TDK

March 2014

Mn-Zn

Ferrite Cores for Switching Power Supplies

RM series

Mn-Zn **RM Cores**

SHAPES AND DIMENSIONS

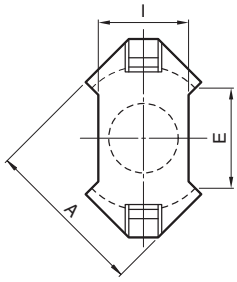


Fig. 1

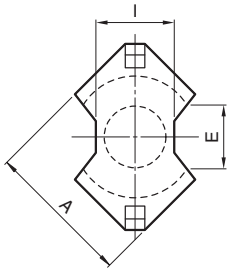


Fig. 2

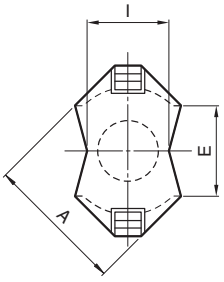
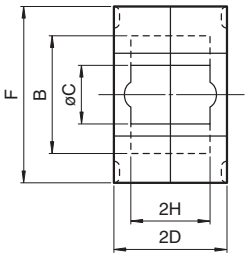


Fig. 3



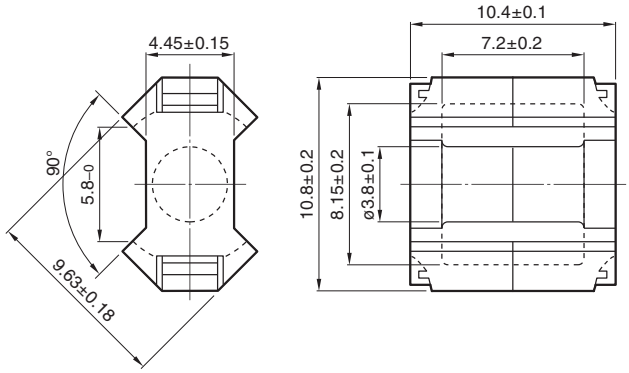
PC47	RM6	Z	-	1	2
Material	Size of RM core	AL-value		Type	Number of lead slot

Part No.	Core	Dimensions (mm)							
		A	B	øC	2D	E min.	F	2H	l
PC47RM4Z-12	Fig.1	9.63±0.18	8.15±0.2	3.8±0.1	10.4±0.1	5.8	10.8±0.2	7.2±0.2	4.45±0.15
PC47RM5Z-12	Fig.1	12.05±0.25	10.4±0.2	4.8±0.1	10.4±0.1	6.0	14.3±0.3	6.5±0.2	6.6±0.2
PC47RM6Z-12	Fig.3	14.4±0.3	12.65±0.25	6.3±0.1	12.4±0.1	8.4	17.6±0.3	8.2±0.2	8.0±0.2
PC47RM8Z-12	Fig.2	19.35±0.35	17.3±0.3	8.4±0.15	16.4±0.1	9.8	22.75±0.45	11.0±0.2	10.8±0.2
PC47RM10Z-12	Fig.2	24.15±0.55	21.65±0.45	10.7±0.2	18.6±0.1	11.3	27.85±0.65	12.7±0.3	13.25±0.25
PC47RM12Z-12	Fig.2	29.25±0.55	25.5±0.5	12.6±0.2	23.5±0.1	12.9	36.75±0.65	17.1±0.3	16.0±0.3
PC47RM14Z-12	Fig.1	34.2±0.5	29.5±0.5	14.75±0.25	28.8±0.2	17.0	41.6±0.6	21.1±0.3	18.7±0.3

