

Soft Ferrites

Planar ER cores and accessories

PRODUCT OVERVIEW AND TYPE NUMBER STRUCTURE

Product overview Planar ER cores

CORE TYPE	V_e (mm ³)	A_e (mm ²)	MASS (g)
ER9.5/2.5/5	120	8.47	0.35
ER11/2.5/6	174	11.9	0.5
ER14.5/3/7	333	17.6	0.9
ER18/3.2/10	667	30.2	1.6
ER23/3.6/13	1340	50.2	3.2
ER32/6/25	5400	141	16
ER41/7.6/32	12900	225	37
ER51/10/38	25800	351	74.7
ER64/13/51	52600	566	152

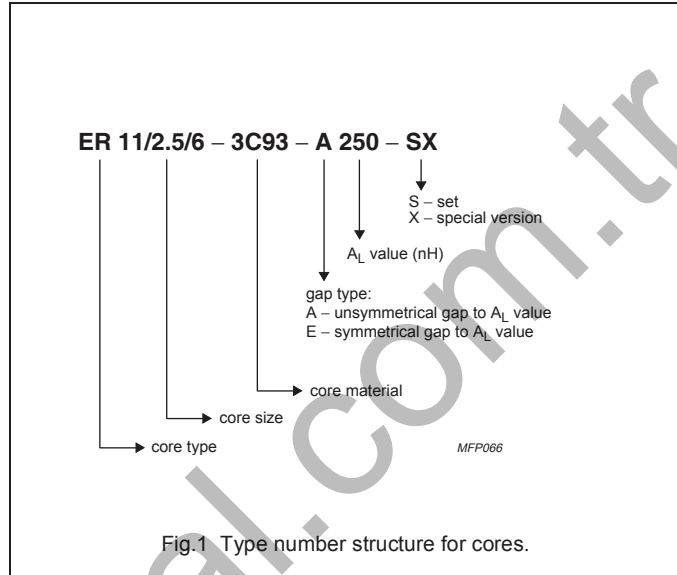


Fig.1 Type number structure for cores.

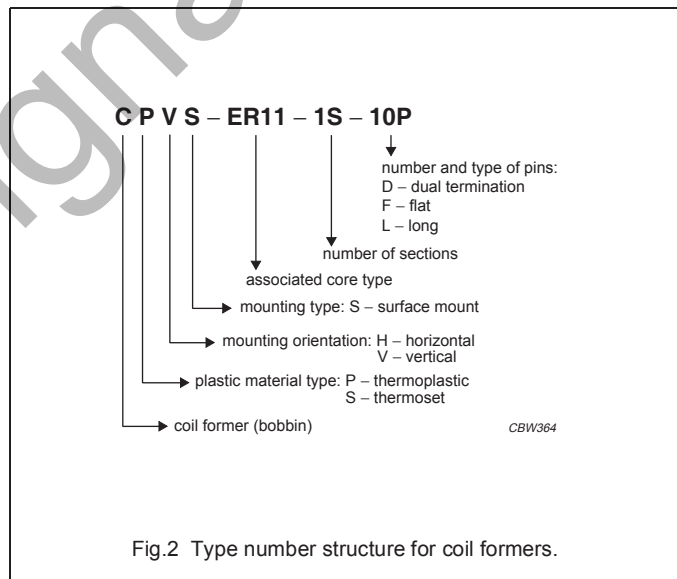
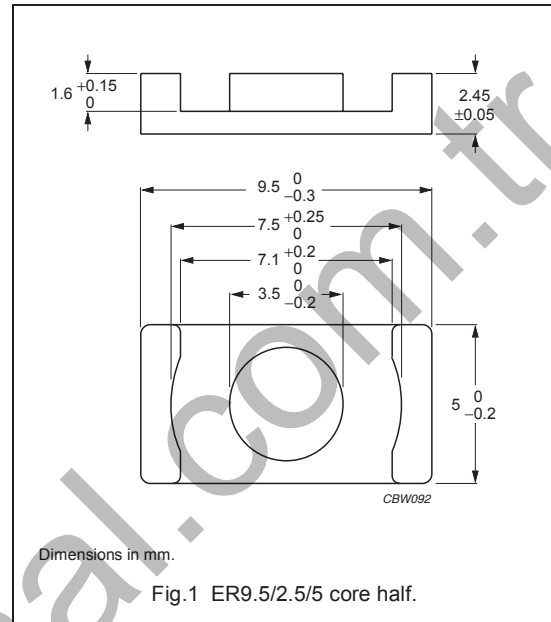


Fig.2 Type number structure for coil formers.

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.67	mm ⁻¹
V_e	effective volume	120	mm ³
l_e	effective length	14.2	mm
A_e	effective area	8.47	mm ²
A_{min}	minimum area	7.60	mm ²
m	mass of core half	≈ 0.35	g



Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 10 ± 5 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μ m)	TYPE NUMBER
3C92 des	750 ±25%	≈ 1000	≈ 0	ER9.5/2.5/5-3C92-S
3C93 des	850 ±25%	≈ 1130	≈ 0	ER9.5/2.5/5-3C93-S
3C94	63 ±3%	≈ 84	≈ 200	ER9.5/2.5/5-3C94-A63-S
	100 ±5%	≈ 133	≈ 120	ER9.5/2.5/5-3C94-A100-S
	160 ±8%	≈ 213	≈ 70	ER9.5/2.5/5-3C94-A160-S
	1000 ±25%	≈ 1330	≈ 0	ER9.5/2.5/5-3C94-S
3C95 des	1150 ±25%	≈ 1540	≈ 0	ER9.5/2.5/5-3C95-S
3C96 des	900 ±25%	≈ 1200	≈ 0	ER9.5/2.5/5-3C96-S
3F3	63 ±3%	≈ 84	≈ 200	ER9.5/2.5/5-3F3-A63-S
	100 ±5%	≈ 133	≈ 120	ER9.5/2.5/5-3F3-A100-S
	160 ±8%	≈ 213	≈ 70	ER9.5/2.5/5-3F3-A160-S
	850 ±25%	≈ 1130	≈ 0	ER9.5/2.5/5-3F3-S
3F35 des	700 ±25%	≈ 930	≈ 0	ER9.5/2.5/5-3F35-S
3F4 des	40 ±3%	≈ 53	≈ 340	ER9.5/2.5/5-3F4-A40-S
	63 ±5%	≈ 84	≈ 190	ER9.5/2.5/5-3F4-A63-S
	100 ±5%	≈ 133	≈ 100	ER9.5/2.5/5-3F4-A100-S
	525 ±25%	≈ 700	≈ 0	ER9.5/2.5/5-3F4-S
3F45 prot	525 ±25%	≈ 700	≈ 0	ER9.5/2.5/5-3F45-S

Planar ER cores and accessories

ER9.5/2.5/5

Core sets of high permeability gradesClamping force for A_L measurements, 10 ± 5 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3E5	3600 +40/-30%	≈ 4800	≈ 0	ER9.5/2.5/5-3E5-S
3E6	4800 +40/-30%	≈ 6400	≈ 0	ER9.5/2.5/5-3E6-S

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; $\hat{B} = 100$ 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	f = 500 kHz; $\hat{B} = 50$ mT; T = 100 °C
3C92	≥ 370	≤ 0.011	–	≤ 0.072	–	–
3C93	≥ 320	$\leq 0.011^{(1)}$	–	$\leq 0.072^{(1)}$	–	–
3C94	≥ 320	≤ 0.011	–	≤ 0.072	–	–
3C95	≥ 320	–	≤ 0.07	≤ 0.07	–	–
3C96	≥ 340	≤ 0.0085	–	≤ 0.058	≤ 0.018	≤ 0.045
3F3	≥ 300	≤ 0.015	–	–	≤ 0.025	–
3F35	≥ 300	–	–	–	≤ 0.011	≤ 0.016
3F4	≥ 250	–	–	–	–	–

