Ferrite Cores

For High Power
High Power Cores

T, UU, EC, EIC, PQ, EE, EI, DT, SP Series

FEATURES

- Large size ferrite cores developed for reactors and transformers used in high power units.
- Please contact us for machinability of non-standard special forms.

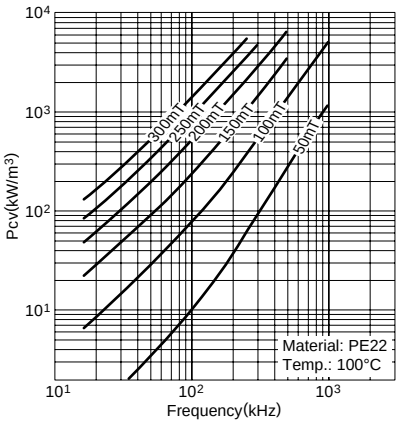
MATERIAL CHARACTERISTICS (Typical)

Material					PE22	PC40
Initial permeability		μi	[23°C]		1800	2300
Curie temperature		Tc		°C	>200	>200
Saturation magnetic flux density H=1194A/m		Bs	[23°C] [100°C]	mT	510 410	500 380
Remanent flux density		Br	[23°C]	mT	170	140
Coercive force		Hc	[23°C]	A/m	16	15
Core loss	25kHz, 200mT 100kHz, 200mT	Pcv	[100°C]	kW/m^3	80 520	70 420
Electrical resistivity		ρ		Ω-m	3	6.5
Approximate density		d_{app}		kg/m^3	4.8×10^3	4.8×10^3
Thermal expansion coefficient		α		1/K	12×10^{-6}	12×10^{-6}
Thermal conductivity		κ		W/mK	5	5
Specific heat		C_p		J/kg • K	600	600
Bending strength		δb_3		N/m^2	9×10^7	9×10^7
Young's modulus		E		N/m^2	1.2×10^{11}	1.2×10^{11}
Magnetostriction		λs			-0.6×10^{-6}	-0.6×10^{-6}

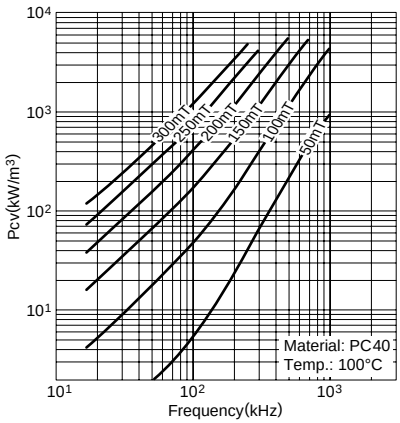
• 1(mT)=10(G),1(A/m)=0.012566(Oe)

