–
3C96	≥ 315	≤ 0.4	≤ 2.7	≤ 2.2

**BOBBINS AND ACCESSORIES**

For coil formers, winding data and mounting parts, see data sheet, "P30/19".



**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.339	mm <sup>-1</sup>
$V_e$	effective volume	8140	mm <sup>3</sup>
$l_e$	effective length	52.5	mm
$A_e$	effective area	155	mm <sup>2</sup>
$A_{min}$	minimum area	145	mm <sup>2</sup>
$m$	mass of set	≈ 46	g

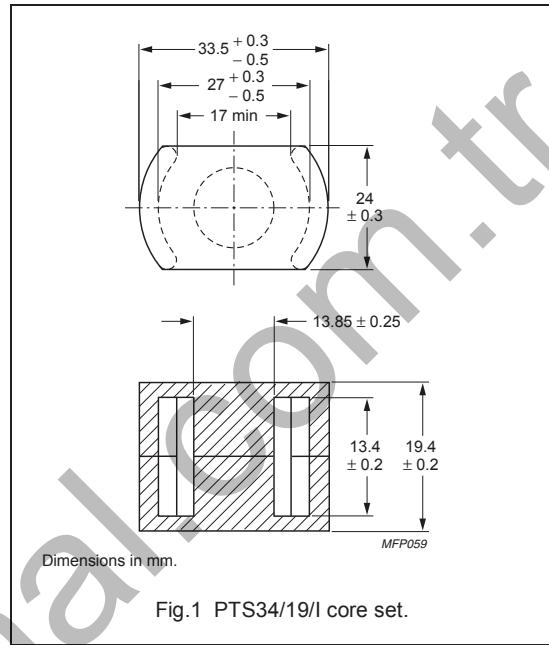


Fig.1 PTS34/19/I core set.

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

Clamping force for  $A_L$  measurements,  $80 \pm 20$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C92 <small>des</small>	$4770 \pm 25 \%$	≈ 1290	≈ 0	PTS34/19/I-3C92
3C94	$6800 \pm 25 \%$	≈ 1830	≈ 0	PTS34/19/I-3C94
3C96 <small>des</small>	$6070 \pm 25 \%$	≈ 1640	≈ 0	PTS34/19/I-3C96

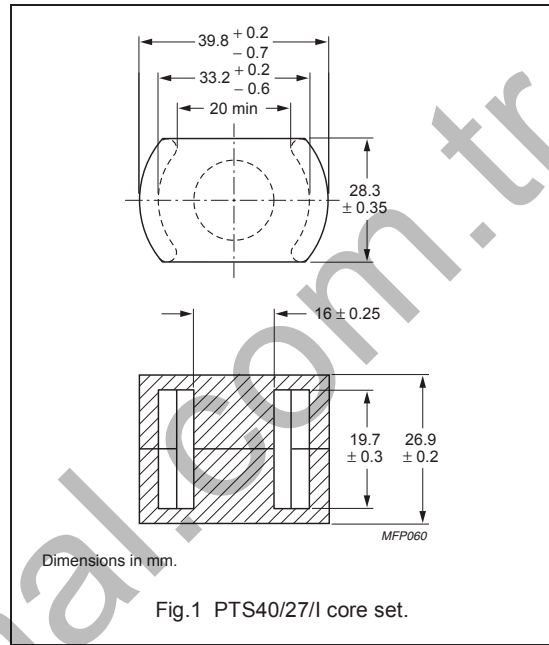
**Properties of core sets under power conditions**

GRADE	B (mT) at	CORE LOSS (W) at		
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 500 kHz; B = 50 mT; T = 100 °C
3C92	≥ 320	≤ 0.8	≤ 4.9	–
3C94	≥ 320	≤ 0.8	≤ 4.9	–
3C96	≥ 315	≤ 0.6	≤ 3.7	≤ 3.0

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.346	mm <sup>-1</sup>
$V_e$	effective volume	14400	mm <sup>3</sup>
$l_e$	effective length	70.5	mm
$A_e$	effective area	204	mm <sup>2</sup>
$A_{min}$	minimum area	201	mm <sup>2</sup>
$m$	mass of set	≈ 66	g



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

Clamping force for  $A_L$  measurements,  $100 \pm 25$  N.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C92 <small>des</small>	$4740 \pm 25 \%$	≈ 1300	≈ 0	PTS40/27/I-3C92
3C94	$6800 \pm 25 \%$	≈ 1870	≈ 0	PTS40/27/I-3C94
3C96 <small>des</small>	$6060 \pm 25 \%$	≈ 1670	≈ 0	PTS40/27/I-3C96

**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 = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 500 kHz; B = 50 mT; T = 100 °C
3C92	≥320	≤ 1.5	≤ 8.6	–
3C94	≥320	≤ 1.5	≤ 8.6	–
3C96	≥315	≤ 1.1	≤ 6.5	≤ 5.4