

Soft Ferrites

ER cores

PRODUCT OVERVIEW AND TYPE NUMBER STRUCTURE

Product overview ER cores

CORE TYPE	$V_e$ (mm <sup>3</sup> )	$A_e$ (mm <sup>2</sup> )	MASS (g)
ER28/14/11	5260	81.4	14
ER28/17/11	6140	81.4	16
ER35/21/11	9710	107	23
ER35W/21/11	9548	103	27
ER40/22/13	14600	149	37
ER42/22/16	19200	194	50
ER42/22/15	16800	170	42
ER48/21/21	25500	255	64
ER48/18/18	20300	231	51
ER54/18/18	23000	250	61

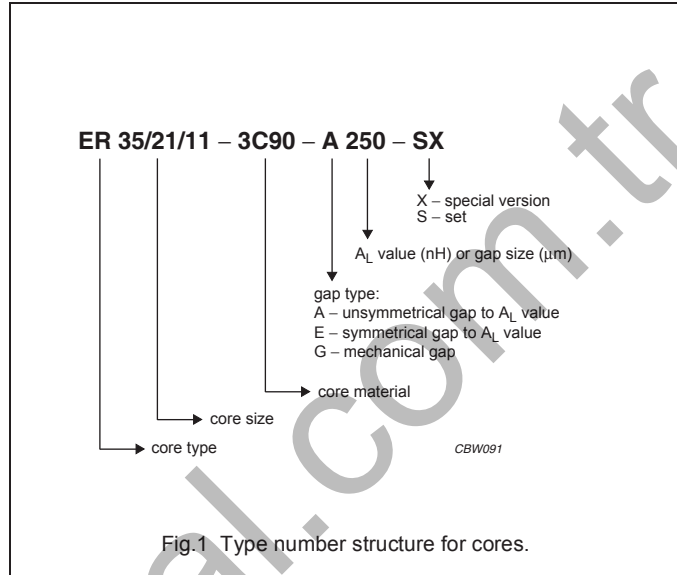
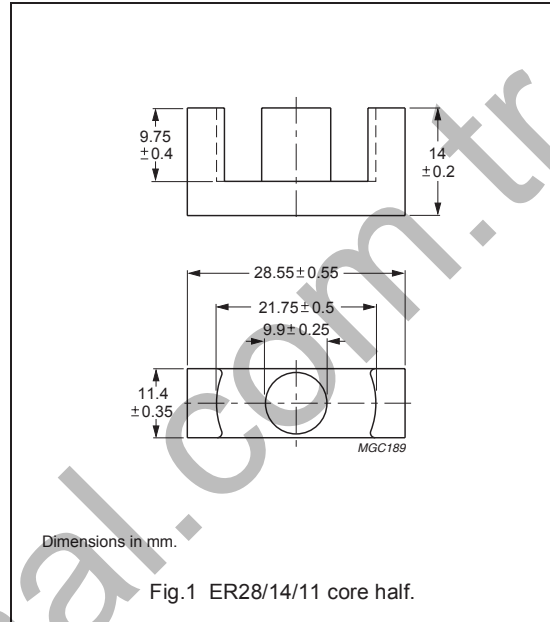


Fig.1 Type number structure for cores.

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.786	mm <sup>-1</sup>
$V_e$	effective volume	5260	mm <sup>3</sup>
$l_e$	effective length	64.0	mm
$A_e$	effective area	81.4	mm <sup>2</sup>
$A_{min}$	minimum area	77.0	mm <sup>2</sup>
$m$	mass of core half	≈ 14	g



**Core halves**

Clamping force for  $A_L$  measurements, 40 ± 20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C90	2900 ± 25%	≈ 1800	≈ 0	ER28/14/11-3C90
3C94	2900 ± 25%	≈ 1800	≈ 0	ER28/14/11-3C94