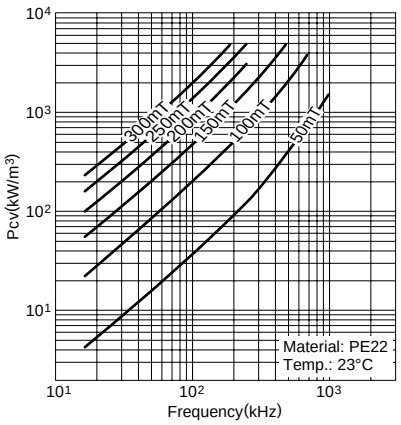
CORE LOSS vs. FREQUENCY CHARACTERISTICS

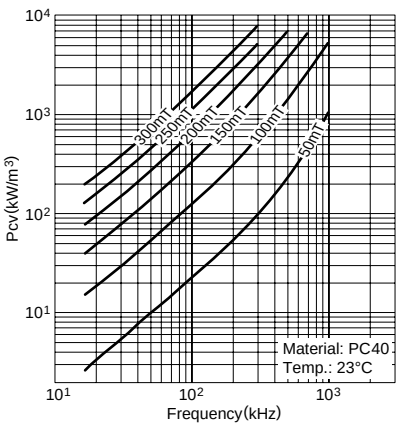
MATERIAL:PE22



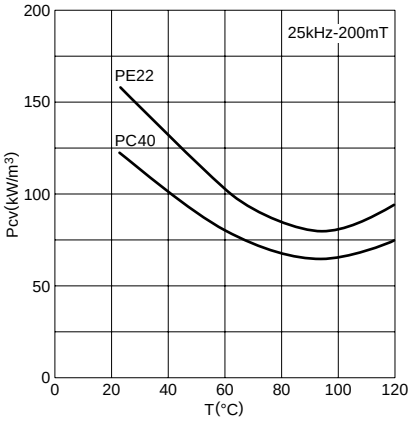
MATERIAL:PC40

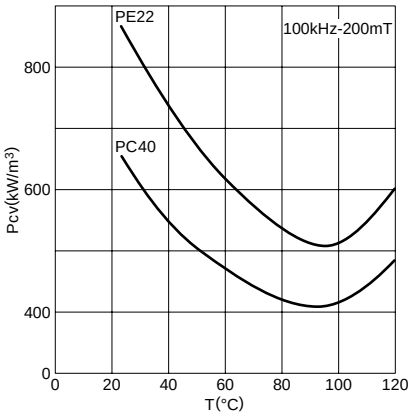






CORE LOSS vs. TEMPERATURE CHARACTERISTICS





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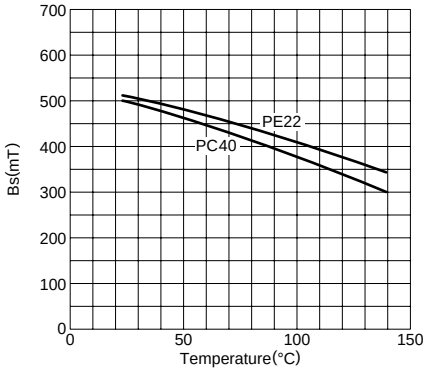
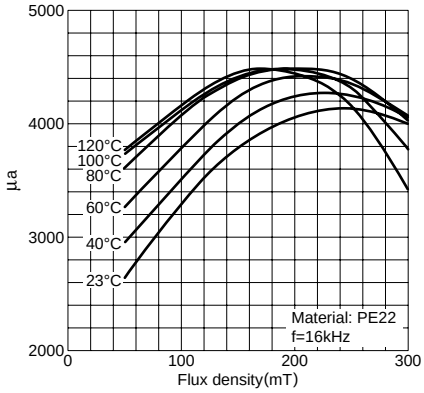
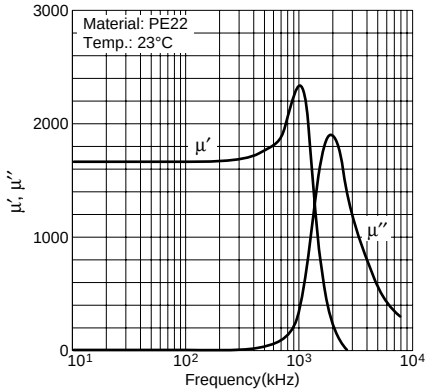
SATURATION MAGNETIC FLUX DENSITY vs. TEMPERATURE CHARACTERISTICS



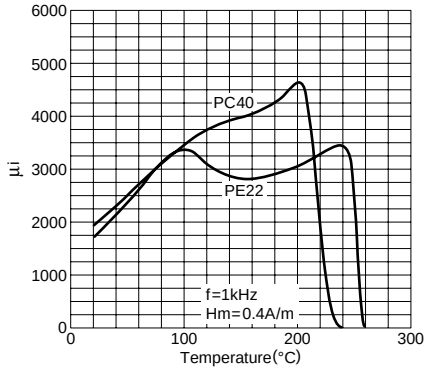
AMPLITUDE PERMEABILITY vs. SATURATION MAGNETIC FLUX DENSITY CHARACTERISTICS

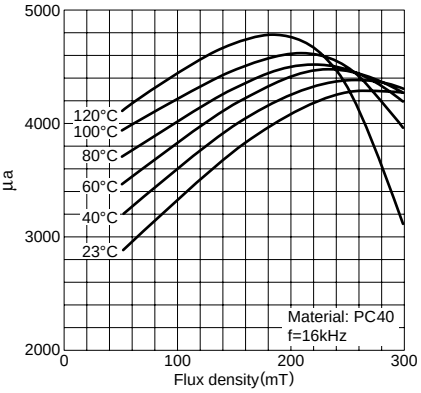


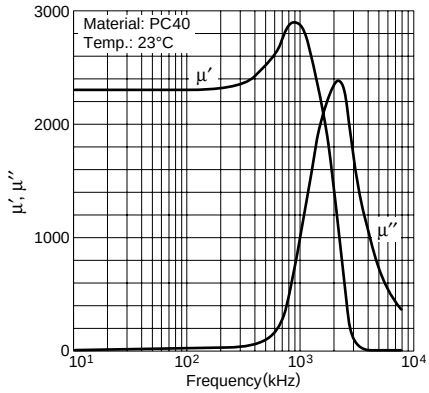
MAGNETIC PERMEABILITY vs. FREQUENCY CHARACTERISTICS



INITIAL MAGNETIC PERMEABILITY vs. TEMPERATURE CHARACTERISTICS







DIMENSIONALRESONANCE

Dimensional resonance is a phenomenon which increases loss and decreases magnetic permeability by electromagnetic standing waves when the magnetic field of the core frequency is applied.