Part No.	Effective parameter					Electrical characteristics		
	Core factor $C_1(mm^{-1})$	Effective cross-sectional area $Ae(mm^2)$	Effective magnetic path length $\ell e(mm)$	Effective core volume $Ve(mm^3)$	Weigh (g)	AL-value (nH/N^2) 1kHz 0.5mA 100Ts		Core loss (W) max. 100kHz 200mT 100°C
						Without air gap	With air gap	
PC47RM4Z-12	1.62	14.0	22.7	318	1.7	680 min.	63±3% 100±3% 160±3%	0.11
PC47RM5Z-12	0.940	23.7	22.4	530	3.0	1250 min.	63±3% 100±3% 160±3%	0.17
PC47RM6Z-12	0.781	36.6	28.6	1050	5.5	2450±25%	100±3% 160±3% 250±3%	0.38
PC47RM8Z-12	0.594	64.0	38.0	2430	13	1950 min.	100±3% 160±3% 250±3%	0.91
PC47RM10Z-12	0.450	98.0	44.0	4310	23	4850±25%	160±3% 250±3% 400±3%	1.70
PC47RM12Z-12	0.406	140	56.9	7970	42	4150 min.	160±3% 250±3% 400±3%	3.00
PC47RM14Z-12	0.393	178	70.0	12500	70	4600 min.	160±3% 250±3% 400±3%	4.60

Mn-Zn RM series Part No.: PC47RM4Z-12

SHAPES AND DIMENSIONS



Dimensions in mm

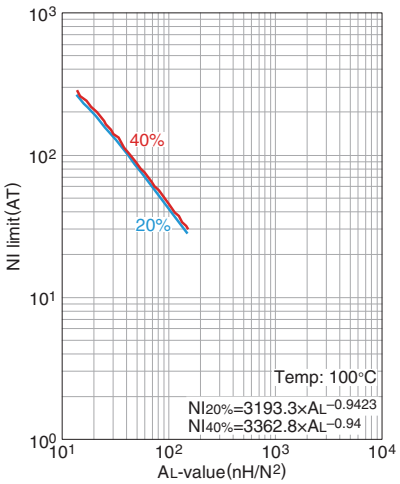
Based on JIS C 2516, IEC Publication 60431 and DIN 41980.

Effective parameter								Electrical characteristics		
Core factor C_1 (mm^{-1})	Effective magnetic path length ℓe (mm)	Effective cross-sectional area Ae (mm^2)	Effective core volume Ve (mm^3)	Cross-sectional center pole area Acp (mm^2)	Minimum cross-sectional center pole are Acp min. (mm^2)	Cross-sectional winding area of core Acw (mm^2)	Weigh (g/set)	A_L-value * (nH/N^2) 1kHz 0.5mA	A_L-value * (nH/N^2) 100kHz 200mT	Core loss (W)max. 100kHz 200mT 100°C
1.62	22.7	14.0	318	11.3	10.7	15.6	1.7	680 min.	1650 min.	0.11

* Coil：ø0.18 2UEW 100Ts

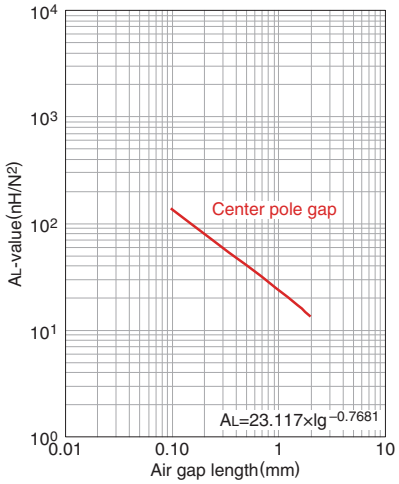
○ Calculated output power (forward converter mode): 8.4W (100kHz)

NI limit vs. A_L-value (Typ.)



