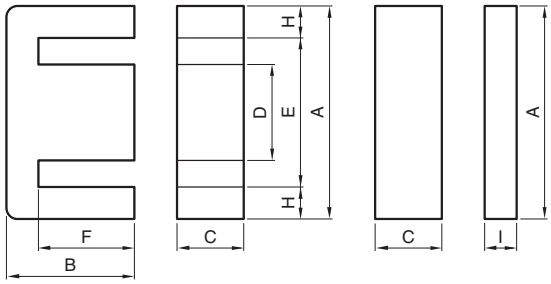
Mn-Zn EI Cores

SHAPES AND DIMENSIONS



PC47 | EI12.5 - Z

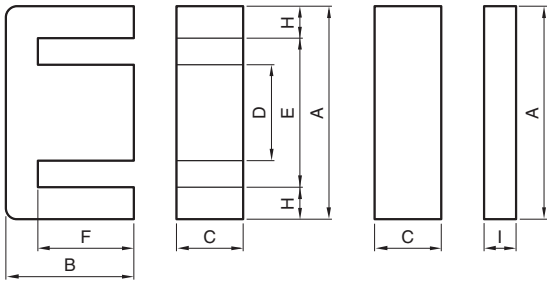
Material	Size of E core	AL-value (Z: without air gap)

Part No.	JIS	Dimensions (mm)							
		A	B	C	D	E min.	F	H	I
PC47EI12.5-Z	JIS FEI 12.5	12.4±0.3	7.4±0.1	4.85±0.15	2.4±0.1	8.8	5.1±0.1	1.6	1.5±0.1
PC47EI16-Z	JIS FEI 16	16.0±0.3	12.2±0.2	4.8±0.2	4.0±0.2	11.6	10.2±0.2	2.05	2.0±0.2
PC47EI19-Z		20.0±0.3	13.55±0.25	5.0±0.2	4.55±0.15	14.3	11.15±0.15	2.75	2.3±0.1
PC47EI22-Z		22.0±0.3	14.55±0.25	5.75±0.25	5.75±0.25	13.0	10.55±0.25	4.5	4.5±0.2
PC47EI22/19/6-Z	JIS FEI 22	22.0±0.4	14.7±0.2	5.75±0.25	5.75±0.25	15.75	10.7±0.2	3.0	4.0±0.2
PC47EI25-Z		25.3±0.5	15.55±0.25	6.75±0.25	6.5±0.3	19.0	12.35±0.25	3.0	2.7±0.2
PC47EI28-Z	JIS FEI 28	$28.0^{+0.7}_{-0.5}$	16.75±0.25	10.6±0.2(E core) 10.7±0.3(I core)	7.2±0.3	18.4	12.25±0.25	4.5	3.5±0.3
PC47EI30-Z	JIS FEI 30	$30.0^{+0.7}_{-0.4}$	21.25±0.25	10.7±0.3	10.7±0.3	19.7	16.25±0.25	5.0	5.5±0.2

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	
PC47EI12.5-Z	1.48	14.4	21.3	308	1.9	1200±25%	63±7% 100±10%	0.1
PC47EI16-Z	1.75	19.8	34.6	685	3.3	1100±25%	80±7% 160±10%	0.3
PC47EI19-Z	1.65	24.0	39.6	950	5.1	1400±25%	80±7% 160±10%	0.4
PC47EI22-Z	0.936	42.0	39.3	1650	9.8	2400±25%	125±7% 250±10%	0.6
PC47EI22/19/6-Z	1.13	37.0	41.8	1550	8.5	2000±25%	125±7% 250±10%	0.6
PC47EI25-Z	1.15	41.0	47.0	1930	9.8	2140±25%	125±7% 250±10%	0.8
PC47EI28-Z	0.56	86.0	48.2	4150	22	4300±25%	200±5% 400±7%	1.6
PC47EI30-Z	0.522	111	58.0	6440	34	4690±25%	200±5% 400±7%	2.2

Mn-Zn EI Cores

SHAPES AND DIMENSIONS



PC47 EI40 - Z

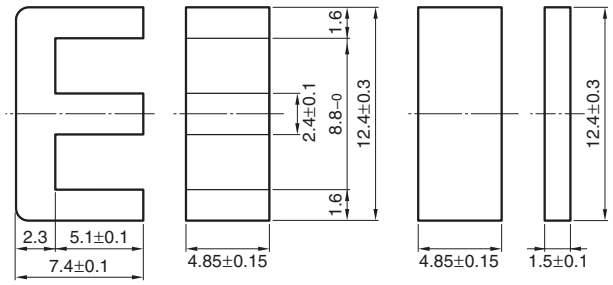
Material	Size of E core	AL-value (Z: without air gap)

Part No.	JIS	Dimensions (mm)							
		A	B	C	D	E min.	F	H	I
PC47EI33/29/13-Z		$33.0^{+0.8}_{-0.5}$	23.75±0.25	12.7±0.3	9.7±0.3	23.4	19.25±0.25	4.45	5.0±0.3
PC47EI35-Z	JIS FEI 35	35.0±0.5	24.35±0.15	10.0±0.3	10.0±0.3	24.5	18.25±0.15	5.0	4.6±0.3
PC47EI40-Z	JIS FEI 40	40.0±0.5	27.25±0.25	11.65±0.35	11.65±0.35	27.2	20.25±0.25	6.2	7.5±0.3
PC47EI50-Z	JIS FEI 50	$50.0^{+1.2}_{-0.7}$	33.35±0.35	14.6±0.4	14.6±0.4	33.5	24.75±0.25	7.7	9.0±0.3
PC47EI60-Z	JIS FEI 60	$60.0^{+1.4}_{-0.8}$	35.85±0.35	15.6±0.4	15.6±0.4	43.6	27.85±0.35	7.7	8.5±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	
PC47EI33/29/13-Z	0.567	119	67.5	8030	41	4400±25%	200±5% 400±7%	2.7
PC47EI35-Z	0.664	101	67.1	6780	36	3800±25%	200±5% 400±7%	2.3
PC47EI40-Z	0.520	148	77.0	11400	60	4860±25%	200±5% 400±7%	3.7
PC47EI50-Z	0.409	230	94.0	21620	115	6110±25%	250±5% 500±7%	8.6
PC47EI60-Z	0.441	247	109	26900	139	5670±25%	250±5% 500±7%	9.2