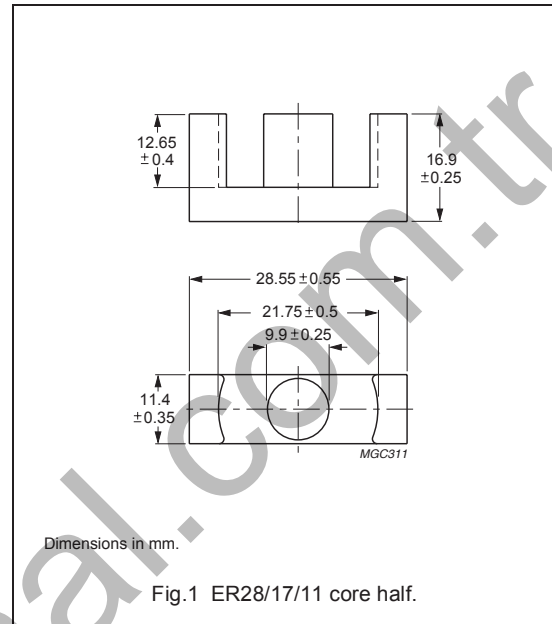
**Properties of core sets under power conditions**

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
3C90	≥ 320	≤ 0.63	≤ 0.67	–
3C94	≥ 320	–	≤ 0.5	≤ 3.2

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.928	mm <sup>-1</sup>
$V_e$	effective volume	6 140	mm <sup>3</sup>
$l_e$	effective length	75.5	mm
$A_e$	effective area	81.4	mm <sup>2</sup>
$A_{min}$	minimum area	77.0	mm <sup>2</sup>
$m$	mass of core half	≈ 16	g



**Core halves**

Clamping force for  $A_L$  measurements, 40 ± 20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C90	2500 ± 25%	≈ 1900	≈ 0	ER28/17/11-3C90
3C94	2500 ± 25%	≈ 1900	≈ 0	ER28/17/11-3C94

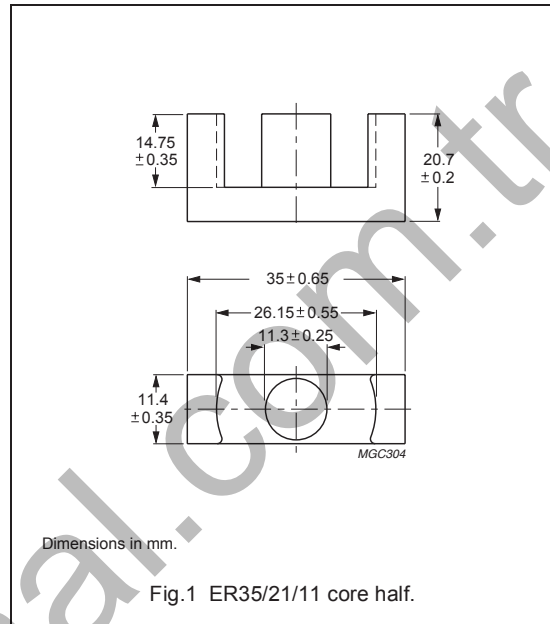
**Properties of core sets under power conditions**

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
3C90	≥ 320	≤ 0.74	≤ 0.77	–
3C94	≥ 320	–	≤ 0.58	≤ 3.7

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.849	mm <sup>-1</sup>
$V_e$	effective volume	9710	mm <sup>3</sup>
$l_e$	effective length	90.8	mm
$A_e$	effective area	107	mm <sup>2</sup>
$A_{min}$	minimum area	100	mm <sup>2</sup>
$m$	mass of core half	≈ 23	g



**Core halves**

Clamping force for  $A_L$  measurements, 40 ± 20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C90	2800 ± 25%	≈ 1900	≈ 0	ER35/21/11-3C90
3C94	2800 ± 25%	≈ 1900	≈ 0	ER35/21/11-3C94

