

DATA SHEET

E22/6/16

Planar E cores and accessories

Supersedes data of February 2002

2004 Sep 01

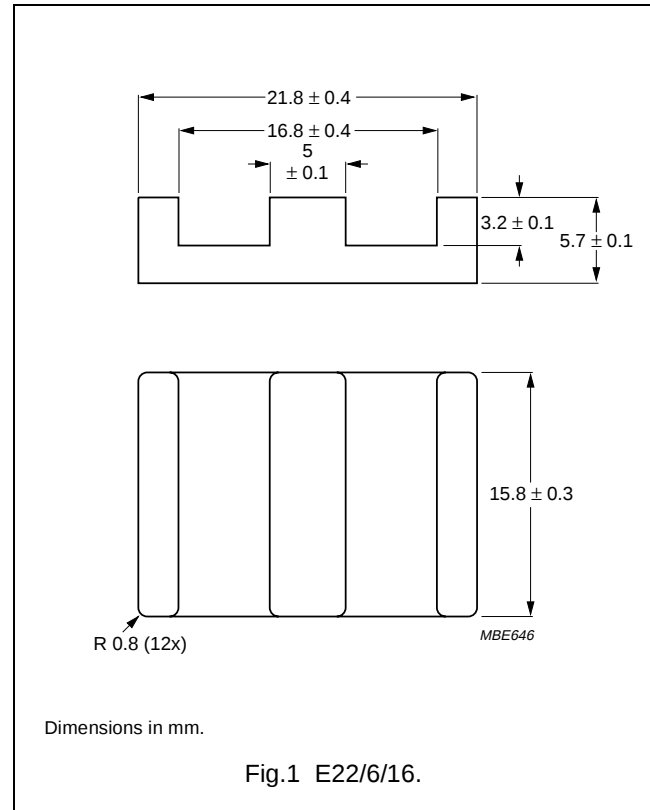
Planar E cores and accessories

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CORES

Effective core parameters of a set of E cores

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.414	mm ⁻¹
V_e	effective volume	2550	mm ³
l_e	effective length	32.5	mm
A_e	effective area	78.3	mm ²
A_{min}	minimum area	78.3	mm ²
m	mass of core half	≈ 6.5	g

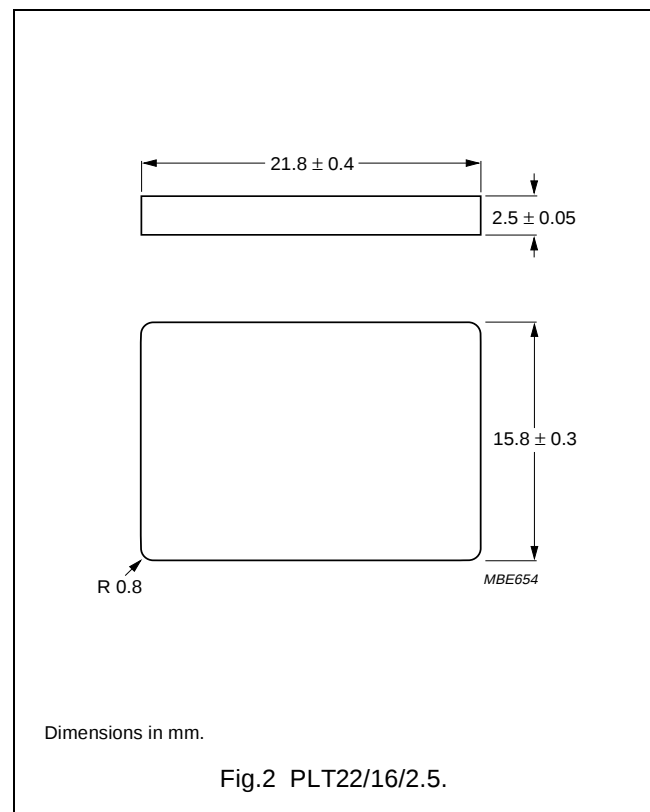


Effective core parameters of an E/PLT combination

SYMBOL	PARAMETER	VALUE	UNIT
$\Sigma(l/A)$	core factor (C1)	0.332	mm ⁻¹
V_e	effective volume	2040	mm ³
l_e	effective length	26.1	mm
A_e	effective area	78.5	mm ²
A_{min}	minimum area	78.5	mm ²
m	mass of plate	≈ 4	g

Ordering information for plates

GRADE	TYPE NUMBER
3C90	PLT22/16/2.5-3C90
3C92 des	PLT22/16/2.5-3C92
3C93 des	PLT22/16/2.5-3C93
3C94	PLT22/16/2.5-3C94
3C96 des	PLT22/16/2.5-3C96
3F3	PLT22/16/2.5-3F3
3F35 prot	PLT22/16/2.5-3F35
3F4 des	PLT22/16/2.5-3F4
3F45 prot	PLT22/16/2.5-3F45
3E6	PLT22/16/2.5-3E6



