

# DATA SHEET

**E64/10/50**

**Planar E cores and accessories**

Supersedes data of September 2004

2008 Sep 01

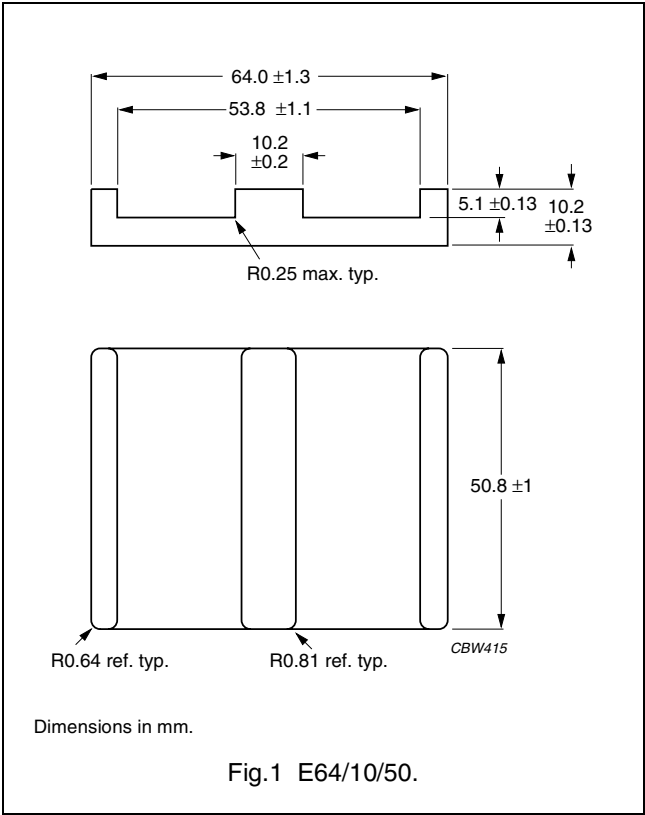
Planar E cores and accessories

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CORES

Effective core parameters of a set of E cores

| SYMBOL        | PARAMETER         | VALUE | UNIT             |
|---------------|-------------------|-------|------------------|
| $\Sigma(l/A)$ | core factor (C1)  | 0.156 | mm <sup>-1</sup> |
| $V_e$         | effective volume  | 40700 | mm <sup>3</sup>  |
| $l_e$         | effective length  | 79.9  | mm               |
| $A_e$         | effective area    | 519   | mm <sup>2</sup>  |
| $A_{min}$     | minimum area      | 519   | mm <sup>2</sup>  |
| m             | mass of core half | ≈ 100 | g                |

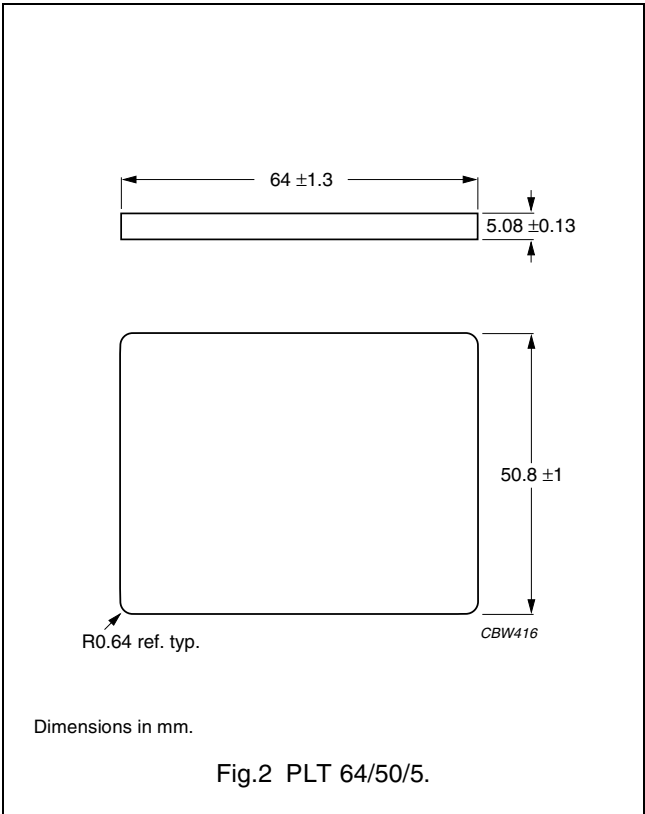


Effective core parameters of an E/PLT combination

| SYMBOL        | PARAMETER        | VALUE | UNIT             |
|---------------|------------------|-------|------------------|
| $\Sigma(l/A)$ | core factor (C1) | 0.136 | mm <sup>-1</sup> |
| $V_e$         | effective volume | 35500 | mm <sup>3</sup>  |
| $l_e$         | effective length | 69.7  | mm               |
| $A_e$         | effective area   | 519   | mm <sup>2</sup>  |
| $A_{min}$     | minimum area     | 519   | mm <sup>2</sup>  |
| m             | mass of plate    | ≈ 78  | g                |