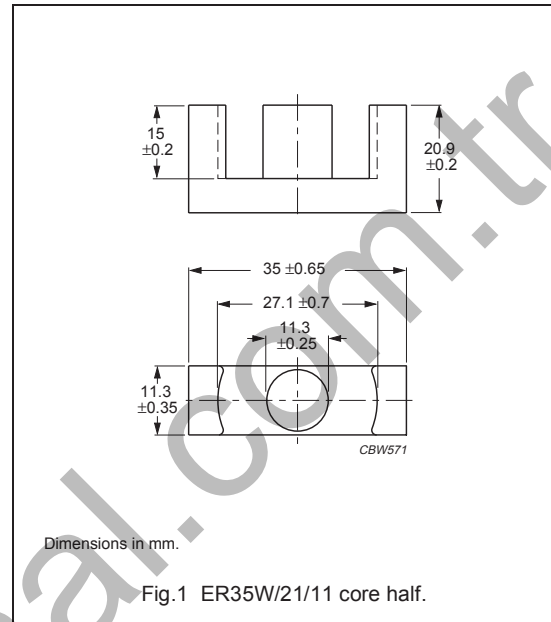
**Properties of core sets under power conditions**

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
3C90	≥ 320	≤ 1.2	≤ 1.3	–
3C94	≥ 320	–	≤ 0.95	≤ 5.8

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.900	mm <sup>-1</sup>
$V_e$	effective volume	9548	mm <sup>3</sup>
$l_e$	effective length	92.7	mm
$A_e$	effective area	103	mm <sup>2</sup>
$A_{min}$	minimum area	100	mm <sup>2</sup>
$m$	mass of core half	≈ 27	g



**Core halves**

Clamping force for  $A_L$  measurements, 40 ± 20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C90	3000 ± 25%	≈ 2150	≈ 0	ER35W/21/11-3C90
3C94	3000 ± 25%	≈ 2150	≈ 0	ER35W/21/11-3C94

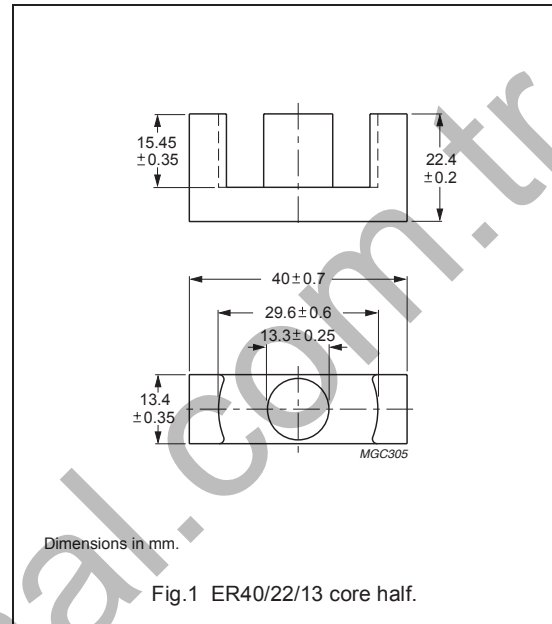
**Properties of core sets under power conditions**

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
3C90	≥ 320	≤ 1.2	≤ 1.3	–
3C94	≥ 320	–	≤ 1.0	≤ 5.7

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.658	mm <sup>-1</sup>
$V_e$	effective volume	14600	mm <sup>3</sup>
$l_e$	effective length	98.0	mm
$A_e$	effective area	149	mm <sup>2</sup>
$A_{min}$	minimum area	139	mm <sup>2</sup>
m	mass of core half	≈ 37	g



**Core halves**

Clamping force for  $A_L$  measurements, 50 ± 20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C90	3600 ± 25%	≈ 1900	≈ 0	ER40/22/13-3C90
3C94	3600 ± 25%	≈ 1900	≈ 0	ER40/22/13-3C94