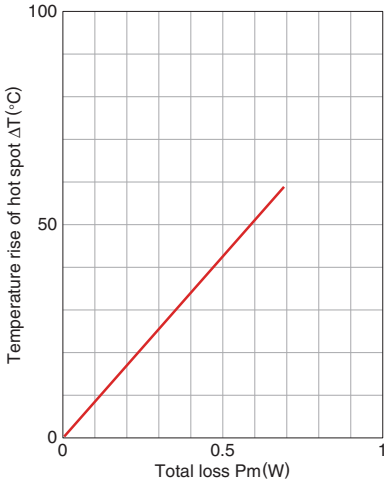
The 20% and 40% graph shows when a 20% and 40% drop from the initial A_L-value has been made due to the DC superimposition.

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

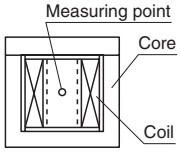


Measuring conditions
- Coil：ø0.18 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

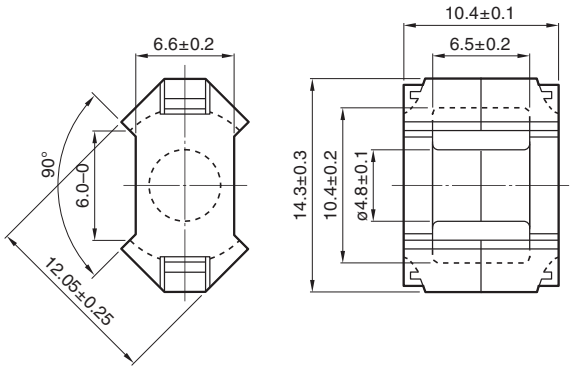


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn RM series **Part No.: PC47RM5Z-12**

SHAPES AND DIMENSIONS



Dimensions in mm

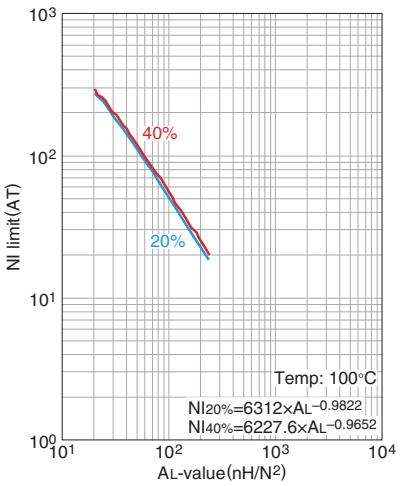
Based on JIS C 2516, IEC Publication 60431 and DIN 41980.

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)		(W)max.
								1kHz 0.5mA	100kHz 200mT	100kHz 200mT 100°C
0.940	22.4	23.7	530	18.1	17.3	18.2	3.0	1250 min.	3340 min.	0.17

* Coil：ø0.2 2UEW 100Ts

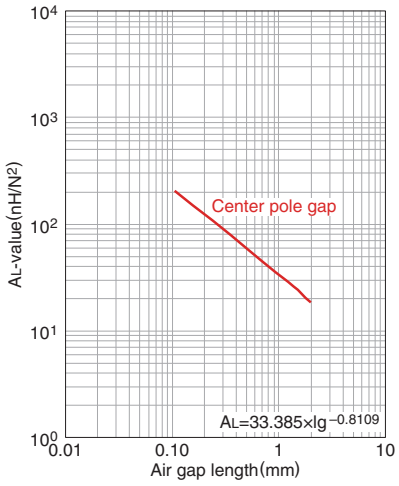
○ Calculated output power (forward converter mode): 20.3W (100kHz)

NI limit vs. AL-value (Typ.)



