TDK

May 2016

Mn-Zn

Ferrite Cores for Switching Power Supplies

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
(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.

Ferrite Core for Switching Power Supplies

Product compatible with RoHS directive
Halogen-free

Overview of the Large PQ Series

FEATURES

- TDK's original shapes
- The PQ Core occupies a smaller mounted area, as a transformer, compared to the E-core and EER-Core

APPLICATION

Tranformers and coils for Switched-mode power supplies (High Mounting Density, Low Profile)

PART NUMBER CONSTRUCTION

PC47 PQ60/42 - Z

Material	Size of PQ core	AL-value	
PC47	PQ60/42	Z	Without air gap
PC95	PQ60/52		
	PQ65/44		
	PQ65/54		

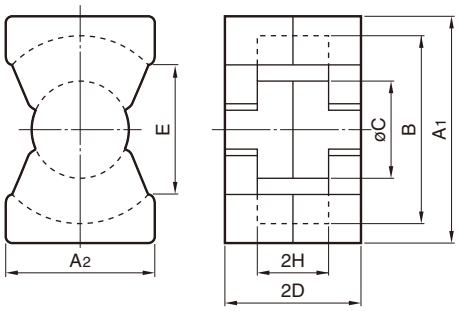
RANGE OF USE AND STORAGE TEMPERATURE

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.

Mn-Zn PQ Cores

SHAPES AND DIMENSIONS



PC47 | PQ60/42 - Z

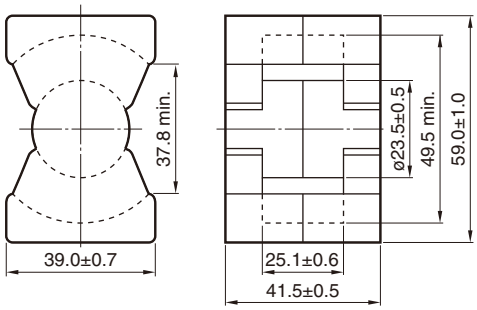
Material	Size of PQ core	AL-value
		Z: Without air gap

Part No.	Dimensions (mm)						
	A1	A2	B	øC	2D	E min.	2H
PC47PQ60/42-Z PC95PQ60/42-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
PC47PQ60/52-Z PC95PQ60/52-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
PC47PQ65/44-Z PC95PQ65/44-Z	65.0±1.0	45.0±0.7	55.0	26.0±0.5	43.5±0.5	40.8	25.5±0.6
PC47PQ65/54-Z PC95PQ65/54-Z	65.0±1.0	45.0±0.7	55.0	26.0±0.5	53.5±0.5	40.8	35.5±0.6

Part No.	Effective parameter					Electrical characteristics				
	Core factor C1(mm−1)	Effective cross-sectional area Ae(mm2)	Effective magnetic path length ℓe(mm)	Effective core volume Ve(mm3)	Weigh (g)	AL-value (nH/N2) 1kHz 0.5mA 100Ts		Core loss (W)max. 100kHz 150mT			
						Without air gap	With air gap	100°C	25°C	80°C	120°C
PC47PQ60/42-Z PC95PQ60/42-Z	0.203	483	98.1	47360	265	10,500±25% 14,300±25%		9.5 —	— 11.0	— 10.0	— 12.5
PC47PQ60/52-Z PC95PQ60/52-Z	0.248	477	118	56237	310	8,500±25% 11,200±25%		11.3 —	— 13.0	— 11.8	— 14.9
PC47PQ65/44-Z PC95PQ65/44-Z	0.171	604	103	62460	355	12,600±25% 15,500±25%		12.5 —	— 14.4	— 13.2	— 16.5
PC47PQ65/54-Z PC95PQ65/54-Z	0.207	597	123	73552	410	10,000±25% 13,500±25%		14.8 —	— 17.0	— 15.5	— 19.5

