



Ferrites and accessories

ETD 29/16/10

Core and accessories

Series/Type: **ETD 29/16/10**

The following products presented in this data sheet are being withdrawn.

| Ordering Code | Substitute Product | Date of Withdrawal | Deadline Last Orders | Last Shipments |
|-----------------|--------------------|--------------------|----------------------|----------------|
| B66359A1013T001 | B66359B1013T001 | 2011-01-14 | 2011-04-30 | 2011-07-31 |

For further information please contact your nearest EPCOS sales office, which will also support you in selecting a suitable substitute. The addresses of our worldwide sales network are presented at www.epcos.com/sales.

- To IEC 61185
- For SMPS transformers with optimum weight/performance ratio at small volume
- Delivery mode: single units

Magnetic characteristics (per set)

$$\Sigma l/A = 0.93 \text{ mm}^{-1}$$

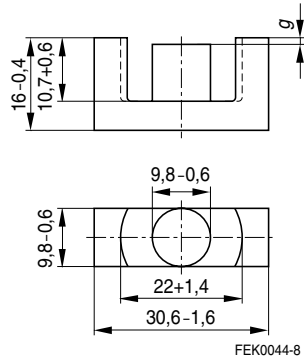
$$l_e = 70.4 \text{ mm}$$

$$A_e = 76.0 \text{ mm}^2$$

$$A_{\min} = 71.0 \text{ mm}^2$$

$$V_e = 5350 \text{ mm}^3$$

Approx. weight 28 g/set


Ungapped

| Material | A_L value nH | μ_e | P_V W/set | Ordering code |
|----------|-------------------|---------|----------------------------------|-----------------|
| N27 | 2000 +30/-20% | 1470 | < 1.04 (200 mT, 25 kHz, 100 °C) | B66358G0000X127 |
| N87 | 2200 +30/-20% | 1610 | < 2.80 (200 mT, 100 kHz, 100 °C) | B66358G0000X187 |
| N97 | 2250 +30/-20% | 1670 | < 2.40 (200 mT, 100 kHz, 100 °C) | B66358G0000X197 |

Gapped

| Material | g mm | A_L value approx. nH | μ_e | Ordering code ** = 27 (N27) = 87 (N87) |
|----------|------------|------------------------------|---------|----------------------------------------------|
| N27, | 0.10 ±0.02 | 621 | 457 | B66358G0100X1** |
| N87 | 0.20 ±0.02 | 383 | 281 | B66358G0200X1** |
| | 0.50 ±0.05 | 201 | 148 | B66358G0500X1** |
| | 1.00 ±0.05 | 124 | 91 | B66358G1000X1** |

The A_L value in the table applies to a core set comprising one ungapped core (dimension g = 0) and one gapped core (dimension g > 0).

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

| Material | Relationship between 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) |
| N27 | 124 | –0.7 | 195 | –0.847 | 181 | –0.865 |
| N87 | 124 | –0.7 | 192 | –0.796 | 176 | –0.873 |

Validity range: K1, K2: 0.10 mm < s < 2.00 mm
 K3, K4: 70 nH < A_L < 680 nH

Coil former (magnetic axis horizontal)

Material: GFR polyterephthalate, UL 94 V-0, insulation class to IEC 60085:
B66359A/B: $F \triangleq$ max. operating temperature 155 °C, color code black
Valox 420-SE0® [E45329 (M)], SABIC INNOVATIVE PLASTICS
B66359W: $H \triangleq$ max. operating temperature 180 °C, color code black
Rynite FR 530® [E41938 (M)], E I DUPONT DE NEMOURS & CO INC

Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s
Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 s
Winding: see Data Book 2007, chapter "Processing notes, 2.1"

Squared pins.

