Mn-Zn

Large Size Ferrite Cores for High Power

PQ series
REMINDERS FOR USING THESE PRODUCTS

Please be sure to read this manual thoroughly before using the products.

The products listed on this catalog are intended for use in general electronic equipment (AV equipment, telecommunications equipment, home appliances, amusement equipment, computer equipment, personal equipment, office equipment, measurement equipment, industrial robots) under a normal operation and use condition.

The products are not designed or warranted to meet the requirements of the applications listed below, whose performance and/or quality require a more stringent level of safety or reliability, or whose failure, malfunction or trouble could cause serious damage to society, person or property.

When using the products for specific purposes, please first make confirmations in areas such as safety, reliability, and quality.

Please understand that we are not in a position to be held responsible for any damage or the like caused by any use exceeding the range or conditions of this specification sheet or by any use in the specific applications.

1. Aerospace/Aviation equipment
2. Transportation equipment (electric trains, ships, etc.)
3. Medical equipment
4. Power-generation control equipment
5. Atomic energy-related equipment
6. Seabed equipment
7. Transportation control equipment

8. Public information-processing equipment
9. Military equipment
10. Electric heating apparatus, burning equipment
11. Disaster prevention/crime prevention equipment
12. Safety equipment
13. Other applications that are not considered general-purpose applications

When using this product in general-purpose standard applications, you are kindly requested to take into consideration securing protection circuit/equipment or providing backup circuits, etc to ensure higher safety.
Large Size Ferrite Cores for High Power

Overview of the PQ Series

**FEATURES**
- Large size cores for transformers with large power outputs.
- Can also be used in reactors.

**APPLICATION**
- Large size industrial equipment, transformers for consumer equipment
- Reactors

**PART NUMBER CONSTRUCTION**

<table>
<thead>
<tr>
<th>PE22</th>
<th>PQ</th>
<th>78</th>
<th>39</th>
<th>42</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material</td>
<td>Core shape</td>
<td>Width</td>
<td>Height when assembled</td>
<td>Thickness</td>
</tr>
<tr>
<td>PE22</td>
<td>PQ</td>
<td>78</td>
<td>39</td>
<td>42</td>
</tr>
<tr>
<td>PC40</td>
<td></td>
<td>107</td>
<td>87</td>
<td>70</td>
</tr>
</tbody>
</table>

**RANGE OF USE AND STORAGE TEMPERATURE**

<table>
<thead>
<tr>
<th>Temperature range</th>
<th>Operating temperature (°C)</th>
<th>Storage temperature (°C)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>–30 to +105</td>
<td>–30 to +85</td>
</tr>
</tbody>
</table>

Halogen-free: Indicates that Cl content is less than 900ppm, Br content is less than 900ppm, and that the total Cl and Br content is less than 1500ppm.

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Mn-Zn PQ Cores

**SHAPES AND DIMENSIONS**

<table>
<thead>
<tr>
<th>Material</th>
<th>Core shape</th>
<th>Width</th>
<th>Height when assembled</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE22 PQ78×39×42</td>
<td>78 × 39 × 42</td>
<td>78.5±1.5</td>
<td>69.0min.</td>
<td>25.8±1.0</td>
</tr>
<tr>
<td>PC40 PQ78×39×42</td>
<td>78.5±1.5</td>
<td>70.0±1.5</td>
<td>93.7min.</td>
<td>72.5min.</td>
</tr>
<tr>
<td>PE22 PQ107×87×70</td>
<td>107.0±2.0</td>
<td>93.7min.</td>
<td>72.5min.</td>
<td>56.0±1.5</td>
</tr>
<tr>
<td>PC40 PQ107×87×70</td>
<td>107.0±2.0</td>
<td>70.0±1.5</td>
<td>93.7min.</td>
<td>72.5min.</td>
</tr>
</tbody>
</table>