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

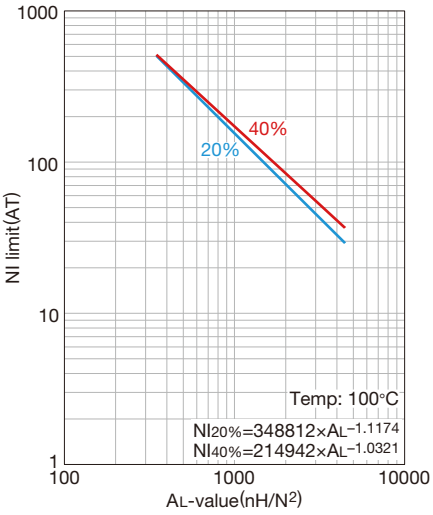
SHAPES AND DIMENSIONS



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 are	Cross-sectional winding area of core	Weigh	AL-value *	Core loss
C1	ℓe	Ae	Ve	Acp	Acp min.	Acw			
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(mm2)	(g/set)	(nH/N2) 1kHz 0.5mA	(W)max. 100kHz 150mT 100°C
0.203	98.1	483	47360	433	415	338	265	10,500±25%	9.5

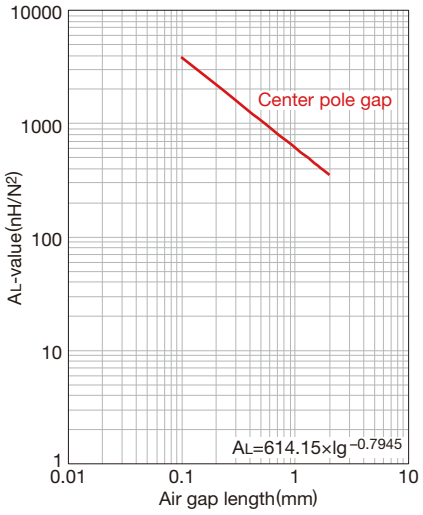
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



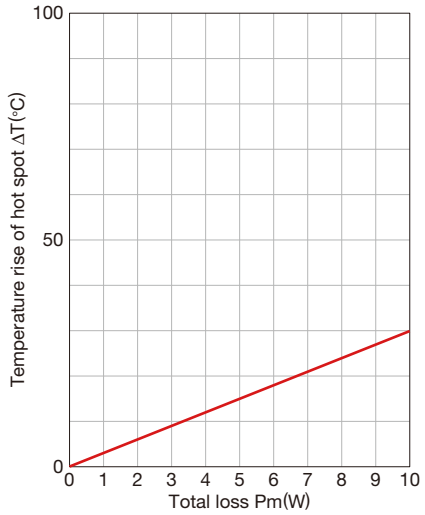
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

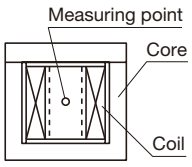


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

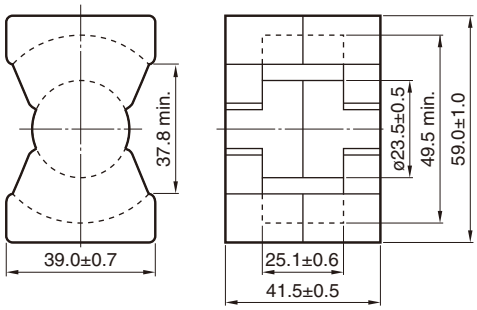


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



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

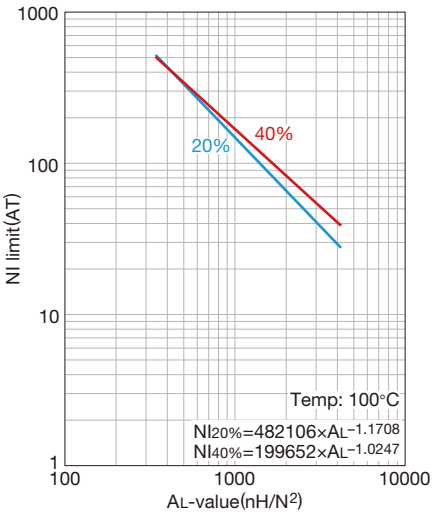
SHAPES AND DIMENSIONS



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 are	Cross-sectional winding area of core	Weigh	AL-value *	Core loss		
C1	ℓe	Ae	Ve	Acp	Acp min.	Acw					
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(mm2)	(g/set)	(nH/N2) 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

