



Mn-Zn

Large Size Ferrite Cores for High Power

Large 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 | (8) Public information-processing equipment |
| (2) Transportation equipment (electric trains, ships, etc.) | (9) Military equipment |
| (3) Medical equipment | (10) Electric heating apparatus, burning equipment |
| (4) Power-generation control equipment | (11) Disaster prevention/crime prevention equipment |
| (5) Atomic energy-related equipment | (12) Safety equipment |
| (6) Seabed equipment | (13) Other applications that are not considered general-purpose applications |
| (7) Transportation control equipment | |

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

Product compatible with RoHS directive
Halogen-free

Overview of the PQ Series

FEATURES

- Our original shape.
- Large size cores for transformers with large power outputs.
- Can also be used in reactors.
- PQ cores require less mounting area as transformers than E or EER cores.

APPLICATION

- Large size industrial equipment, transformers for consumer equipment
- Reactors
- Transformers and coils for power supplies (high density, low profile)

PART NUMBER CONSTRUCTION

PE22	PQ	78	x	39	x	42
Material	Core shape	Width		Height when assembled		Thickness
PE22	PQ	78		39		42
PC40		107		87		70
PC47						
PC95						
PEL95						
PEM95						

RANGE OF USE AND STORAGE TEMPERATURE

Temperature range	
Operating temperature (°C)	Storage temperature (°C)
−30 to +105	−30 to +85

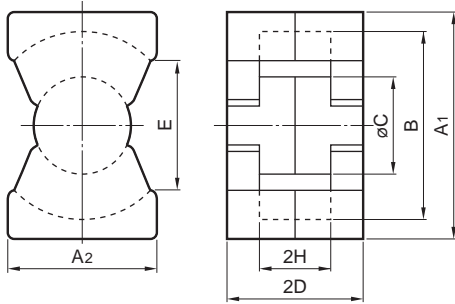
○ RoHS Directive Compliant Product: See the following for more details related to RoHS Directive compliant products. <http://www.tdk.co.jp/rohs/>

○ 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.

⚠ Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use.
Please note that the contents may change without any prior notice due to reasons such as upgrading.

Mn-Zn **PQ Cores**

■ SHAPES AND DIMENSIONS



PC47	PQ60/42	-	Z
Material	Size of PQ core		AL-value
			Z Without air gap

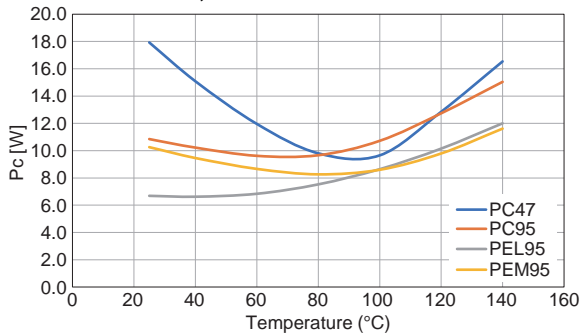
Material	Part No.	Dimensions (mm)						
	Shape Dimensions	A1	A2	B min.	ϕC	2D	E min.	2H
PC47	PQ60/42-Z	59.0±1.0	39.0±0.7	49.5	23.5±0.5	41.5±0.5	37.8	25.1±0.6
PC95								
PEL95								
PEM95								
PC47	PQ60/52-Z	59.0±1.0	39.0±0.7	49.5	23.5±0.5	51.5±0.5	37.8	35.1±0.6
PC95								
PEL95								
PEM95								
PC47	PQ65/44-Z	65.0±1.0	45.0±0.7	55	26.0±0.5	43.5±0.5	40.8	25.5±0.6
PC95								
PEL95								
PEM95								
PC47	PQ65/54-Z	65.0±1.0	45.0±0.7	55	26.0±0.5	53.5±0.5	40.8	35.5±0.6
PC95								
PEL95								
PEM95								
PE22	PQ78x39x42	78.5±1.5	42.0±0.8	69.0	25.5±0.5	39.4±0.6	60.0	25.8±1.0
PC40								
PC95								
PEL95								
PEM95								
PE22	PQ107x87x70	107.0±2.0	70.0±1.5	93.7	41.0±1.0	87.0±1.5	72.5	56.0±1.5
PC40								
PC95								
PEL95								
PEM95								

Mn-Zn PQ Cores

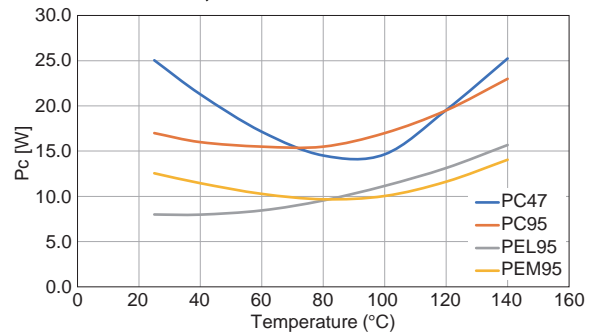
Part No.		Effective parameter						Electrical characteristics				
Material	Shape Dimensions	Core factor		Effective cross-sectional area Ae (mm ²)	Effective magnetic path length Le (mm)	Effective core volume Ve (mm ³)	Weigh (Approx.) (g)	AL-value	Core loss			
		C1 (mm ⁻¹)	C2x10 ⁻² (mm ⁻³)					(nH/N ²)	(W)mas.			
								1kHz, 0.4A/m	100kHz, 150mT			
								23 °C	25 °C	80 °C	100 °C	120 °C
PC47	PQ60/42-Z	0.203	—	483	98.1	47360	265	10,500±25%	—	—	9.5	
PC95								14,300±25%	11.0	10.0	—	12.5
PEL95								—	—	—	—	—
PEM95								—	—	—	—	—
PC47	PQ60/52-Z	0.248	—	477	118	56237	310	8,500±25%	—	—	11.3	—
PC95								11,200±25%	13.0	11.8	—	14.9
PEL95								12,500±25%	6.7	6.8	—	10.0
PEM95								10,000±25%	13.2	9.6	—	9.0
PC47	PQ65/44-Z	0.171	—	604	103	62460	355	12,600±25%	—	—	12.5	—
PC95								15,500±25%	14.4	13.2	—	16.5
PEL95								—	—	—	—	—
PEM95								—	—	—	—	—
PC47	PQ65/54-Z	0.207	—	597	123	73552	410	10,000±25%	—	—	14.8	—
PC95								13,500±25%	17.0	15.5	—	19.5
PEL95								16,500±25%	8.0	9.5	—	13.1
PEM95								12,500±25%	12.6	9.7	—	11.6
PE22	PQ78x39x42	0.2473	0.05153	480	119	56900	304	7940±25	—	—	—	—
PC40								9790±25%	—	—	—	—
PC95								—	—	—	—	—
PEL95								—	—	—	—	—
PEM95	PQ107x87x70	0.1426	0.009989	1428	204	291312	1560	—	—	—	—	—
PE22								15470±25%	—	—	—	—
PC40								18210±25%	—	—	—	—
PC95								—	—	—	—	—
PEL95								—	—	—	—	—
PEM95								—	—	—	—	—

