# DATA SHEET

# E34/14/9

# E cores and accessories
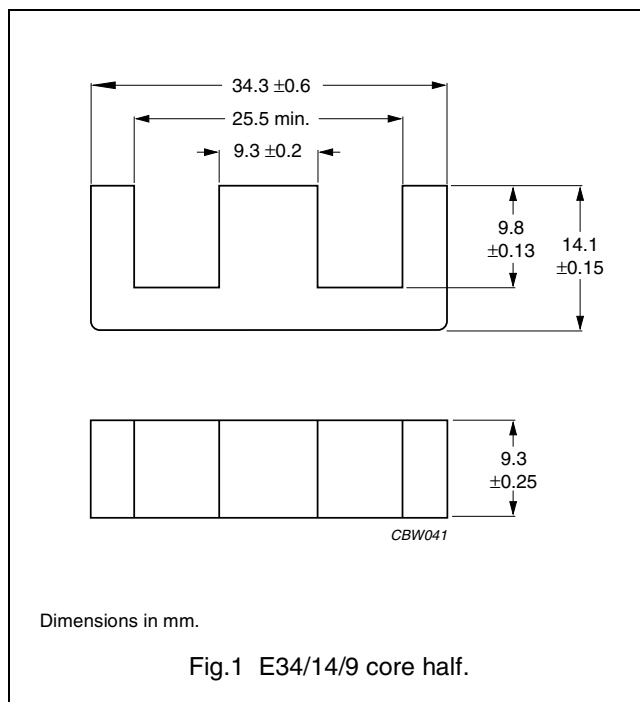
Supersedes data of September 2004                    2008 Sep 01

**FERROXCUBE**

A YAGEO COMPANY

# E cores and accessories

**CORE SETS**

**Effective core parameters**

| SYMBOL | PARAMETER | VALUE | UNIT |
|---|---|---|---|
| $\Sigma(l/A)$ | core factor (C1) | 0.850 | $mm^{-1}$ |
| $V_e$ | effective volume | 5590 | $mm^3$ |
| $l_e$ | effective length | 69.3 | mm |
| $A_e$ | effective area | 80.7 | $mm^2$ |
| $A_{min}$ | minimum area | 80.7 | $mm^2$ |
| m | mass of core half | $\approx 14$ | g |



Dimensions in mm.

Fig.1 E34/14/9 core half.

**Core halves**

$A_L$ measured in combination with a non-gapped core half, clamping force for $A_L$ measurements 40 ±20 N, unless stated otherwise.

| GRADE | $A_L$ (nH) | $\mu_e$ | TOTAL AIR GAP ($\mu$m) | TYPE NUMBER |
|---|---|---|---|---|
| 3C81 | 100 ±5%[1] | $\approx 68$ | $\approx 1520$ | E34/14/9-3C81-E100 |
| | 160 ±5%[1] | $\approx 109$ | $\approx 820$ | E34/14/9-3C81-E160 |
| | 250 ±5% | $\approx 171$ | $\approx 460$ | E34/14/9-3C81-A250 |
| | 315 ±5% | $\approx 215$ | $\approx 350$ | E34/14/9-3C81-A315 |
| | 400 ±8% | $\approx 273$ | $\approx 260$ | E34/14/9-3C81-A400 |
| | 630 ±15% | $\approx 431$ | $\approx 140$ | E34/14/9-3C81-A630 |
| | 3200 ±25% | $\approx 2190$ | $\approx 0$ | E34/14/9-3C81 |
| 3C90 | 100 ±5%[1] | $\approx 68$ | $\approx 1520$ | E34/14/9-3C90-E100 |
| | 160 ±5%[1] | $\approx 109$ | $\approx 820$ | E34/14/9-3C90-E160 |
| | 250 ±5% | $\approx 171$ | $\approx 460$ | E34/14/9-3C90-A250 |
| | 315 ±5% | $\approx 215$ | $\approx 350$ | E34/14/9-3C90-A315 |
| | 400 ±8% | $\approx 273$ | $\approx 260$ | E34/14/9-3C90-A400 |
| | 630 ±15% | $\approx 431$ | $\approx 140$ | E34/14/9-3C90-A630 |
| | 2440 ±25% | $\approx 1670$ | $\approx 0$ | E34/14/9-3C90 |
| 3C91 des | 3200 ±25% | $\approx 2190$ | $\approx 0$ | E34/14/9-3C91 |
| 3C92 des | 1850 ±25% | $\approx 1250$ | $\approx 0$ | E34/14/9-3C92 |
| 3C94 | 2440 ±25% | $\approx 1760$ | $\approx 0$ | E34/14/9-3C94 |
| 3C96 des | 2125 ±25% | $\approx 1450$ | $\approx 0$ | E34/14/9-3C96 |

