Ferrite

For Switching Power Supplies
Introduction

Since its outset in 1935, in the wake of the invention of ferrite, TDK has aimed to develop its world leading electronic technology in both material development and production. This accumulated expertise in fine structural control technology has resulted in high performance ferrite components. These components have recently been in greater demand for electronic equipment requiring reduction in size and weight.

TDK Ferrite Division engineers have successfully explored every avenue of high performance ferrites, aiming to produce self-contained energy sources for microelectronic equipment.

To this end, TDK has developed high frequency power ferrite, such as PC33,PC40,PC44,PC45,PC46,PC47 and PC50 that are identifiable by their excellent magnetic characteristics. It is these high reliability ferrite components that have largely contributed to reducing the size of switching power supplies and DC to DC Converters for micro-electronic equipment.

Other TDK endeavors deserving mention are ferrite for EMI filters and common mode chokes with excellent frequency characteristics. Not only have TDK's researchers overcome the theoretical limiting value of the high μ material's operating frequency, but they have also succeeded in developing new materials HS72 and HS10 those are characterized by its high impedance at high frequencies.

In order for you to take full advantage of these and other materials shown in this booklet, TDK has developed a range of cores and accessories to meet the need for miniature high performance switching power supplies and DC to DC Converters. TDK offers a comprehensive range of materials and core shapes to meet all of your power requirements.

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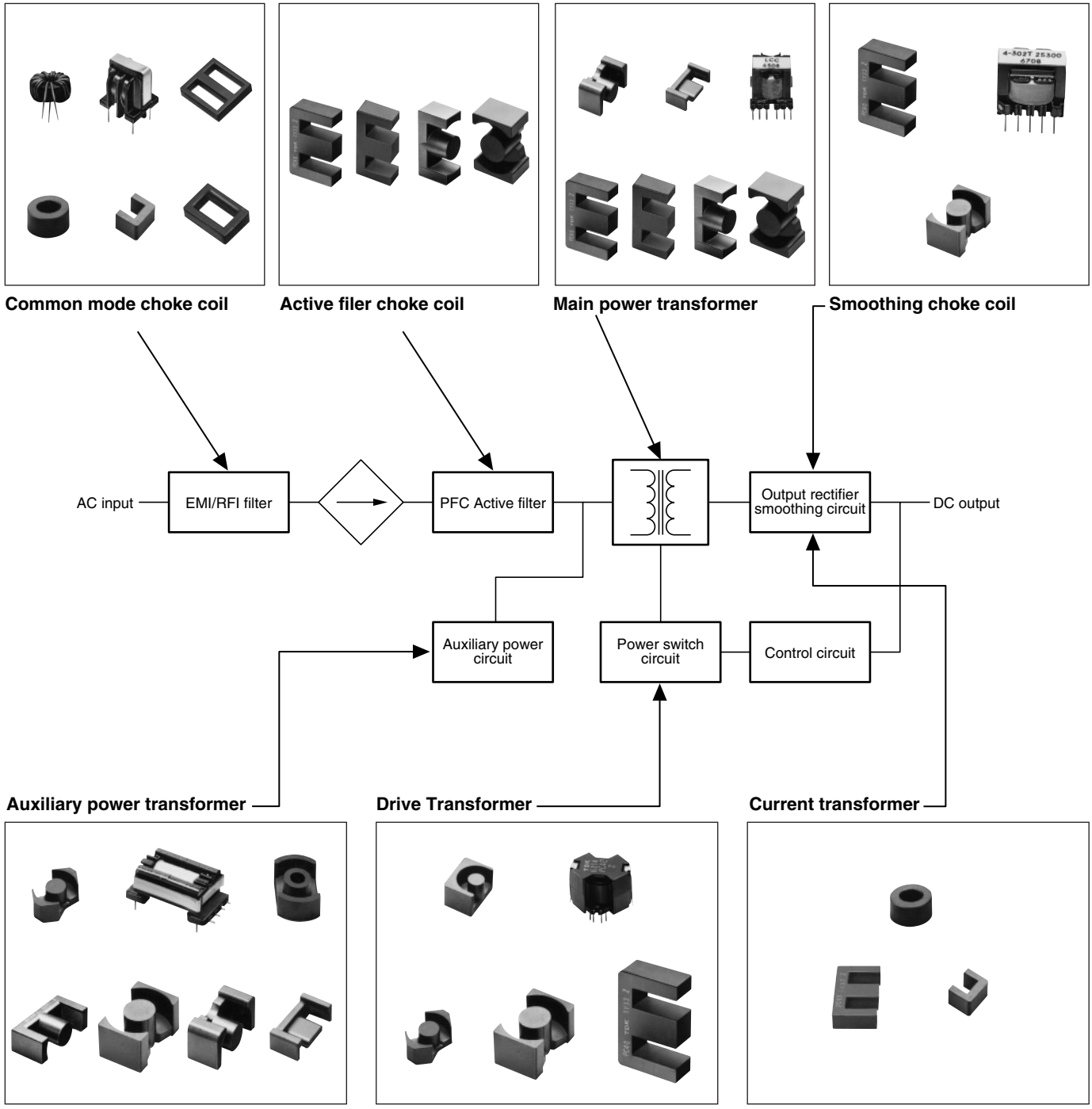
For Switching Power Supplies
Circuit Example