□ Core loss Temperature characteristics (Typ.)

PQ60/52-Z at 100kHz, 150mT

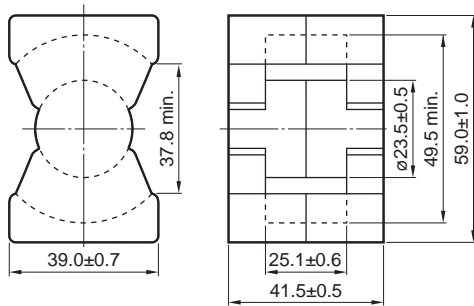


PQ65/54-Z at 100kHz, 150mT



Mn-Zn PQ series **Part No.: PC47PQ60/42-Z**

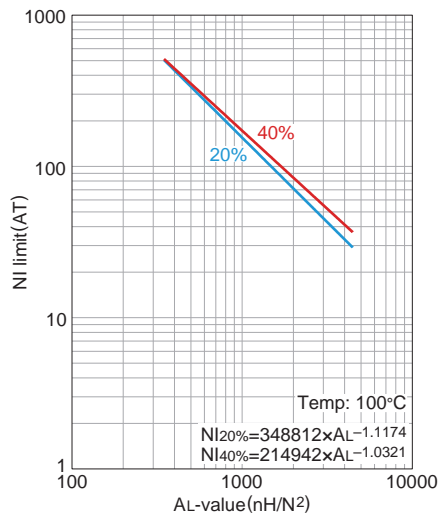
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics	
Core factor C ₁ (mm ⁻¹)	Effective magnetic path length l _e (mm)	Effective cross-sectional area A _e (mm ²)	Effective core volume V _e (mm ³)	Cross-sectional center pole area A _{cp} (mm ²)	Minimum cross-sectional center pole area A _{cp min.} (mm ²)	Cross-sectional winding area of core A _{cw} (mm ²)	Weight (g/set)	AL-value * (nH/N ²) 1kHz 0.5mA	Core loss (W)max. 100kHz 150mT 100°C
0.203	98.1	483	47360	433	415	338	265	10,500±25%	9.5

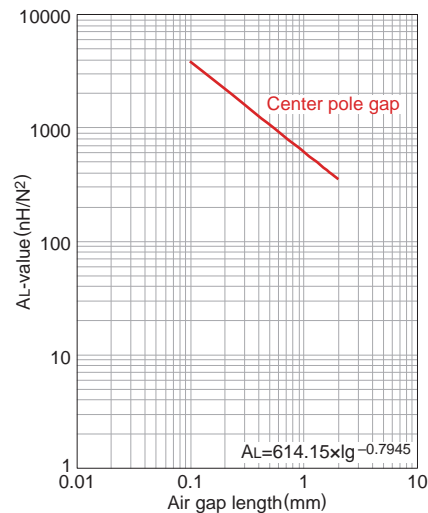
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

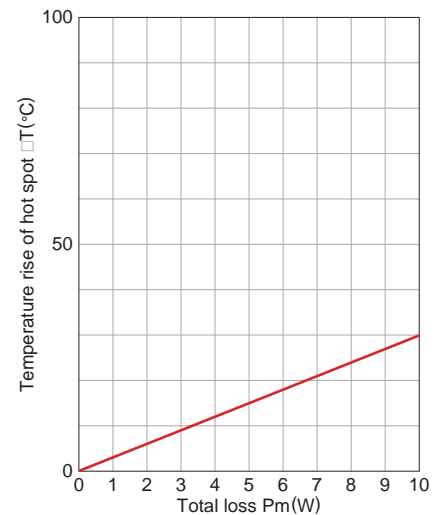
AL-value vs. Air gap length (Typ.)



Measuring conditions

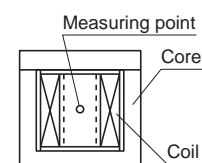
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



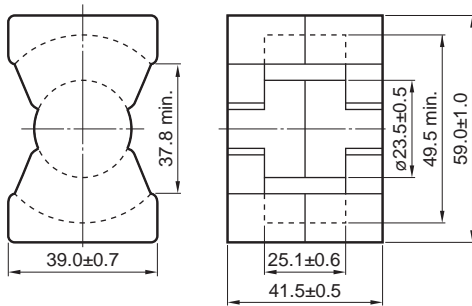
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45(%)RH.



