DATA SHEET

E18/4/10
Planar E cores and accessories

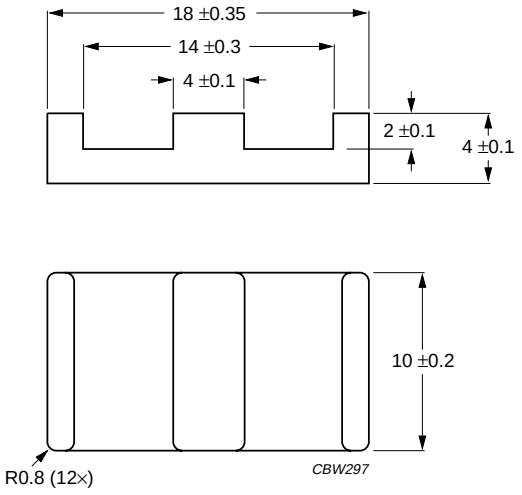
Supersedes data of February 2002 2004 Sep 01

FERROXCUBE
A YAGEO COMPANY

CORES

Effective core parameters of a set of E cores

SYMBOL	PARAMETER	VALUE	UNIT
Σ(l/A)	core factor (C1)	0.616	mm^{-1}
V_e	effective volume	960	mm^3
l_e	effective length	24.3	mm
A_e	effective area	39.3	mm^2
A_{min}	minimum area	39.3	mm^2
m	mass of core half	≈ 2.4	g



Dimensions in mm.

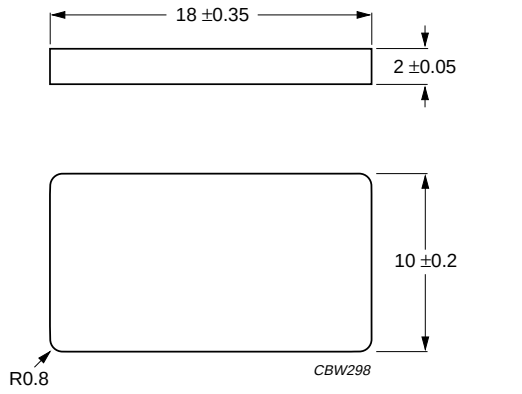
Fig.1 E18/4/10 core half.

Effective core parameters of an E/PLT combination

SYMBOL	PARAMETER	VALUE	UNIT
Σ(l/A)	core factor (C1)	0.514	mm^{-1}
V_e	effective volume	800	mm^3
l_e	effective length	20.3	mm
A_e	effective area	39.5	mm^2
A_{min}	minimum area	39.5	mm^2
m	mass of plate	≈ 1.7	g

Ordering information for plates

GRADE	TYPE NUMBER
3C90	PLT18/10/2-3C90
3C92 des	PLT18/10/2-3C92
3C93 des	PLT18/10/2-3C93
3C94	PLT18/10/2-3C94
3C96 des	PLT18/10/2-3C96
3F3	PLT18/10/2-3F3
3F35 prot	PLT18/10/2-3F35
3F4 des	PLT18/10/2-3F4
3F45 prot	PLT18/10/2-3F45
3E6	PLT18/10/2-3E6



Dimensions in mm.

Fig.2 PLT18/10/2.

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 4 layers of 8 tracks each, total height 1.6 mm.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C90	100 ±3%	≈ 49	≈ 800	E18/4/10-3C90-A100-E
	160 ±3%	≈ 78	≈ 420	E18/4/10-3C90-A160-E
	250 ±5%	≈ 123	≈ 220	E18/4/10-3C90-A250-E
	315 ±8%	≈ 154	≈ 170	E18/4/10-3C90-A315-E
	3200 ±25%	≈ 1560	≈ 0	E18/4/10-3C90
3C92 des	2330 ±25%	≈ 1140	≈ 0	E18/4/10-3C92
3C93 des	2700 ±25%	≈ 1320	≈ 0	E18/4/10-3C93
3C94	100 ±3%	≈ 49	≈ 800	E18/4/10-3C94-A100-E
	160 ±3%	≈ 78	≈ 420	E18/4/10-3C94-A160-E
	250 ±5%	≈ 123	≈ 220	E18/4/10-3C94-A250-E
	315 ±8%	≈ 154	≈ 170	E18/4/10-3C94-A315-E
	3200 ±25%	≈ 1560	≈ 0	E18/4/10-3C94
3C96 des	2900 ±25%	≈ 1410	≈ 0	E18/4/10-3C96
3F3	100 ±3%	≈ 49	≈ 800	E18/4/10-3F3-A100-E
	160 ±3%	≈ 78	≈ 420	E18/4/10-3F3-A160-E
	250 ±5%	≈ 123	≈ 220	E18/4/10-3F3-A250-E
	315 ±8%	≈ 154	≈ 170	E18/4/10-3F3-A315-E
	2700 ±25%	≈ 1320	≈ 0	E18/4/10-3F3
3F35 prot	2200 ±25%	≈ 1070	≈ 0	E18/4/10-3F35
3F4 des	100 ±3%	≈ 49	≈ 800	E18/4/10-3F4-A100-E
	160 ±3%	≈ 78	≈ 420	E18/4/10-3F4-A160-E
	250 ±5%	≈ 123	≈ 220	E18/4/10-3F4-A250-E
	315 ±8%	≈ 154	≈ 170	E18/4/10-3F4-A315-E
	1550 ±25%	≈ 760	≈ 0	E18/4/10-3F4
3F45 prot	1550 ±25%	≈ 760	≈ 0	E18/4/10-3F45
3E6	13500 +40/-30%	≈ 6600	≈ 0	E18/4/10-3E6