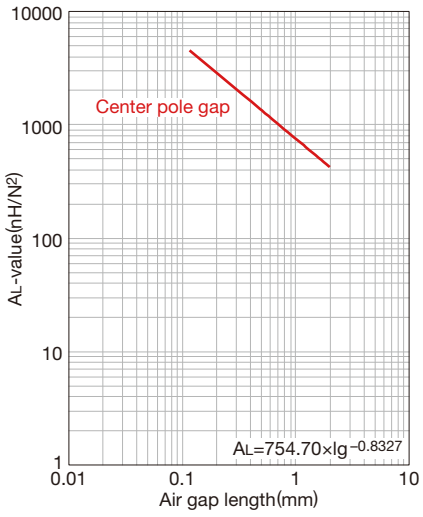
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



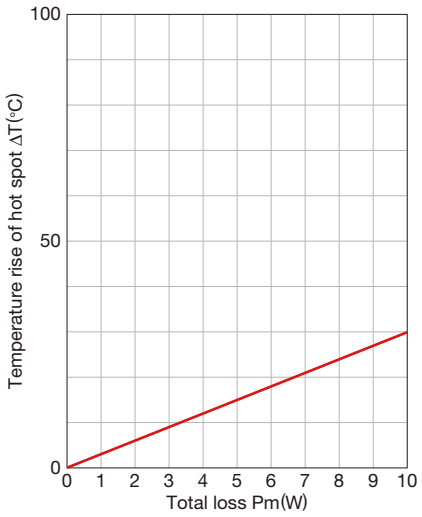
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

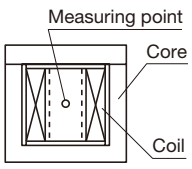


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

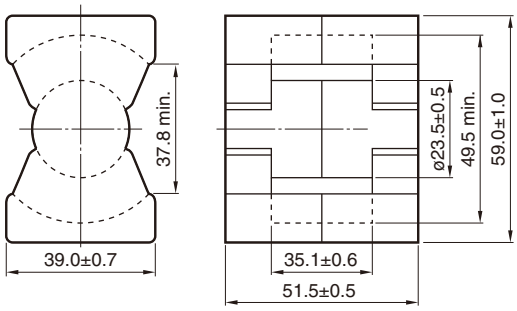


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



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

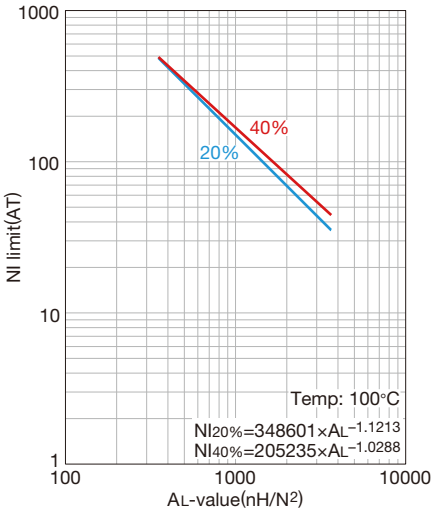
SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics	
Core factor	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	ℓe	Ae	Ve	Acp	Acp min.	Acw			
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(mm2)	(g/set)	(nH/N2) 1kHz 0.5mA	(W)max. 100kHz 150mT 100°C
0.248	118	477	56237	433	415	473	310	8,500±25%	11.3

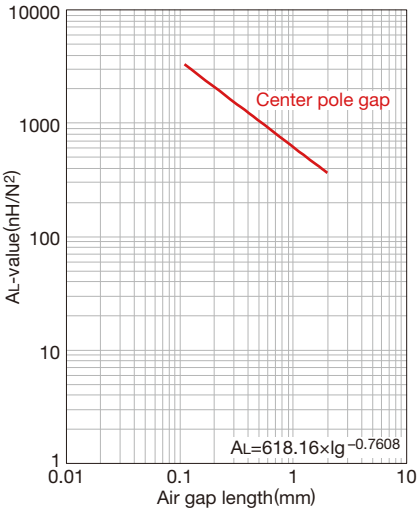
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