Mn-Zn PQ series **Part No.: PC95PQ60/42-Z**

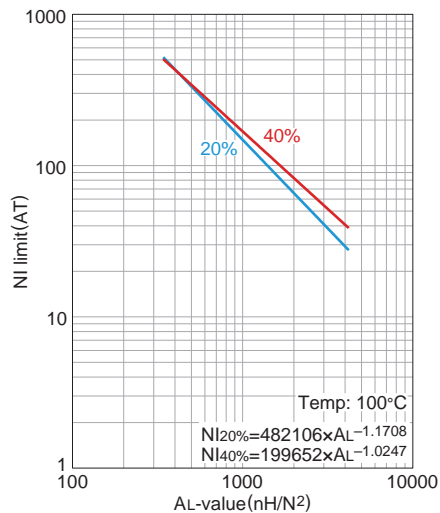
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics			
Core factor	Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional center pole area	Cross-sectional winding area of core	Weigh	AL-value *	Core loss		
C ₁ (mm ⁻¹)	l _e (mm)	A _e (mm ²)	V _e (mm ³)	A _{cp} (mm ²)	A _{cp min.} (mm ²)	A _{cw} (mm ²)	(g/set)	(nH/N ²) 1kHz 0.5mA	(W)max. 100kHz 150mT 25°C	80°C	120°C
0.203	98.1	483	47360	433	415	338	265	14,300±25%	11.0	10.0	12.5

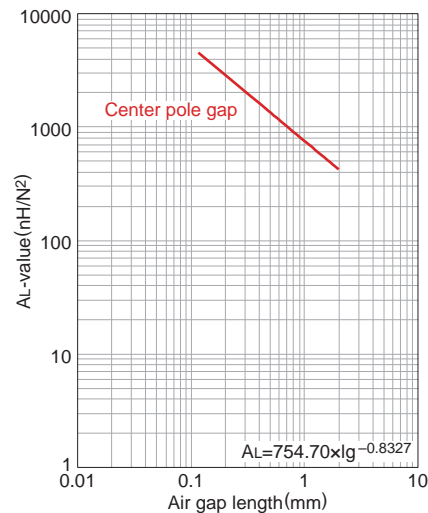
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

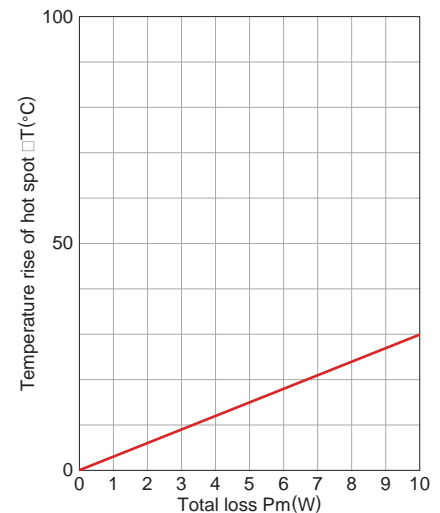
AL-value vs. Air gap length (Typ.)



Measuring conditions

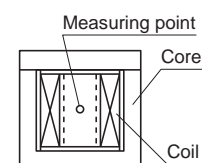
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



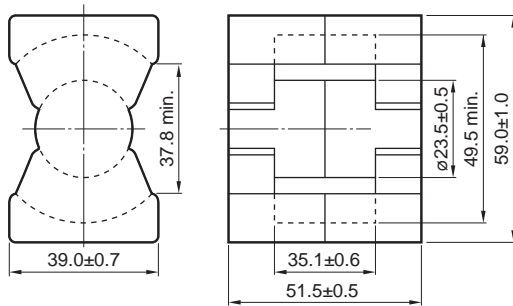
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45%(%)RH.



Mn-Zn PQ series **Part No.: PC47PQ60/52-Z**

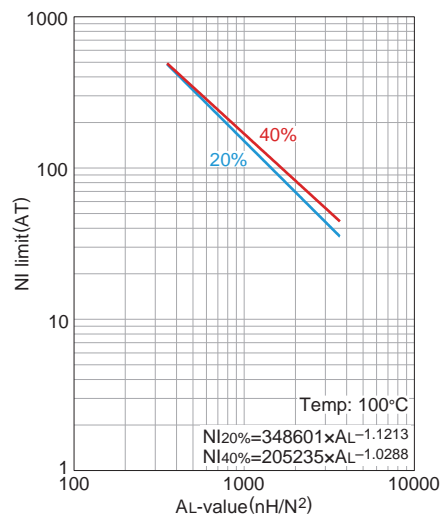
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics	
Core factor C ₁ (mm ⁻¹)	Effective magnetic path length l _e (mm)	Effective cross-sectional area A _e (mm ²)	Effective core volume V _e (mm ³)	Cross-sectional center pole area A _{cp} (mm ²)	Minimum cross-sectional center pole area A _{cp min.} (mm ²)	Cross-sectional winding area of core A _{cw} (mm ²)	Weight (g/set)	AL-value * (nH/N ²) 1kHz 0.5mA	Core loss (W)max. 100kHz 150mT 100°C
0.248	118	477	56237	433	415	473	310	8,500±25%	11.3

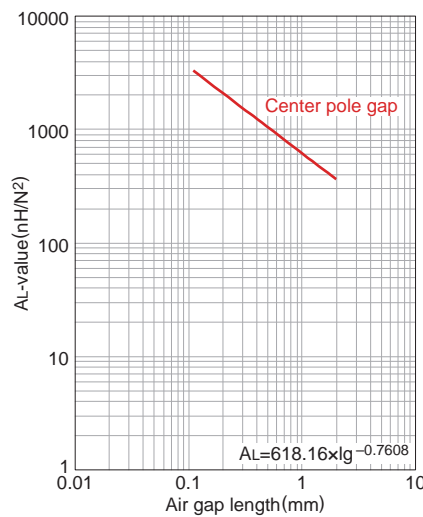
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

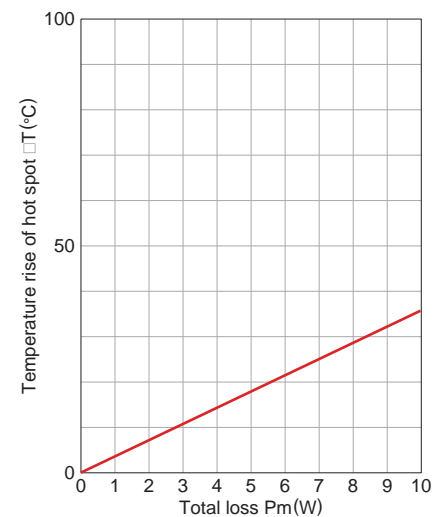
AL-value vs. Air gap length (Typ.)