Mn-Zn E series Part No.: PC47EI12.5-Z

SHAPES AND DIMENSIONS



Dimensions in mm

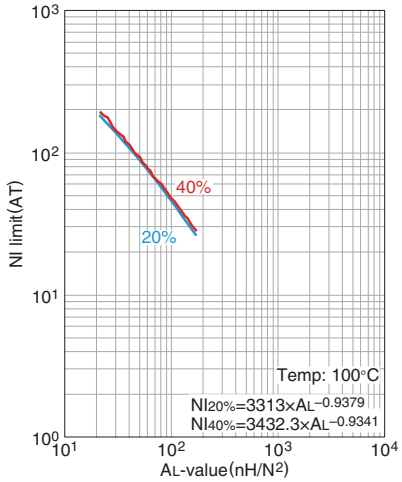
Based on JIS FEI 12.5.

Effective parameter								Electrical characteristics		
Core factor C1 (mm⁻¹)	Effective magnetic path length ℓe (mm)	Effective cross-sectional area Ae (mm²)	Effective core volume Ve (mm³)	Cross-sectional center pole area Acp (mm²)	Minimum cross-sectional center pole are Acp min. (mm²)	Cross-sectional winding area of core Acw (mm²)	Weigh (g/set)	AL-value * (nH/N²) 1kHz 0.5mA	AL-value * (nH/N²) 100kHz 200mT	Core loss (W)max. 100kHz 200mT 100°C
1.48	21.3	14.4	308	11.6	10.8	17.3	1.9	1200±25%	2120 min.	0.10

* Coil：ø0.2 2UEW 100Ts

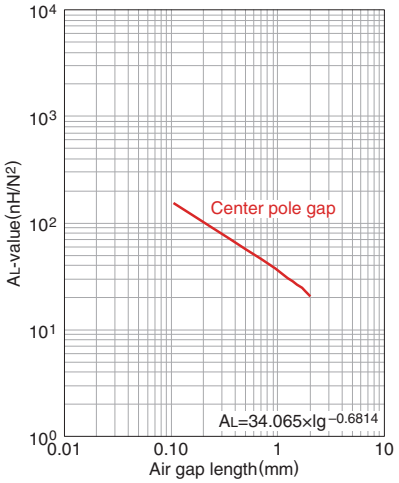
○ Calculated output power (forward converter mode): 11.5W (100kHz)

NI limit vs. AL-value (Typ.)



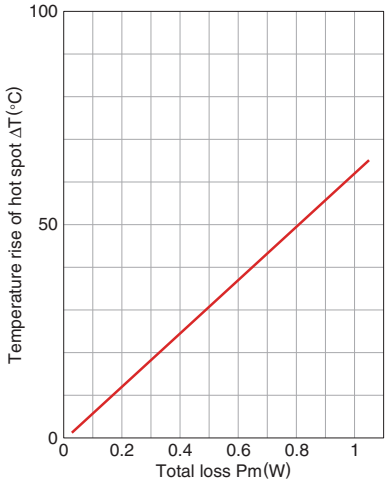
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

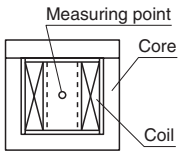


Measuring conditions
- Coil：ø0.2 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

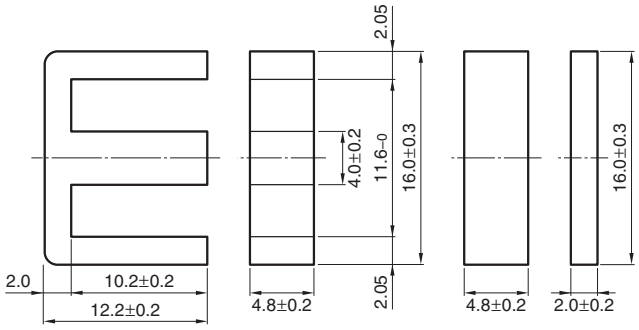


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI16-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

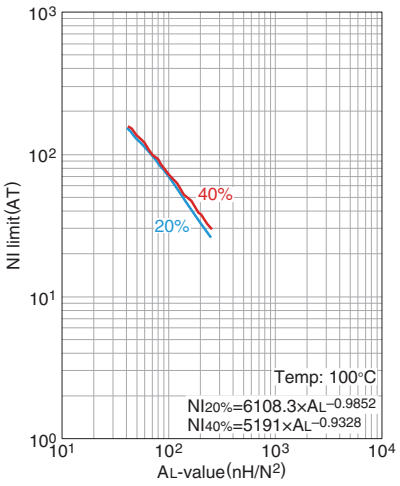
Based on JIS FEI 16.

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
1.75	34.6	19.8	685	19.2	17.5	40.3	3.3	1100±25%	1750 min.	0.29

* Coil：ø0.23 2UEW 100Ts

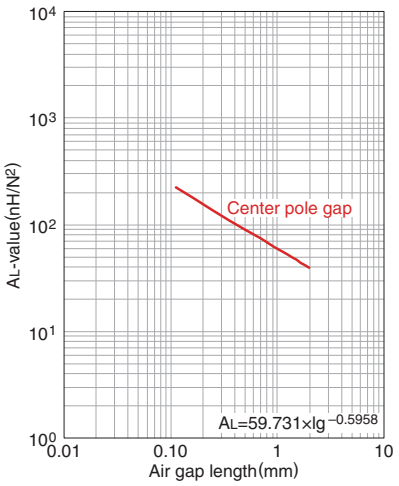
○ Calculated output power (forward converter mode): 33W (100kHz)

NI limit vs. AL-value (Typ.)