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 4 layers of 8 tracks each, total height 1.6 mm.

GRADE	A_L (nH)	μ_e	AIR GAP (μm)	TYPE NUMBER
3C90	100 ±3%	≈ 41	≈ 870	E18/4/10-3C90-A100-P
	160 ±3%	≈ 65	≈ 470	E18/4/10-3C90-A160-P
	250 ±5%	≈ 102	≈ 240	E18/4/10-3C90-A250-P
	315 ±8%	≈ 129	≈ 170	E18/4/10-3C90-A315-P
	3680 ±25%	≈ 1500	≈ 0	E18/4/10-3C90
3C92 des	2690 ±25%	≈ 1100	≈ 0	E18/4/10-3C92
3C93 des	3100 ±25%	≈ 1270	≈ 0	E18/4/10-3C93
3C94	100 ±3%	≈41	≈870	E18/4/10-3C94-A100-P
	160 ±3%	≈65	≈470	E18/4/10-3C94-A160-P
	250 ±5%	≈102	≈240	E18/4/10-3C94-A250-P
	315 ±8%	≈129	≈170	E18/4/10-C94-A315-P
	3680 ±25%	≈ 1500	≈ 0	E18/4/10-3C94
3C96 des	3250 ±25%	≈ 1320	≈ 0	E18/4/10-3C96
3F3	100 ±3%	≈41	≈870	E18/4/10-3F3-A100-P
	160 ±3%	≈65	≈470	E18/4/10-3F3-A160-P
	250 ±5%	≈102	≈240	E18/4/10-3F3-A250-P
prot	315 ±8%	≈129	≈170	E18/4/10-3F3-A315-P
	3100 ±25%	≈ 1270	≈ 0	E18/4/10-3F3
3F35 prot	2500 ±25%	≈ 1020	≈ 0	E18/4/10-3F35
3F4 des	100 ±3%	≈41	≈870	E18/4/10-3F4-A100-P
	160 ±3%	≈65	≈470	E18/4/10-3F4-A160-P
	250 ±5%	≈102	≈240	E18/4/10-3F4-A250-P
	315 ±8%	≈129	≈170	E18/4/10-3F4-A315-P
	1800 ±25%	≈ 740	≈ 0	E18/4/10-3F4
3F45 prot	1800 ±25%	≈ 740	≈ 0	E18/4/10-3F45
3E6	15500 +40/-30%	≈ 6400	≈ 0	E18/4/10-3E6

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 = 400 kHz; $\hat{B}$ = 50 mT; T = 100 °C	f = 500 kHz; $\hat{B}$ = 50 mT; T = 100 °C
E+E18-3C90	≥320	≤ 0.105	–	–	–
E+PLT18-3C90	≥320	≤ 0.095	–	–	–
E+E18-3C92	≥370	≤ 0.085	≤ 0.6	–	–
E+PLT18-3C92	≥370	≤ 0.075	≤ 0.5	–	–
E+E18-3C93	≥320	≤ 0.085[1]	≤ 0.6[1]	–	–
E+PLT18-3C93	≥320	≤ 0.075[1]	≤ 0.5[1]	–	–
E+E18-3C94	≥320	≤ 0.085	≤ 0.6	–	–
E+PLT18-3C94	≥320	≤ 0.075	≤ 0.5	–	–
E+E18-3C96	≥320	≤ 0.065	≤ 0.45	≤ 0.18	≤ 0.35
E+PLT18-3C96	≥320	≤ 0.06	≤ 0.4	≤ 0.15	≤ 0.3
E+E18-3F3	≥300	≤ 0.11	–	≤ 0.19	–
E+PLT18-3F3	≥300	≤ 0.09	–	≤ 0.16	–
E+E18-3F35	≥300	–	–	≤ 0.09	≤ 0.13
E+PLT18-3F35	≥300	–	–	≤ 0.08	≤ 0.12