1. Measured at 140 °C.

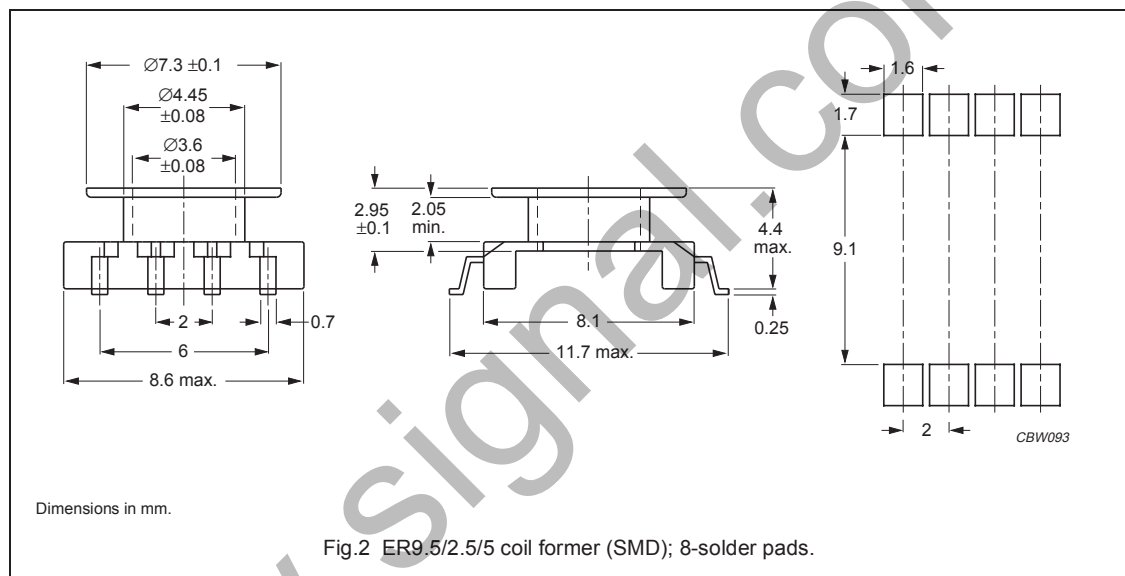
Properties of core sets under power conditions (continued)

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 500 kHz; $\hat{B} = 100$ 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
3F35	≥ 300	≤ 0.13	–	–	–
3F4	≥ 250	–	≤ 0.036	–	≤ 0.056
3F45	≥ 250	–	≤ 0.027	≤ 0.1	≤ 0.048

COIL FORMERS

General data

PARAMETER	SPECIFICATION
Coil former material	liquid crystal polymer (LCP), glass reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E54705(M)
Pin material	copper-tin alloy (CuSn), 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



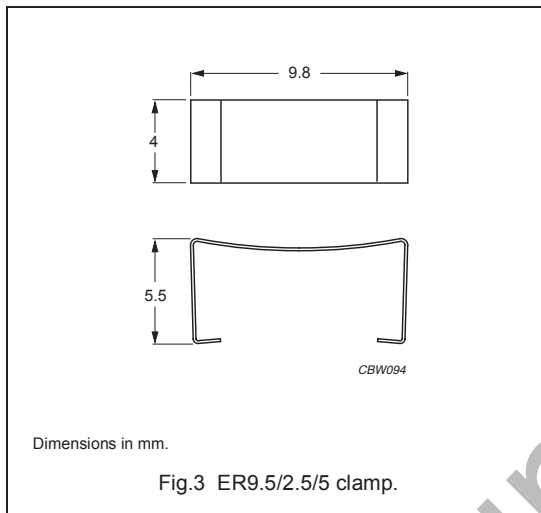
Winding data and area product for ER9.5/2.5/5 coil former (SMD) with 8 solder pads

NUMBER OF SECTIONS	WINDING AREA (mm ²)	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm ⁴)	TYPE NUMBER
1	2.8	2.05	18.4	23.7	CPVS-ER9.5-1S-8P-Z

MOUNTING PARTS

General data and ordering information

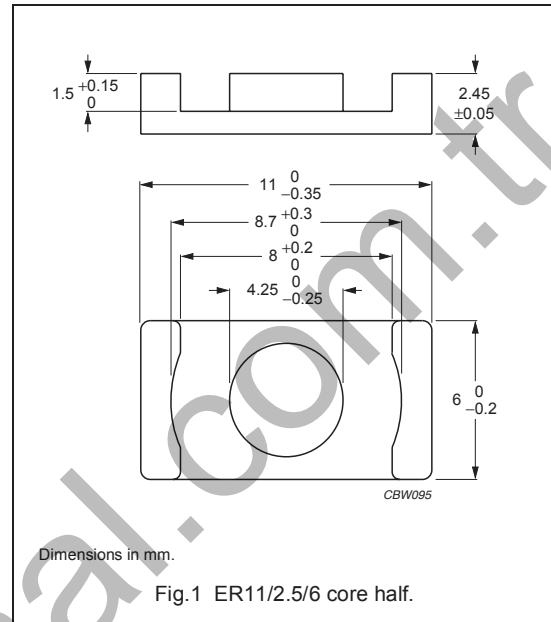
ITEM	REMARKS	FIGURE	TYPE NUMBER
Clamp	stainless steel (CrNi); clamping force \approx 20 N	3	CLM-ER9.5



CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.23	mm ⁻¹
V_e	effective volume	174	mm ³
l_e	effective length	14.7	mm
A_e	effective area	11.9	mm ²
A_{min}	minimum area	10.3	mm ²
m	mass of core half	≈ 0.5	g



Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 15 ± 5 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C92 <small>des</small>	1050 ±25%	≈ 1030	≈ 0	ER11/2.5/6-3C92-S
3C93 <small>des</small>	1200 ±25%	≈ 1170	≈ 0	ER11/2.5/6-3C93-S
3C94	100 ±3%	≈ 98	≈ 170	ER11/2.5/6-3C94-A100-S
	160 ±5%	≈ 157	≈ 100	ER11/2.5/6-3C94-A160-S
	250 ±8%	≈ 246	≈ 60	ER11/2.5/6-3C94-A250-S
	1400 ±25%	≈ 1370	≈ 0	ER11/2.5/6-3C94-S
3C95 <small>des</small>	1620 ±25%	≈ 1600	≈ 0	ER11/2.5/6-3C95-S
3C96 <small>des</small>	1250 ±25%	≈ 1220	≈ 0	ER11/2.5/6-3C96-S
3F3	100 ±3%	≈ 98	≈ 170	ER11/2.5/6-3F3-A100-S
	160 ±5%	≈ 157	≈ 100	ER11/2.5/6-3F3-A160-S
	250 ±8%	≈ 246	≈ 60	ER11/2.5/6-3F3-A250-S
	1200 ±25%	≈ 1170	≈ 0	ER11/2.5/6-3F3-S
3F35 <small>des</small>	1000 ±25%	≈ 980	≈ 0	ER11/2.5/6-3F35-S
3F4 <small>des</small>	63 ±3%	≈ 62	≈ 280	ER11/2.5/6-3F4-A63-S
	100 ±5%	≈ 98	≈ 160	ER11/2.5/6-3F4-A100-S
	160 ±8%	≈ 157	≈ 85	ER11/2.5/6-3F4-A160-S
	725 ±25%	≈ 710	≈ 0	ER11/2.5/6-3F4-S
3F45 <small>prot</small>	725 ±25%	≈ 710	≈ 0	ER11/2.5/6-3F45-S

Planar ER cores and accessories

ER11/2.5/6

Core sets of high permeability grades

Clamping force for A_L measurements, 15 ± 5 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3E5	5000 +40/-30%	≈ 4920	≈ 0	ER11/2.5/6-3E5-S
3E6	6700 +40/-30%	≈ 6590	≈ 0	ER11/2.5/6-3E6-S