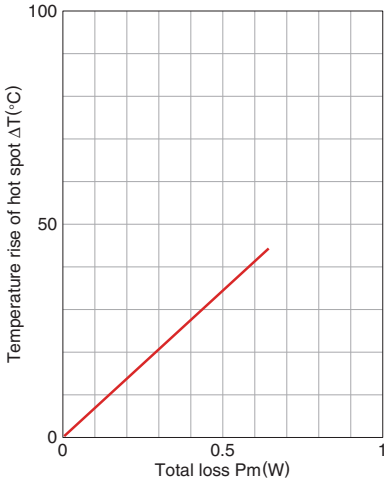
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

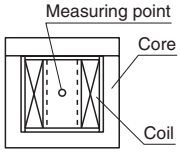


Measuring conditions
- Coil：ø0.2 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

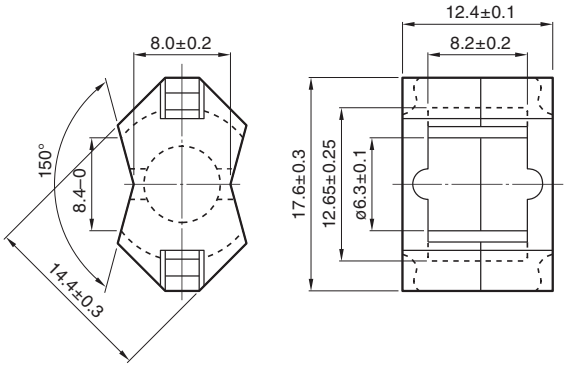


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn RM series **Part No.: PC47RM6Z-12**

SHAPES AND DIMENSIONS



Dimensions in mm

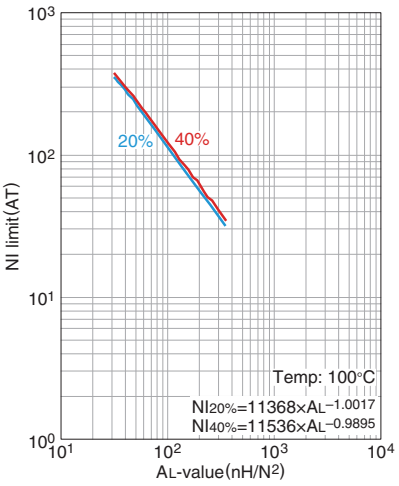
Based on JIS C 2516, IEC Publication 60431 and DIN 41980.

Effective parameter								Electrical characteristics		
Core factor C_1 (mm^{-1})	Effective magnetic path length ℓe (mm)	Effective cross-sectional area Ae (mm^2)	Effective core volume Ve (mm^3)	Cross-sectional center pole area Acp (mm^2)	Minimum cross-sectional center pole are Acp min. (mm^2)	Cross-sectional winding area of core Acw (mm^2)	Weigh (g/set)	A_L-value * (nH/N^2) 1kHz 0.5mA	100kHz 200mT	Core loss (W)max. 100kHz 200mT 100°C
0.781	28.6	36.6	1050	31.2	30.2	26.0	5.5	2450±25%	4030 min.	0.38

* Coil：ø0.26 2UEW 100Ts

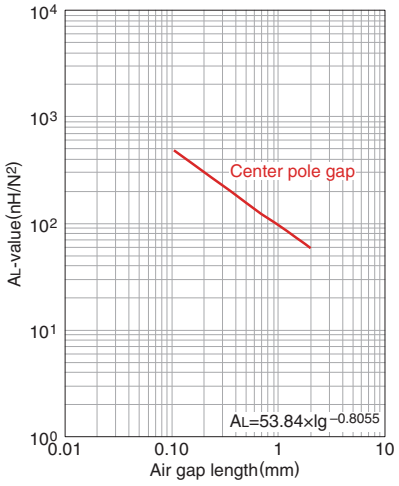
○ Calculated output power (forward converter mode): 36.2W (100kHz)

NI limit vs. A_L-value (Typ.)



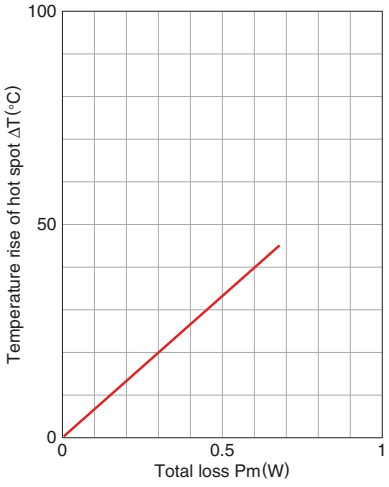
The 20% and 40% graph shows when a 20% and 40% drop from the initial A_L-value has been made due to the DC superimposition.

