



## **Ferrites and accessories**

EELP 22, EILP 22

Core set (with and without clamp recess)

**Series/Type:** B66285G, B66285P, B66455G, B66455P, B65804

**Date:** September 2006

## ELP 22/6/16

Core (with clamp recess)

B66285

### Core set EELP 22

Combination: ELP 22/6/16 with ELP 22/6/16

- To IEC 62317-9
- Delivery mode: single units

### Magnetic characteristics (per set)

$$\Sigma l/A = 0.41 \text{ mm}^{-1}$$

$$l_e = 32.5 \text{ mm}$$

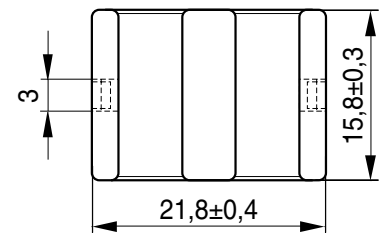
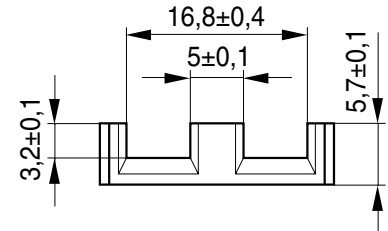
$$A_e = 78.3 \text{ mm}^2$$

$$A_{\min} = 77.9 \text{ mm}^2$$

$$V_e = 2540 \text{ mm}^3$$

Approx. weight 13 g/set

### ELP 22/6/16



FEK0339-R

### Ungapped

| Material | $A_L$ value<br>nH | $\mu_e$ | $P_V$<br>W/set                   | Ordering code<br>(per piece) |
|----------|-------------------|---------|----------------------------------|------------------------------|
| N49      | 3100 $\pm 25\%$   | 1010    | < 0.65 ( 50 mT, 500 kHz, 100 °C) | B66285G0000X149              |
| N92      | 3400 $\pm 25\%$   | 1110    | < 1.65 (200 mT, 100 kHz, 100 °C) | B66285G0000X192              |
| N87      | 4500 $\pm 25\%$   | 1470    | < 1.50 (200 mT, 100 kHz, 100 °C) | B66285G0000X187              |
| N97      | 4600 $\pm 25\%$   | 1520    | < 1.20 (200 mT, 100 kHz, 100 °C) | B66285G0000X197              |

### Calculation factors (for formulas, see “E cores: general information”)

#### EELP 22:

| Material | Relationship between<br>air gap – $A_L$ value |            | Calculation of saturation current |            |             |             |
|----------|-----------------------------------------------|------------|-----------------------------------|------------|-------------|-------------|
|          | K1 (25 °C)                                    | K2 (25 °C) | K3 (25 °C)                        | K4 (25 °C) | K3 (100 °C) | K4 (100 °C) |
| N87      | 126                                           | −0.814     | 232                               | −0.796     | 200         | −0.873      |

Validity range: K1, K2: 0.10 mm < s < 1.50 mm  
K3, K4: 100 nH <  $A_L$  < 700 nH

# ELP 22/6/16 with I 22/2.5/16

## Core and accessories (with clamp recess)

B66285, B65804

### Core set EILP 22

#### Combination:

#### ELP 22/6/16 with I 22/2.5/16

- To IEC 62317-9
- Delivery mode: single units

#### Magnetic characteristics (per set)

$$\Sigma l/A = 0.33 \text{ mm}^{-1}$$

$$l_e = 26.1 \text{ mm}$$

$$A_e = 78.5 \text{ mm}^2$$

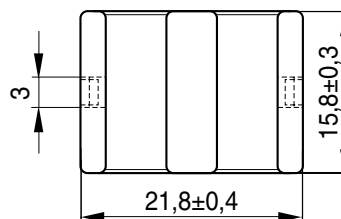
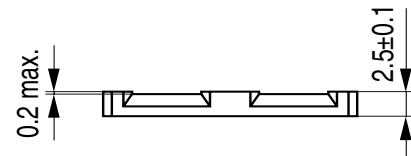
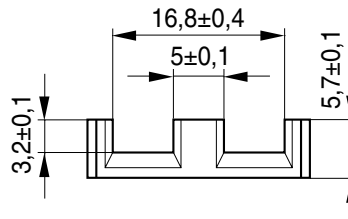
$$A_{\min} = 77.9 \text{ mm}^2$$