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 = 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+E18-3F35	≥300	≤ 1.0	–	–	–
E+PLT18-3F35	≥300	≤ 0.9	–	–	–
E+E18-3F4	≥250	–	≤ 0.3	–	≤ 0.45
E+PLT18-3F4	≥250	–	≤ 0.24	–	≤ 0.39
E+E18-3F45	≥250	–	≤ 0.2	≤ 0.48	≤ 0.35
E+PLT18-3F45	≥250	–	≤ 0.16	≤ 0.4	≤ 0.3

MOUNTING INFORMATION

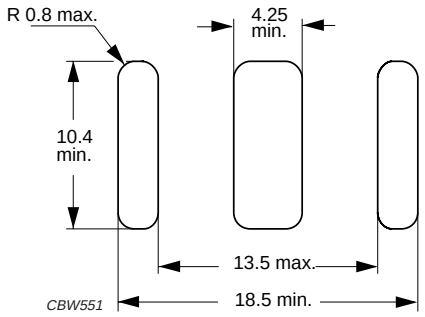
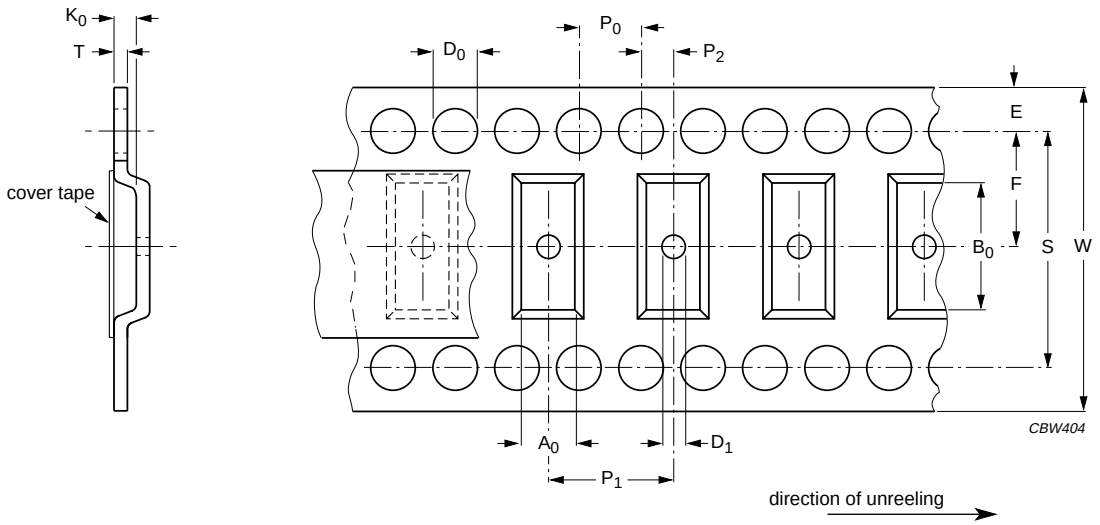


Fig.3 Recommended PCB cut-out for glued planar E18/4/10 cores.

BLISTER TAPE AND REEL DIMENSIONS prot



For dimensions see Table 1.

Fig.4 Blister tape.

Table 1 Physical dimensions of blister tape; see Fig.4

SIZE	DIMENSIONS (mm)
A_0	10.5 ±0.2
B_0	18.7 ±0.2
K_0	4.5 ±0.2
T	0.3 ±0.05
W	32.0 ±0.3
E	1.75 ±0.1
F	14.2 ±0.1
D_0	1.5 +0.1
D_1	≥ 2.0
P_0	4.0 ±0.1
P_1	16.0 ±0.1
P_2	2.0 ±0.1
S	28.4 ±0.1