SINGLE FORWARD CONVERTER



Notes: • LP and EPC cores are ideal for use in thin transformers.
• LP cores are available in .5 and .7 inches in height (when mounted).
• EP cores are available in .5 and .65 inches in height (when mounted).

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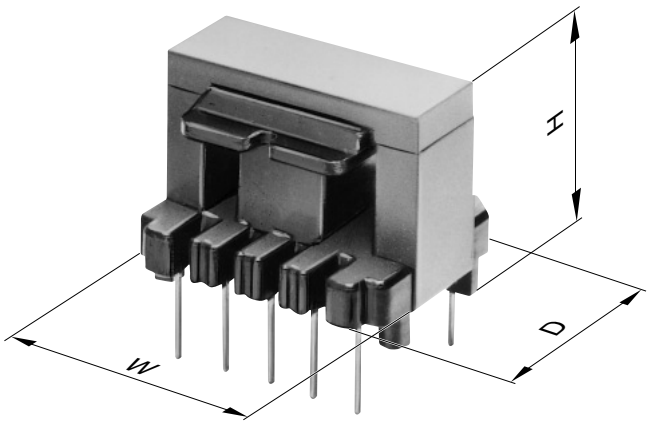
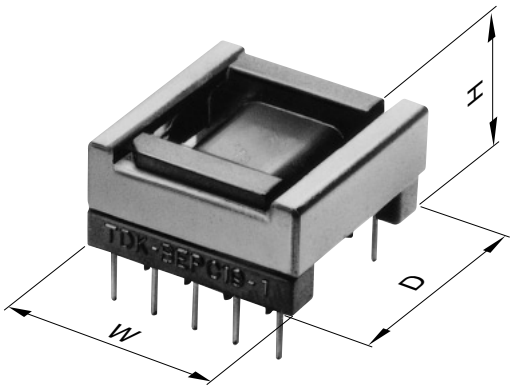
For Switching Power Supplies
Selected Items of Legend

$C_1 = \Sigma \frac{\ell}{A}$	Core constant mm^{-1}
Ae	Effective cross-sectional area, mm^2
ℓe	Effective magnetic path length, mm
Ve	Effective core volume mm^3
Acp	Cross-sectional center leg/pole area, mm^2
Acp min.	Minimum cross-sectional center pole area, mm^2
Acw	Cross-sectional winding area of core, mm^2
Aw	Cross-sectional winding area of bobbin, mm^2
ℓw	Average length of turns around bobbin, mm
t	Minimum thickness of bobbin inside which core is placed, including flanges, mm
W	Bobbin-core assembly dimensions
D	Bobbin-core assembly dimensions
H	Bobbin-core assembly dimensions





Ferrite

For Switching Power Supplies
Material Characteristics

MATERIAL CHARACTERISTICS(for Transformer and Choke)

Material					PC40	PC44	PC47	PC50
Initial permeability	μi				2300±25%	2400±25%	2500±25%	1400±25%
Amplitude permeability	μa				3000 min.	3000 min.		
Core loss volume density (Core loss)* [B=200mT]	Pcv	kW/m^3	25kHz sine wave	25°C	120			
				60°C	80			
				100°C	70			
				120°C	85			
			100kHz sine wave	25°C	600	600	600	130**
				60°C	450	400	400	80**
				100°C	410	300	250	80**
				120°C	500	380	360	110**
Saturation magnetic flux density* [H=1194A/m]	Bs	mT		25°C	510	510	530	470
				60°C	450	450	480	440
				100°C	390	390	420	380
				120°C	350	350	390	350
Remanent flux density*	Br	mT		25°C	95	110	180	140
				60°C	65	70	100	110
				100°C	55	60	60	98
				120°C	50	55	60	100
Coercive force*	Hc	A/m		25°C	14.3	13	13	36.5
				60°C	10.3	9	9	31.0
				100°C	8.8	6.5	6	27.2
				120°C	8	6	7	26.0
Curie temperature	Tc	°C			>215	>215	>230	>240
Density*	db	kg/m^3			4.8×10^3	4.8×10^3	4.9×10^3	4.8×10^3
Electrical resistivity*	ρv	Ω • m			6.5	6.5	4.0	30