Ordering information for plates

| GRADE                   | TYPE NUMBER     |
|-------------------------|-----------------|
| 3C90                    | PLT64/50/5-3C90 |
| 3C92 <small>des</small> | PLT64/50/5-3C92 |
| 3C93 <small>des</small> | PLT64/50/5-3C93 |
| 3C94                    | PLT64/50/5-3C94 |
| 3C95 <small>des</small> | PLT64/50/5-3C95 |
| 3F3                     | PLT64/50/5-3F3  |
| 3F4 <small>des</small>  | PLT64/50/5-3F4  |



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**Core halves for use in combination with an E core**

$A_L$  measured in combination with a non-gapped core half, clamping force for  $A_L$  measurements,  $100 \pm 30$  N, unless stated otherwise.

| GRADE                   | $A_L$<br>(nH)        | $\mu_e$        | TOTAL AIR GAP<br>( $\mu\text{m}$ ) | TYPE NUMBER            |
|-------------------------|----------------------|----------------|------------------------------------|------------------------|
| 3C90                    | $630 \pm 3\%^{(1)}$  | $\approx 78$   | $\approx 1100$                     | E64/10/50-3C90-E630-E  |
|                         | $1000 \pm 3\%^{(1)}$ | $\approx 124$  | $\approx 660$                      | E64/10/50-3C90-E1000-E |
|                         | $1600 \pm 5\%$       | $\approx 199$  | $\approx 385$                      | E64/10/50-3C90-A1600-E |
|                         | $2500 \pm 10\%$      | $\approx 310$  | $\approx 225$                      | E64/10/50-3C90-A2500-E |
|                         | $3150 \pm 10\%$      | $\approx 391$  | $\approx 170$                      | E64/10/50-3C90-A3150-E |
|                         | $14640 \pm 25\%$     | $\approx 1820$ | $\approx 0$                        | E64/10/50-3C90         |
| 3C92 <small>des</small> | $11200 \pm 25\%$     | $\approx 1390$ | $\approx 0$                        | E64/10/50-3C92         |
| 3C93 <small>des</small> | $13300 \pm 25\%$     | $\approx 1650$ | $\approx 0$                        | E64/10/50-3C93         |
| 3C94                    | $630 \pm 3\%^{(1)}$  | $\approx 78$   | $\approx 1100$                     | E64/10/50-3C94-E630-E  |
|                         | $1000 \pm 3\%^{(1)}$ | $\approx 124$  | $\approx 660$                      | E64/10/50-3C94-E1000-E |
|                         | $1600 \pm 5\%$       | $\approx 199$  | $\approx 385$                      | E64/10/50-3C94-A1600-E |
|                         | $2500 \pm 10\%$      | $\approx 310$  | $\approx 225$                      | E64/10/50-3C94-A2500-E |
|                         | $3150 \pm 10\%$      | $\approx 391$  | $\approx 170$                      | E64/10/50-3C94-A3150-E |
|                         | $14640 \pm 25\%$     | $\approx 1820$ | $\approx 0$                        | E64/10/50-3C94         |
| 3C95 <small>des</small> | $17890 \pm 25\%$     | $\approx 2190$ | $\approx 0$                        | E64/10/50-3C95         |
| 3F3                     | $630 \pm 3\%^{(1)}$  | $\approx 78$   | $\approx 1100$                     | E64/10/50-3F3-E630-E   |
|                         | $1000 \pm 3\%^{(1)}$ | $\approx 124$  | $\approx 660$                      | E64/10/50-3F3-E1000-E  |
|                         | $1600 \pm 5\%$       | $\approx 199$  | $\approx 385$                      | E64/10/50-3F3-A1600-E  |
|                         | $2500 \pm 10\%$      | $\approx 310$  | $\approx 225$                      | E64/10/50-3F3-A2500-E  |
|                         | $3150 \pm 10\%$      | $\approx 391$  | $\approx 170$                      | E64/10/50-3F3-A3150-E  |
|                         | $13300 \pm 25\%$     | $\approx 1650$ | $\approx 0$                        | E64/10/50-3F3          |
| 3F4 <small>des</small>  | $630 \pm 3\%^{(1)}$  | $\approx 78$   | $\approx 1100$                     | E64/10/50-3F4-E630-E   |
|                         | $1000 \pm 3\%^{(1)}$ | $\approx 124$  | $\approx 660$                      | E64/10/50-3F4-E1000-E  |
|                         | $1600 \pm 5\%$       | $\approx 199$  | $\approx 385$                      | E64/10/50-3F4-A1600-E  |
|                         | $2500 \pm 10\%$      | $\approx 310$  | $\approx 225$                      | E64/10/50-3F4-A2500-E  |
|                         | $3150 \pm 10\%$      | $\approx 391$  | $\approx 170$                      | E64/10/50-3F4-A3150-E  |
|                         | $6960 \pm 25\%$      | $\approx 860$  | $\approx 0$                        | E64/10/50-3F4          |