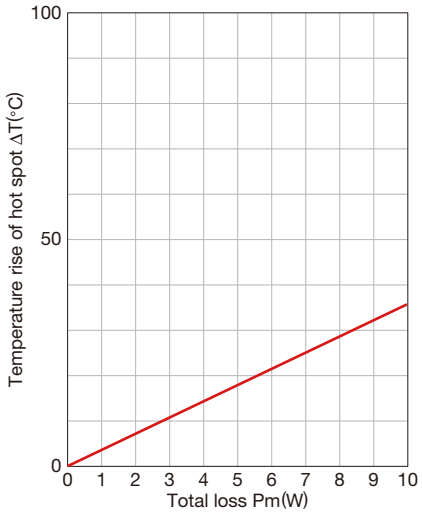
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

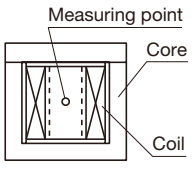


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

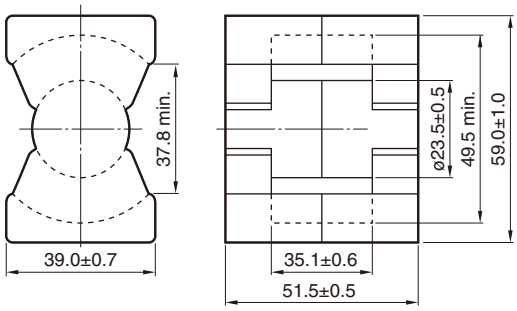


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



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

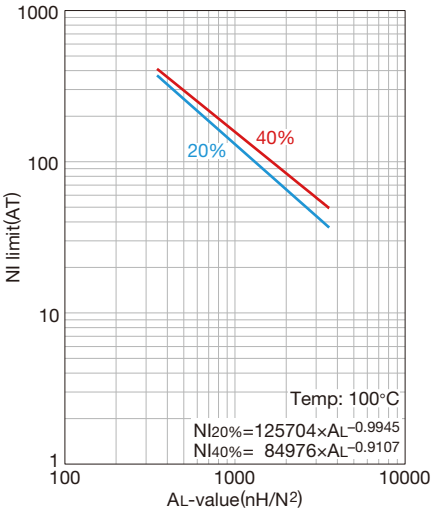
SHAPES AND DIMENSIONS



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 are	Cross-sectional winding area of core	Weigh	AL-value *	Core loss		
C1	ℓe	Ae	Ve	Acp	Acp min.	Acw					
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(mm2)	(g/set)	(nH/N2) 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

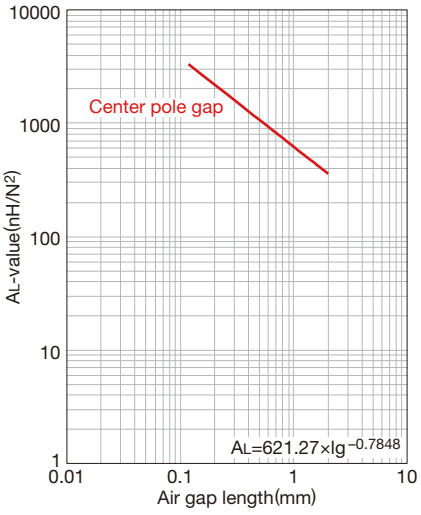
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



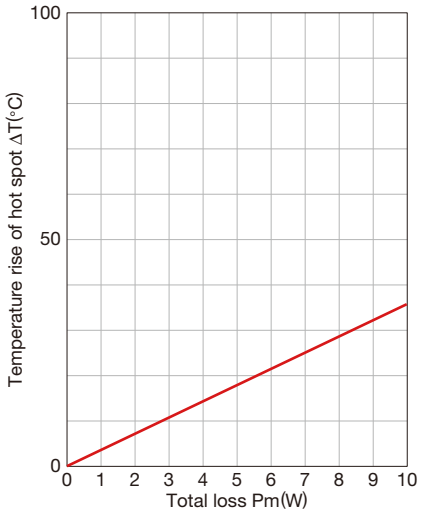
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