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; $\hat{B} = 100$ 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	f = 500 kHz; $\hat{B} = 50$ mT; T = 100 °C
3C92	≥ 370	≤ 0.018	–	≤ 0.1	–	–
3C93	≥ 320	$\leq 0.018^{(1)}$	–	$\leq 0.1^{(1)}$	–	–
3C94	≥ 320	≤ 0.018	–	≤ 0.1	–	–
3C95	≥ 320	–	≤ 0.11	≤ 0.1	–	–
3C96	≥ 340	≤ 0.014	–	≤ 0.08	≤ 0.033	≤ 0.065
3F3	≥ 300	≤ 0.025	–	–	≤ 0.04	–
3F35	≥ 300	–	–	–	≤ 0.016	≤ 0.023
3F4	≥ 250	–	–	–	–	–

1. Measured at 140 °C.

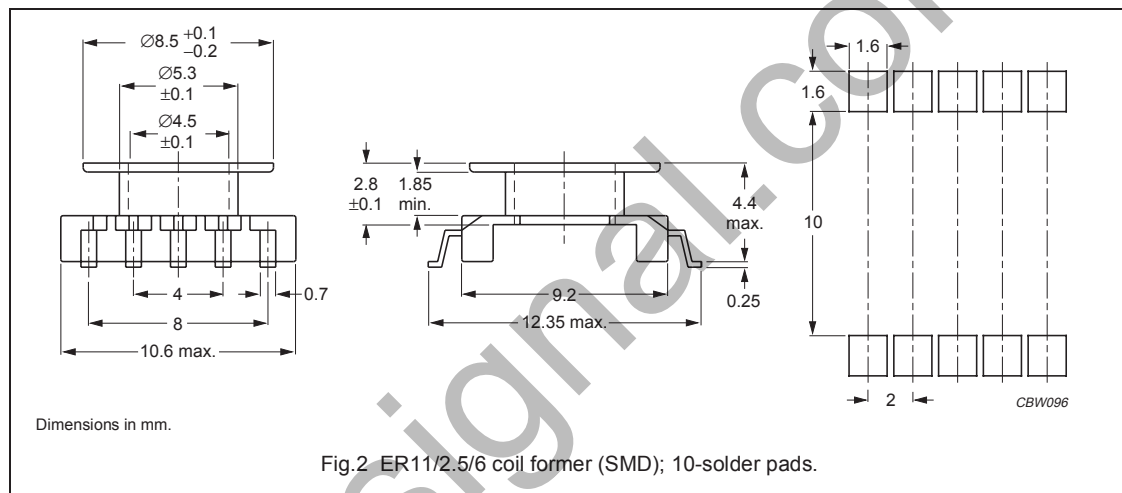
Properties of core sets under power conditions (continued)

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 500 kHz; $\hat{B} = 100$ 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
3F35	≥ 300	≤ 0.18	–	–	–
3F4	≥ 250	–	≤ 0.052	–	≤ 0.084
3F45	≥ 250	–	≤ 0.04	≤ 0.15	≤ 0.07

COIL FORMERS

General data

PARAMETER	SPECIFICATION
Coil former material	liquid crystal polymer (LCP), glass reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E54705(M)
Pin material	copper-tin alloy (CuSn), 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

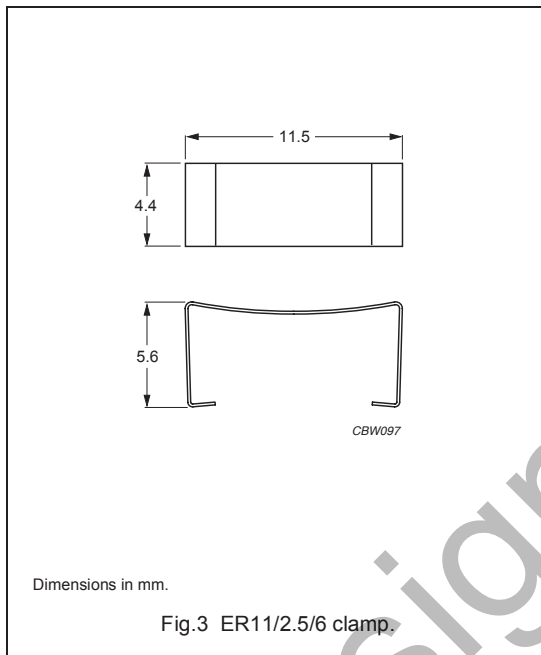


Winding data and area product for ER11/2.5/6 coil former (SMD)

NUMBER OF SECTIONS	WINDING AREA (mm ²)	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm ⁴)	TYPE NUMBER
1	2.8	1.85	21.6	33.3	CPVS-ER11-1S-12P

MOUNTING PARTS**General data and ordering information**

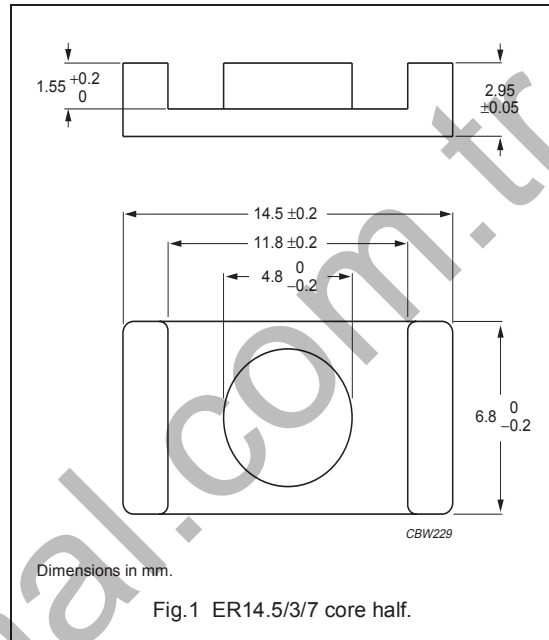
ITEM	REMARKS	FIGURE	TYPE NUMBER
Clamp	stainless steel (CrNi); clamping force ≈ 25 N	3	CLM-ER11



CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	1.08	mm ⁻¹
V_e	effective volume	333	mm ³
l_e	effective length	19.0	mm
A_e	effective area	17.6	mm ²
A_{min}	minimum area	17.3	mm ²
m	mass of core half	≈ 0.9	g



Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 10 ± 5 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μ m)	TYPE NUMBER
3C92 <small>des</small>	1250 ± 25%	≈ 1070	≈ 0	ER14.5/3/7-3C92-S
3C93 <small>des</small>	1400 ± 25%	≈ 1200	≈ 0	ER14.5/3/7-3C93-S
3C94	100 ± 3%	≈ 86	≈ 250	ER14.5/3/7-3C94-A100-S
	160 ± 5%	≈ 137	≈ 150	ER14.5/3/7-3C94-A160-S
	250 ± 8%	≈ 215	≈ 90	ER14.5/3/7-3C94-A250-S
	1600 ± 25%	≈ 1370	≈ 0	ER14.5/3/7-3C94-S
3C95 <small>des</small>	1850 ± 25%	≈ 1600	≈ 0	ER14.5/3/7-3C95-S
3C96 <small>des</small>	1500 ± 25%	≈ 1290	≈ 0	ER14.5/3/7-3C96-S
3F3	100 ± 3%	≈ 86	≈ 250	ER14.5/3/7-3F3-A100-S
	160 ± 5%	≈ 137	≈ 150	ER14.5/3/7-3F3-A160-S
	250 ± 8%	≈ 215	≈ 90	ER14.5/3/7-3F3-A250-S
	1400 ± 25%	≈ 1200	≈ 0	ER14.5/3/7-3F3-S
3F35 <small>des</small>	1150 ± 25%	≈ 990	≈ 0	ER14.5/3/7-3F35-S
3F4 <small>des</small>	100 ± 3%	≈ 86	≈ 240	ER14.5/3/7-3F4-A100-S
	160 ± 5%	≈ 137	≈ 130	ER14.5/3/7-3F4-A160-S
	250 ± 8%	≈ 215	≈ 70	ER14.5/3/7-3F4-A250-S
	850 ± 25%	≈ 730	≈ 0	ER14.5/3/7-3F4-S
3F45 <small>prot</small>	850 ± 25%	≈ 730	≈ 0	ER14.5/3/7-3F45-S

Planar ER cores and accessories

ER14.5/3/7

Core sets of high permeability gradesClamping force for A_L measurements.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3E6	7900 +40/-30%	≈ 6800	≈ 0	ER14.5/3/7-3E6-S