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

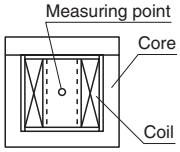


Measuring conditions
- Coil：ø0.26 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

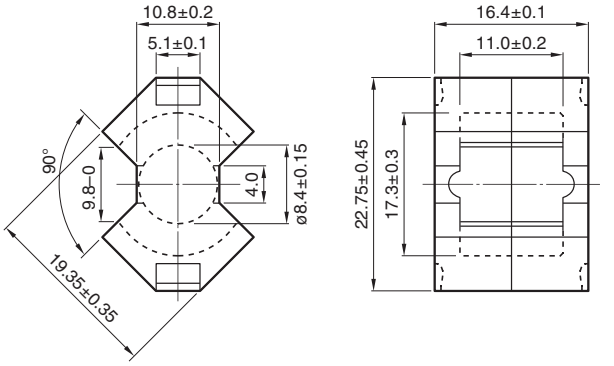


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn RM series **Part No.: PC47RM8Z-12**

SHAPES AND DIMENSIONS



Dimensions in mm

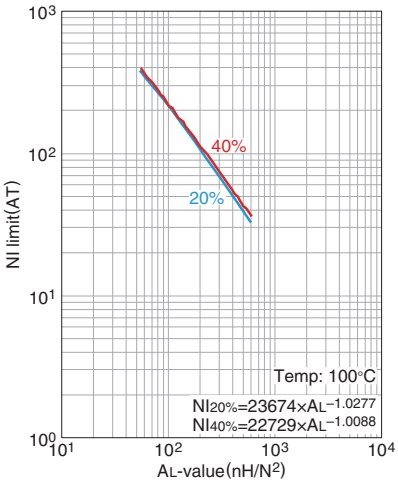
Based on JIS C 2516, IEC Publication 60431 and DIN 41980.

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)		(W)max.
								1kHz 0.5mA	100kHz 200mT	100kHz 200mT 100°C
0.594	38.0	64.0	2430	55.4	53.5	48.9	13	1950 min.	5290 min.	0.91

* Coil：ø0.4 2UEW 100Ts

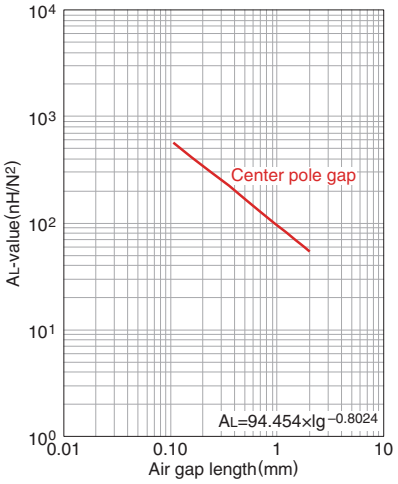
○ Calculated output power (forward converter mode): 92.4W (100kHz)

NI limit vs. AL-value (Typ.)



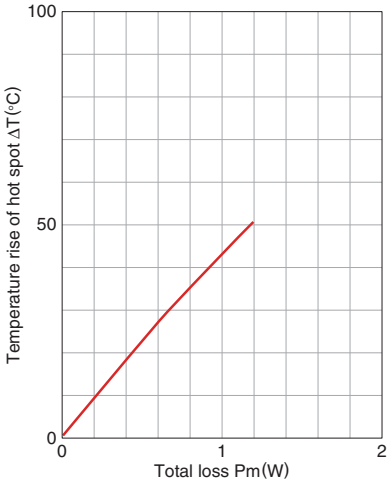
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