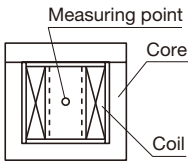


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

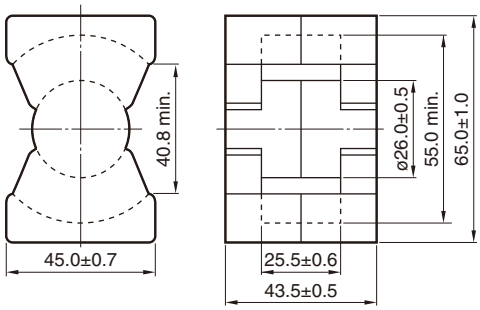


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



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

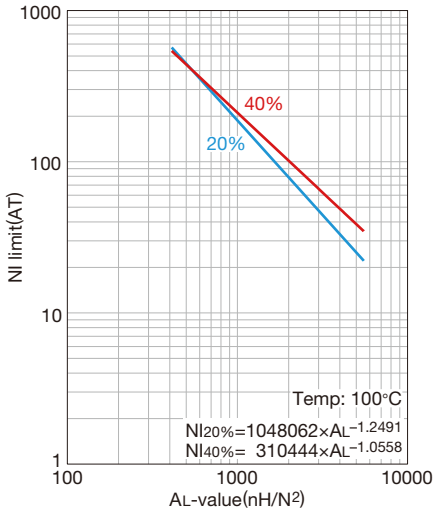
SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics	
Core factor	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	ℓe	Ae	Ve	Acp	Acp min.	Acw			
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(mm2)	(g/set)	(nH/N2) 1kHz 0.5mA	(W)max. 100kHz 150mT 100°C
0.171	103	604	62460	531	511	382	355	12,600±25%	12.5

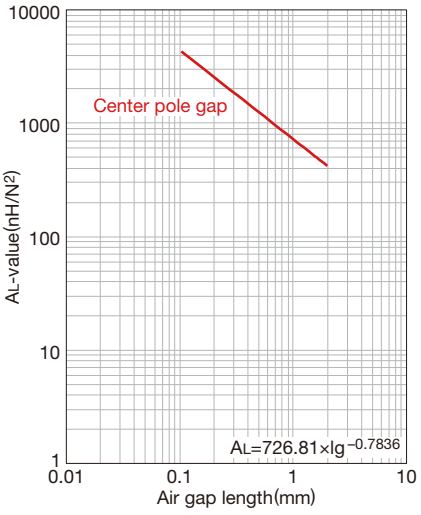
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



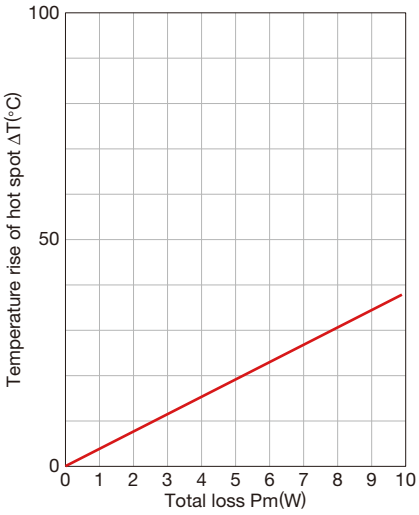
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

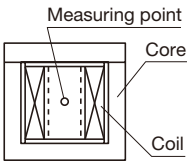


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

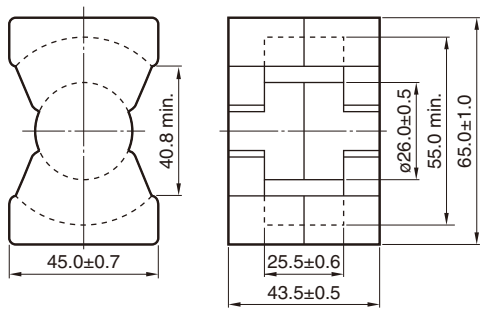


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



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

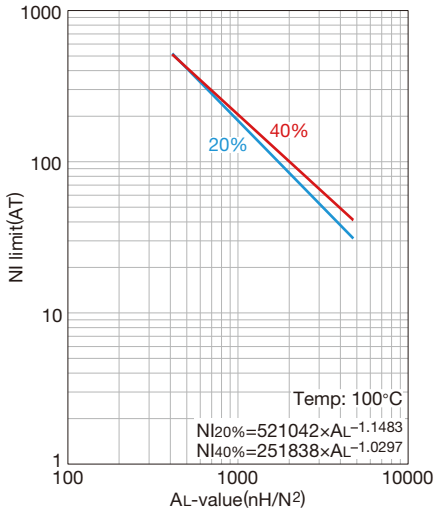
SHAPES AND DIMENSIONS



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		
C1	ℓe	Ae	Ve	Acp	Acp min.	Acw					
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(mm2)	(g/set)	(nH/N2) 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