Measuring conditions

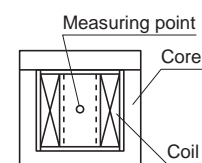
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



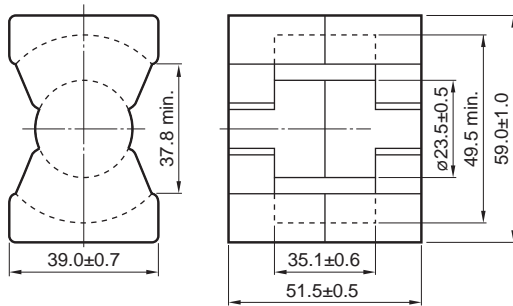
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45(%)RH.



Mn-Zn PQ series **Part No.: PC95PQ60/52-Z**

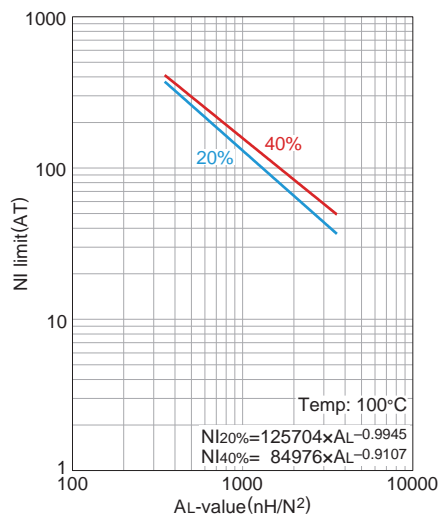
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics			
Core factor	Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional center pole area	Cross-sectional winding area of core	Weigh	AL-value *	Core loss		
C ₁ (mm ⁻¹)	l _e (mm)	A _e (mm ²)	V _e (mm ³)	A _{cp} (mm ²)	A _{cp min.} (mm ²)	A _{cw} (mm ²)	(g/set)	(nH/N ²) 1kHz 0.5mA	(W)max. 100kHz 150mT 25°C	80°C	120°C
0.248	118	477	56237	433	415	473	310	11,200±25%	13.0	11.8	14.9

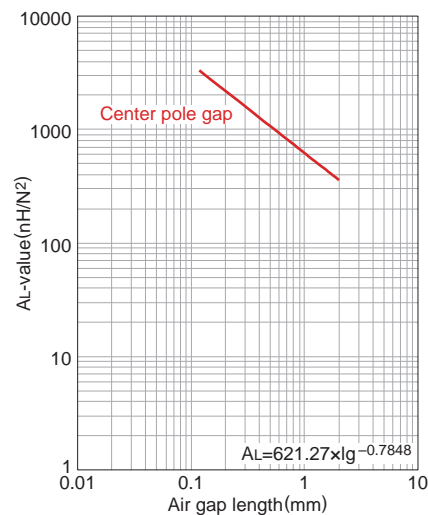
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

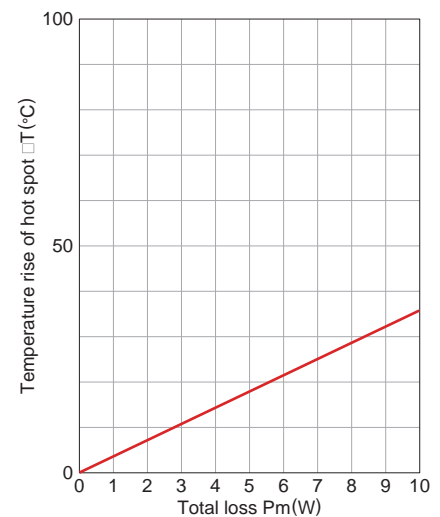
AL-value vs. Air gap length (Typ.)



Measuring conditions

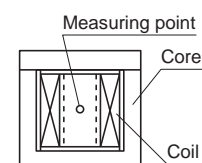
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



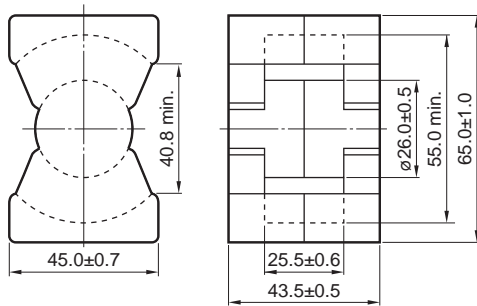
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45(%)RH.



Mn-Zn PQ series **Part No.: PC47PQ65/44-Z**

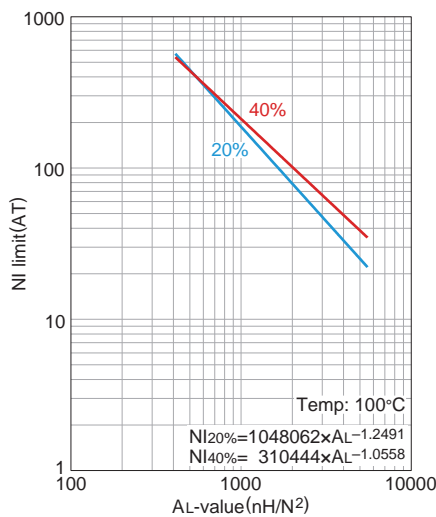
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics	
Core factor C ₁ (mm ⁻¹)	Effective magnetic path length l _e (mm)	Effective cross-sectional area A _e (mm ²)	Effective core volume V _e (mm ³)	Cross-sectional center pole area A _{cp} (mm ²)	Minimum cross-sectional center pole area A _{cp min.} (mm ²)	Cross-sectional winding area of core A _{cw} (mm ²)	Weight (g/set)	AL-value *	Core loss
0.171	103	604	62460	531	511	382	355	AL-value * (nH/N ²) 1kHz 0.5mA	Core loss (W)max. 100kHz 150mT 100°C
								12,600±25%	12.5

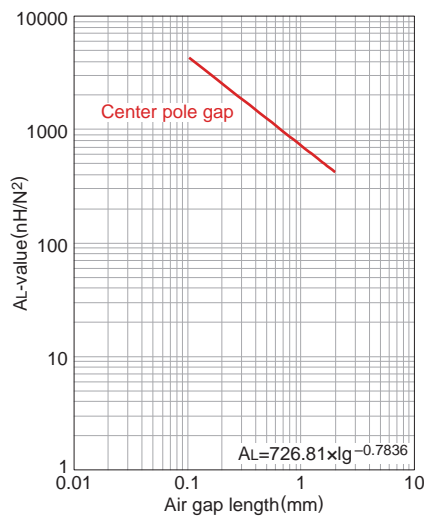
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