The phenomenon appears when the maximum dimension of the cross section of the core perpendicular to the magnetic field is the integral multiple of about half of the electromagnetic wavelength λ.

$$\lambda = \frac{C}{f \times \sqrt{\mu r \times \varepsilon r}}$$

C: Electromagnetic wave speed in a vacuum(3.0×10^8m/s)

μr: Relative magnetic permeability

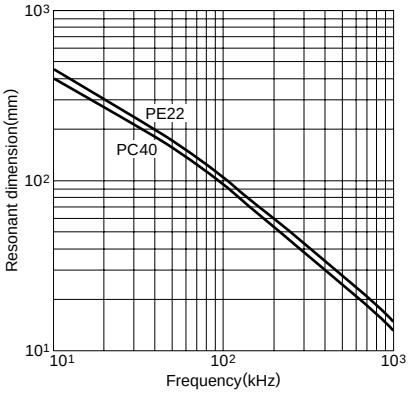
εr: Relative permissivity

f: Frequency of the applied magnetic field(electromagnetic wave)

As μe decreases by inserting into the gap, using the same core enables high frequency wave usage as indicated by the formula above.

As dimensional resonance quickly decreases magnetic permeability, design the actual frequency to avoid dimensional resonance. In the case of possible dimensional resonance, it can be protected against by dividing the core in the magnetic circuit direction and bonding them.

RESONANCE DIMENSION vs. TEMPERATURE CHARACTERISTICS



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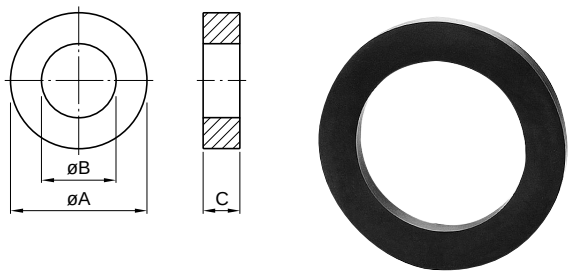
T CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS



PRODUCT IDENTIFICATION

PE22 T 51 × 13 × 31
(1) (2) (3) (4) (5)

(1) Material name
(2) Shape
(3) Dimension A
(4) Thickness
(5) Dimension B

Part No.	AL*(nH/N^2) ±25%	Dimensions (mm)			Core factor					Weight (g)
		A	B	C	C_1(mm^{-1})	$C_2 \times 10^{-2}$(mm^{-3})	Ae(mm^2)	Le(mm)	Ve(mm^3)	
PE22 T51X13X31	2330	51±1	31±0.6	13±0.5	0.97084	0.76235	127	124	15740	80
PC40 T51X13X31	2980									
PE22 T62.5X13.5X39	2290	62.5±1.2	39±0.8	13.5±0.5	0.98689	0.63377	156	154	23930	121
PC40 T62.5X13.5X39	2930									
PE22 T73X20X45	3480	73±1.5	45±0.9	20±0.5	0.64936	0.23647	275	178	48970	249
PC40 T73X20X45	4450									
PE22 T75X20X15	11590	75±1.5	15±0.3	20±0.5	0.19520	0.04019	486	95	46040	407
PC40 T75X20X15	14810									
PE22 T80X20X50	3380	80±1.6	50±1	20±0.5	0.66842	0.22694	295	197	57990	294
PC40 T80X20X50	4320									
PE22 T96X20X70	2270	96±1.9	70±1.4	20±0.5	0.99464	0.38574	258	256	66130	325
PC40 T96X20X70	2910									
PE22 T124X20X100	1550	124±2.5	100±2	20±0.5	1.46045	0.61087	239	349	83480	405
PC40 T124X20X100	1980									
PE22 T137X20X112	1450	137±3	112±2.2	20±0.5	1.55924	0.62581	249	388	96800	469
PC40 T137X20X112	1850									
PE22 T150X20X70	5490	150±3	70±1.4	20±0.5	0.41221	0.05407	762	314	239580	1330
PC40 T150X20X70	7010									
PE22 T202X20X70	7630	202±4	70±1.5	20±0.5	0.29644	0.02464	1203	357	429080	2710
PC40 T202X20X70	9750									
PE22 T310X30X210	4210	310±6.2	210±4.2	30±0.5	0.53776	0.03631	1481	797	1179800	5880
PC40 T310X30X210	5370									

* Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m

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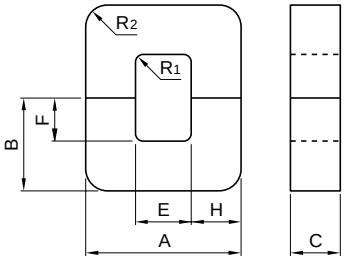
High Power Cores

UU CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS



PRODUCT IDENTIFICATION

PE22	UU	79 × 129 × 31.5
(1)	(2)	(3) (4) (5)

(1) Material name
(2) Shape
(3) Dimension A
(4) Dimension B×2
(5) Thickness

Part No.	AL*1(nH/N²) ±25%	Dimensions (mm) A	B×2	C	E	F×2	H	R1	R2	E×2F(mm²)
PE22 UU79X129X31.5 PC40 UU79X129X31.5	4790 6030	79±2.5	129±2.5	31.5±1	34min.	85±1.5	22±1	5	22	2980
PE22 UU100X151X30 PC40 UU100X151X30	5540 6990	100±3	151±2.5	30±1	39min.	90±1.5	30±1.5	5	30	3600
PE22 UU100X160X20 PC40 UU100X160X20	3460 4360	100±3	160±2.5	20±1	39min.	100±1.5	30±1.5	5	35	4000
PE22 UU101X115X25.4 PC40 UU101X115X25.4	4480 5640	101±3	115±2.5	25.4±1	50min.	64±1.5	25±1	5	25	3260
PE22 UU120X160X20 PC40 UU120X160X20	3140 3960	120±3	160±2.5	20±1	59min.	100±1.5	30±1.5	5	35	6000
PE22 UU120X310X20*2 PC40 UU120X310X20*2	— —	120±3	310±2.5	20±1	59min.	250±1.5	30±1.5	5	35	15000

*1 Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m
*2 Stacked 2U cores.

Part No.	Core factor C1(mm⁻¹)	C2×10⁻²(mm⁻³)	Ae(mm²)	Le(mm)	Ve(mm³)	Weight(g)
PE22 UU79X129X31.5 PC40 UU79X129X31.5	0.44605	0.06437	693	309	214220	1080
PE22 UU100X151X30 PC40 UU100X151X30	0.38801	0.04241	915	355	324860	1630
PE22 UU100X160X20 PC40 UU100X160X20	0.62375	0.10396	600	374	224550	1130
PE22 UU101X115X25.4 PC40 UU101X115X25.4	0.47757	0.07373	648	309	200350	1000
PE22 UU120X160X20 PC40 UU120X160X20	0.69041	0.11507	600	414	248550	1240
PE22 UU120X310X20 PC40 UU120X310X20	1.19041	0.19840	600	714	428550	2110

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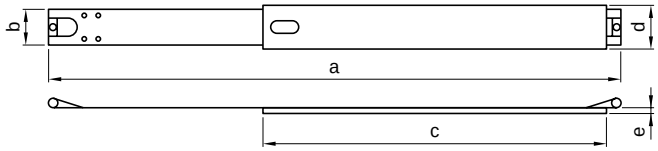
High Power Cores

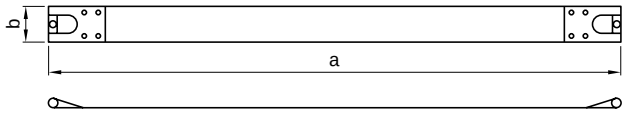
UU CORE BAND

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS

A-type band



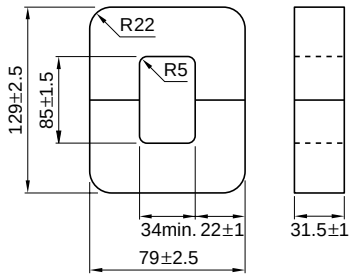
B-type band



•A-type is the band with a board and B-type is the band without a board.