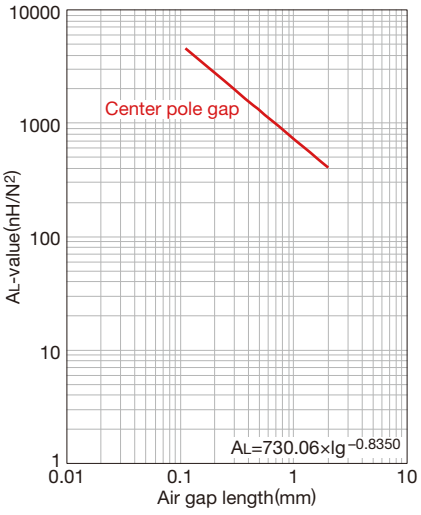
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



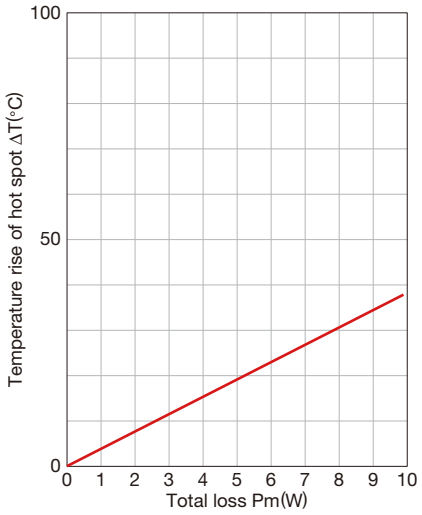
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

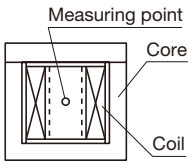


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

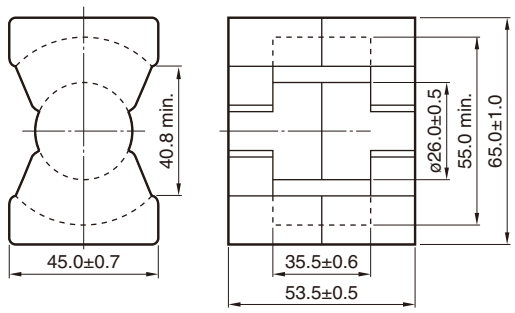


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



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

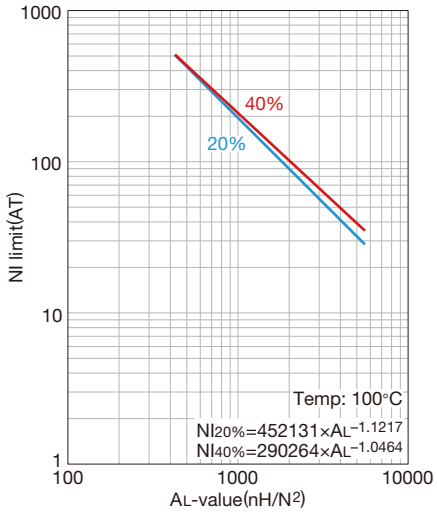
SHAPES AND DIMENSIONS



Effective parameter								Electrical characteristics	
Core factor	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	ℓe	Ae	Ve	Acp	Acp min.	Acw			
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(mm2)	(g/set)	(nH/N2) 1kHz 0.5mA	(W)max. 100kHz 150mT 100°C
0.207	123	597	73552	531	511	532	410	10,000±25%	14.8

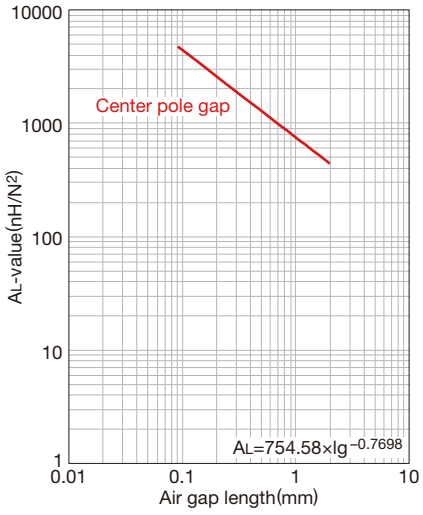
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