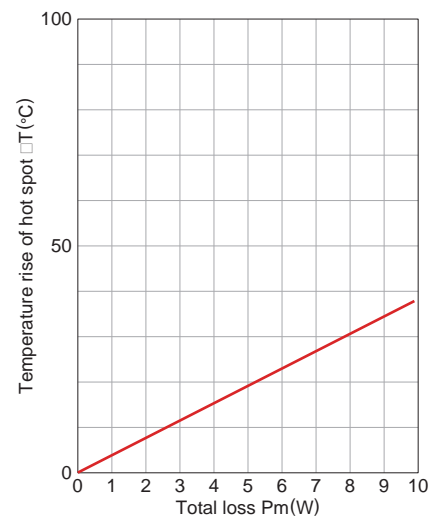
AL-value vs. Air gap length (Typ.)



Measuring conditions

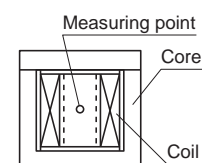
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



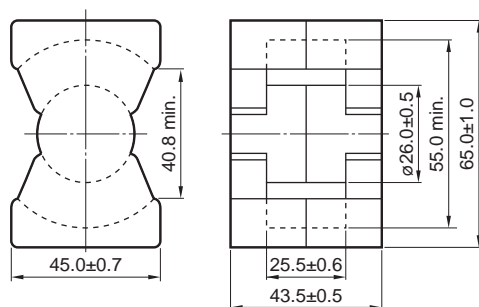
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45(%)RH.



Mn-Zn PQ series **Part No.: PC95PQ65/44-Z**

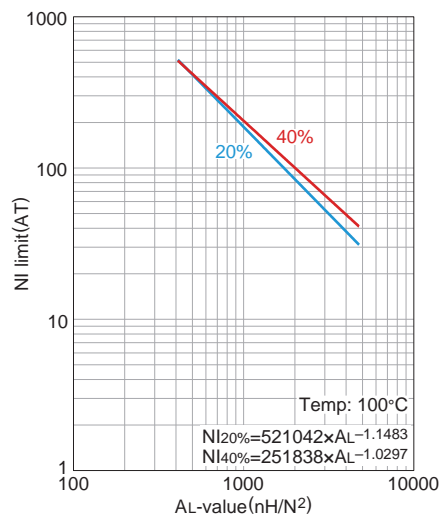
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics				
Core factor	Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional center pole are	Cross-sectional winding area of core	Weigh	AL-value *		Core loss		
C ₁ (mm ⁻¹)	l _e (mm)	A _e (mm ²)	V _e (mm ³)	A _{cp} (mm ²)	A _{cp min.} (mm ²)	A _{cw} (mm ²)	(g/set)	(nH/N ²) 1kHz 0.5mA	(W)max. 100kHz 150mT	25°C	80°C	120°C
0.171	103	604	62460	531	511	382	355	15,500±25%	14.4	13.2	16.5	

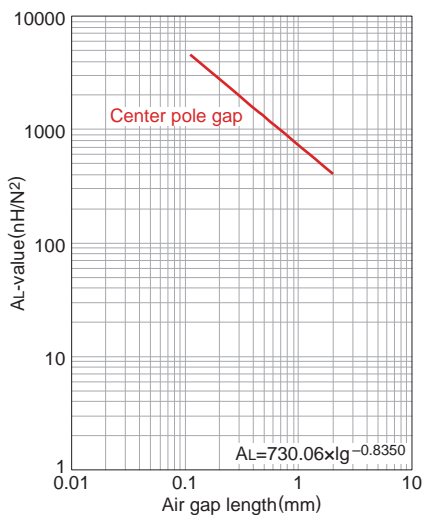
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

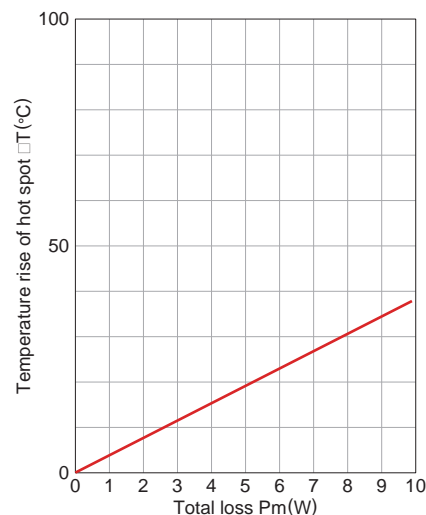
AL-value vs. Air gap length (Typ.)



Measuring conditions

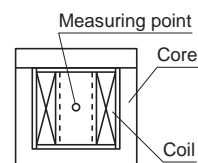
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



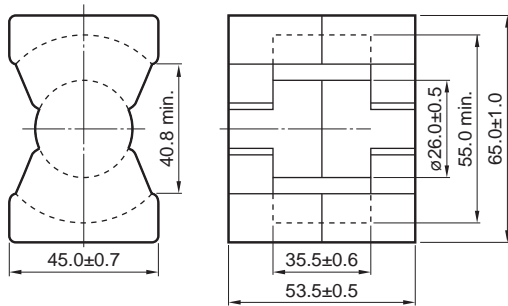
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45%(%)RH.