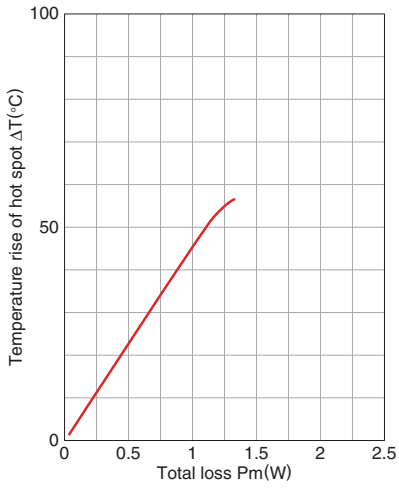
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

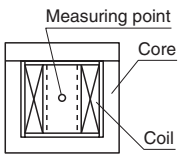


Measuring conditions
- Coil：ø0.23 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

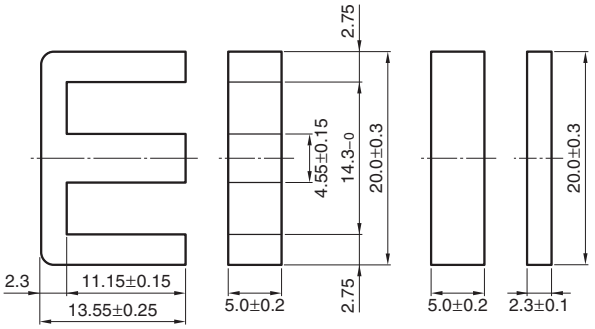


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI19-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

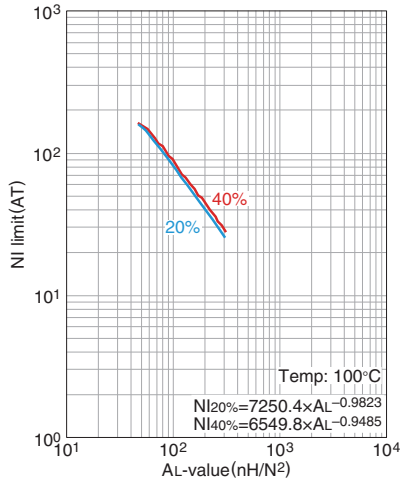
Based on JIS FEI 12.5.

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
1.65	39.6	24.0	950	22.8	21.1	55.5	5.1	1400±25%	1830 min.	0.39

* Coil：ø0.23 2UEW 100Ts

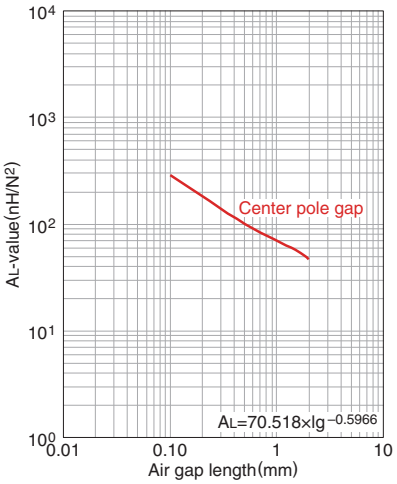
○ Calculated output power (forward converter mode): 45W (100kHz)

NI limit vs. AL-value (Typ.)



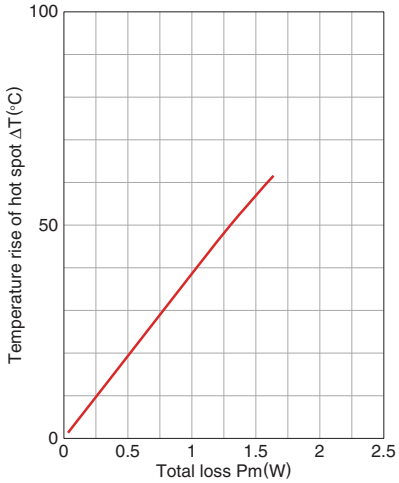
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

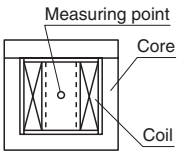


Measuring conditions
- Coil：ø0.23 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

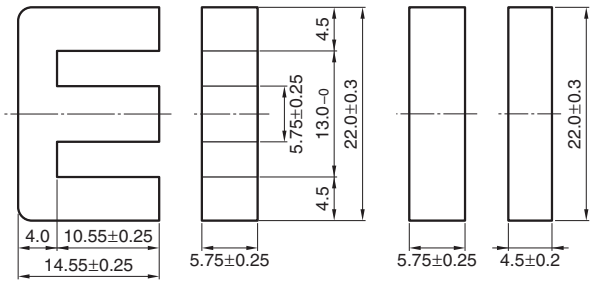


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI22-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

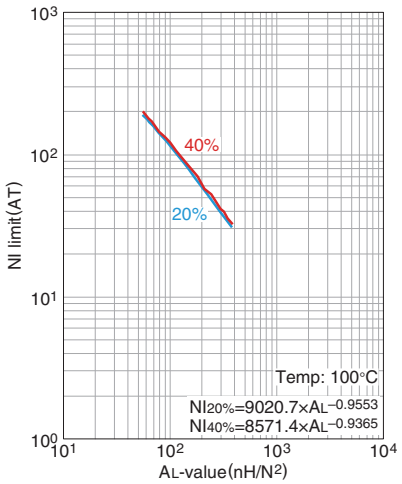
Based on JIS FEI 12.5.

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
0.936	39.3	42.0	1650	33.1	30.3	38.2	9.8	2400±25%	3360 min.	0.56

* Coil：ø0.23 2UEW 100Ts

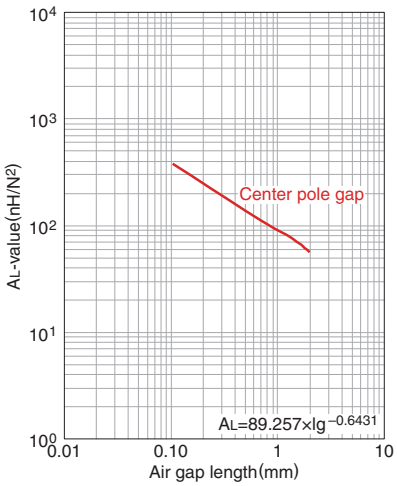
○ Calculated output power (forward converter mode): 49W (100kHz)

NI limit vs. AL-value (Typ.)