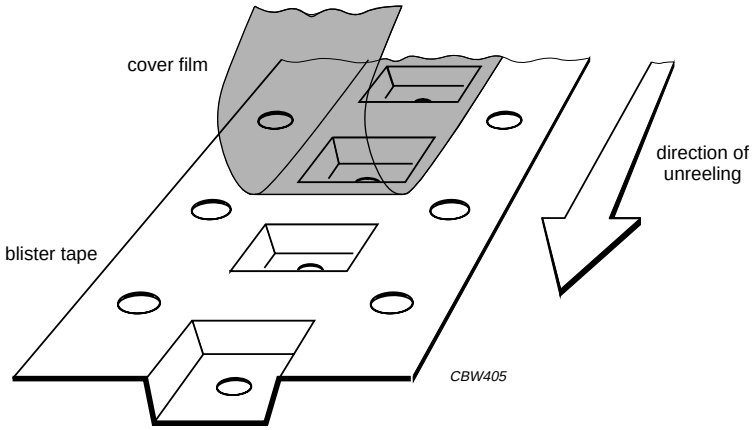
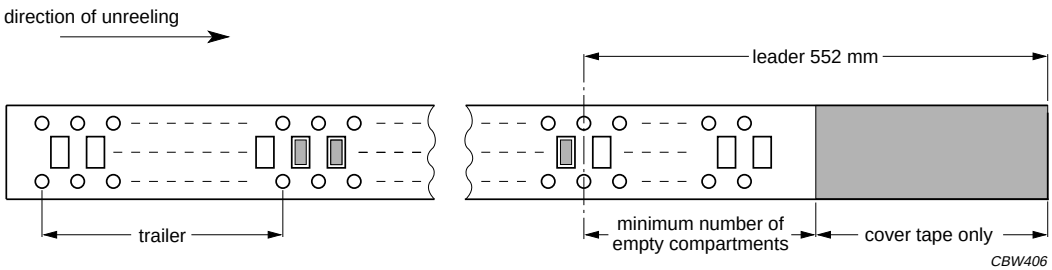
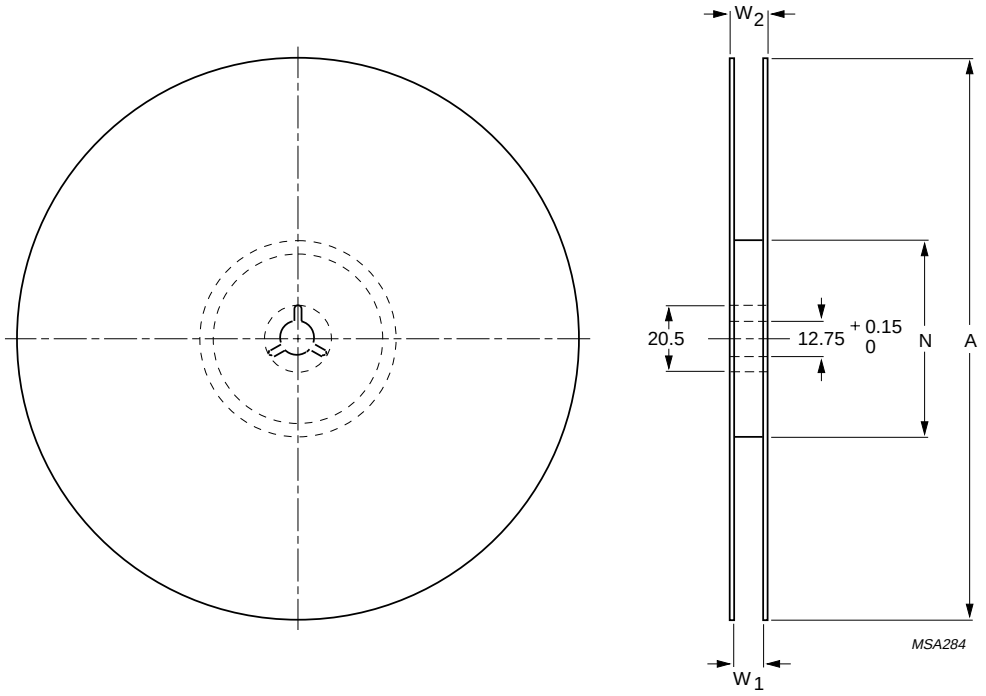


Fig.5 Construction of blister tape.



Leader: length of leader tape is 552 mm minimum covered with cover tape.
Trailer: 160 mm minimum (secured with tape).
Storage temperature range for tape: –25 to +45 °C.

Fig.6 Leader/trailer tape.



Dimensions in mm.
For dimensions see Table 2.

Fig.7 Reel.

Table 2 Reel dimensions; see Fig.7

SIZE	DIMENSIONS (mm)			
	A	**N**	**W_1**	**W_2**
32	330	100 ±5	32.4	≤36.4

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

STATUS	INDICATION	DEFINITION
Prototype	prot	These are products that have been made as development samples for the purposes of technical evaluation only. The data for these types is provisional and is subject to change.
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Preferred		These products are recommended for use in current designs and are available via our sales channels.
Support	sup	These products are **not** recommended for new designs and may not be available through all of our sales channels. Customers are advised to check for availability.