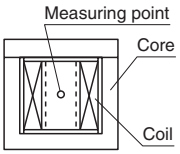


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

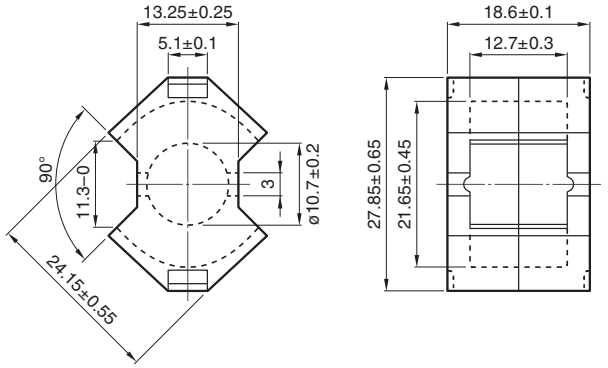


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn RM series Part No.: PC47RM10Z-12

SHAPES AND DIMENSIONS



Dimensions in mm

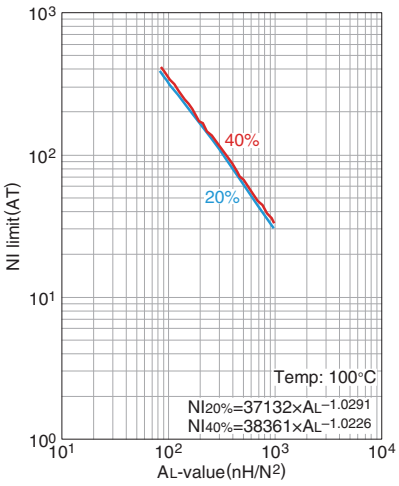
Based on JIS C 2516, IEC Publication 60431 and DIN 41980.

Effective parameter								Electrical characteristics		
Core factor C_1 (mm^{-1})	Effective magnetic path length ℓe (mm)	Effective cross-sectional area Ae (mm^2)	Effective core volume Ve (mm^3)	Cross-sectional center pole area Acp (mm^2)	Minimum cross-sectional center pole are Acp min. (mm^2)	Cross-sectional winding area of core Acw (mm^2)	Weigh (g/set)	AL-value * (nH/N^2) 1kHz 0.5mA	AL-value * (nH/N^2) 100kHz 200mT	Core loss (W)max. 100kHz 200mT 100°C
0.450	44.0	98.0	4310	89.9	86.6	69.5	23	4850±25%	7000 min.	1.70

* Coil：ø0.4 2UEW 100Ts

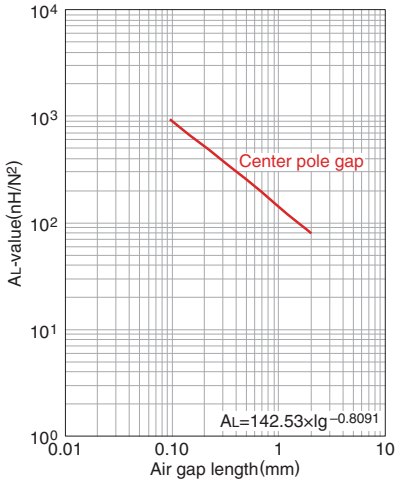
○ Calculated output power (forward converter mode): 177.8W (100kHz)

NI limit vs. AL-value (Typ.)