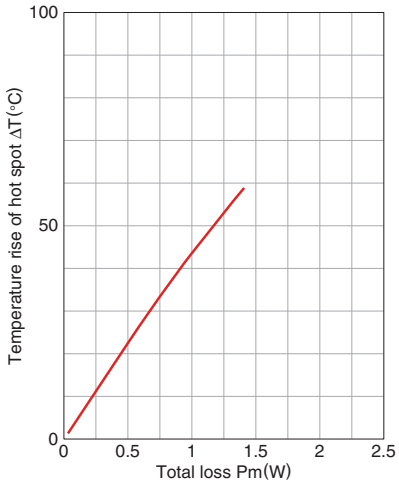
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

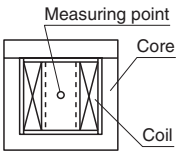


Measuring conditions
- Coil：ø0.23 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

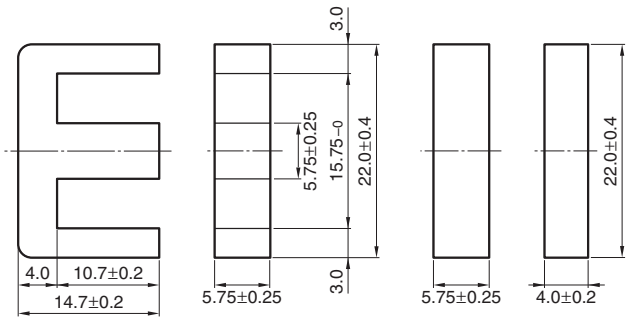


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI22/19/6-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

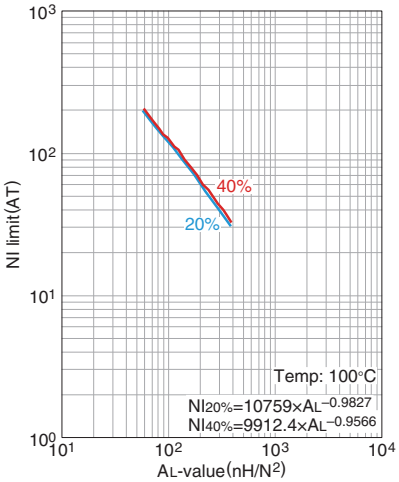
Based on JIS FEI 22.

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
1.13	41.8	37.0	1550	33.1	30.3	54.8	8.5	2000±25%	2780 min.	0.59

* Coil：ø0.23 2UEW 100Ts

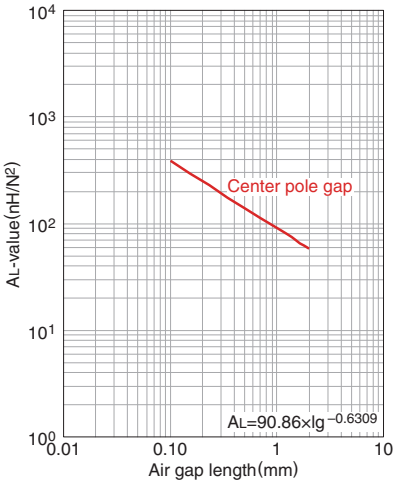
○ Calculated output power (forward converter mode): 59W (100kHz)

NI limit vs. AL-value (Typ.)



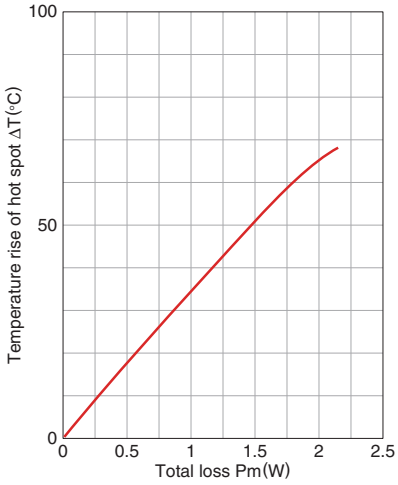
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

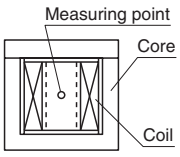


Measuring conditions
- Coil：ø0.23 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

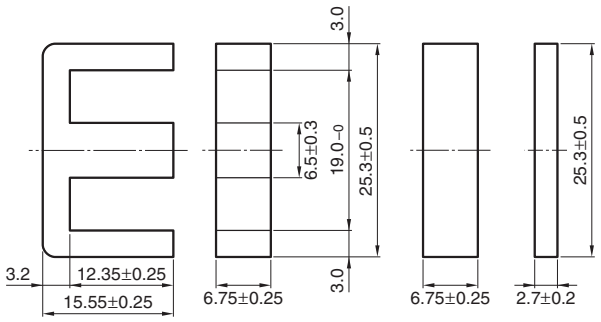


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI25-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

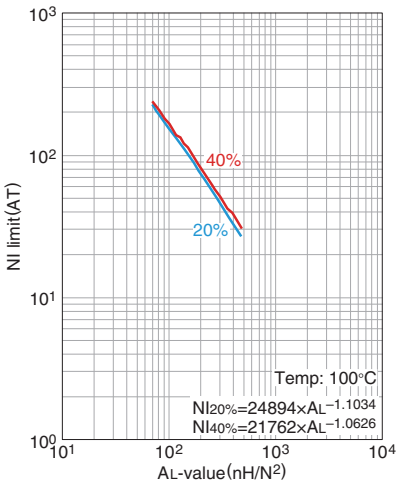
Based on JIS FEI 12.5.

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)	(mm^2)	(mm^3)	(mm^2)	(mm^2)	(mm^2)	(g/set)	(nH/N2)		(W)max.
								1kHz 0.5mA	100kHz 200mT	100kHz 200mT 100°C
1.15	47.0	41.0	1930	43.9	40.3	77.2	9.8	2140±25%	2950 min.	0.82

* Coil：ø0.35 2UEW 100Ts

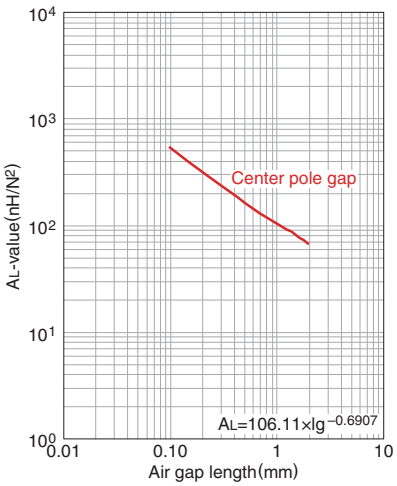
○ Calculated output power (forward converter mode): 82W (100kHz)

NI limit vs. AL-value (Typ.)