Mn-Zn PQ series **Part No.: PC47PQ65/54-Z**

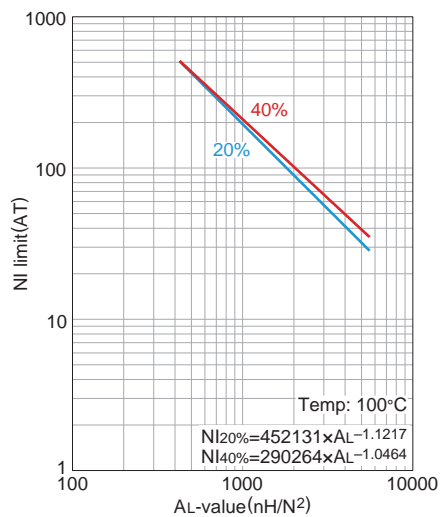
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics	
Core factor C ₁ (mm ⁻¹)	Effective magnetic path length l _e (mm)	Effective cross-sectional area A _e (mm ²)	Effective core volume V _e (mm ³)	Cross-sectional center pole area A _{cp} (mm ²)	Minimum cross-sectional center pole area A _{cp min.} (mm ²)	Cross-sectional winding area of core A _{cw} (mm ²)	Weight (g/set)	AL-value * (nH/N ²) 1kHz 0.5mA	Core loss (W)max. 100kHz 150mT 100°C
0.207	123	597	73552	531	511	532	410	10,000±25%	14.8

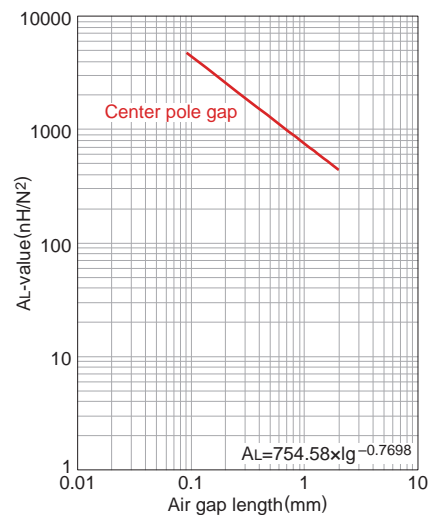
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

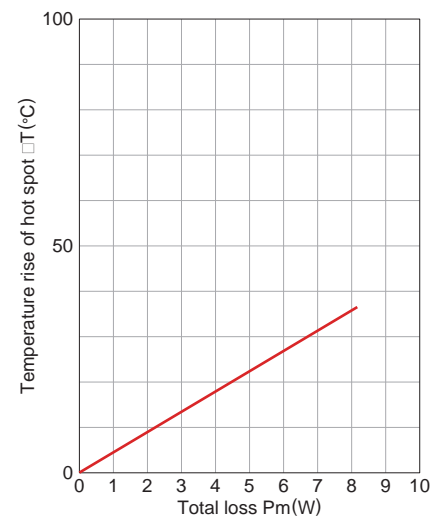
AL-value vs. Air gap length (Typ.)



Measuring conditions

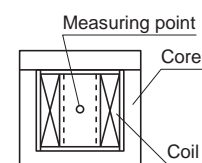
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



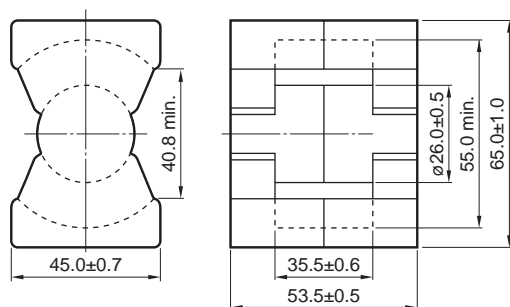
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45%(%)RH.



Mn-Zn PQ series **Part No.: PC95PQ65/54-Z**

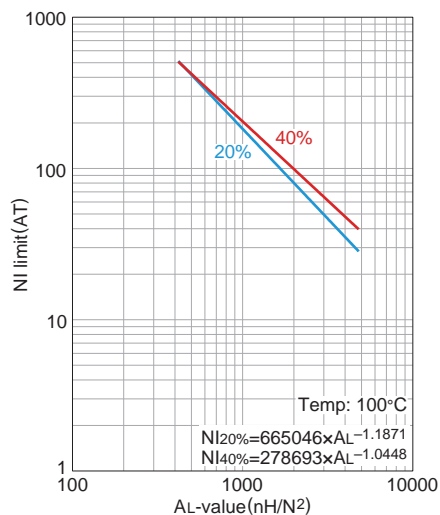
■ SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics				
Core factor	Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional center pole are	Cross-sectional winding area of core	Weigh	AL-value *		Core loss		
C1 (mm-1)	le (mm)	Ae (mm2)	Ve (mm3)	Acp (mm2)	Acp min. (mm2)	Acw (mm2)	(g/set)	(nH/N2) 1kHz 0.5mA		(W)max. 100kHz 150mT 25°C	80°C	120°C
0.207	123	597	73552	531	511	532	410	13,500±25%		17.0	15.5	19.5

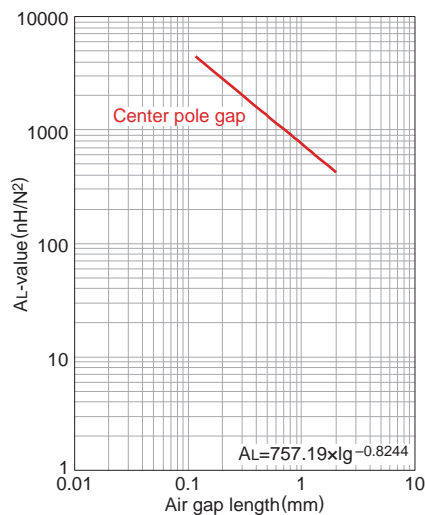
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



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.

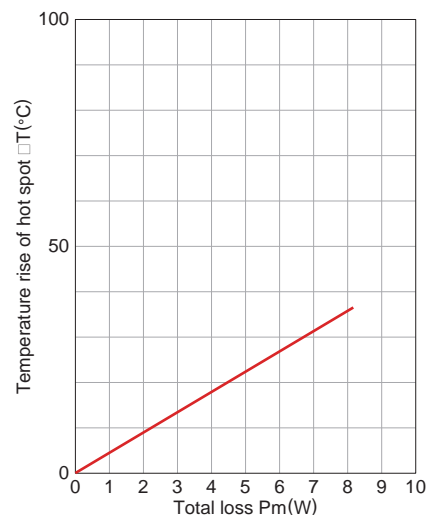
AL-value vs. Air gap length (Typ.)