Part No.	Dimensions (mm)				
	a	b	c	d	e
FHH 79X129A	370	27	180	31.5	3
FHH 79X129B	370	27	—	—	—
FHH 100X151A	435	27	190	28	3
FHH 100X151B	435	30	—	—	—
FHH 100X160A	482	18	206	20	3
FHH 100X160B	482	18	—	—	—
FHH 101X115A	378	23.4	140	25.4	3
FHH 101X115B	378	23.4	—	—	—
FHH 120X160A	482	18	206	20	3
FHH 120X160B	482	18	—	—	—
FHH 120X310A	782	18	356	20	3
FHH 120X310B	782	18	—	—	—

CORE CHARACTERISTIC EXAMPLE

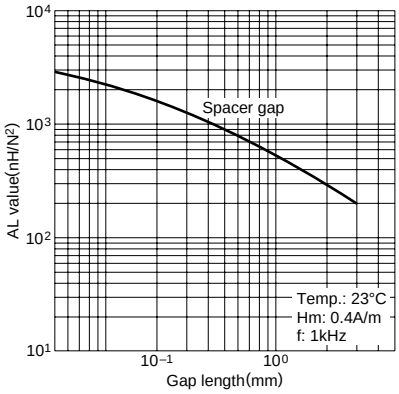


Dimensions in mm

Parameter		Unit	
Core constant	C_1	mm^{-1}	0.44605
	$C_2 \times 10^{-2}$	mm^{-3}	0.06437
Effective magnetic pass length	le	mm	309
Effective cross-sectional area	Ae	mm^2	693
Effective core volume	Ve	mm^3	214220
Cross-sectional center leg area	Ac	mm^2	693
Minimum cross-sectional center leg area*	Amin.	mm^2	693LB
Cross-sectional winding area of core	Acw	mm^2	2980
Weight	W	g	1080

* The symbol after Amin.:Value shows the position of the minimum cross section. C is for mid-leg, L for external leg and B for back.

PE22UU79X129X31.5



TDK

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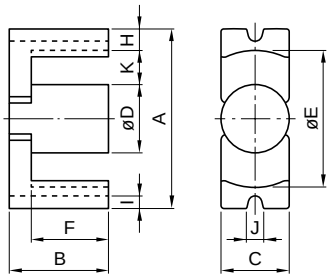
EC CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS

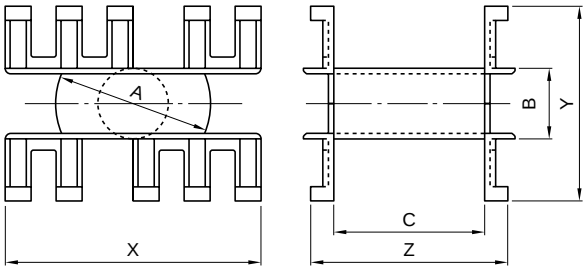


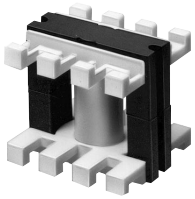
PRODUCT IDENTIFICATION

PE22 EU 90 – Z
(1) (2) (3) (4)

(1) Material name
(2) Shape
(3) Dimension A
(4) Gap dimension(Z=0)

EC CORE BOBBIN





Part No.	AL*(nH/N²) ±25%	Dimensions (mm) A	B×2	C	D	E	F×2	H	I	J	K	K×2F(mm²)
PE22 EC70-Z PC40 EC70-Z	3950 4890	70±1.7	69±1	16.4±0.5	16.4±0.5	43.3min.	45.5±1	12.75±0.4	5.2±0.2	4.75±0.3	14.1	639
PE22 EC90-Z PC40 EC90-Z	6340 7940	90±1.8	90±1.3	30±1	30±1	68.5min.	71±1	10±0.6	5.5±0.2	6±0.3	20	1420
PE22 EC120-Z PC40 EC120-Z	6450 8090	120±2	101±1.3	30±1	30±1	93.3min.	71±1	12.5±0.7	5.5±0.2	6±0.3	32.5	2307

* Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m

Part No.	Core factor C1(mm⁻¹)	C2×10⁻²(mm⁻³)	Ae(mm²)	Le(mm)	Ve(mm³)	Weight (g)
PE22 EC70-Z PC40 EC70-Z	0.5260563	0.18635	282	149	41920	250
PE22 EC90-Z PC40 EC90-Z	0.3561571	0.05690	626	223	139560	635
PE22 EC120-Z PC40 EC120-Z	0.3448813	0.04464	773	266	205810	986