# E cores and accessories

| GRADE | $A_L$ (nH) | $\mu_e$ | TOTAL AIR GAP ($\mu$m) | TYPE NUMBER |
|---|---|---|---|---|
| 3F3 | 100 $\pm$5%[1] | $\approx$ 68 | $\approx$ 1520 | E34/14/9-3F3-E100 |
| | 160 $\pm$5%[1] | $\approx$ 109 | $\approx$ 820 | E34/14/9-3F3-E160 |
| | 250 $\pm$5% | $\approx$ 171 | $\approx$ 460 | E34/14/9-3F3-A250 |
| | 315 $\pm$5% | $\approx$ 215 | $\approx$ 350 | E34/14/9-3F3-A315 |
| | 400 $\pm$8% | $\approx$ 273 | $\approx$ 260 | E34/14/9-3F3-A400 |
| | 630 $\pm$15% | $\approx$ 431 | $\approx$ 140 | E34/14/9-3F3-A630 |
| | 2125 $\pm$25% | $\approx$ 1450 | $\approx$ 0 | E34/14/9-3F3 |
| 3F35 `des` | 1680 $\pm$25% | $\approx$ 1150 | $\approx$ 0 | E34/14/9-3F35 |

**Note**

1. Measured in combination with an equal gapped core half, clamping force for $A_L$ measurements, 40 $\pm$20 N.

**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 | $\leq$ 1.2 | – | – | – |
| 3C90 | $\geq$320 | $\leq$ 0.56 | $\leq$ 0.63 | – | – |
| 3C91 | $\geq$320 | – | $\leq$ 0.38[1] | $\leq$ 2.3[1] | – |
| 3C92 | $\geq$370 | – | $\leq$ 0.5 | $\leq$ 2.9 | – |
| 3C94 | $\geq$320 | – | $\leq$ 0.5 | $\leq$ 2.9 | – |
| 3C96 | $\geq$340 | – | $\leq$ 0.38 | $\leq$ 2.3 | – |
| 3F3 | $\geq$320 | – | $\leq$ 0.62 | – | $\leq$ 1.1 |
| 3F35 | $\geq$300 | – | – | – | – |

**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; $\hat{B}$ = 50 mT; T = 100 °C | f = 500 kHz; $\hat{B}$ = 100 mT; T = 100 °C | f = 1 MHz; $\hat{B}$ = 30 mT; T = 100 °C | f = 3 MHz; $\hat{B}$ = 10 mT; T = 100 °C |
| 3C96 | $\geq$340 | $\leq$ 2.1 | – | – | – |
| 3F3 | $\geq$320 | – | – | – | – |
| 3F35 | $\geq$300 | $\leq$ 0.75 | $\leq$ 5.9 | – | – |

**Note**

1. Measured at 60 °C.

**COIL FORMERS**

**General data for E34/14/9 coil former**

| PARAMETER | SPECIFICATION |
|---|---|
| Coil former material | polyamide (PA6.6), glass reinforced, flame retardant in accordance with *"UL 94-HB"*; UL file number E41938(M) |
| Maximum operating temperature | 130 °C, *"IEC 60085"*, class B |
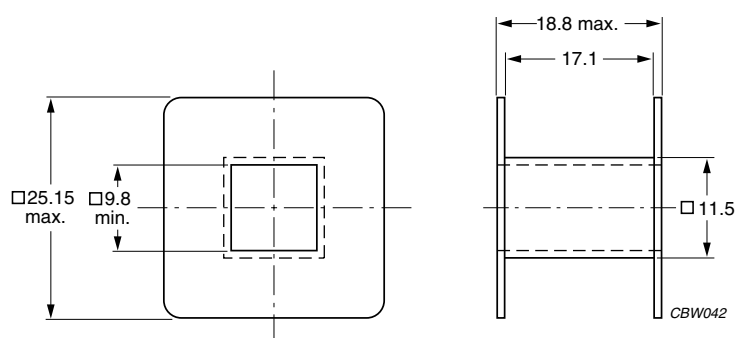


Dimensions in mm.

Fig.2  E34/14/9 coil former.