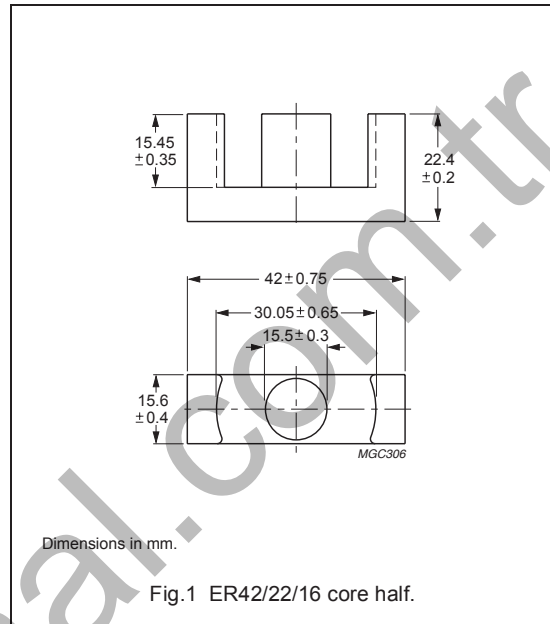
**Properties of core sets under power conditions**

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
3C90	≥ 320	≤ 1.8	≤ 1.9	–
3C94	≥ 320	–	≤ 1.45	≤ 8.7

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.509	mm <sup>-1</sup>
$V_e$	effective volume	19200	mm <sup>3</sup>
$l_e$	effective length	98.8	mm
$A_e$	effective area	194	mm <sup>2</sup>
$A_{min}$	minimum area	189	mm <sup>2</sup>
m	mass of core half	≈ 50	g



**Core halves**

Clamping force for  $A_L$  measurements, 50 ± 20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C90	4600 ± 25%	≈ 1900	≈ 0	ER42/22/16-3C90
3C94	4600 ± 25%	≈ 1900	≈ 0	ER42/22/16-3C94

**Properties of core sets under power conditions**

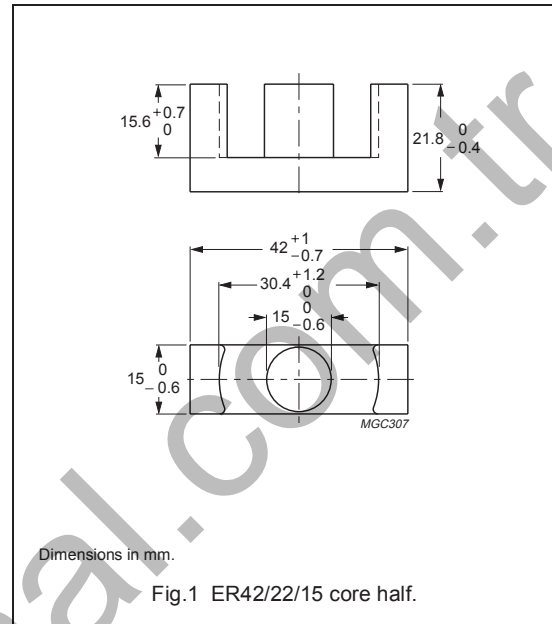
GRADE	B (mT) at	CORE LOSS (W) at		
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 25 kHz; B̂ = 200 mT; T = 100 °C	f = 100 kHz; B̂ = 100 mT; T = 100 °C	f = 100 kHz; B̂ = 200 mT; T = 100 °C
3C90	≥ 320	≤ 2.3	≤ 2.4	–
3C94	≥ 320	–	≤ 1.8	≤ 11



**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.582	mm <sup>-1</sup>
$V_e$	effective volume	16800	mm <sup>3</sup>
$l_e$	effective length	99.0	mm
$A_e$	effective area	170	mm <sup>2</sup>
$A_{min}$	minimum area	170	mm <sup>2</sup>
$m$	mass of core half	≈ 42	g



**Core halves**

Clamping force for  $A_L$  measurements, 40 ±20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C90	4000 ±25%	≈ 1900	≈ 0	ER42/22/15-3C90
3C94	4000 ±25%	≈ 1900	≈ 0	ER42/22/15-3C94