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 = 25 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C	f = 500 kHz; B = 50 mT; T = 100 °C
3C92	≥ 370	≤ 0.032	–	≤ 0.2	–	–
3C93	≥ 320	$\leq 0.032^{(1)}$	–	$\leq 0.2^{(1)}$	–	–
3C94	≥ 320	≤ 0.032	–	≤ 0.2	–	–
3C95	≥ 320	–	≤ 0.2	≤ 0.19	–	–
3C96	≥ 340	≤ 0.025	–	≤ 0.16	≤ 0.06	≤ 0.13
3F3	≥ 300	≤ 0.043	–	–	≤ 0.061	–
3F35	≥ 300	–	–	–	≤ 0.03	≤ 0.045
3F4	≥ 250	–	–	–	–	–

1. Measured at 140 °C.

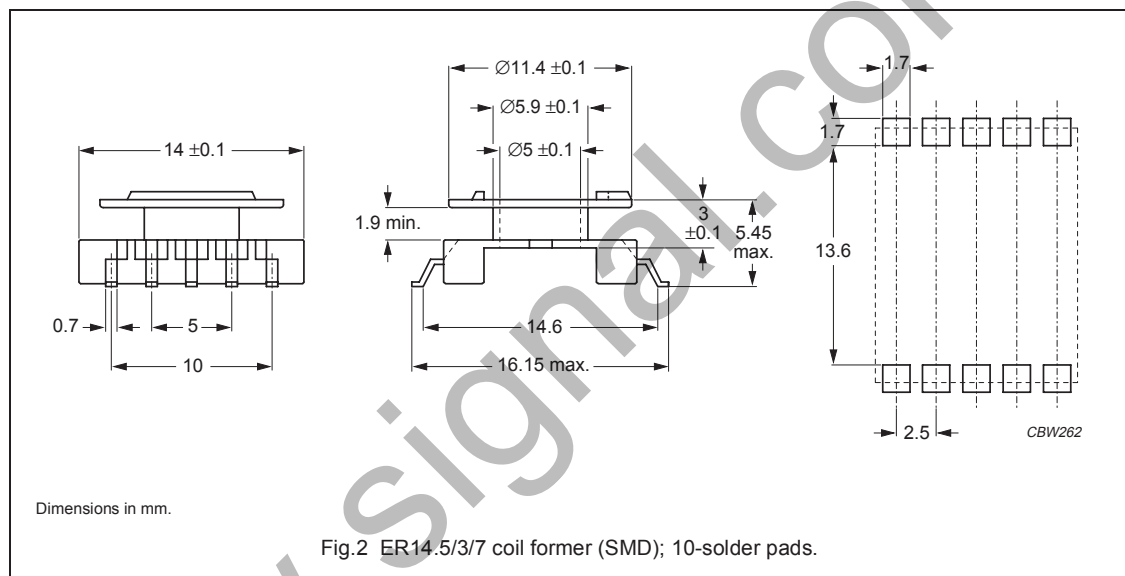
Properties of core sets under power conditions (continued)

GRADE	B (mT) at	CORE LOSS (W) at			
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 500 kHz; B = 100 mT; T = 100 °C	f = 1 MHz; B = 30 mT; T = 100 °C	f = 1 MHz; B = 50 mT; T = 100 °C	f = 3 MHz; B = 10 mT; T = 100 °C
3F35	≥ 300	≤ 0.35	–	–	–
3F4	≥ 250	–	≤ 0.1	–	≤ 0.16
3F45	≥ 250	–	≤ 0.077	≤ 0.29	≤ 0.13

COIL FORMERS

General data

PARAMETER	SPECIFICATION
Coil former material	liquid crystal polymer (LCP), glass reinforced, flame retardant in accordance with "UL 94V-0"; UL file number E54705(M)
Pin material	copper-tin alloy (CuSn), 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



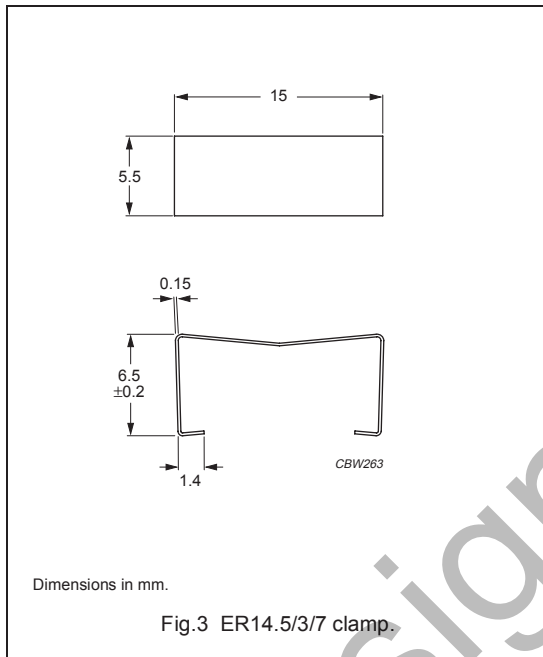
Winding data and area product for ER14.5/3/7 coil former (SMD) with 10 solder pads

NUMBER OF SECTIONS	WINDING AREA (mm ²)	MINIMUM WINDING WIDTH (mm)	AVERAGE LENGTH OF TURN (mm)	AREA PRODUCT Ae x Aw (mm ⁴)	TYPE NUMBER
1	5.1	1.9	27	89.8	CPVS-ER14.5-1S-10P-Z

MOUNTING PARTS

General data and ordering information

ITEM	REMARKS	FIGURE	TYPE NUMBER
Clamp	stainless steel (CrNi)	3	CLM-ER14.5

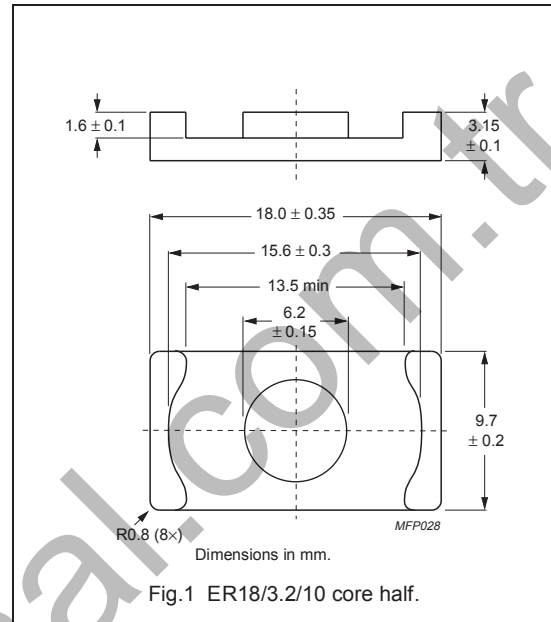


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CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.730	mm ⁻¹
V_e	effective volume	667	mm ³
l_e	effective length	22.1	mm
A_e	effective area	30.2	mm ²
A_{min}	minimum area	30.1	mm ²
m	mass of core half	≈ 1.6	g



Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 15 ± 5 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C92 des	160 ± 3 %	≈ 93	≈ 260	ER18/3.2/10-3C92-A160-S
	250 ± 5 %	≈ 146	≈ 150	ER18/3.2/10-3C92-A250-S
	400 ± 8 %	≈ 232	≈ 85	ER18/3.2/10-3C92-A400-S
	1900 ± 25 %	≈ 1100	≈ 0	ER18/3.2/10-3C92-S
3C93 des	2200 ± 25 %	≈ 1270	≈ 0	ER18/3.2/10-3C93-S
3C95 des	3120 ± 25 %	≈ 1810	≈ 0	ER18/3.2/10-3C95-S
3C96 des	160 ± 3 %	≈ 93	≈ 260	ER18/3.2/10-3C96-A160-S
	250 ± 5 %	≈ 146	≈ 155	ER18/3.2/10-3C96-A250-S
	400 ± 8 %	≈ 232	≈ 90	ER18/3.2/10-3C96-A400-S
	2400 ± 25 %	≈ 1100	≈ 0	ER18/3.2/10-3C96-S
3F3	2400 ± 25 %	≈ 1100	≈ 0	ER18/3.2/10-3F3-S
3F35 des	160 ± 3 %	≈ 93	≈ 260	ER18/3.2/10-3F35-A160-S
	250 ± 5 %	≈ 146	≈ 150	ER18/3.2/10-3F35-A250-S
	400 ± 8 %	≈ 232	≈ 85	ER18/3.2/10-3F35-A400-S
	1800 ± 25 %	≈ 1100	≈ 0	ER18/3.2/10-3F35-S
3F4 des	1300 ± 25 %	≈ 794	≈ 0	ER18/3.2/10-3F4-S
3F45 prot	1300 ± 25 %	≈ 794	≈ 0	ER18/3.2/10-3F45-S