**Winding data and area product for E34/14/9 coil former without pins**

| NUMBER OF SECTIONS | MINIMUM WINDING AREA (mm²) | NOMINAL WINDING WIDTH (mm) | AVERAGE LENGTH OF TURN (mm) | AREA PRODUCT Ae x Aw (mm⁴) | TYPE NUMBER |
|---|---|---|---|---|---|
| 1 | 111 | 17.1 | 67.0 | 8960 | CP-E34/14/9-1S |

**General data for 12-pins E34/14/9 coil former**

| PARAMETER | SPECIFICATION |
|---|---|
| Coil former material | polyamide (PA6.6), glass reinforced, flame retardant in accordance with "UL 94-HB"; UL file number E41938(M) |
| Maximum operating temperature | 130 °C, "IEC 60085", class B |
| Pin material | copper-zinc alloy (CuZnP), tin (Sn) plated |
| 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 |



Dimensions in mm.

Fig.3 E34/14/9 coil former: 12-pins.
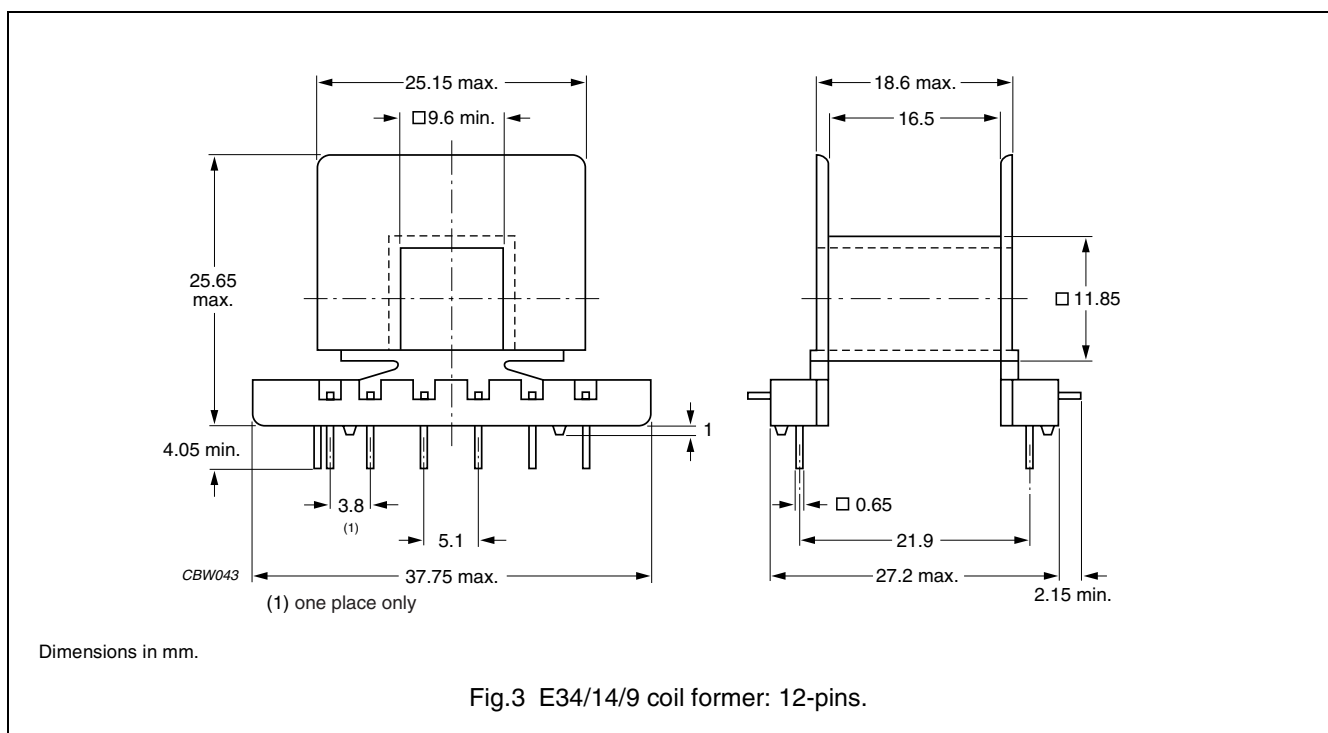
**Winding data and area product for 12-pins E34/14/9 coil former**

| NUMBER OF SECTIONS | MINIMUM WINDING AREA (mm$^2$) | NOMINAL WINDING WIDTH (mm) | AVERAGE LENGTH OF TURN (mm) | AREA PRODUCT Ae x Aw (mm$^4$) | TYPE NUMBER |
|---|---|---|---|---|---|
| 1 | 102 | 16.5 | 69.0 | 8230 | CPH-E34/14/9-1S-12PD-Z |

**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. |

**DISCLAIMER**

**Life support applications** — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Ferroxcube customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Ferroxcube for any damages resulting from such application.

**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. |
| **Design-in** | des | These products are recommended for new designs. |
| **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. |