$$V_e = 2050 \text{ mm}^3$$

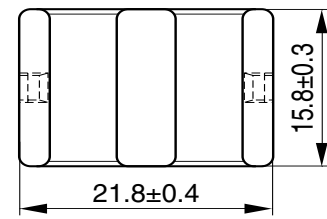
Approx. weight 10.5 g/set

### ELP 22/6/16

### I 22/2.5/16



FEK0339-R



FEK0340-U

### Ungapped

| Material | $A_L$ value<br>nH | $\mu_e$ | $P_V$<br>W/set                   | Ordering code<br>(per piece)                           |
|----------|-------------------|---------|----------------------------------|--------------------------------------------------------|
| N49      | 3700 $\pm 25\%$   | 960     | < 0.50 ( 50 mT, 500 kHz, 100 °C) | B66285G0000X149 (ELP core)<br>B66285P0000X149 (I core) |
| N92      | 4000 $\pm 25\%$   | 1050    | < 1.38 (200 mT, 100 kHz, 100 °C) | B66285G0000X192 (ELP core)<br>B66285P0000X192 (I core) |
| N87      | 5200 $\pm 25\%$   | 1360    | < 1.25 (200 mT, 100 kHz, 100 °C) | B66285G0000X187 (ELP core)<br>B66285P0000X187 (I core) |
| N97      | 5250 $\pm 25\%$   | 1390    | < 1.00 (200 mT, 100 kHz, 100 °C) | B66285G0000X197 (ELP core)<br>B66285P0000X197 (I core) |

### Calculation factors (for formulas, see "E cores: general information")

#### EILP 22:

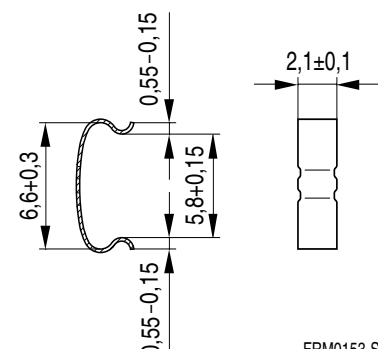
| Material | Relationship between<br>air gap – $A_L$ value |            | Calculation of saturation current |            |             |             |
|----------|-----------------------------------------------|------------|-----------------------------------|------------|-------------|-------------|
|          | K1 (25 °C)                                    | K2 (25 °C) | K3 (25 °C)                        | K4 (25 °C) | K3 (100 °C) | K4 (100 °C) |
| N87      | 134                                           | −0.806     | 243                               | −0.796     | 206         | −0.873      |

Validity range: K1, K2: 0.10 mm < s < 1.50 mm  
K3, K4: 100 nH <  $A_L$  < 700 nH

### Clamp

Ordering code per piece, 2 pieces required

Ordering code: B65804P2204X000



FRM0153-S

## ELP 22/6/16

Core (without clamp recess)