**Note**

1. Measured in combination with an equal-gapped core half, clamping force for  $A_L$  measurements,  $100 \pm 30$  N.

## Planar E cores and accessories

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**Core halves for use in combination with a plate (PLT)**A<sub>L</sub> measured in combination with a plate (PLT), clamping force for A<sub>L</sub> measurements, 100 ±30 N.

| GRADE                   | A <sub>L</sub><br>(nH) | μ <sub>e</sub> | AIR GAP<br>(μm) | TYPE NUMBER            |
|-------------------------|------------------------|----------------|-----------------|------------------------|
| 3C90                    | 630 ±3%                | ≈ 78           | ≈ 1100          | E64/10/50-3C90-A630-P  |
|                         | 1000 ±3%               | ≈ 124          | ≈ 660           | E64/10/50-3C90-A1000-P |
|                         | 1600 ±5%               | ≈ 199          | ≈ 385           | E64/10/50-3C90-A1600-P |
|                         | 2500 ±10%              | ≈ 310          | ≈ 225           | E64/10/50-3C90-A2500-P |
|                         | 3150 ±10%              | ≈ 391          | ≈ 170           | E64/10/50-3C90-A3150-P |
|                         | 16540 ±25%             | ≈ 1790         | ≈ 0             | E64/10/50-3C90         |
| 3C92 <small>des</small> | 12700 ±25%             | ≈ 1370         | ≈ 0             | E64/10/50-3C92         |
| 3C93 <small>des</small> | 15050 ±25%             | ≈ 1630         | ≈ 0             | E64/10/50-3C93         |
| 3C94                    | 630 ±3%                | ≈ 78           | ≈ 1100          | E64/10/50-3C94-A630-P  |
|                         | 1000 ±3%               | ≈ 124          | ≈ 660           | E64/10/50-3C94-A1000-P |
|                         | 1600 ±5%               | ≈ 199          | ≈ 385           | E64/10/50-3C94-A1600-P |
|                         | 2500 ±10%              | ≈ 310          | ≈ 225           | E64/10/50-3C94-A2500-P |
|                         | 3150 ±10%              | ≈ 391          | ≈ 170           | E64/10/50-3C94-A3150-P |
|                         | 16540 ±25%             | ≈ 1790         | ≈ 0             | E64/10/50-3C94         |
| 3C95 <small>des</small> | 20150 ±25%             | ≈ 2150         | ≈ 0             | E64/10/50-3C95         |
| 3F3                     | 630 ±3%                | ≈ 78           | ≈ 1100          | E64/10/50-3F3-A630-P   |
|                         | 1000 ±3%               | ≈ 124          | ≈ 660           | E64/10/50-3F3-A1000-P  |
|                         | 1600 ±5%               | ≈ 199          | ≈ 385           | E64/10/50-3F3-A1600-P  |
|                         | 2500 ±10%              | ≈ 310          | ≈ 225           | E64/10/50-3F3-A2500-P  |
|                         | 3150 ±10%              | ≈ 391          | ≈ 170           | E64/10/50-3F3-A3150-P  |
|                         | 15050 ±25%             | ≈ 1630         | ≈ 0             | E64/10/50-3F3          |
| 3F4 <small>des</small>  | 630 ±3%                | ≈ 78           | ≈ 1100          | E64/10/50-3F4-A630-P   |
|                         | 1000 ±3%               | ≈ 124          | ≈ 660           | E64/10/50-3F4-A1000-P  |
|                         | 1600 ±5%               | ≈ 199          | ≈ 385           | E64/10/50-3F4-A1600-P  |
|                         | 2500 ±10%              | ≈ 310          | ≈ 225           | E64/10/50-3F4-A2500-P  |
|                         | 3150 ±10%              | ≈ 391          | ≈ 170           | E64/10/50-3F4-A3150-P  |
|                         | 7920 ±25%              | ≈ 860          | ≈ 0             | E64/10/50-3F4          |