Properties of core sets under power condition

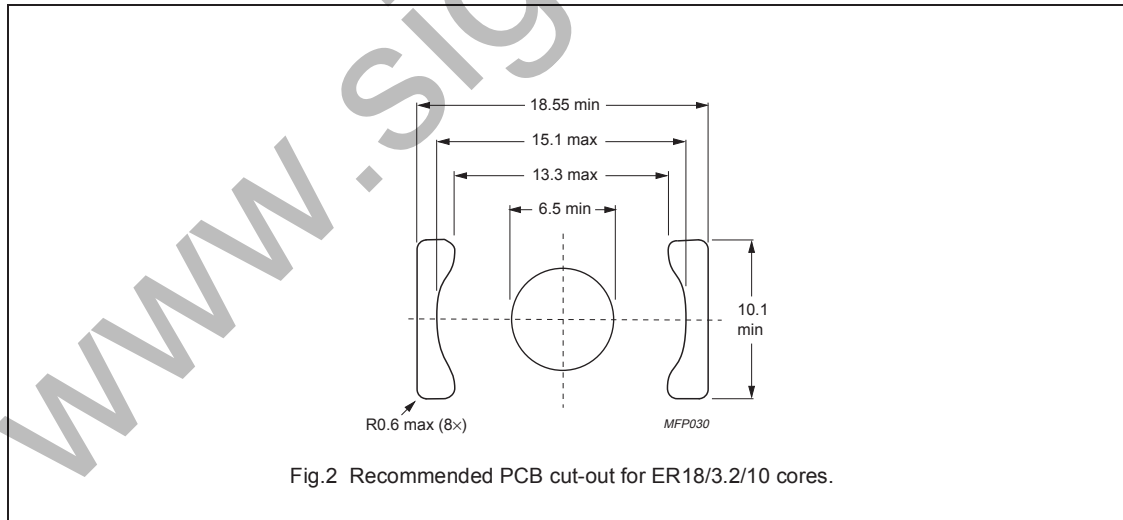
GRADE	B (mT) at	CORE LOSS (W) at					
	H = 250 A/m; f = 25 kHz; T = 100 °C	f̂ = 100 kHz; B̂ = 100 mT; T = 100 °C	f̂ = 100 kHz; B̂ = 200 mT; T = 25 °C	f̂ = 100 kHz; B̂ = 200 mT; T = 100 °C	f̂ = 400 kHz; B̂ = 50 mT; T = 100 °C	f̂ = 500 kHz; B̂ = 50 mT; T = 100 °C	f̂ = 500 kHz; B̂ = 100 mT; T = 100 °C
3C92	≥ 370	≤ 0.052	–	≤ 0.35	–	–	–
3C93	≥ 320	≤ 0.052 ⁽¹⁾	–	≤ 0.35 ⁽¹⁾	–	–	–
3C95	≥ 320	–	≤ 0.4	≤ 0.38	–	–	–
3C96	≥ 340	≤ 0.035	–	≤ 0.26	–	≤ 0.22	–
3F3	≥ 300	≤ 0.07	–	–	≤ 0.13	–	–
3F35	≥ 300	–	–	–	–	≤ 0.078	≤ 0.61

1. Measured at 140 °C.

Properties of core sets under power condition (continued)

GRADE	B (mT) at	CORE LOSS (W) at		
	H = 1200 A/m; f = 25 kHz; T = 100 °C	f̂ = 1 MHz; B̂ = 30 mT; T = 100 °C	f̂ = 1 MHz; B̂ = 50 mT; T = 100 °C	f̂ = 3 MHz; B̂ = 10 mT; T = 100 °C
3F4	≥ 250	≤ 0.2	–	≤ 0.32
3F45	≥ 250	≤ 0.16	≤ 0.6	≤ 0.27

MOUNTING INFORMATION



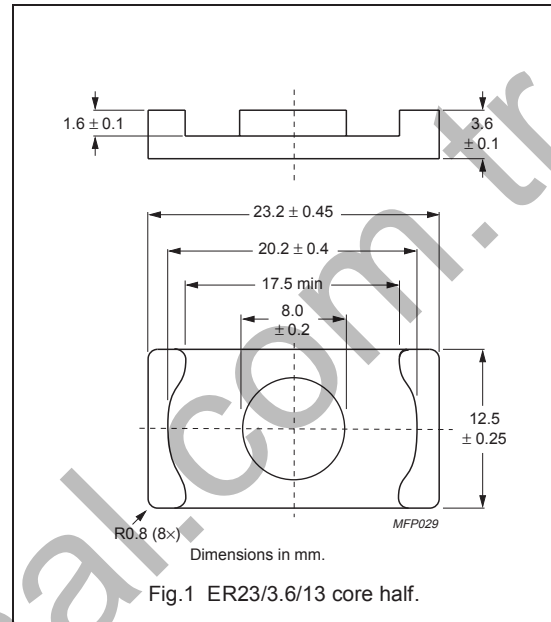
Winding data for ER18/3.2/10 planar core

WINDING AREA (mm ²)	AVERAGE TRACK LENGTH (mm)	FOOTPRINT AREA (mm ²)
15.0	34.2	225

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.530	mm ⁻¹
V_e	effective volume	1340	mm ³
l_e	effective length	26.6	mm
A_e	effective area	50.2	mm ²
A_{min}	minimum area	50.0	mm ²
m	mass of core half	≈ 3.2	g



Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 20 ± 10 N.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C92 des	250 ± 3 %	≈ 105	≈ 260	ER23/3.6/13-3C92-A250-S
	400 ± 5 %	≈ 169	≈ 150	ER23/3.6/13-3C92-A400-S
	630 ± 8 %	≈ 266	≈ 85	ER23/3.6/13-3C92-A630-S
	2800 ± 25 %	≈ 1180	≈ 0	ER23/3.6/13-3C92-S
3C93 des	3200 ± 25 %	≈ 1350	≈ 0	ER23/3.6/13-3C93-S
3C95 des	4460 ± 25 %	≈ 1880	≈ 0	ER23/3.6/13-3C95-S
3C96 des	250 ± 3 %	≈ 105	≈ 270	ER23/3.6/13-3C96-A250-S
	400 ± 5 %	≈ 169	≈ 155	ER23/3.6/13-3C96-A400-S
	630 ± 8 %	≈ 266	≈ 90	ER23/3.6/13-3C96-A630-S
	3400 ± 25 %	≈ 1180	≈ 0	ER23/3.6/13-3C96-S
3F3	3400 ± 25 %	≈ 1180	≈ 0	ER23/3.6/13-3F3-S
3F35 des	250 ± 3 %	≈ 105	≈ 260	ER23/3.6/13-3F35-A250-S
	400 ± 5 %	≈ 169	≈ 150	ER23/3.6/13-3F35-A400-S
	630 ± 8 %	≈ 266	≈ 85	ER23/3.6/13-3F35-A630-S
	2600 ± 25 %	≈ 1180	≈ 0	ER23/3.6/13-3F35-S
3F4 des	1850 ± 25 %	≈ 840	≈ 0	ER23/3.6/13-3F4-S
3F45 prot	1850 ± 25 %	≈ 840	≈ 0	ER23/3.6/13-3F45-S