B66455

### Core set EELP 22

Combination: ELP 22/6/16 with ELP 22/6/16

- To IEC 62317-9
- Delivery mode: single units

### Magnetic characteristics (per set)

$$\Sigma l/A = 0.41 \text{ mm}^{-1}$$

$$l_e = 32.5 \text{ mm}$$

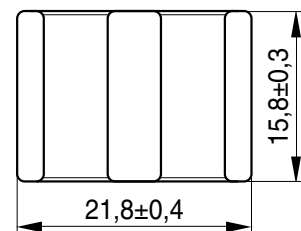
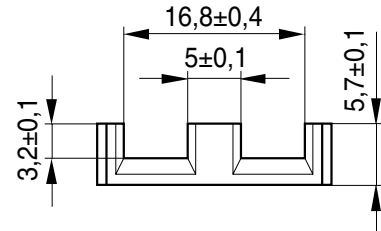
$$A_e = 78.3 \text{ mm}^2$$

$$A_{\min} = 77.9 \text{ mm}^2$$

$$V_e = 2540 \text{ mm}^3$$

Approx. weight 13 g/set

### ELP 22/6/16



FEK0402-N

### Ungapped

| Material | $A_L$ value<br>nH | $\mu_e$ | $P_V$<br>W/set                   | Ordering code<br>(per piece) |
|----------|-------------------|---------|----------------------------------|------------------------------|
| N49      | 3100 $\pm 25\%$   | 1010    | < 0.65 ( 50 mT, 500 kHz, 100 °C) | B66455G0000X149              |
| N92      | 3400 $\pm 25\%$   | 1110    | < 1.65 (200 mT, 100 kHz, 100 °C) | B66455G0000X192              |
| N87      | 4500 $\pm 25\%$   | 1470    | < 1.50 (200 mT, 100 kHz, 100 °C) | B66455G0000X187              |
| N97      | 4600 $\pm 25\%$   | 1520    | < 1.20 (200 mT, 100 kHz, 100 °C) | B66455G0000X197              |

### Calculation factors (for formulas, see “E cores: general information”)

#### EELP 22:

| Material | Relationship between<br>air gap – $A_L$ value |            | Calculation of saturation current |            |             |             |
|----------|-----------------------------------------------|------------|-----------------------------------|------------|-------------|-------------|
|          | K1 (25 °C)                                    | K2 (25 °C) | K3 (25 °C)                        | K4 (25 °C) | K3 (100 °C) | K4 (100 °C) |
| N87      | 126                                           | −0.814     | 232                               | −0.796     | 200         | −0.873      |

Validity range: K1, K2: 0.10 mm < s < 1.50 mm  
K3, K4: 100 nH <  $A_L$  < 700 nH

# ELP 22/6/16 with I 22/2.5/16

Core (without clamp recess)

B66455

## Core set EILP 22

### Combination:

ELP 22/6/16 with I 22/2.5/16

- To IEC 62317-9
- Delivery mode: single units

### Magnetic characteristics (per set)

$$\Sigma l/A = 0.33 \text{ mm}^{-1}$$

$$l_e = 26.1 \text{ mm}$$

$$A_e = 78.5 \text{ mm}^2$$

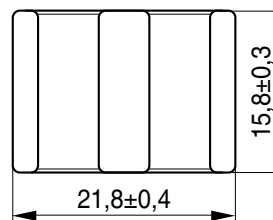
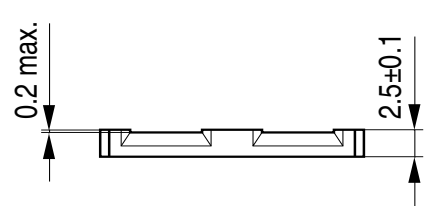
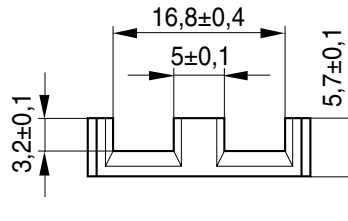
$$A_{\min} = 77.9 \text{ mm}^2$$