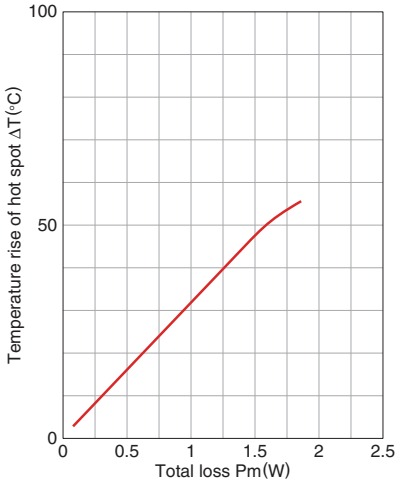
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

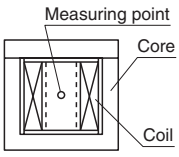


Measuring conditions
- Coil：ø0.35 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

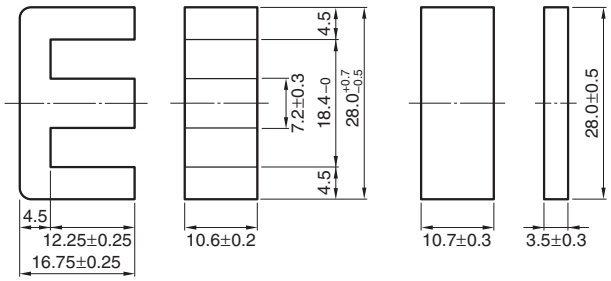


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI28-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

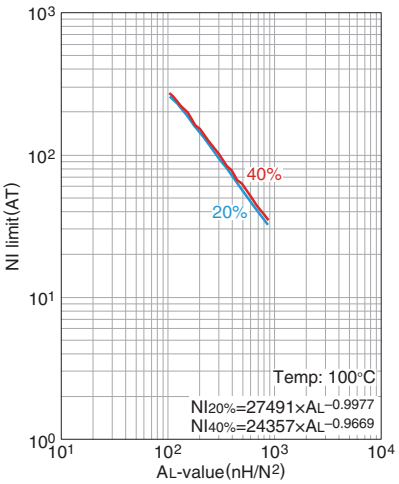
Based on JIS FEI 28.

Effective parameter								Electrical characteristics		
Core factor C1 (mm⁻¹)	Effective magnetic path length ℓe (mm)	Effective cross-sectional area Ae (mm²)	Effective core volume Ve (mm³)	Cross-sectional center pole area Acp (mm²)	Minimum cross-sectional center pole are Acp min. (mm²)	Cross-sectional winding area of core Acw (mm²)	Weigh (g/set)	AL-value * (nH/N²) 1kHz 0.5mA	100kHz 200mT	Core loss (W)max. 100kHz 200mT 100°C
0.560	48.2	86.0	4150	76.3	71.8	69.8	22	4300±25%	6060 min.	1.58

* Coil：ø0.35 2UEW 100Ts

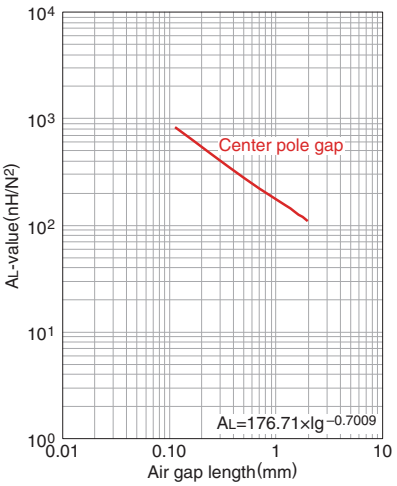
○ Calculated output power (forward converter mode): 145W (100kHz)

NI limit vs. AL-value (Typ.)



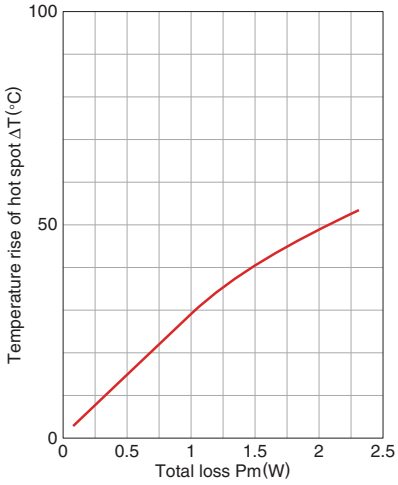
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

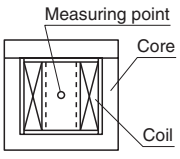


Measuring conditions
- Coil：ø0.35 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

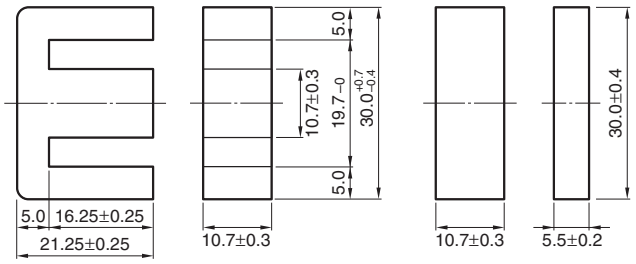


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI30-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

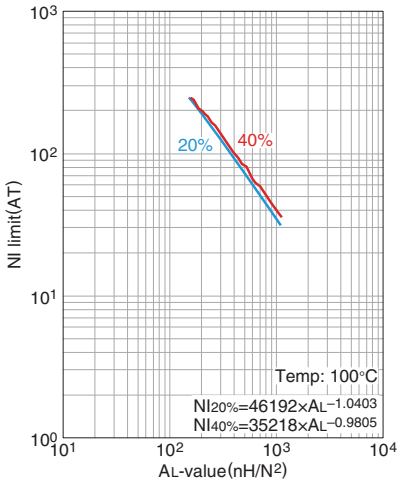
Based on JIS FEI 30.