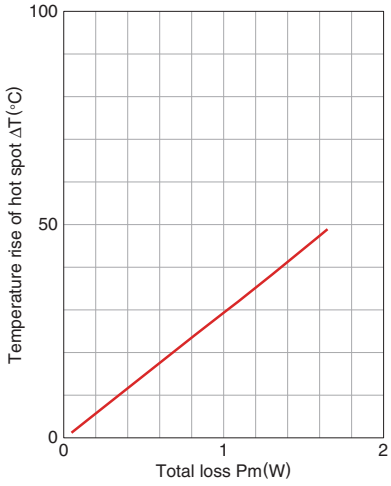
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

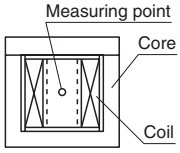


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

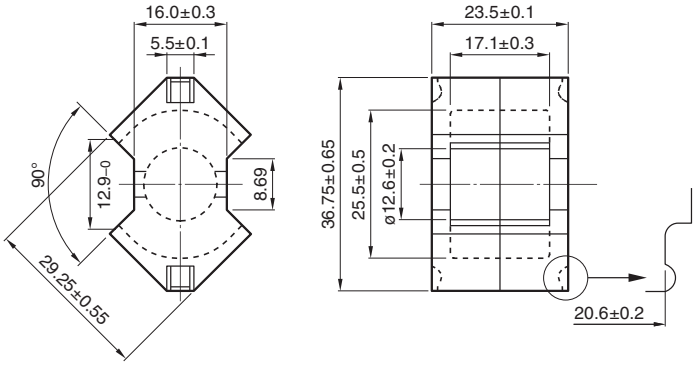


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn RM series Part No.: PC47RM12Z-12

SHAPES AND DIMENSIONS



Dimensions in mm

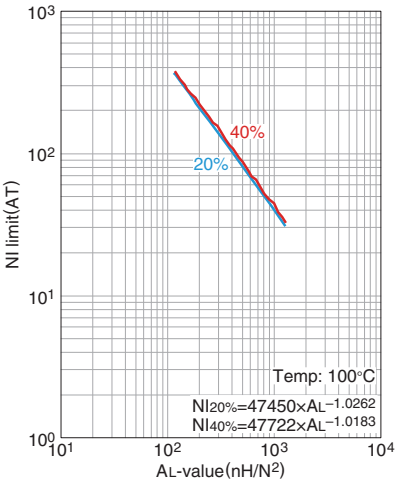
Based on JIS C 2516, IEC Publication 60431.

Effective parameter								Electrical characteristics		
Core factor C_1 (mm^{-1})	Effective magnetic path length ℓe (mm)	Effective cross-sectional area Ae (mm^2)	Effective core volume Ve (mm^3)	Cross-sectional center pole area Acp (mm^2)	Minimum cross-sectional center pole are Acp min. (mm^2)	Cross-sectional winding area of core Acw (mm^2)	Weigh (g/set)	AL-value * (nH/N^2) 1kHz 0.5mA	AL-value * (nH/N^2) 100kHz 200mT	Core loss (W)max. 100kHz 200mT 100°C
0.406	56.9	140	7960	125	121	110	42	4150 min.	9290 min.	3.00

* Coil：ø0.4 2UEW 100Ts

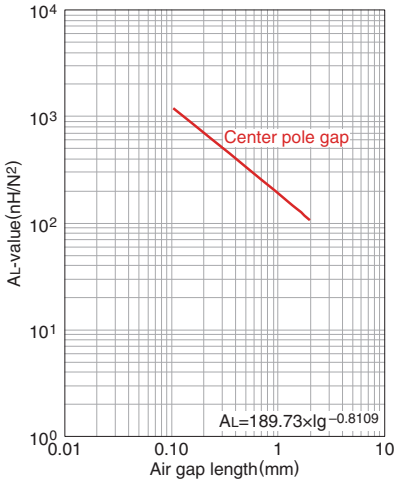
○ Calculated output power (forward converter mode): 466.2W (100kHz)

NI limit vs. AL-value (Typ.)