$$V_e = 2050 \text{ mm}^3$$

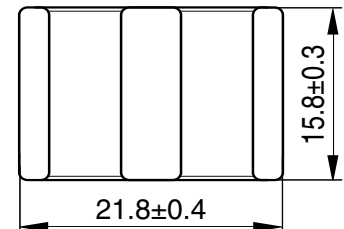
Approx. weight 10.5 g/set

## ELP 22/6/16

## I 22/2.5/16



FEK0402-N



FEK0404-5

## Ungapped

| Material | $A_L$ value<br>nH | $\mu_e$ | $P_V$<br>W/set                   | Ordering code<br>(per piece)                           |
|----------|-------------------|---------|----------------------------------|--------------------------------------------------------|
| N49      | 3700 $\pm 25\%$   | 960     | < 0.50 ( 50 mT, 500 kHz, 100 °C) | B66455G0000X149 (ELP core)<br>B66455P0000X149 (I core) |
| N92      | 4000 $\pm 25\%$   | 1050    | < 1.38 (200 mT, 100 kHz, 100 °C) | B66455G0000X192 (ELP core)<br>B66455P0000X192 (I core) |
| N87      | 5200 $\pm 25\%$   | 1360    | < 1.25 (200 mT, 100 kHz, 100 °C) | B66455G0000X187 (ELP core)<br>B66455P0000X187 (I core) |
| N97      | 5250 $\pm 25\%$   | 1390    | < 1.00 (200 mT, 100 kHz, 100 °C) | B66455G0000X197 (ELP core)<br>B66455P0000X197 (I core) |

## Calculation factors (for formulas, see "E cores: general information")

### EILP 22:

| Material | Relationship between<br>air gap – $A_L$ value |            | Calculation of saturation current |            |             |             |
|----------|-----------------------------------------------|------------|-----------------------------------|------------|-------------|-------------|
|          | K1 (25 °C)                                    | K2 (25 °C) | K3 (25 °C)                        | K4 (25 °C) | K3 (100 °C) | K4 (100 °C) |
| N87      | 134                                           | –0.806     | 243                               | –0.796     | 206         | –0.873      |

Validity range: K1, K2: 0.10 mm < s < 1.50 mm  
K3, K4: 100 nH <  $A_L$  < 700 nH

## Ferrites and accessories

### Cautions and warnings

#### Mechanical stress and mounting

Ferrite cores have to meet mechanical requirements during assembling and for a growing number of applications. Since ferrites are ceramic materials one has to be aware of the special behavior under mechanical load.

As valid for any ceramic material, ferrite cores are brittle and sensitive to any shock, fast changing or tensile load. Especially high cooling rates under ultrasonic cleaning and high static or cyclic loads can cause cracks or failure of the ferrite cores.

For detailed information see Data Book 2007, chapter "General – Definitions, 8.1".

#### Effects of core combination on $A_L$ value

Stresses in the core affect not only the mechanical but also the magnetic properties. It is apparent that the initial permeability is dependent on the stress state of the core. The higher the stresses are in the core, the lower is the value for the initial permeability. Thus the embedding medium should have the greatest possible elasticity.

For detailed information see Data Book 2007, chapter "General – Definitions, 8.2".

#### Heating up

Ferrites can run hot during operation at higher flux densities and higher frequencies.

#### NiZn-materials

The magnetic properties of NiZn-materials can change irreversible in high magnetic fields.

#### Processing notes

- The start of the winding process should be soft. Else the flanges may be destroyed.
- Too strong winding forces may blast the flanges or squeeze the tube that the cores can no more be mounted.
- Too long soldering time at high temperature (>300 °C) may affect coplanarity or pin arrangement.
- Not following the processing notes for soldering of the J-leg terminals may cause solderability problems at the transformer because of pollution with Sn oxide of the tin bath or burned insulation of the wire. For detailed information see Data Book 2007, chapter "Processing notes, 2.2".
- The dimensions of the hole arrangement have fixed values and should be understood as a recommendation for drilling the printed circuit board. For dimensioning the pins, the group of holes can only be seen under certain conditions, as they fit into the given hole arrangement. To avoid problems when mounting the transformer, the manufacturing tolerances for positioning the customers' drilling process must be considered by increasing the hole diameter.

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