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/N²) 1kHz 0.5mA	A_L-value * (nH/N²) 100kHz 200mT	Core loss (W)max. 100kHz 200mT 100°C
0.523	58.0	111	6440	114	108	75.6	34	4690±25%	6490 min.	2.17

*Coil：ø0.35 2UEW 100Ts

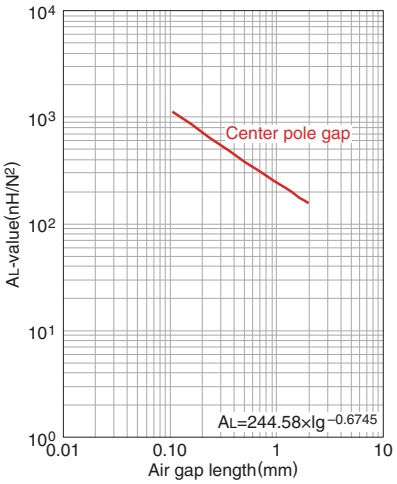
○ Calculated output power (forward converter mode): 214W (100kHz)

NI limit vs. A_L-value (Typ.)



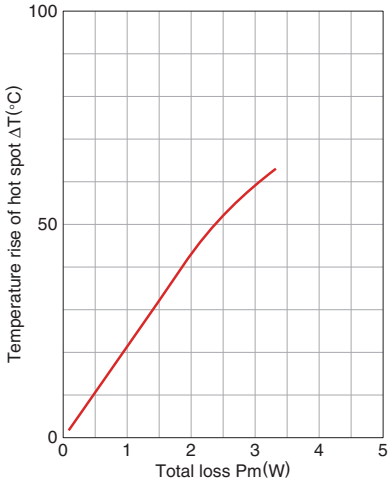
The 20% and 40% graph shows when a 20% and 40% drop from the initial A_L-value has been made due to the DC superimposition.

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

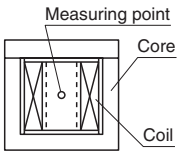


Measuring conditions
- Coil：ø0.35 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

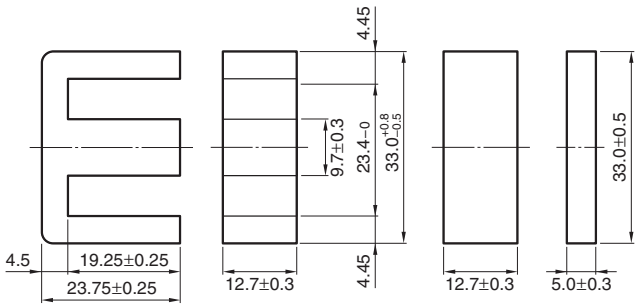


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI33/29/13-Z**

SHAPES AND DIMENSIONS



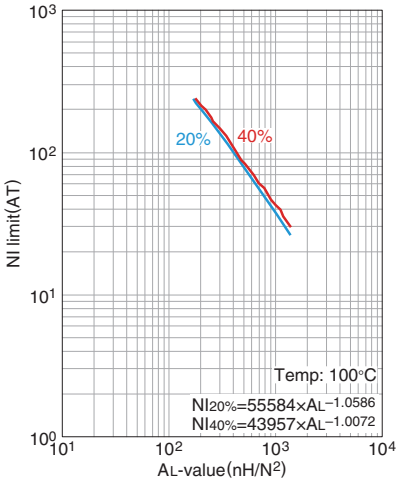
Dimensions in mm

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
0.567	67.5	119	8030	123	117	138.6	41	4400±25%	5980 min.	2.67

* Coil：ø0.35 2UEW 100Ts

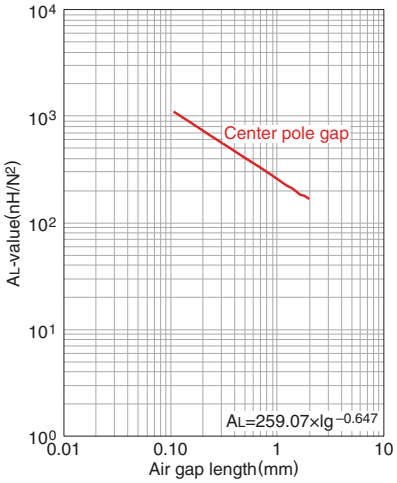
○ Calculated output power (forward converter mode): 288W (100kHz)

NI limit vs. AL-value (Typ.)



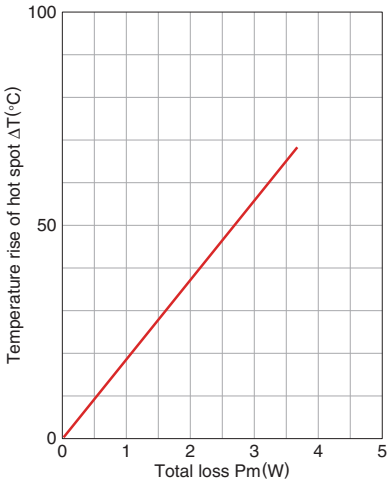
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

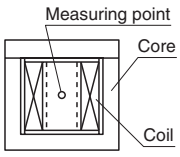


Measuring conditions
- Coil：ø0.35 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

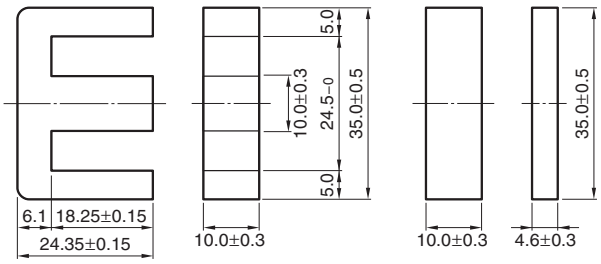


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI35-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

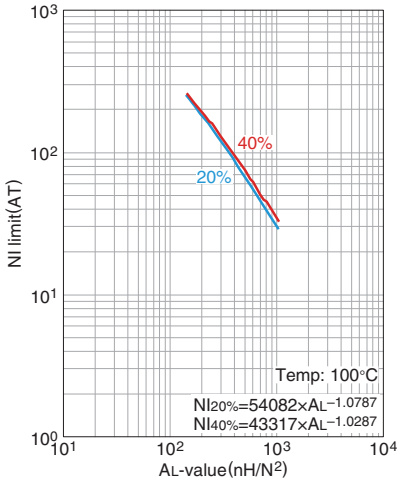
Based on JIS FEI 35.