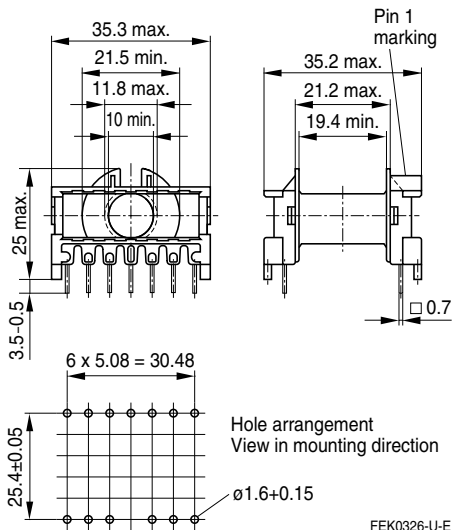
Yoke

Material: Stainless spring steel (0.3 mm)

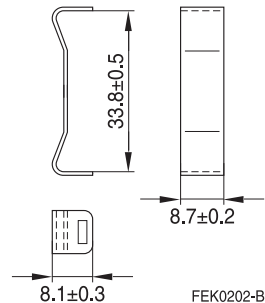
| Coil former | | | | | Ordering code |
|------------------------------------------------|--------------------------|-------------|----------------------------|------|---------------------------------------------------------------------|
| Sections | A_N mm ² | I_N mm | A_R value $\mu\Omega$ | Pins | |
| 1 | 97 | 52.8 | 18.7 | 13 | B66359A1013T001 ¹⁾ B66359B1013T001 B66359W1013T001 |
| Yoke (ordering code per piece, 2 are required) | | | | | B66359S2000X000 |

1) Molded-in pins

Coil former



Yoke



Coil former (magnetic axis vertical)

Material: GFR polyterephthalate (UL 94 V-0, insulation class to IEC 60085:
H \triangleq max. operating temperature 180 °C), color code black
Rynite FR 530® [E41938 (M)], E I DUPONT DE NEMOURS & CO INC

Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s

Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 s

Winding: see Data Book 2007, chapter "Processing notes, 2.1"

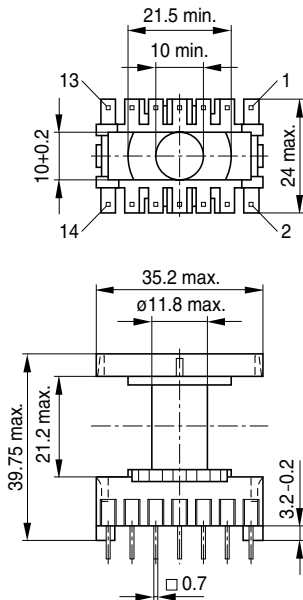
Squared pins.

Yoke

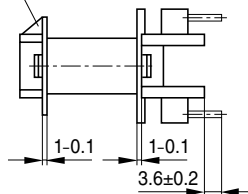
Material: Stainless spring steel (0.3 mm)

| Coil former | | | | | Ordering code |
|------------------------------------------------|-----------------------------------|----------------------|----------------------------|------|-----------------|
| Sections | A _N mm ² | I _N mm | A _R value μΩ | Pins | |
| 1 | 97 | 52.8 | 18.7 | 14 | B66359X1014T001 |
| Yoke (ordering code per piece, 2 are required) | | | | | B66359S2000X000 |

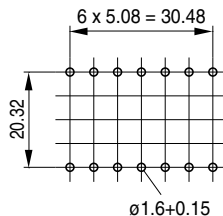
Coil former



Pin 1 marking

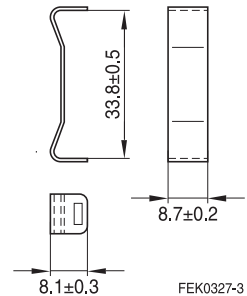


Hole arrangement
View in mounting direction



FEK0466-U-E

Yoke



FEK0327-3

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 their special behavior under mechanical load.

Just like any ceramic material, ferrite cores are brittle and sensitive to any shock, fast changing or tensile load. Especially fast cooling rates under ultrasonic cleaning, high static and 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 the value for the initial permeability. Thus, the embedding medium should offer 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 irreversibly when exposed to strong magnetic fields.

Processing notes

- The start of the winding process should be soft. Otherwise, the flanges may be destroyed.
- Excessive winding forces may damage the flanges or squeeze the tube so that the cores can no longer be mounted.
- Excessive 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 contamination with tin oxide (SnO) from the tin bath or burned insulation from the wire. For detailed information see Data Book 2007, chapter "Processing notes, 2.2".
- The dimensions of the pin hole arrangement are fixed and should be understood as an ideal recommendation for drilling the printed circuit board. In order to avoid problems when mounting the transformer, customers should make allowances for manufacturing tolerances in the drilling and pick-and-place processes by increasing the diameter of the pin holes.

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