* *Average value*
** *500kHz, 50mT*

Material					PC45	PC46	PC33
Initial permeability	μi				2500±25%	3200±25%	1400±25%
Amplitude permeability	μa						
Core loss volume density (Core loss)* [B=200mT]	Pcv	kW/m^3	25kHz sine wave	25°C			
				60°C			
				100°C			
				120°C			
			100kHz sine wave	25°C	570	350	1100
				60°C	250(75°C)	250(45°C)	800
				100°C	460	660	600
				120°C	650	760	680
Saturation magnetic flux density* [H=1194A/m]	Bs	mT		25°C	530	520	520
				60°C	480	470	490
				100°C	420	410	440
				120°C	390	380	420
Remanent flux density*	Br	mT		25°C	120	80	220
				60°C	80	80	150
				100°C	80	130	100
				120°C	110	140	100
Coercive force*	Hc	A/m		25°C	12	10	23
				60°C	9	9	17
				100°C	8	10	14
				120°C	9	9	14
Curie temperature	Tc	°C			>230	>230	>290
Density*	db	kg/m^3			4.8	4.8	4.8
Electrical resistivity*	ρv	Ω • m			3.0	3.0	2.5

* *Average value*

Ferrite

For Switching Power Supplies
Material Characteristics

MATERIAL CHARACTERISTICS(for Common mode Choke)

Material				HS52	HS72	HS10
Initial permeability	μi			5500±25%	7500±25% (2000min. at 500kHz)	10000±25%
Relative loss factor*	tanδ/μi	×10^{-6}		10(100kHz)	30(100kHz)	30(100kHz)
Saturation magnetic flux density* [H=1194A/m]	Bs	mT	25°C	410	410	380
Remanent flux density*	Br	mT	25°C	70	80	120
Coercive force*	Hc	A/m	25°C	6	6	5
Curie temperature	Tc	°C		>130	>130	>120
Density*	db	kg/m^3		4.9×10^3	4.9×10^3	4.9×10^3
Electrical resistivity*	ρv	Ω • m		1	0.2	0.2

* *Average value*

MATERIAL CHARACTERISTICS(for Telecommunication)

Material				H5A	H5B2	H5C2	H5C3
Initial permeability	μi			3300$^{+40\%}_{-0\%}$	7500±25%	10000±30%	15000±30%
Relative loss factor	tanδ/μi	×10^{-6}		<2.5(10kHz) <10(100kHz)	<6.5(10kHz)	<7.0(10kHz)	<7.0(10kHz)
Temperature factor of initial permeability	αμir	×10^{-6}	–30 to +20°C 0 to 20°C 20 to 70°C	–0.5 to 2.0 –0.5 to 2.0	0 to 1.8 0 to 1.8	–0.5 to 1.5 –0.5 to 1.5	–0.5 to 1.5 –0.5 to 1.5
Saturation magnetic flux density* [H=1194A/m]	Bs	mT	25°C	410	420	400	360
Remanent flux density*	Br	mT	25°C	100	40	90	105
Coercive force*	Hc	A/m	25°C	8.0	5.6	7.2	4.4
Curie temperature	Tc	°C		>130	>130	>120	>105
Hysteresis material constant	η_B	$\frac{10^{-6}}{mT}$		<0.8	<1.0	<1.4	<0.5
Disaccommodation factor	D_F	×10^{-6}		<3	<3	<2	<2
Density*	db	kg/m^3		4.8×10^3	4.9×10^3	4.9×10^3	4.95×10^3
Electrical resistivity*	ρv	Ω • m		1	0.1	0.15	0.15