Measuring conditions

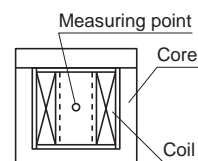
- Coil : ø0.4 2UEW 100Ts
- Frequency : 1kHz
- Current level : 0.5mA
- Ambient temperature : 25°C

Temperature rise vs. Total loss (Typ.)



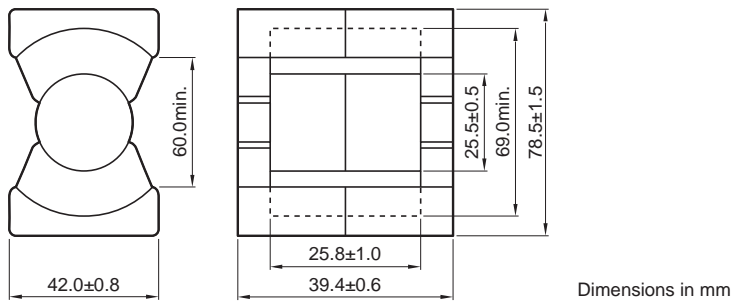
Measuring conditions

- Room space: approx. 400x300x 300cm
- Ambient temperature : 25°C
- Humidity: 45(%)RH.



Mn-Zn PQ series **Part No.: PE22 PQ78X39X42**

SHAPES AND DIMENSIONS



Effective parameter									Electrical characteristics
Core factor		Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional area	Winding cross-sectional area	Weigh (approx.)	AL-value
C ₁ (mm ⁻¹)	C ₂ ×10 ⁻² (mm ⁻³)	l _e (mm)	A _e (mm ²)	V _e (mm ³)	A _c (mm ²)	A min.* (mm ²)	A _{cw} (mm ²)	(g)	(nH/N ²) 1kHz 0.4A/m 23°C
0.2473	0.05153	119	480	56900	510	510C*	570	304	7940±25%

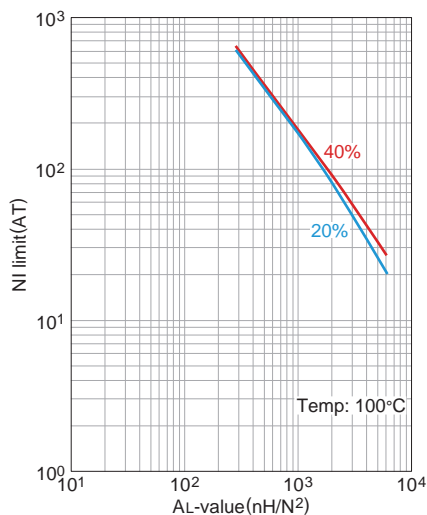
* The symbol followed A min. value shows minimum cross-sectional area part.

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

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

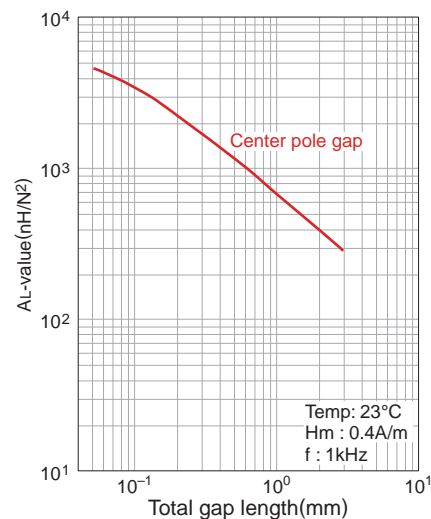
○ Calculated output power (forward converter mode): 1.6kW (100kHz)

NI limit vs. AL-value



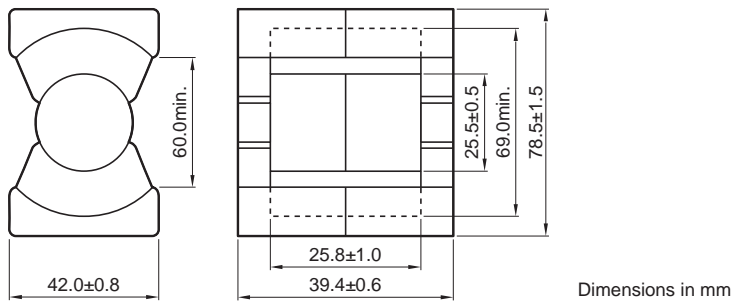
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

AL-value vs. Air gap length



Mn-Zn PQ series **Part No.: PC40 PQ78X39X42**

SHAPES AND DIMENSIONS



Effective parameter									Electrical characteristics
Core factor		Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional area	Winding cross-sectional area	Weigh (approx.)	AL-value
C ₁ (mm ⁻¹)	C ₂ ×10 ⁻² (mm ⁻³)	l _e (mm)	A _e (mm ²)	V _e (mm ³)	A _c (mm ²)	A min.* (mm ²)	A _{cw} (mm ²)	(g)	(nH/N ²) 1kHz 0.4A/m 23°C
0.2473	0.05153	119	480	56900	510	510C*	570	304	9790±25%

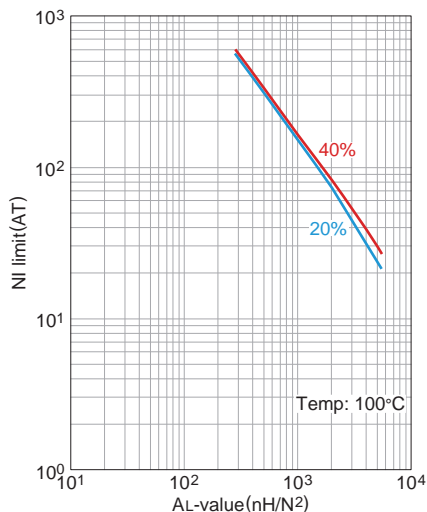
* The symbol followed A min. value shows minimum cross-sectional area part.