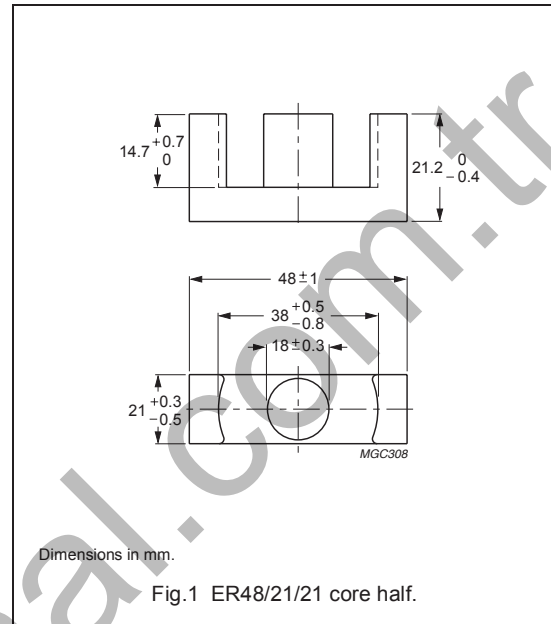
**Properties of core sets under power conditions**

GRADE	B (mT) at	CORE LOSS (W) at		
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 25 kHz; B̂ = 200 mT; T = 100 °C	f = 100 kHz; B̂ = 100 mT; T = 100 °C	f = 100 kHz; B̂ = 200 mT; T = 100 °C
3C90	≥320	≤ 2.0	≤ 2.1	–
3C94	≥320	–	≤ 1.6	≤ 9.0

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.392	mm <sup>-1</sup>
$V_e$	effective volume	25500	mm <sup>3</sup>
$l_e$	effective length	100	mm
$A_e$	effective area	255	mm <sup>2</sup>
$A_{min}$	minimum area	248	mm <sup>2</sup>
$m$	mass of core half	≈ 64	g



**Core halves**

Clamping force for  $A_L$  measurements, 50 ±20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP ( $\mu$ m)	TYPE NUMBER
3C90	5700 ±25%	≈ 1900	≈ 0	ER48/21/21-3C90
3C94	5700 ±25%	≈ 1900	≈ 0	ER48/21/21-3C94

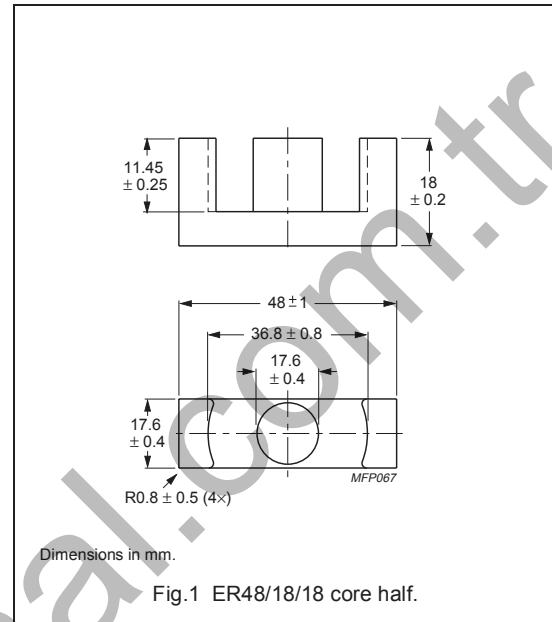
**Properties of core sets under power conditions**

GRADE	B (mT) at	CORE LOSS (W) at		
	H = 250 A/m; f = 25 kHz; T = 100 °C	f = 25 kHz; B̂ = 200 mT; T = 100 °C	f = 100 kHz; B̂ = 100 mT; T = 100 °C	f = 100 kHz; B̂ = 200 mT; T = 100 °C
3C90	≥320	≤ 3.1	≤ 3.3	–
3C94	≥320	–	≤ 2.6	≤ 15

## CORE SETS

## Effective core parameters

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.377	mm <sup>-1</sup>
$V_e$	effective volume	20300	mm <sup>3</sup>
$l_e$	effective length	87.0	mm
$A_e$	effective area	231	mm <sup>2</sup>
$A_{min}$	minimum area	221	mm <sup>2</sup>
$m$	mass of core half	≈ 51	g



## Core halves

Clamping force for  $A_L$  measurements,  $50 \pm 20$  N.

