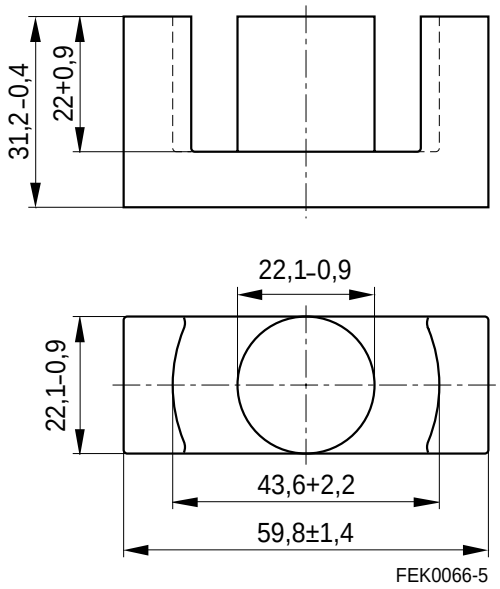
Ferrites and accessories

ETD 59/31/22
Core and accessories

Series/Type: **B66397, B66398**
Date: September 2006, December 2008

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



Magnetic characteristics (per set)

$\Sigma l/A$ = 0.38 mm^{-1}
l_e = 139 mm
A_e = 368 mm^2
A_{min} = 368 mm^2
V_e = 51200 mm^3

Approx. weight 260 g/set

Ungapped

Material	A_L value nH	μ_e	P_V W/set	Ordering code
N27	5000 +30/–20%	1500	< 9.62 (200 mT, 25 kHz, 100 °C)	B66397G0000X127
N87	5300 +30/–20%	1590	< 5.20 (100 mT, 100 kHz, 100 °C)	B66397G0000X187
N97	5500 +30/–20%	1660	< 4.50 (100 mT, 100 kHz, 100 °C)	B66397G0000X197

Gapped

Material	g mm	A_L value approx. nH	μ_e	Ordering code ** = 27 (N27) = 87 (N87)
N27, N87	0.20 ±0.02	1588	476	B66397G0200X1**
	1.00 ±0.05	508	152	B66397G1000X1**
	1.50 ±0.05	381	114	B66397G1500X1**
	2.00 ±0.05	311	93	B66397G2000X1**

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	508	–0.708	853	–0.847	799	–0.865
N87	508	–0.708	812	–0.796	783	–0.873

Validity range: K1, K2: 0.10 mm < s < 3.50 mm
K3, K4: 170 nH < A_L < 1660 nH

Coil former

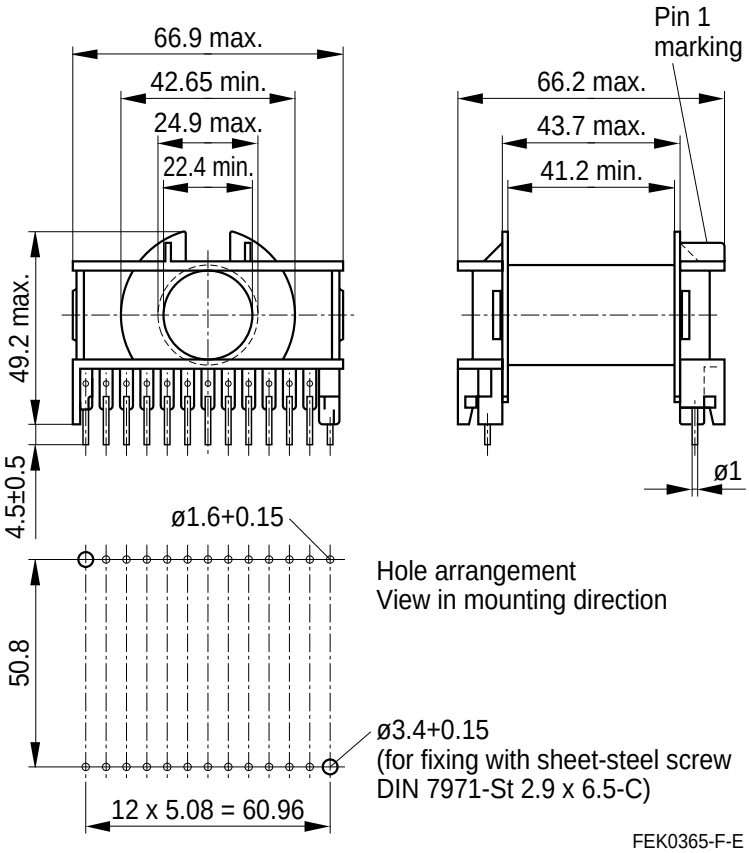
Material: GFR polyterephthalate (UL 94 V-0, insulation class to IEC 60085:
H ≙ max. operating temperature 180 °C), color code black
Rynite FR 530® [E41938 (M)], E I DUPONT DE NEMOURS & CO INC
Solderability: to IEC 60068-2-20, test Ta, method 1 (aging 3): 235 °C, 2 s
Resistance to soldering heat: to IEC 60068-2-20, test Tb, method 1B: 350 °C, 3.5 s
Winding: see Data Book 2007, chapter “Processing notes, 2.1”

Yoke

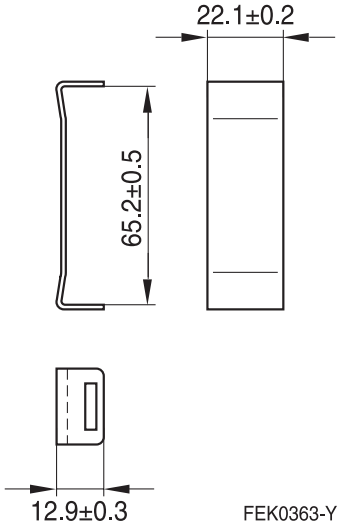
Material: Stainless spring steel (0.4 mm)

Coil former					Ordering code
Sections	A_N mm²	l_N mm	A_R value μΩ	Pins	
1	365.6	106.1	10.0	24	B66398W1024T001
Yoke (ordering code per piece, 2 are required)					B66398A2000X000

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 destroid.

– 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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