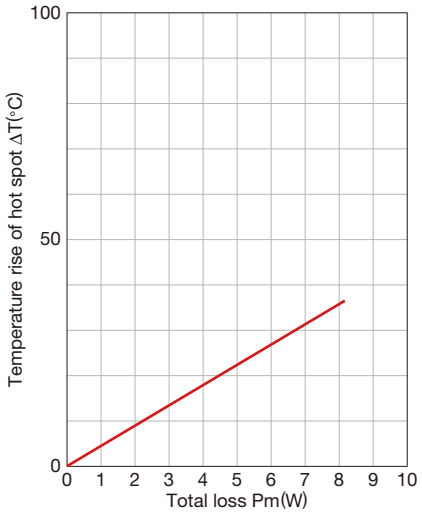
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

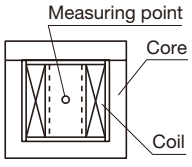


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

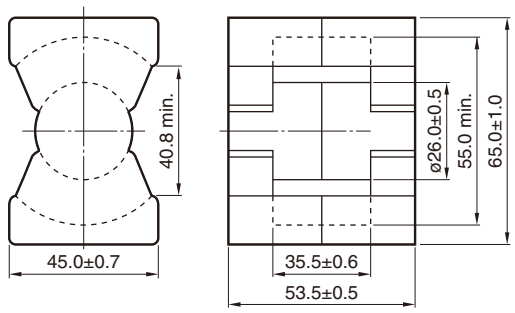


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



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

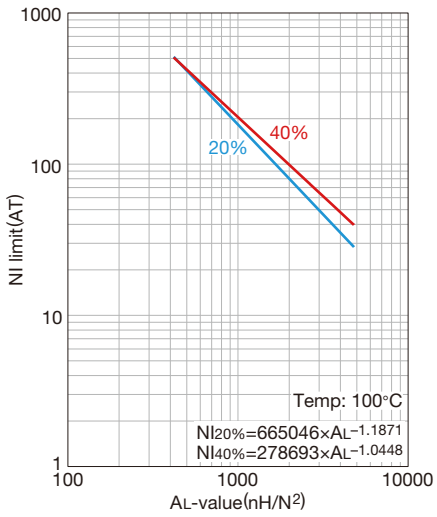
SHAPES AND DIMENSIONS



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	ℓe	Ae	Ve	Acp	Acp min.	Acw					
(mm−1)	(mm)	(mm2)	(mm3)	(mm2)	(mm2)	(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

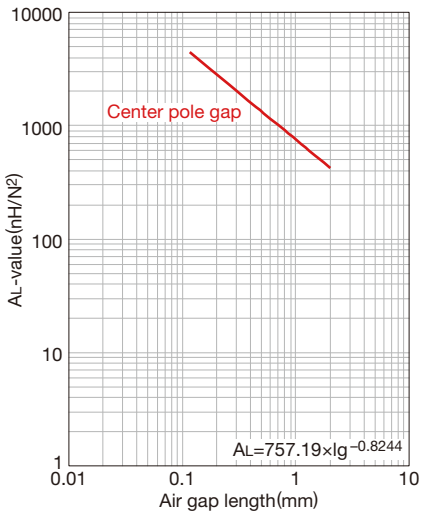
* Coil: ø0.4 2UEW 100Ts

NI limit vs. AL-value (Typ.)



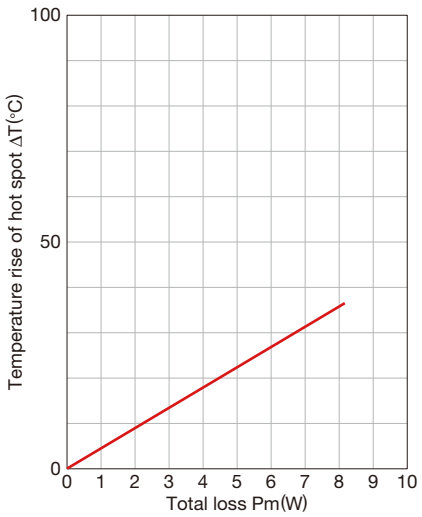
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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.