GRADE	$A_L$ (nH)	$\mu_e$	TOTAL AIR GAP ( $\mu$ m)	TYPE NUMBER
3C90	$180 \pm 5\%$	≈ 54	≈ 2500	ER48/18/18-3C90-E180
	$265 \pm 5\%$	≈ 77	≈ 1500	ER48/18/18-3C90-E265
	$309 \pm 5\%$	≈ 93	≈ 1250	ER48/18/18-3C90-E309
	$370 \pm 5\%$	≈ 111	≈ 1000	ER48/18/18-3C90-E370
	$465 \pm 5\%$	≈ 140	≈ 750	ER48/18/18-3C90-E465
	$6400 \pm 25\%$	≈ 1920	≈ 0	ER48/18/18-3C90
3C94	$6400 \pm 25\%$	≈ 1920	≈ 0	ER48/18/18-3C94

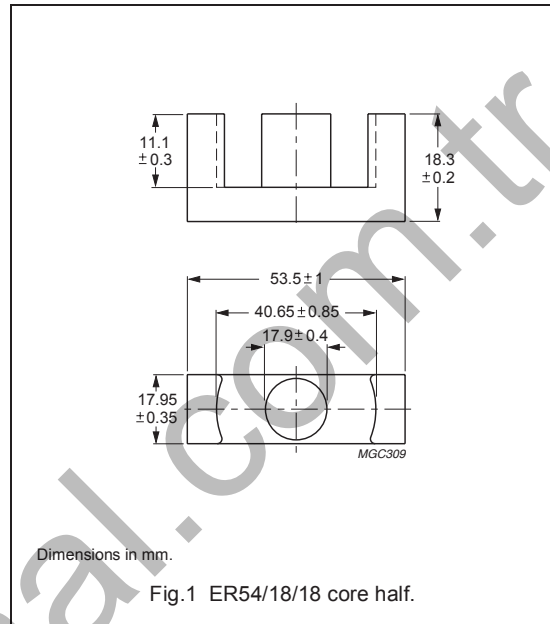
## Properties of core sets under power conditions

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
3C90	≥330	≤ 2.4	≤ 2.5	–
3C94	≥330	–	≤ 2.1	≤ 12

**CORE SETS**

**Effective core parameters**

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.370	mm <sup>-1</sup>
$V_e$	effective volume	23000	mm <sup>3</sup>
$l_e$	effective length	91.8	mm
$A_e$	effective area	250	mm <sup>2</sup>
$A_{min}$	minimum area	240	mm <sup>2</sup>
$m$	mass of core half	≈ 61	g



**Core halves**

Clamping force for  $A_L$  measurements, 50 ± 20 N. Gapped cores are available on request.

GRADE	$A_L$ (nH)	$\mu_e$	AIR GAP (μm)	TYPE NUMBER
3C90	6100 ± 25%	≈ 1800	≈ 0	ER54/18/18-3C90
3C94	6100 ± 25%	≈ 1800	≈ 0	ER54/18/18-3C94

**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; B̂ = 200 mT; T = 100 °C	f = 100 kHz; B̂ = 100 mT; T = 100 °C	f = 100 kHz; B̂ = 200 mT; T = 100 °C
3C90	≥ 320	≤ 2.8	≤ 2.9	–
3C94	≥ 320	–	≤ 2.3	≤ 12.5