## Planar E cores and accessories

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## Properties of core sets under power conditions

| GRADE        | B (mT) at                                 | CORE LOSS (W) at                                  |                                                  |                                                   |                                                  |
|--------------|-------------------------------------------|---------------------------------------------------|--------------------------------------------------|---------------------------------------------------|--------------------------------------------------|
|              | H = 250 A/m;<br>f = 10 kHz;<br>T = 100 °C | f = 100 kHz;<br>$\hat{B}$ = 100 mT;<br>T = 100 °C | f = 100 kHz;<br>$\hat{B}$ = 200 mT;<br>T = 25 °C | f = 100 kHz;<br>$\hat{B}$ = 200 mT;<br>T = 100 °C | f = 400 kHz;<br>$\hat{B}$ = 50 mT;<br>T = 100 °C |
| E+E64-3C90   | ≥320                                      | ≤ 4.8                                             | –                                                | –                                                 | –                                                |
| E+PLT64-3C90 | ≥320                                      | ≤ 4.2                                             | –                                                | –                                                 | –                                                |
| E+E64-3C92   | ≥370                                      | ≤ 3.6                                             | –                                                | ≤ 25                                              | –                                                |
| E+PLT64-3C92 | ≥370                                      | ≤ 3.2                                             | –                                                | ≤ 23                                              | –                                                |
| E+E64-3C93   | ≥320                                      | ≤ 3.6 <sup>(1)</sup>                              | –                                                | ≤ 25 <sup>(1)</sup>                               | –                                                |
| E+PLT64-3C93 | ≥320                                      | ≤ 3.2 <sup>(1)</sup>                              | –                                                | ≤ 23 <sup>(1)</sup>                               | –                                                |
| E+E64-3C94   | ≥320                                      | ≤ 3.6                                             | –                                                | ≤ 25                                              | –                                                |
| E+PLT64-3C94 | ≥320                                      | ≤ 3.2                                             | –                                                | ≤ 23                                              | –                                                |
| E+E64-3C95   | ≥320                                      | –                                                 | ≤ 25.6                                           | ≤ 24.4                                            | –                                                |
| E+PLT64-3C95 | ≥320                                      | –                                                 | ≤ 22.4                                           | ≤ 21.3                                            | –                                                |
| E+E64-3F3    | ≥300                                      | ≤ 4.8                                             | –                                                | –                                                 | ≤ 7.8                                            |
| E+PLT64-3F3  | ≥300                                      | ≤ 4.2                                             | –                                                | –                                                 | ≤ 6.8                                            |
| E+E64-3F4    | ≥250                                      | –                                                 | –                                                | –                                                 | –                                                |
| E+PLT64-3F4  | ≥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;<br>f = 10 kHz;<br>T = 100 °C | f = 500 kHz;<br>$\hat{B}$ = 50 mT;<br>T = 100 °C | f = 500 kHz;<br>$\hat{B}$ = 100 mT;<br>T = 100 °C | f = 1 MHz;<br>$\hat{B}$ = 30 mT;<br>T = 100 °C | f = 3 MHz;<br>$\hat{B}$ = 10 mT;<br>T = 100 °C |
| E+E64-3F4   | ≥250                                      | –                                                | –                                                 | ≤ 12                                           | ≤ 20                                           |
| E+PLT64-3F4 | ≥250                                      | –                                                | –                                                 | ≤ 10.5                                         | ≤ 17                                           |

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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

| STATUS           | INDICATION                                                                          | DEFINITION                                                                                                                                                                     |
|------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Prototype</b> |  | 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. |
| <b>Design-in</b> |  | These products are recommended for new designs.                                                                                                                                |
| <b>Preferred</b> |                                                                                     | These products are recommended for use in current designs and are available via our sales channels.                                                                            |
| <b>Support</b>   |  | These products are <b>not</b> recommended for new designs and may not be available through all of our sales channels. Customers are advised to check for availability.         |