### Effective parameter

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Effective parameter</th>
<th>Electrical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core factor C1 (mm⁻¹)</td>
<td>Core factor C2×10⁻² (mm⁻³)</td>
</tr>
<tr>
<td>PE22 PQ78×39×42</td>
<td>0.24730</td>
<td>0.051530</td>
</tr>
<tr>
<td>PC40 PQ78×39×42</td>
<td>0.14260</td>
<td>0.009989</td>
</tr>
</tbody>
</table>

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Mn-Zn  PQ series  Part No.: PE22 PQ78X39X42

**SHAPES AND DIMENSIONS**

![Dimensions in mm](image)

**Effective parameter**

<table>
<thead>
<tr>
<th>Effective parameter</th>
<th>Core factor</th>
<th>Effective magnetic path length</th>
<th>Effective cross-sectional area</th>
<th>Effective core volume</th>
<th>Cross-sectional center pole area</th>
<th>Minimum cross-sectional area</th>
<th>Winding cross-sectional area</th>
<th>Weigh (approx.)</th>
<th>Electrical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1 (mm⁻¹)</td>
<td>C2×10⁻² (mm⁻²)</td>
<td>e (mm)</td>
<td>Ae (mm²)</td>
<td>Ve (mm³)</td>
<td>Ac (mm²)</td>
<td>A min.* (mm²)</td>
<td>Acw (mm²)</td>
<td>Al-value (nH/N²)</td>
</tr>
<tr>
<td></td>
<td>0.2473</td>
<td>0.05153</td>
<td>119</td>
<td>480</td>
<td>56900</td>
<td>510</td>
<td>510C*</td>
<td>570</td>
<td>304</td>
</tr>
</tbody>
</table>

* The symbol followed A min. value shows minimum cross-sectional area part.

C is center pole part, L: is outer pole part, B is the back part.

- Available customize core like this. Please specify when ordering.

- Calculated output power (forward converter mode): 1.6kW (100kHz)

**NI limit vs. Al-value**

![NI limit vs. Al-value](image)

The 20% and 40% graph shows when a 20% and 40% drop from the initial Al-value has been made due to the DC superimposition.

**Al-value vs. Air gap length**

![Al-value vs. Air gap length](image)

Temp: 23°C  
Hm : 0.4A/m  
f : 1kHz  
Center pole gap

Temp: 100°C  
Hm : 0.4A/m  
f : 1kHz  
Total gap length (mm)
FERRITES

Mn-Zn PQ series Part No.: PC40 PQ78X39X42

SHAPES AND DIMENSIONS

![Diagram showing shapes and dimensions]

Dimensions in mm

<table>
<thead>
<tr>
<th>Effective parameter</th>
<th>Core factor</th>
<th>Effective magnetic path length</th>
<th>Effective cross-sectional area</th>
<th>Effective core volume</th>
<th>Cross-sectional center pole area</th>
<th>Minimum cross-sectional area</th>
<th>Winding cross-sectional area</th>
<th>Weigh (approx.)</th>
<th>Electrical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>C1 (mm⁻¹)</td>
<td>C2 x 10⁻² (mm⁻³)</td>
<td>e (mm)</td>
<td>Ae (mm²)</td>
<td>Ve (mm³)</td>
<td>Ac (mm²)</td>
<td>A min.* (mm²)</td>
<td>Acw (mm²)</td>
<td>AL-value (nH/N²)</td>
</tr>
<tr>
<td>0.2473</td>
<td>0.05153</td>
<td>119</td>
<td>480</td>
<td>56900</td>
<td>510</td>
<td>510C*</td>
<td>570</td>
<td>304</td>
<td>(1kHz 100°C 0.4A/m)</td>
</tr>
</tbody>
</table>

* The symbol followed A min. value shows minimum cross-sectional area part.
  C is center pole part, L is outer pole part, B is back part.

- Calculated output power (forward converter mode): 1.7kW (100kHz)
- Available customize core like this. Please specify when ordering.