Properties of core sets under power condition

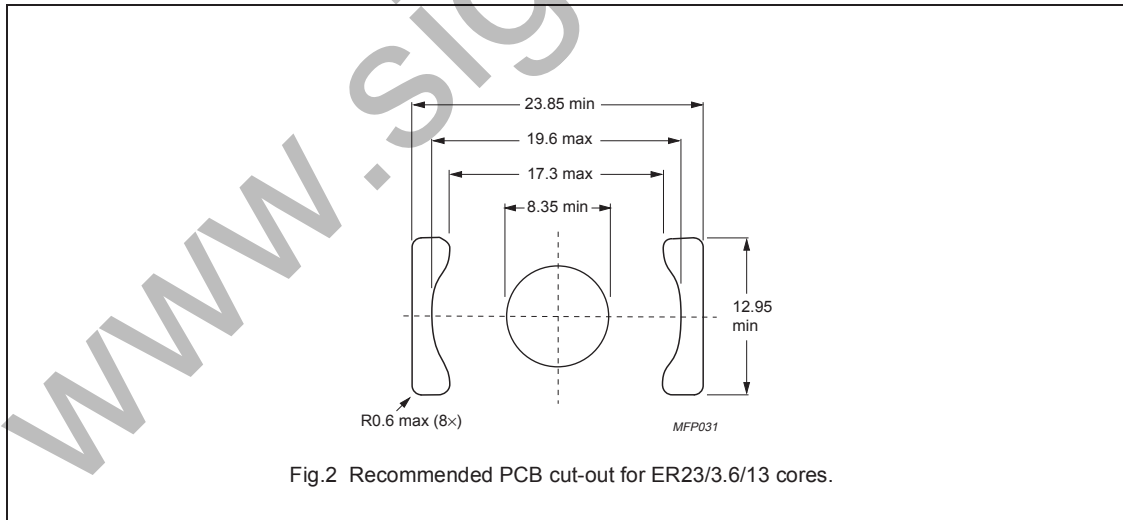
GRADE	B (mT) at	CORE LOSS (W) at					
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 100 kHz; B = 100 mT; T = 100 °C	f = 100 kHz; B = 200 mT; T = 25 °C	f = 100 kHz; B = 200 mT; T = 100 °C	f = 400 kHz; B = 50 mT; T = 100 °C	f = 500 kHz; B = 50 mT; T = 100 °C	f = 500 kHz; B = 100 mT; T = 100 °C
3C92	≥ 370	≤ 0.11	–	≤ 0.70	–	–	–
3C93	≥ 320	≤ 0.11 ⁽¹⁾	–	≤ 0.70 ⁽¹⁾	–	–	–
3C95	≥ 320	–	≤ 0.87	≤ 0.82	–	–	–
3C96	≥ 340	≤ 0.070	–	≤ 0.52	–	≤ 0.44	–
3F3	≥ 300	≤ 0.15	–	–	≤ 0.31	–	–
3F35	≥ 300	–	–	–	–	≤ 0.16	≤ 1.2

1. Measured at 140 °C.

Properties of core sets under power condition (continued)

GRADE	B (mT) at	CORE LOSS (W) at		
	H = 1200 A/m; f = 25 kHz; T = 100 °C	f = 1 MHz; B = 30 mT; T = 100 °C	f = 1 MHz; B = 50 mT; T = 100 °C	f = 3 MHz; B = 10 mT; T = 100 °C
3F4	≥ 250	≤ 0.4	–	≤ 0.64
3F45	≥ 250	≤ 0.31	≤ 1.15	≤ 0.53

MOUNTING INFORMATION



Winding data for ER23/3.6/13 planar core

WINDING AREA (mm ²)	AVERAGE TRACK LENGTH (mm)	FOOTPRINT AREA (mm ²)
19.5	44.3	375

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.270	mm ⁻¹
V_e	effective volume	5400	mm ³
l_e	effective length	38.2	mm
A_e	effective area	141	mm ²
A_{min}	minimum area	121	mm ²
m	mass of core half	≈ 16	g

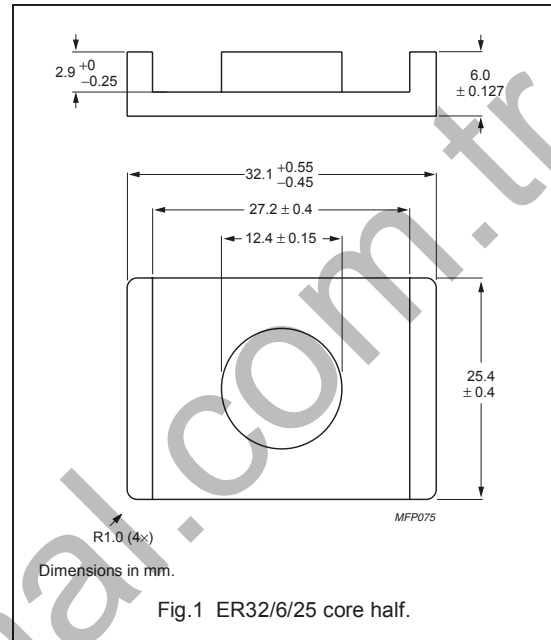


Fig.1 ER32/6/25 core half.

Core sets for general purpose transformers and power applications

Clamping force for A_L measurements, 50 ± 20 N.

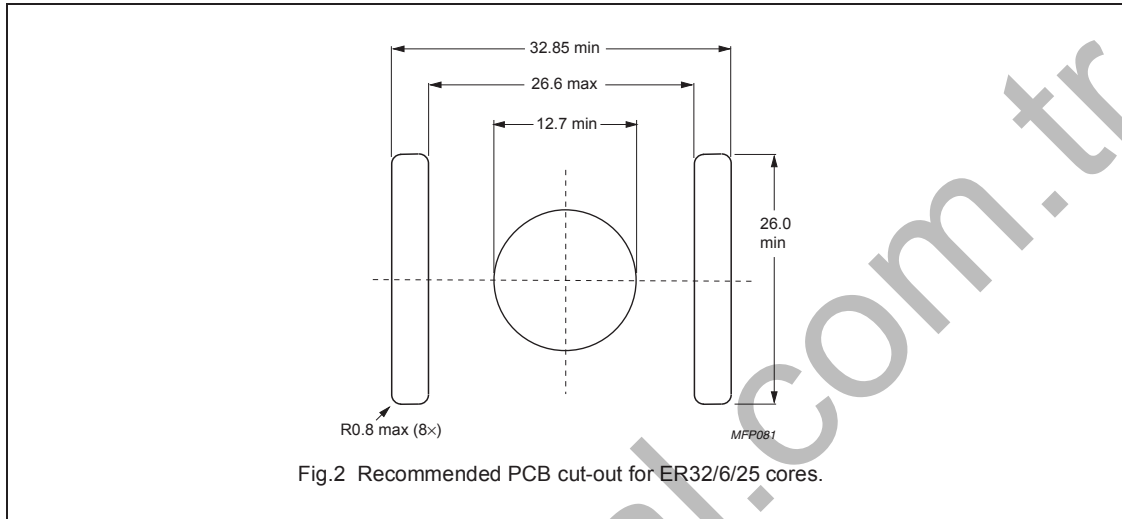
GRADE	A_L (nH)	μ_e	AIR GAP (μ m)	TYPE NUMBER
3C92 <small>des</small>	5700 ± 25 %	≈ 1220	≈ 0	ER32/6/25-3C92-S
3C93 <small>des</small>	6600 ± 25 %	≈ 1420	≈ 0	ER32/6/25-3C93-S
3C95 <small>des</small>	9640 ± 25 %	≈ 2080	≈ 0	ER32/6/25-3C95-S
3C96 <small>des</small>	7160 ± 25 %	≈ 1540	≈ 0	ER32/6/25-3C96-S
3F3	7160 ± 25 %	≈ 1540	≈ 0	ER32/6/25-3F3-S

