



Ferrites and accessories

ETD 54/28/19
Core and accessories

Series/Type: **B66395, B66396**
Date: September 2006

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

Magnetic characteristics (per set)

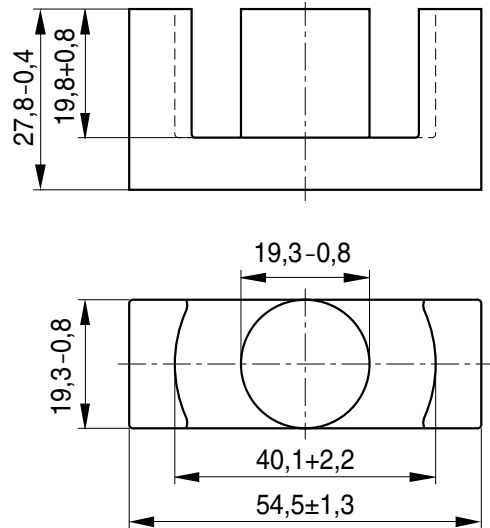
$$\Sigma l/A = 0.45 \text{ mm}^{-1}$$

$$l_e = 127 \text{ mm}$$

$$A_e = 280 \text{ mm}^2$$

$$A_{\min} = 280 \text{ mm}^2$$

$$V_e = 35600 \text{ mm}^3$$

Approx. weight 180 g/set

Ungapped

Material	A_L value nH	μ_e	P_V W/set	Ordering code
N27	4200 +30/-20%	1510	< 6.66 (200 mT, 25 kHz, 100 °C)	B66395G0000X127
N87	4450 +30/-20%	1600	< 21.00 (200 mT, 100 kHz, 100 °C)	B66395G0000X187
N97	4600 +30/-20%	1650	< 18.00 (200 mT, 100 kHz, 100 °C)	B66395G0000X197

Gapped

Material	g mm	A_L value approx. nH	μ_e	Ordering code ** = 27 (N27) = 87 (N87)
N27,	0.20 ±0.02	1377	496	B66395G0200X1**
N87	1.00 ±0.05	393	141	B66395G1000X1**
	1.50 ±0.05	287	103	B66395G1500X1**
	2.00 ±0.05	229	82	B66395G2000X1**

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	393	-0.779	658	-0.847	615	-0.865
N87	393	-0.779	630	-0.796	603	-0.873

Validity range: K1, K2: 0.10 mm < s < 3.50 mm
 K3, K4: 140 nH < A_L < 1390 nH

Coil former

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

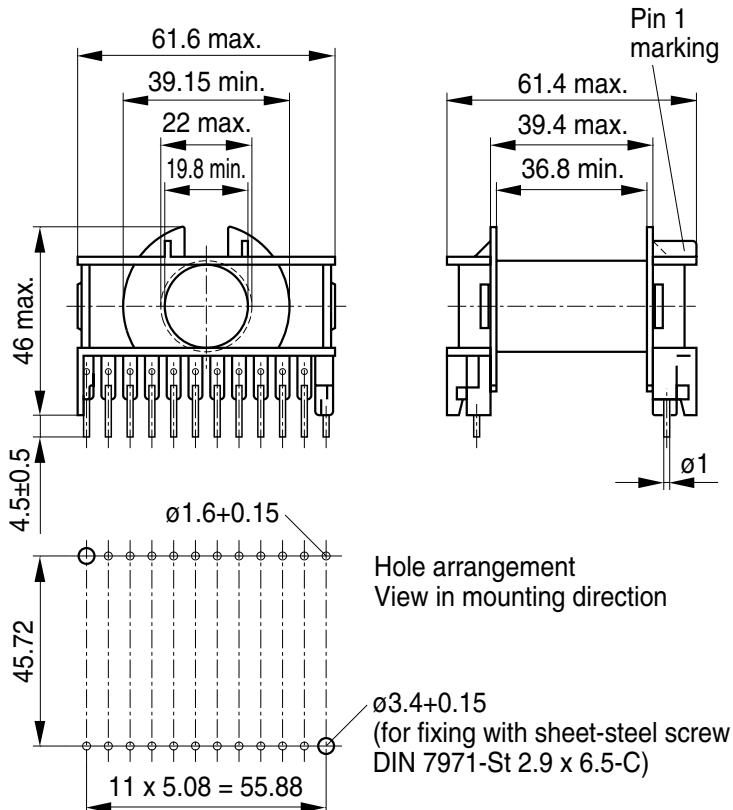
Winding: see Data Book 2007, chapter “Processing notes, 2.1”

Yoke

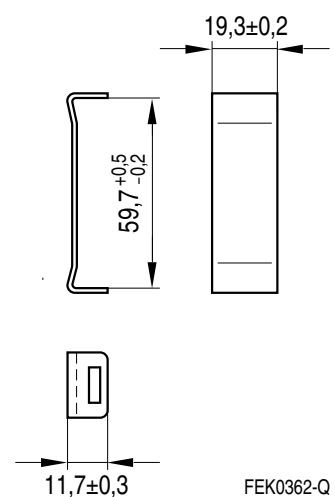
Material: Stainless spring steel (0.4 mm)

Coil former					Ordering code
Sections	A_N mm ²	l_N mm	A_R value $\mu\Omega$	Pins	
1	315.6	96	10.5	22	B66396W1022T001
Yoke (ordering code per piece, 2 are required)					B66396A2000X000

Coil former



Yoke



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.
- To strong winding forces may blast the flanges or squeeze the tube that the cores can no more be mount.
- To long soldering time at high temperature (>300 °C) may effect 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 oxyd 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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