EC CORE BOBBIN

Part No.	Dimensions (mm) øA	øB	C	X	Y	Z	t*	Cross-sectional winding area Aw(mm²)	Average winding length lw(mm)	Weight (g)	Material
BEC-70-5116	42.7	19.5	41.45	70	56.3	57.8	1.13	471.4	98	19	PBT
BEC-90-0112	67.6	35.4	65.3	80	77	89.8	1.9	1047	162	8.2	PBT

* Bobbin minimum thickness
• Soldering condition: 350°C max./2s

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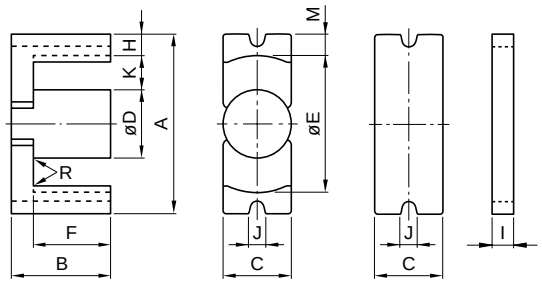
EIC CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS



PRODUCT IDENTIFICATION

PE22	EIC	90	Z
(1)	(2)	(3)	(4)

(1) Material name
(2) Shape
(3) Dimension A
(4) Gap dimension(Z=0)

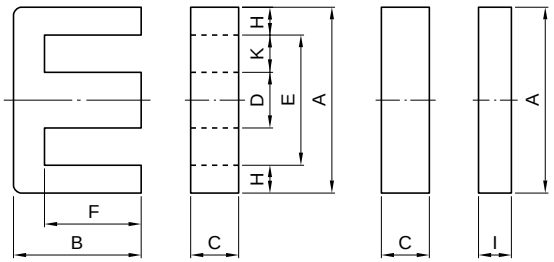
Part No.	AL*(nH/N²) ±25%	Dimensions (mm)											
		A	B+I	C	D	E	F	H	I	M	J	R	K
PE22 EIC90-Z PC40 EIC90-Z	8680 10770	90±1.8	55.05±1.3	30±1	30±1	68.5min.	35.5±0.5	10±0.6	10±0.3	5.5±0.2	5.5±0.3	1max.	20
PE22 EIC120-Z PC40 EIC120-Z	9040 11270	120±2	65.5±1.3	30±1	30±1	93.3min.	35.5±0.5	12.5±0.7	15±0.6	5.5±0.3	6±0.3	1.5max.	32.5

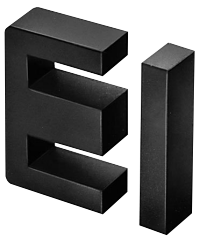
* Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m

Part No.	Core factor					Weight (g)
	C_1(mm^{-1})	$C_2\times10^{-2}$(mm^{-3})	Ae(mm²)	Le(mm)	Ve(mm³)	
PE22 EIC90-Z PC40 EIC90-Z	0.2255	0.0336	671	151	101599	469
PE22 EIC120-Z PC40 EIC120-Z	0.2321	0.0258	792	208	187081	747

EI CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS





PRODUCT IDENTIFICATION

PE22	EI	70	-	Z
(1)	(2)	(3)		(4)

(1) Material name
(2) Shape
(3) Dimension A
(4) Gap dimension(Z=0)

Part No.	AL*(nH/N²) ±25%	Dimensions (mm)									
		A	B+I	C	D	E	F	H	I	K	K×F(mm²)
PE22 EI70-Z PC40 EI70-Z	5820 7200	70±1.5	56±1	19.5±0.5	19.5±0.5	48.5min.	35.5±0.5	10±0.5	10.5±0.5	15.3	543

* Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m

Part No.	Core factor					Weight (g)
	C_1(mm^{-1})	$C_2\times10^{-2}$(mm^{-3})	Ae(mm²)	Le(mm)	Ve(mm³)	
PE22 EI70-Z PC40 EI70-Z	0.35211	0.09032	390	137	53520	266

