Ferrites and accessories

E 25/13/7 (EF 25)
Core and accessories

Series/Type: B66317, B66208
Date: September 2006, January 2010
E 25/13/7 (EF 25)  
Core  B66317

To IEC 61246
Delivery mode: single units

**Magnetic characteristics** (per set)
\[ \Sigma I/A = 1.1 \text{ mm}^{-1} \]
- \( I_e = 57.5 \text{ mm} \)
- \( A_e = 52.5 \text{ mm}^2 \)
- \( A_{\text{min}} = 51.5 \text{ mm}^2 \)
- \( V_e = 3020 \text{ mm}^3 \)

**Approx. weight** 16 g/set

### Ungapped

<table>
<thead>
<tr>
<th>Material</th>
<th>A_L value ( nH )</th>
<th>( \mu_e )</th>
<th>( P_V ) W/set</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>N30</td>
<td>2900 +30/−20%</td>
<td>2530</td>
<td></td>
<td>B66317G0000X130</td>
</tr>
<tr>
<td>N27</td>
<td>1750 +30/−20%</td>
<td>1520</td>
<td>&lt; 0.59 (200 mT, 25 kHz, 100 °C)</td>
<td>B66317G0000X127</td>
</tr>
<tr>
<td>N87</td>
<td>1850 +30/−20%</td>
<td>1620</td>
<td>&lt; 1.60 (200 mT, 100 kHz, 100 °C)</td>
<td>B66317G0000X187</td>
</tr>
</tbody>
</table>

### Gapped

<table>
<thead>
<tr>
<th>Material</th>
<th>( g ) mm</th>
<th>A_L value approx. ( nH )</th>
<th>( \mu_e )</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>N27, N87</td>
<td>0.10 ±0.02</td>
<td>489</td>
<td>425</td>
<td>B66317G0100X1**</td>
</tr>
<tr>
<td></td>
<td>0.16 ±0.02</td>
<td>347</td>
<td>302</td>
<td>B66317G0160X1**</td>
</tr>
<tr>
<td></td>
<td>0.25 ±0.02</td>
<td>250</td>
<td>218</td>
<td>B66317G0250X1**</td>
</tr>
<tr>
<td></td>
<td>0.50 ±0.05</td>
<td>151</td>
<td>131</td>
<td>B66317G0500X1**</td>
</tr>
<tr>
<td></td>
<td>1.00 ±0.05</td>
<td>91</td>
<td>79</td>
<td>B66317G1000X1**</td>
</tr>
</tbody>
</table>

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”)

<table>
<thead>
<tr>
<th>Material</th>
<th>Relationship between air gap – $A_L$ value</th>
<th>Calculation of saturation current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$K_1$ (25 °C)</td>
<td>$K_2$ (25 °C)</td>
</tr>
<tr>
<td>N27</td>
<td>90</td>
<td>$-0.731$</td>
</tr>
<tr>
<td>N87</td>
<td>90</td>
<td>$-0.731$</td>
</tr>
</tbody>
</table>

Validity range: $K_1, K_2$: $0.10 \text{ mm} < s < 2.00 \text{ mm}$
$K_3, K_4$: $60 \text{ nH} < A_L < 570 \text{ nH}$
Coil former (magnetic axis horizontal or vertical)

Material: GFR polyterephthalate, UL 94 V-0, insulation class to IEC 60085:
- B66208B, X: F  max. operating temperature 155 °C, color code black
- Valox 420-SEO® [E45329 (M)], GE PLASTICS B V
- B66208-W: 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”

Squared pins.

Yoke Material: Stainless spring steel (0.25 mm)

<table>
<thead>
<tr>
<th>Coil former</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Version</td>
<td>Sections</td>
</tr>
<tr>
<td>--------------</td>
<td>----------</td>
</tr>
<tr>
<td>Horizontal</td>
<td>1</td>
</tr>
<tr>
<td>Vertical</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Yoke (ordering code per piece, 2 are required)</td>
<td></td>
</tr>
</tbody>
</table>

Horizontal version (B66208B)

Hole arrangement View in mounting direction

Please read Cautions and warnings and Important notes at the end of this document.
Vertical version (B66208W, B66208X)

Yoke

Please read Cautions and warnings and Important notes at the end of this document.
Coil former for SMPS transformers with line isolation

Material: GFR polyterephthalate (UL 94 V-0, insulation class to IEC 60085:
F  max. operating temperature 155 °C), color code black
Pocan B4235® [E245249 (M)], LANXESS AG

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: Nickel silver (0.3 mm) with ground terminal

<table>
<thead>
<tr>
<th>Coil former</th>
<th>Ordering code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sections</td>
<td>A_N mm²</td>
</tr>
<tr>
<td>1</td>
<td>56.9</td>
</tr>
<tr>
<td>Yoke (ordering code per piece)</td>
<td></td>
</tr>
</tbody>
</table>

Hole arrangement
View in mounting direction

FEK0397-I
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 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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