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
0.664	67.1	101	6780	100	94.1	131.6	36	3800±25%	5110 min.	2.35

* Coil：ø0.35 2UEW 100Ts

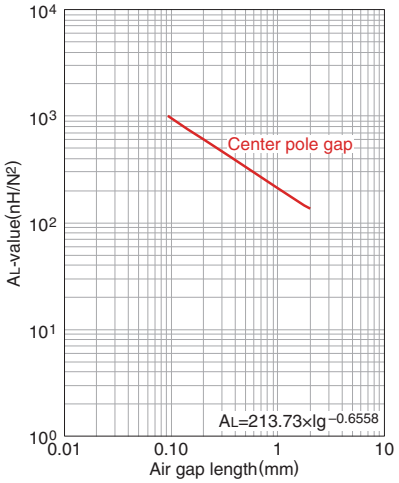
○ Calculated output power (forward converter mode): 266W (100kHz)

NI limit vs. AL-value (Typ.)



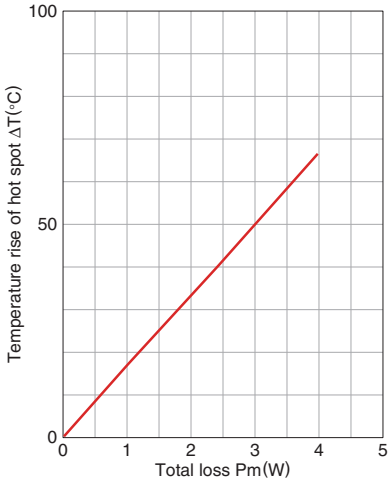
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

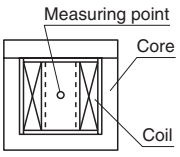


Measuring conditions
- Coil：ø0.35 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

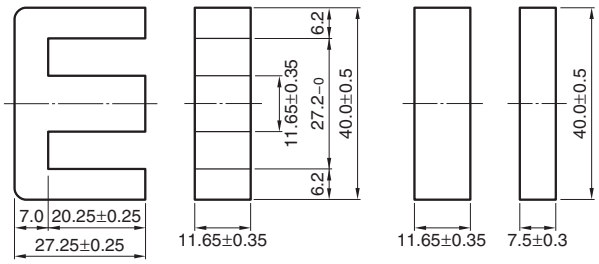


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI40-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

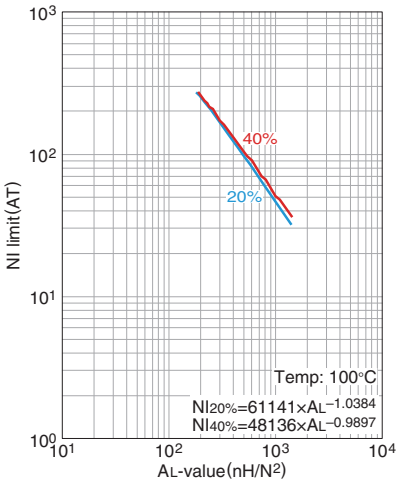
Based on JIS FEI 40.

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
0.520	77.0	148	11400	136	128	160.5	60	4860±25%	6520 min.	3.66

* Coil：ø0.35 2UEW 100Ts

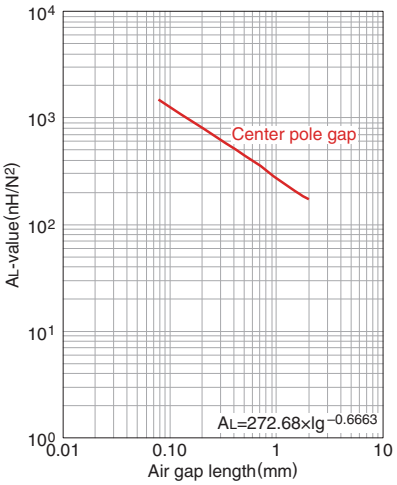
○ Calculated output power (forward converter mode): 361W (100kHz)

NI limit vs. AL-value (Typ.)



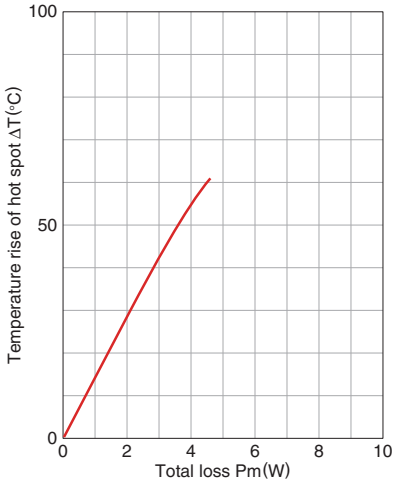
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

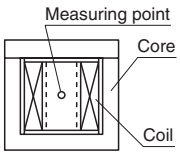


Measuring conditions
- Coil：ø0.35 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

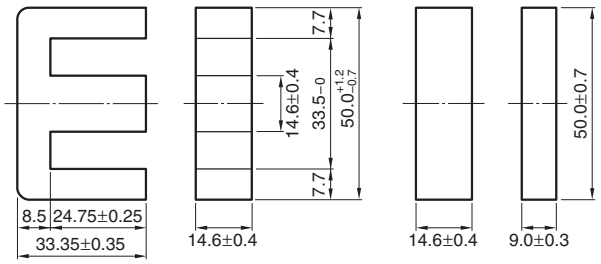


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI50-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

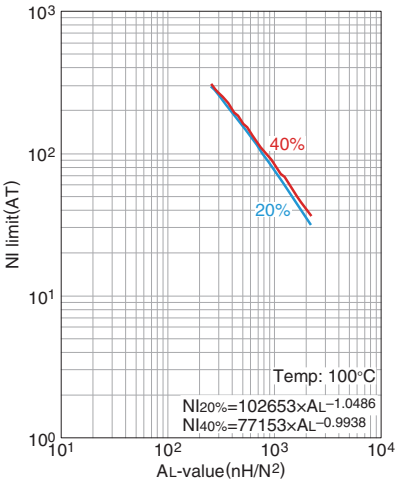
Based on JIS FEI 50.