Ferrite Cores

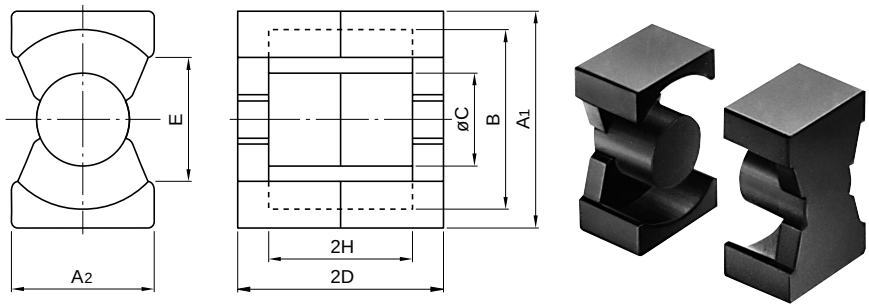
T, UU, EC, EIC, PQ, EE, EI, DT, SP Series

For High Power

High Power Cores

PQ CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS



PRODUCT IDENTIFICATION

PE22 PQ 59 - Z

(1) (2) (3) (4)

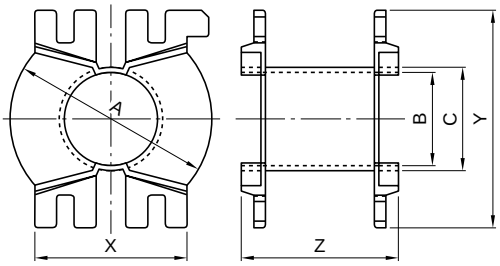
(1) Material name

(2) Shape

(3) Dimension A_1

(4) Gap dimension(Z=0)

PQ CORE BOBBIN



Part No.	AL*(nH/N²) ±25%	Dimensions (mm)						
		A_1	A_2	B	øC	2D	Emin.	2H
PE22 PQ59 PC40 PQ59	10540 12810	59±0.8	42±0.8	51.5min.	24±0.5	26.8±0.4	42min.	14.2±0.4
PE22 PQ79 PC40 PQ79	7940 9790	78.5±1.5	42±0.8	69min.	25.5±0.5	39.4±0.6	60min.	25.8±1
PE22 PQ100 PC40 PQ100	14570 18210	107±2	70±1.5	93.7min.	41±1	87±1.5	72.5min.	56±1.5

* Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m

Part No.	Core factor					Weight(g)
	$C_1(mm^{-1})$	$C_2 \times 10^{-2}(mm^{-3})$	$Ae(mm^2)$	Le(mm)	$Ve(mm^3)$	
PE22 PQ59 PC40 PQ59	0.17520	0.038292	458	80	36700	185
PE22 PQ79 PC40 PQ79	0.24730	0.051530	480	119	56900	304
PE22 PQ100 PC40 PQ100	0.14260	0.009989	1428	204	290600	1560

PQ CORE BOBBIN

Part No.	Dimensions (mm)					Cross-sectional winding area $Aw(mm^2)$	Average winding length lw(mm)	Material
	øA	øB	X	Y	Z			
BPQ59-0112	50.6	25.1	40	58	20.2	115	124	PBT
BPQ79-0112	68	26.7	57.5	78	32	377	154	PBT
BPQ100-0112	92.5	42.7	69.5	100	71.8	1140	218	PBT

• Soldering condition: 350°C max./2s

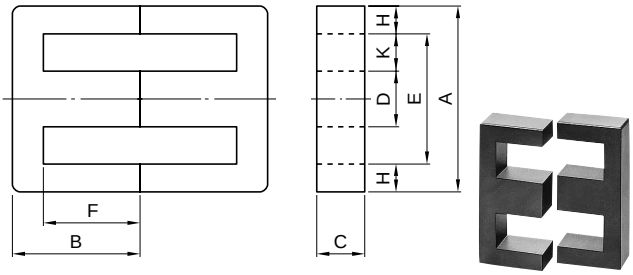
Ferrite Cores

For High Power
High Power Cores

T, UU, EC, EIC, PQ, EE, EI, DT, SP Series

EE CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS

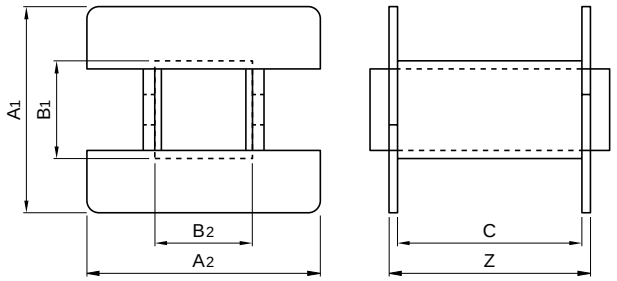


PRODUCT IDENTIFICATION

$$\frac{\text{PE22}}{(1)}\ \frac{\text{EE}}{(2)}\ \frac{320\times250\times20\text{ - Z}}{(3)\ (4)\ (5)\ (6)}$$