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

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

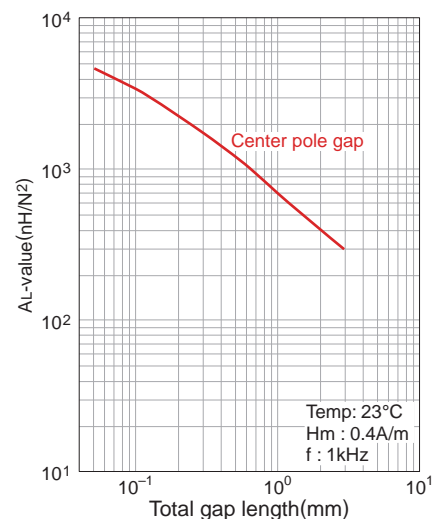
○ Calculated output power (forward converter mode): 1.7kW (100kHz)

NI limit vs. AL-value



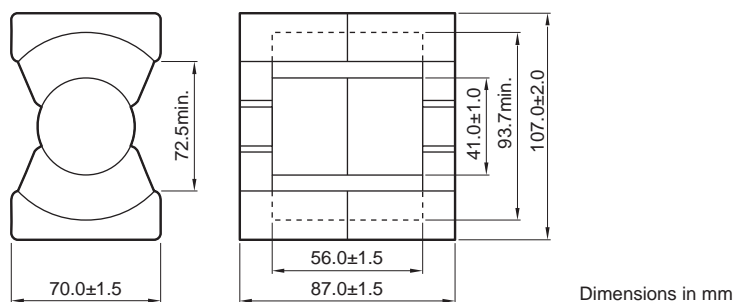
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

AL-value vs. Air gap length



Mn-Zn PQ series **Part No.: PE22 PQ107X87X70**

■ SHAPES AND DIMENSIONS



Effective parameter									Electrical characteristics
Core factor		Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional area	Winding cross-sectional area	Weigh (approx.)	AL-value
C ₁ (mm ⁻¹)	C ₂ ×10 ⁻² (mm ⁻³)	l _e (mm)	A _e (mm ²)	V _e (mm ³)	A _c (mm ²)	A min.* (mm ²)	A _{cw} (mm ²)	(g)	(nH/N ²) 1kHz 0.4A/m 23°C
0.1426	0.009989	204	1428	290600	1320	1320C*	1540	1560	14570±25%

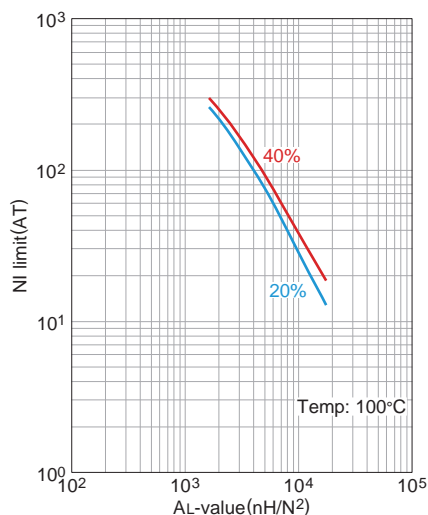
* The symbol followed A min. value shows minimum cross-sectional area part.

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

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

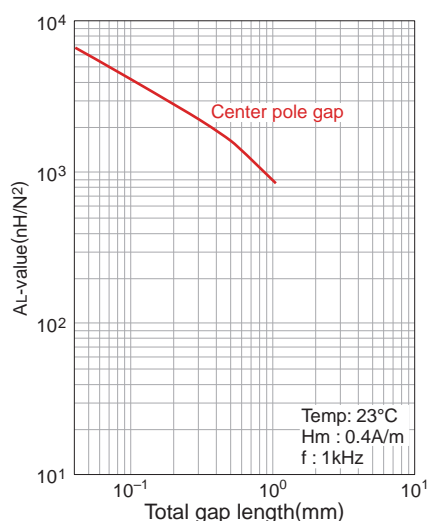
○ Calculated output power (forward converter mode): 8.3kW (100kHz)

NI limit vs. AL-value



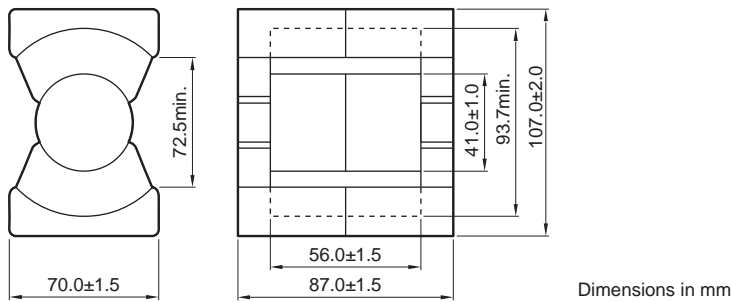
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

AL-value vs. Air gap length



Mn-Zn PQ series **Part No.: PC40 PQ107X87X70**

SHAPES AND DIMENSIONS



Effective parameter									Electrical characteristics
Core factor		Effective magnetic path length	Effective cross-sectional area	Effective core volume	Cross-sectional center pole area	Minimum cross-sectional area	Winding cross-sectional area	Weigh (approx.)	AL-value
C ₁ (mm ⁻¹)	C ₂ ×10 ⁻² (mm ⁻³)	l _e (mm)	A _e (mm ²)	V _e (mm ³)	A _c (mm ²)	A min.* (mm ²)	A _{cw} (mm ²)	(g)	(nH/N ²) 1kHz 0.4A/m 23°C
0.1426	0.009989	204	1428	290600	1320	1320C*	1540	1560	18210±25%

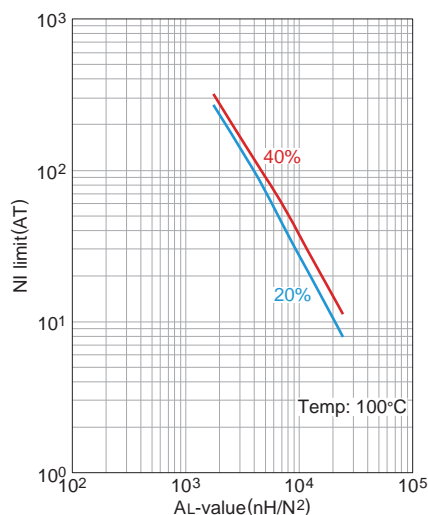
* The symbol followed A min. value shows minimum cross-sectional area part.

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



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