Electrical characteristics

- AL-value (nH/N²)
- 1kHz
- 100°C
- 0.4A/m

NI limit vs. AL-value

<table>
<thead>
<tr>
<th>AL-value (nH/N²)</th>
<th>NI limit (A/T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10⁻¹</td>
<td>10³</td>
</tr>
<tr>
<td>10⁻²</td>
<td>10²</td>
</tr>
<tr>
<td>10⁻³</td>
<td>10¹</td>
</tr>
</tbody>
</table>

The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

AL-value vs. Air gap length

<table>
<thead>
<tr>
<th>Total gap length (mm)</th>
<th>AL-value (nH/N²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10⁻¹</td>
<td>10⁴</td>
</tr>
<tr>
<td>10⁻²</td>
<td>10³</td>
</tr>
<tr>
<td>10⁻³</td>
<td>10²</td>
</tr>
</tbody>
</table>

Temp: 23°C
Hm: 0.4A/m
f: 1kHz

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FERRITES

Mn-Zn  PQ series  Part No.: PE22 PQ107X87X70

SHAPES AND DIMENSIONS

Dimensions in mm

Effective parameter

<table>
<thead>
<tr>
<th><strong>Core factor</strong></th>
<th><strong>Effective magnetic path length</strong></th>
<th><strong>Effective cross-sectional area</strong></th>
<th><strong>Effective core volume</strong></th>
<th><strong>Cross-sectional center pole area</strong></th>
<th><strong>Minimum cross-sectional area</strong></th>
<th><strong>Winding cross-sectional area</strong></th>
<th><strong>Weight (approx.)</strong></th>
<th><strong>Electrical characteristics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (mm⁻¹)</td>
<td>C₂×10⁻² (mm⁻³)</td>
<td>Ae (mm²)</td>
<td>Ve (mm³)</td>
<td>Aₑ (mm²)</td>
<td>A₀ min. (mm²)</td>
<td>Acw (mm²)</td>
<td>g</td>
<td>(nH/N²)</td>
</tr>
<tr>
<td>0.1426</td>
<td>0.009989</td>
<td>204</td>
<td>1428</td>
<td>290600</td>
<td>1320</td>
<td>1320C*</td>
<td>1540</td>
<td>1560</td>
</tr>
</tbody>
</table>

* The symbol followed A min. value shows minimum cross-sectional area part.

C is center pole part, L is outer pole part, B is the back part.

Available customize core like this. Please specify when ordering.

Calculated output power (forward converter mode): 8.3kW (100kHz)

NI limit vs. Al-value

Al-value vs. Air gap length

The 20% and 40% graph shows when a 20% and 40% drop from the initial Al-value has been made due to the DC superimposition.

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Mn-Zn  PQ series  Part No.: PC40 PQ107X87X70

**SHAPES AND DIMENSIONS**

Dimensions in mm

**Effective parameter**

<table>
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<tr>
<th>Core factor</th>
<th>Effective magnetic path length</th>
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<th>Winding cross-sectional area</th>
<th>Weigh (approx.)</th>
<th>Electrical characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1 (mm⁻¹)</td>
<td>C=10⁻² (mm⁻⁹)</td>
<td>ℓe (mm)</td>
<td>Ae (mm²)</td>
<td>Ve (mm³)</td>
<td>Ac (mm²)</td>
<td>Acw (mm²)</td>
<td>1540</td>
<td>(nH/N²) 1kHz 0.4A/m 23°C</td>
</tr>
<tr>
<td>0.1426</td>
<td>0.009989</td>
<td>204</td>
<td>1428</td>
<td>290600</td>
<td>1320</td>
<td>1320C*</td>
<td>1560</td>
<td>18210±25%</td>
</tr>
</tbody>
</table>

* The symbol followed A min. value shows minimum cross-sectional area part.
* C is center pole part, L: is outer pole part, B is the back part.
* Available customize core like this. Please specify when ordering.
* Calculated output power (forward converter mode): 9.0kW (100kHz)

**NI limit vs. Al-value**

**Al-value vs. Air gap length**

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