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Core halves for use in combination with an non-gapped E core

A_L measured in combination with a non-gapped core half, clamping force for A_L measurements, 20 ± 10 N, using a PCB coil containing 5 layers of 20 tracks each, total height 2.5 mm.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C90	$160 \pm 3\%$	≈ 53	≈ 900	E22/6/16-3C90-A160-E
	$250 \pm 3\%$	≈ 82	≈ 490	E22/6/16-3C90-A250-E
	$315 \pm 3\%$	≈ 104	≈ 360	E22/6/16-3C90-A315-E
	$400 \pm 5\%$	≈ 132	≈ 280	E22/6/16-3C90-A400-E
	$630 \pm 8\%$	≈ 208	≈ 160	E22/6/16-3C90-A630-E
	$5150 \pm 25\%$	≈ 1700	≈ 0	E22/6/16-3C90
3C92 	$3700 \pm 25\%$	≈ 1220	≈ 0	E22/6/16-3C92
3C93 	$4300 \pm 25\%$	≈ 1420	≈ 0	E22/6/16-3C93
3C94	$160 \pm 3\%$	≈ 53	≈ 900	E22/6/16-3C94-A160-E
	$250 \pm 3\%$	≈ 82	≈ 490	E22/6/16-3C94-A250-E
	$315 \pm 3\%$	≈ 104	≈ 360	E22/6/16-3C94-A315-E
	$400 \pm 5\%$	≈ 132	≈ 280	E22/6/16-3C94-A400-E
	$630 \pm 8\%$	≈ 208	≈ 160	E22/6/16-3C94-A630-E
	$5150 \pm 25\%$	≈ 1700	≈ 0	E22/6/16-3C94
3C96 	$4600 \pm 25\%$	≈ 1520	≈ 0	E22/6/16-3C96
3F3	$160 \pm 3\%$	≈ 53	≈ 900	E22/6/16-3F3-A160-E
	$250 \pm 3\%$	≈ 82	≈ 490	E22/6/16-3F3-A250-E
	$315 \pm 3\%$	≈ 104	≈ 360	E22/6/16-3F3-A315-E
	$400 \pm 5\%$	≈ 132	≈ 280	E22/6/16-3F3-A400-E
	$630 \pm 8\%$	≈ 208	≈ 160	E22/6/16-3F3-A630-E
	$4300 \pm 25\%$	≈ 1420	≈ 0	E22/6/16-3F3
3F35 	$3500 \pm 25\%$	≈ 1160	≈ 0	E22/6/16-3F35
3F4 	$160 \pm 3\%$	≈ 53	≈ 900	E22/6/16-3F4-A160-E
	$250 \pm 3\%$	≈ 82	≈ 490	E22/6/16-3F4-A250-E
	$315 \pm 3\%$	≈ 104	≈ 360	E22/6/16-3F4-A315-E
	$400 \pm 5\%$	≈ 132	≈ 280	E22/6/16-3F4-A400-E
	$630 \pm 8\%$	≈ 208	≈ 160	E22/6/16-3F4-A630-E
	$2400 \pm 25\%$	≈ 790	≈ 0	E22/6/16-3F4
3F45 	$2400 \pm 25\%$	≈ 790	≈ 0	E22/6/16-3F45
3E6	$22000 +40/-30\%$	≈ 7250	≈ 0	E22/6/16-3E6

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Core halves for use in combination with a plate (PLT)