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; B̂ = 100 mT; T = 100 °C	f = 100 kHz; B̂ = 200 mT; T = 25 °C	f = 100 kHz; B̂ = 200 mT; T = 100 °C	f = 400 kHz; B̂ = 50 mT; T = 100 °C	f = 500 kHz; B̂ = 50 mT; T = 100 °C
3C92	≥ 370	≤ 0.45	–	≤ 3.0	–	–
3C93	≥ 320	≤ 0.45 ⁽¹⁾	–	≤ 3.0 ⁽¹⁾	–	–
3C95	≥ 320	–	≤ 3.5	≤ 3.33	–	–
3C96	≥ 340	≤ 0.3	–	≤ 2.2	–	≤ 1.9
3F3	≥ 300	≤ 0.65	–	–	≤ 1.0	–

1. Measured at 140 °C.

MOUNTING INFORMATION



Winding data for ER32/6/25 planar core

WINDING AREA (mm ²)	AVERAGE TRACK LENGTH (mm)	FOOTPRINT AREA (mm ²)
41.1	62.2	828

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.253	mm ⁻¹
V_e	effective volume	12900	mm ³
l_e	effective length	57.0	mm
A_e	effective area	225	mm ²
A_{min}	minimum area	201	mm ²
m	mass of core half	≈ 37	g

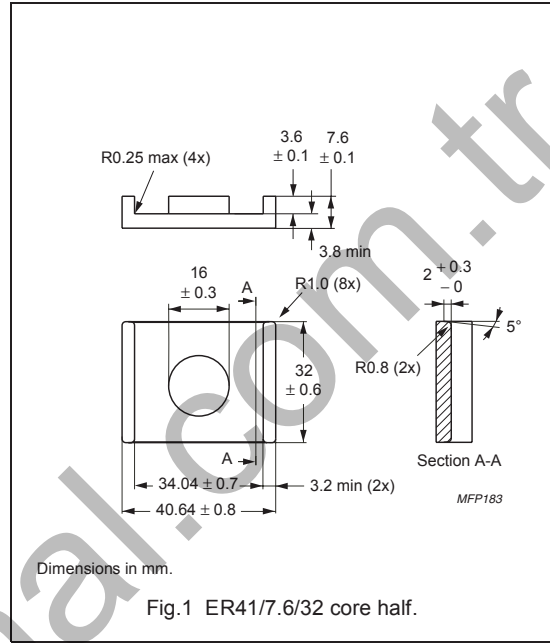


Fig.1 ER41/7.6/32 core half.

Core halves for general purpose transformers and power applications

Clamping force for A_L measurements, 100 ± 25 N.

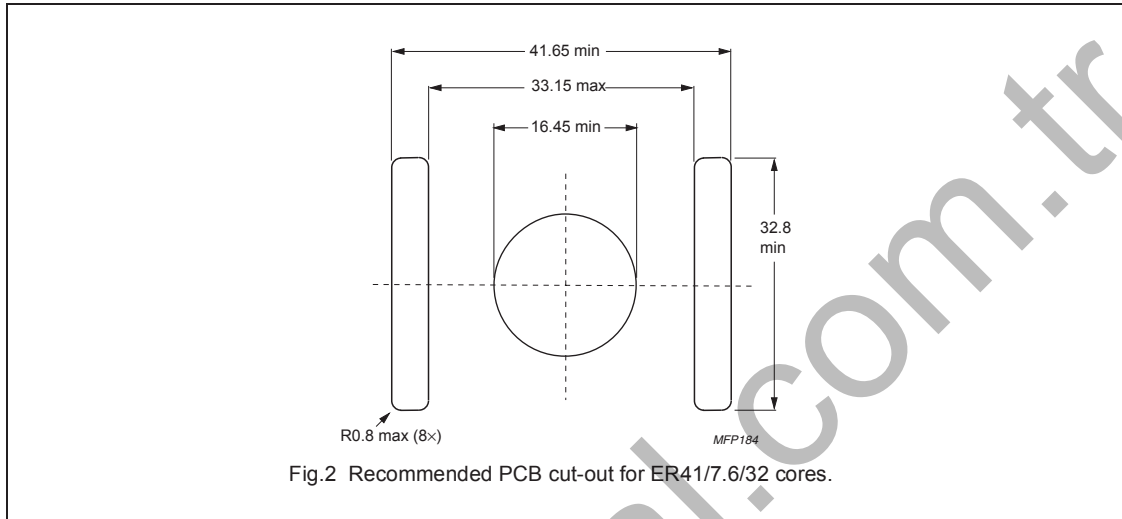
GRADE	A_L (nH)	μ_e	AIR GAP (μ m)	TYPE NUMBER
3C92 <small>des</small>	$6500 \pm 25 \%$	≈ 1310	≈ 0	ER41/7.6/32-3C92
3C93 <small>des</small>	$7500 \pm 25 \%$	≈ 1510	≈ 0	ER41/7.6/32-3C93
3C95 <small>des</small>	$11120 \pm 25 \%$	≈ 2240	≈ 0	ER41/7.6/32-3C95
3C96 <small>des</small>	$8100 \pm 25 \%$	≈ 1630	≈ 0	ER41/7.6/32-3C96
3F3	$8100 \pm 25 \%$	≈ 1630	≈ 0	ER41/7.6/32-3F3

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; $\hat{B} = 100$ 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	f = 500 kHz; $\hat{B} = 50$ mT; T = 100 °C
3C92	≥ 370	≤ 1.3	–	≤ 7.8	–	–
3C93	≥ 320	≤ 1.3 ⁽¹⁾	–	≤ 7.8 ⁽¹⁾	–	–
3C95	≥ 320	–	≤ 8.94	≤ 8.51	–	–
3C96	≥ 340	≤ 0.92	–	≤ 5.88	–	≤ 5.58
3F3	≥ 300	≤ 1.7	–	–	≤ 2.5	–

1. Measured at 140 °C.

MOUNTING INFORMATION



Winding data for ER41/7.6/32 planar core

WINDING AREA (mm ²)	AVERAGE TRACK LENGTH (mm)	FOOTPRINT AREA (mm ²)
64.9	78.6	1316

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.209	mm ⁻¹
V_e	effective volume	25800	mm ³
l_e	effective length	73.5	mm
A_e	effective area	351	mm ²
A_{min}	minimum area	314	mm ²
m	mass of core half	≈ 74.7	g

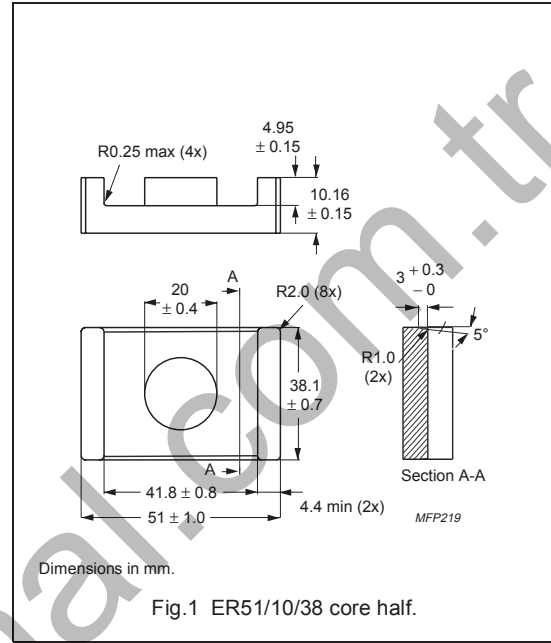


Fig.1 ER51/10/38 core half.

Core halves for general purpose transformers and power applications

Clamping force for A_L measurements, 150 ± 25 N.