(1) Material name
(2) Shape
(3) Dimension A
(4) Dimension Bx2
(5) Thickness
(6) Gap dimension(Z=0)

EE CORE BOBBIN



Part No.	AL*1(nH/N²) ±25%	Dimensions (mm) A	B×2	C	D	E	F×2	H	K	K×2F(mm²)
PE22 EE70-Z PC40 EE70-Z	3390 4910	70±1.5	91±1	19.5±0.5	19.5±0.5	48.5min.	71±1	10±0.5	15.3	1086
PE22 EE80X76-Z PC40 EE80X76-Z	4590 5720	80±1.5	76±1	20±0.5	20±0.5	58.5min.	55±0.8	10±0.5	20	1100
PE22 EE90-Z PC40 EE90-Z	5960 7380	90±2	56.4±1	16.5±0.5	25±1	63min.	30.4±1	12.5±0.5	20	608
PE22 EE320X250X20-Z*2 PC40 EE320X250X20-Z*2	— —	320±5	250±1	20±1	100±2.4	217min.	150±3	50±1	60	7950

*1 Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m
*2 EE320x250x20-Z is a bonded product.

Part No.	Core factor C1(mm⁻¹)	C2×10⁻²(mm⁻³)	Ae(mm²)	Le(mm)	Ve(mm³)	Weight (g)
PE22 EE70-Z PC40 EE70-Z	0.52779	0.13669	386	204	78690	394
PE22 EE80X76-Z PC40 EE80X76-Z	0.44878	0.11058	406	182	73910	372
PE22 EE90-Z PC40 EE90-Z	0.33583	0.08009	419	141	59050	306
PE22 EE320X250X20-Z PC40 EE320X250X20-Z	0.28854	0.01443	2000	577	1154160	6150

EE CORE BOBBIN

Part No.	Dimensions (mm) A1	A2	B1	B2	C	Z	Cross-sectional winding area Aw(mm²)	Average winding length lw(mm)	Weight (g)	Material
BE-80-S	56.56	60.92	25.52	25.52	48.16	52.3	747	168	32	PBT
BE-80-W	56.56	81.42	25.52	46.02	48.16	52.3	747	209	41	PBT

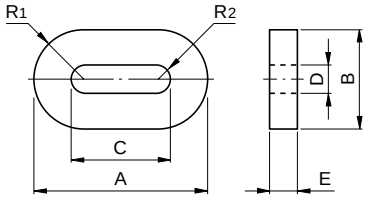
Ferrite Cores

For High Power
High Power Cores

T, UU, EC, EIC, PQ, EE, EI, DT, SP Series

DT CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS



R_1=1/2B
R_2=1/2D

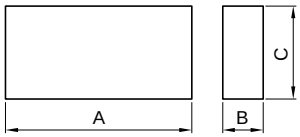
Part No.	AL*(nH/N²) ±25%	Dimensions (mm)				
		A	B	C	D	E
PE22 DT138X20X58 PC40 DT138X20X58	6680 8540	138±2.8	104±2.1	58±1.5	24.7±0.5	20±0.4
PE22 DT200X20X100 PC40 DT200X20X100	5630 7200	200±5	130±3	102±2.5	31.5±1	20±0.4

* Measuring condition: T=23°C, f=1kHz, Hm=0.4A/m

Part No.	Core factor					Weight (g)
	C_1(mm^{-1})	$C_2\times10^{-2}$(mm^{-3})	Ae(mm²)	Le(mm)	Ve(mm³)	
PE22 DT138X20X58 PC40 DT138X20X58	0.33806	0.04235	798	270	215000	1020
PE22 DT200X20X100 PC40 DT200X20X100	0.40121	0.04087	982	394	387000	1870

SP CORE

CORE SHAPES AND DIMENSIONS/CHARACTERISTICS



Part No.	Dimensions (mm)		
	A	B	C
PE22 SP135X65X20 PC40 SP135X65X20	135±2.5	20±0.5	65±1.5
PE22 SP185X110X20 PC40 SP185X110X20	185±4.5	20±0.5	110±2
PE22 SP250X155X20 PC40 SP250X155X20	250±5	20±0.5	155±3

PRODUCT IDENTIFICATION

PE22 (1) SP (2) 135 (3) × 65 (4) × 20 (5)

(1) Material name
(2) Shape
(3) Dimension A
(4) Dimension B
(5) Dimension C