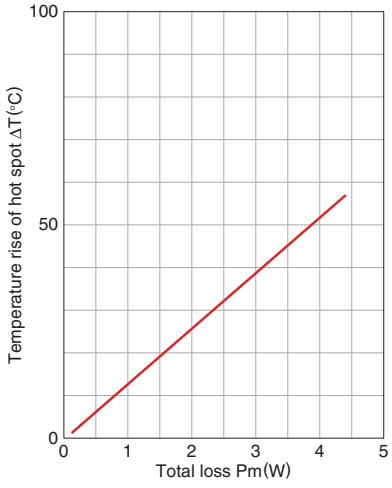
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

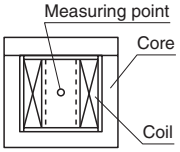


Measuring conditions
- Coil：ø0.4 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

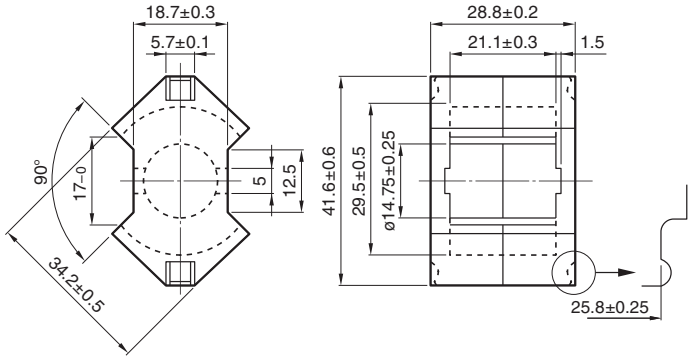


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn RM series **Part No.: PC47RM14Z-12**

SHAPES AND DIMENSIONS



Dimensions in mm

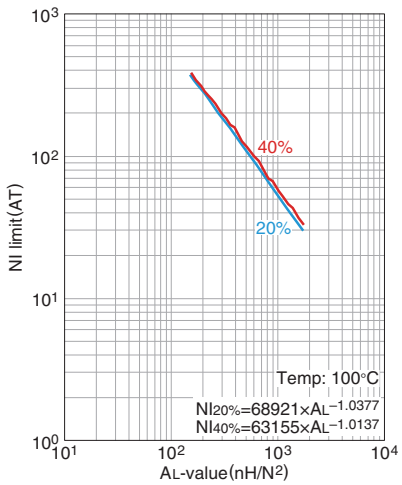
Based on JIS C 2516, IEC Publication 60431 and DIN 41980.

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)		(W)max.
								1kHz 0.5mA	100kHz 200mT	100kHz 200mT 100°C
0.393	70.0	178	12500	171	165	155	70	4600 min.	9590 min.	4.60

* Coil：ø0.4 2UEW 100Ts

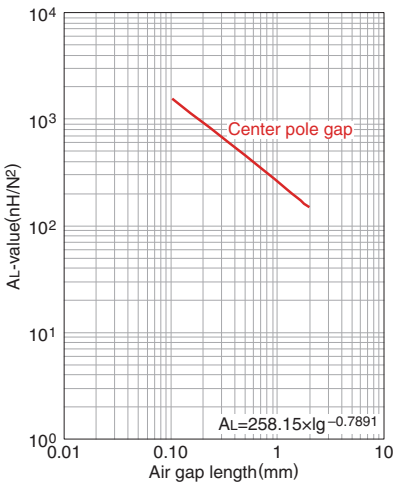
○ Calculated output power (forward converter mode): 462.6W (100kHz)

NI limit vs. AL-value (Typ.)



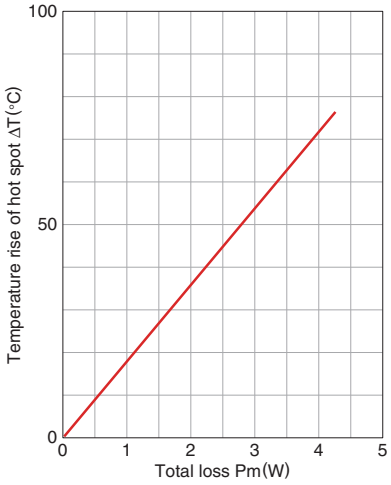
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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.