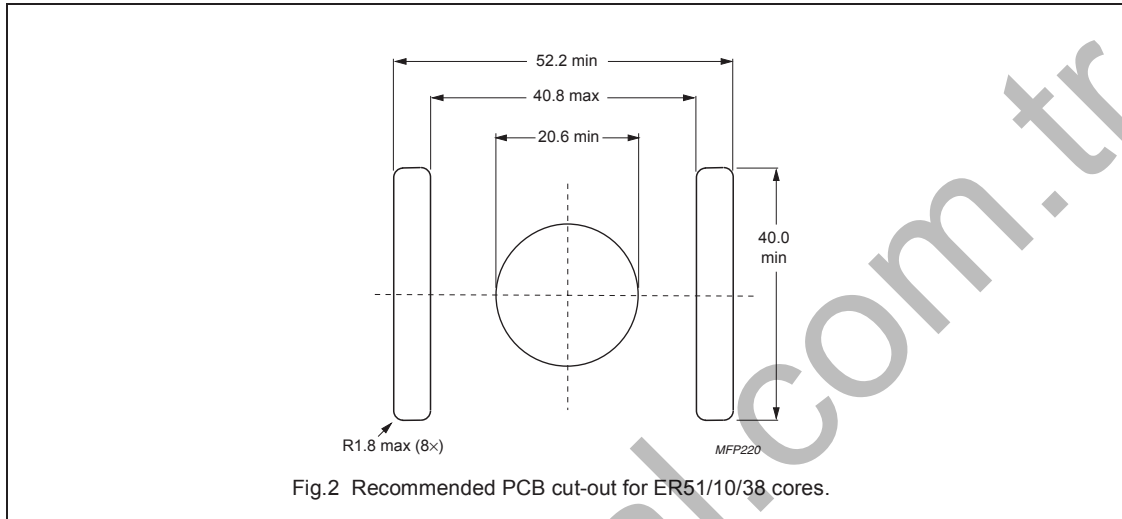
GRADE	A_L (nH)	μ_e	AIR GAP (μ m)	TYPE NUMBER
3C92 <small>des</small>	$8100 \pm 25 \%$	≈ 1350	≈ 0	ER51/10/38-3C92
3C93 <small>des</small>	$9400 \pm 25 \%$	≈ 1570	≈ 0	ER51/10/38-3C93
3C95 <small>des</small>	$14230 \pm 25 \%$	≈ 2370	≈ 0	ER51/10/38-3C95
3C96 <small>des</small>	$10200 \pm 25 \%$	≈ 1700	≈ 0	ER51/10/38-3C96
3F3	$10200 \pm 25 \%$	≈ 1700	≈ 0	ER51/10/38-3F3

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; B̂ = 100 mT; T = 100 °C	f = 100 kHz; B̂ = 200 mT; T = 25 °C	f = 100 kHz; B̂ = 200 mT; T = 100 °C	f = 400 kHz; B̂ = 50 mT; T = 100 °C	f = 500 kHz; B̂ = 50 mT; T = 100 °C
3C92	≥ 370	≤ 2.5	–	≤ 15.2	–	–
3C93	≥ 320	≤ 2.5 ⁽¹⁾	–	≤ 15.2 ⁽¹⁾	–	–
3C95	≥ 320	–	≤ 17.9	≤ 17	–	–
3C96	≥ 340	≤ 1.68	–	≤ 11.2	–	≤ 10.5
3F3	≥ 300	≤ 3.2	–	–	≤ 5.0	–

1. Measured at 140 °C.

MOUNTING INFORMATION



Winding data for ER51/10/38 planar core

WINDING AREA (mm ²)	AVERAGE TRACK LENGTH (mm)	FOOTPRINT AREA (mm ²)
108	97.1	1986

CORE SETS

Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.164	mm ⁻¹
V_e	effective volume	52600	mm ³
l_e	effective length	93.0	mm
A_e	effective area	566	mm ²
A_{min}	minimum area	507	mm ²
m	mass of core half	≈ 152	g

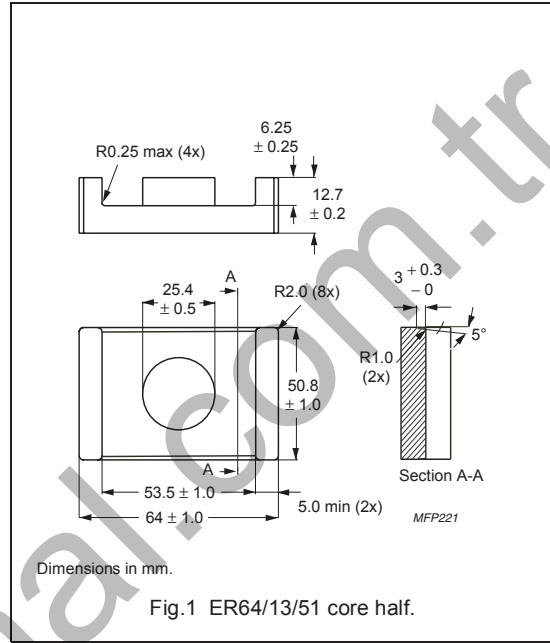


Fig.1 ER64/13/51 core half.

Core halves for general purpose transformers and power applications

Clamping force for A_L measurements, 200 ± 25 N.

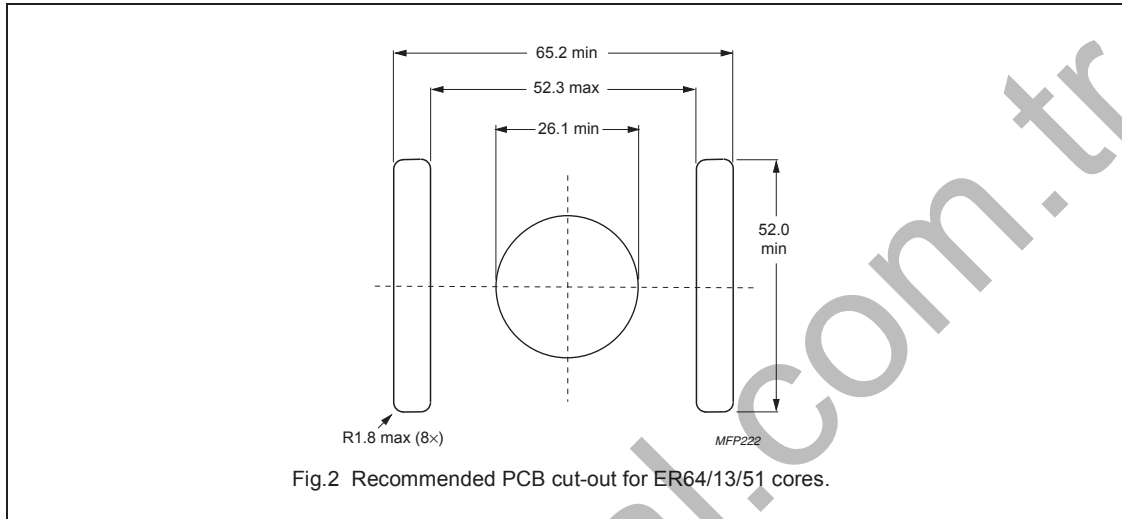
GRADE	A_L (nH)	μ_e	AIR GAP (μ m)	TYPE NUMBER
3C92 <small>des</small>	10600 ± 25 %	≈ 1390	≈ 0	ER64/13/51-3C92
3C93 <small>des</small>	12300 ± 25 %	≈ 1610	≈ 0	ER64/13/51-3C93
3C95 <small>des</small>	18920 ± 25 %	≈ 2475	≈ 0	ER64/13/51-3C95
3C96 <small>des</small>	13400 ± 25 %	≈ 1760	≈ 0	ER64/13/51-3C96
3F3	13400 ± 25 %	≈ 1760	≈ 0	ER64/13/51-3F3

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; \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	f = 500 kHz; \hat{B} = 50 mT; T = 100 °C
3C92	≥ 370	≤ 5.3	–	≤ 32.4	–	–
3C93	≥ 320	≤ 5.3 ⁽¹⁾	–	≤ 32.4 ⁽¹⁾	–	–
3C95	≥ 320	–	≤ 36.5	≤ 34.7	–	–
3C96	≥ 340	≤ 3.71	–	≤ 24	–	≤ 22.7
3F3	≥ 300	≤ 6.3	–	–	≤ 10.2	–

1. Measured at 140 °C.

MOUNTING INFORMATION



Winding data for ER64/13/51 planar core

WINDING AREA (mm ²)	AVERAGE TRACK LENGTH (mm)	FOOTPRINT AREA (mm ²)
176	124	3282