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
0.409	94.0	230	21620	213	202	246.3	115	6110±25%	8300 min.	8.62

* Coil：ø0.35 2UEW 100Ts

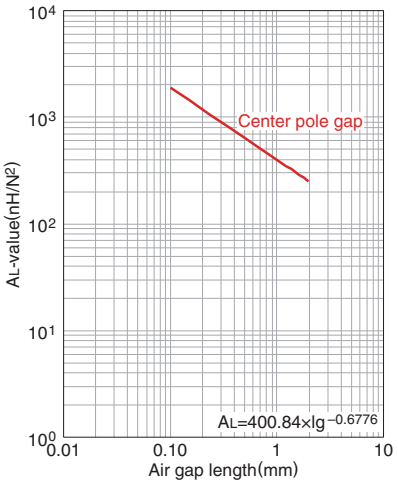
○ Calculated output power (forward converter mode): 554W (100kHz)

NI limit vs. AL-value (Typ.)



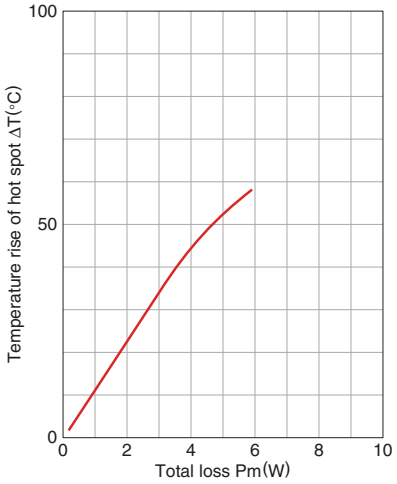
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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

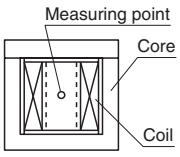


Measuring conditions
- Coil：ø0.35 2UEW 100Ts
- Frequency：1kHz
- Current level：0.5mA
- Ambient temperature：25°C

Temperature rise vs. Total loss (Typ.)

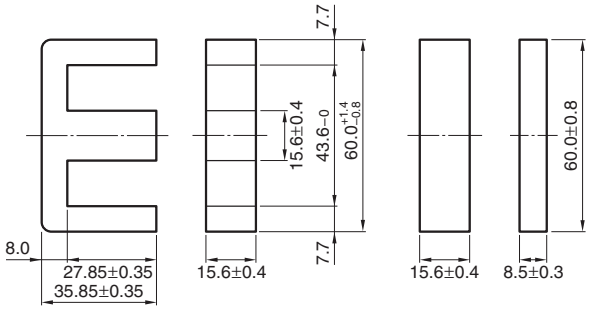


Measuring conditions
- Room space: approx. 400x300x 300cm
- Ambient temperature：25°C
- Humidity：45(%)RH.



Mn-Zn E series **Part No.: PC47EI60-Z**

SHAPES AND DIMENSIONS



Dimensions in mm

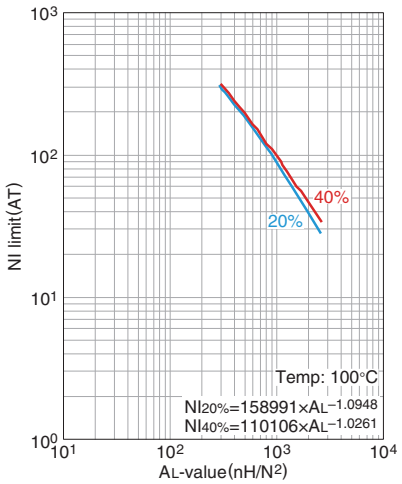
Based on JIS FEI 60.

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)	(mm^2)	(mm^3)	(mm^2)	(mm^2)	(mm^2)	(g/set)	(nH/N²)		(W)max.
								1kHz 0.5mA	100kHz 200mT	100kHz 200mT 100°C
0.441	109	247	26900	243	231	402.4	139	5670±25%	7690 min.	9.16

* Coil：ø0.35 2UEW 100Ts

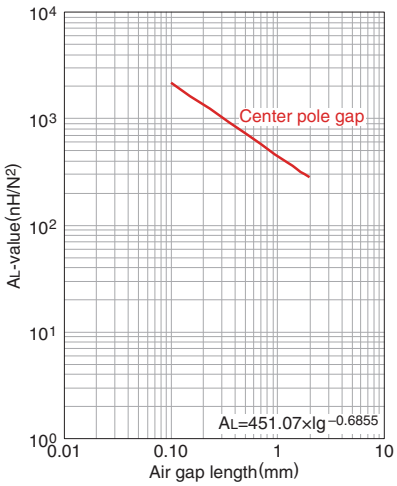
○ Calculated output power (forward converter mode): 712W (100kHz)

NI limit vs. AL-value (Typ.)



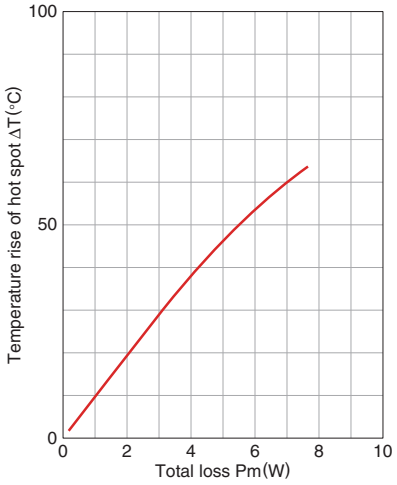
The 20% and 40% graph shows when a 20% and 40% drop from the initial AL-value has been made due to the DC superimposition.

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



Measuring conditions
- Coil：ø0.35 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.