A_L measured in combination with a plate (PLT), clamping force for A_L measurements, 20 ± 10 N, using a PCB coil containing 5 layers of 20 tracks each, total height 2.5 mm.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C90	$160 \pm 3\%$	≈ 42	≈ 950	E22/6/16-A160-P
	$250 \pm 3\%$	≈ 66	≈ 550	E22/6/16-3C90-A250-P
	$315 \pm 3\%$	≈ 83	≈ 400	E22/6/16-3C90-A315-P
	$400 \pm 5\%$	≈ 106	≈ 280	E22/6/16-3C90-A400-P
	$630 \pm 8\%$	≈ 166	≈ 160	E22/6/16-3C90-A630-P
	$6150 \pm 25\%$	≈ 1620	≈ 0	E22/6/16-3C90
3C92 	$4410 \pm 25\%$	≈ 1170	≈ 0	E22/6/16-3C92
3C93 	$5000 \pm 25\%$	≈ 1320	≈ 0	E22/6/16-3C93
3C94	$160 \pm 3\%$	≈ 42	≈ 950	E22/6/16-3C94-A160-P
	$250 \pm 3\%$	≈ 66	≈ 550	E22/6/16-3C94-A250-P
	$315 \pm 3\%$	≈ 83	≈ 400	E22/6/16-3C94-A315-P
	$400 \pm 5\%$	≈ 106	≈ 280	E22/6/16-3C94-A400-P
	$630 \pm 8\%$	≈ 166	≈ 160	E22/6/16-3C94-A630-P
	$6150 \pm 25\%$	≈ 1620	≈ 0	E22/6/16-3C94
3C96 	$5450 \pm 25\%$	≈ 1440	≈ 0	E22/6/16-3C96
3F3	$160 \pm 3\%$	≈ 42	≈ 950	E22/6/16-3F3-A160-P
	$250 \pm 3\%$	≈ 66	≈ 550	E22/6/16-3F3-A250-P
	$315 \pm 3\%$	≈ 83	≈ 400	E22/6/16-3F3-A315-P
	$400 \pm 5\%$	≈ 106	≈ 280	E22/6/16-3F3-A400-P
	$630 \pm 8\%$	≈ 166	≈ 160	E22/6/16-3F3-A630-P
	$5000 \pm 25\%$	≈ 1320	≈ 0	E22/6/16-3F3
3F35 	$4100 \pm 25\%$	≈ 1080	≈ 0	E22/6/16-3F35
3F4 	$160 \pm 3\%$	≈ 42	≈ 950	E22/6/16-3F4-A160-P
	$250 \pm 3\%$	≈ 66	≈ 550	E22/6/16-3F4-A250-P
	$315 \pm 3\%$	≈ 83	≈ 400	E22/6/16-3F4-A315-P
	$400 \pm 5\%$	≈ 106	≈ 280	E22/6/16-3F4-A400-P
	$630 \pm 8\%$	≈ 166	≈ 160	E22/6/16-3F4-A630-P
	$2900 \pm 25\%$	≈ 770	≈ 0	E22/6/16-3F4
3F45 	$2900 \pm 25\%$	≈ 770	≈ 0	E22/6/16-3F45
3E6	$26000 +40/-30\%$	≈ 6900	≈ 0	E22/6/16-3E6

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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 = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C	f = 500 kHz; $\hat{B}$ = 50 mT; T = 100 °C
E+E22-3C90	≥320	≤ 0.28	–	–	–
E+PLT22-3C90	≥320	≤ 0.23	–	–	–
E+E22-3C92	≥370	≤ 0.22	≤ 1.5	–	–
E+PLT22-3C92	≥370	≤ 0.18	≤ 1.25	–	–
E+E22-3C93	≥320	≤ 0.22 ⁽¹⁾	≤ 1.5 ⁽¹⁾	–	–
E+PLT22-3C93	≥320	≤ 0.18 ⁽¹⁾	≤ 1.25 ⁽¹⁾	–	–
E+E22-3C94	≥320	≤ 0.22	≤ 1.5	–	–
E+PLT22-3C94	≥320	≤ 0.18	≤ 1.25	–	–
E+E22-3C96	≥320	≤ 0.17	≤ 1.1	≤ 0.45	≤ 1.0
E+PLT22-3C96	≥320	≤ 0.14	≤ 1.0	≤ 0.38	≤ 0.75
E+E22-3F3	≥300	≤ 0.28	–	≤ 0.5	–
E+PLT22-3F3	≥300	≤ 0.23	–	≤ 0.40	–
E+E22-3F35	≥300	–	–	≤ 0.25	≤ 0.4
E+PLT22-3F35	≥300	–	–	≤ 0.2	≤ 0.3

1. Measured at 140 °C.

Properties of core sets under power conditions (continued)

GRADE	B (mT) at				
	H = 250 A/m; f = 10 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
E+E22-3F35	≥300	≤ 3.0	–	–	–
E+PLT22-3F35	≥300	≤ 2.2	–	–	–
E+E22-3F4	≥250	–	≤ 0.8	–	≤ 1.2
E+PLT22-3F4	≥250	–	≤ 0.6	–	≤ 1.0
E+E22-3F45	≥250	–	≤ 0.51	≤ 1.3	≤ 0.9
E+PLT22-3F45	≥250	–	≤ 0.41	≤ 1.1	≤ 0.72

MOUNTING INFORMATION

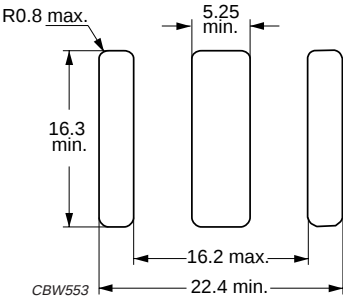


Fig.3 Recommended PCB cut-out for glued cores.

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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

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