* *Average value*

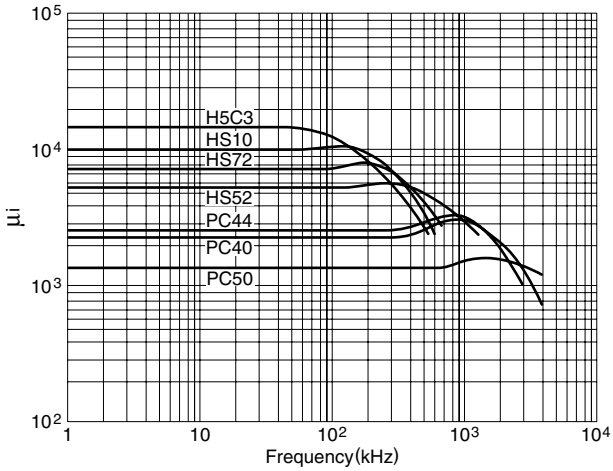
Material				HP5	DN40	DN70
Initial permeability	μi			5000±20%	4000±25%	7500±25%
Relative loss factor	tanδ/μi	×10^{-6}		<3.5(10kHz)	<2.5(10kHz)	<2.0(10kHz)
Temperature factor of initial permeability	αμir	×10^{-6}	–30 to +20°C 0 to 20°C 20 to 70°C	 ±12.5% ±12.5%	–0.5 to 2.0 –0.5 to 2.0	–0.5 to 1.5 –0.5 to 1.5
Saturation magnetic flux density* [H=1194A/m]	Bs	mT	25°C	400	405	390
Remanent flux density*	Br	mT	25°C	65	95	45
Coercive force*	Hc	A/m	25°C	7.2	8.0	3.5
Curie temperature	Tc	°C		>140	>130	>105
Hysteresis material constant	η_B	$\frac{10^{-6}}{mT}$		<0.4	<0.8	<0.2
Disaccommodation factor	D_F	×10^{-6}		<3	<3	<2.5
Density*	db	kg/m^3		4.8×10^3	4.8×10^3	5.0×10^3
Electrical resistivity*	ρv	Ω • m		0.15	1.0	0.3

* *Average value*

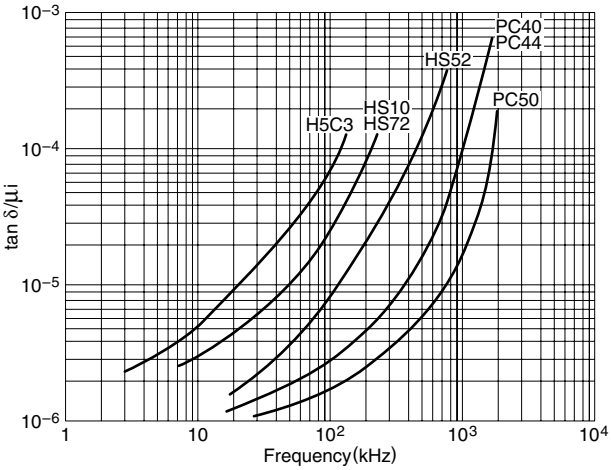
Ferrite

For Switching Power Supplies
Material Characteristics

μi vs. Frequency Characteristics

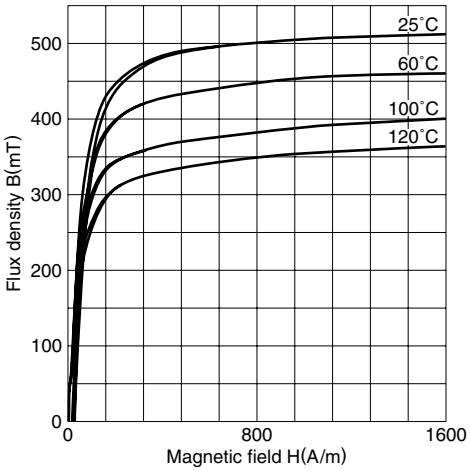


tanδ/μi vs. Frequency Characteristics

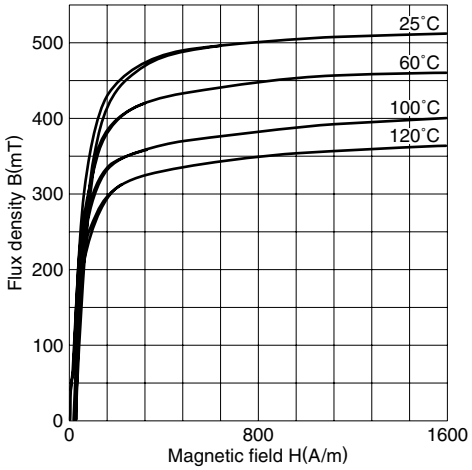


Magnetization Curves (Typical)

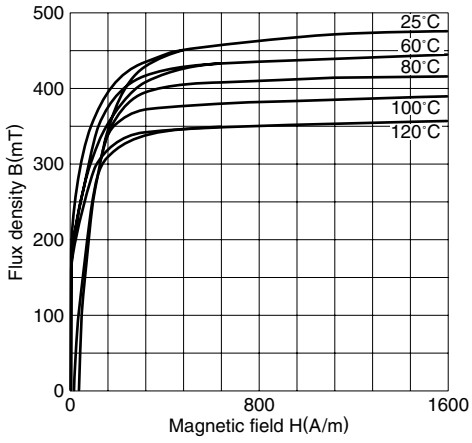
Material: PC40



Material: PC44



Material: PC50

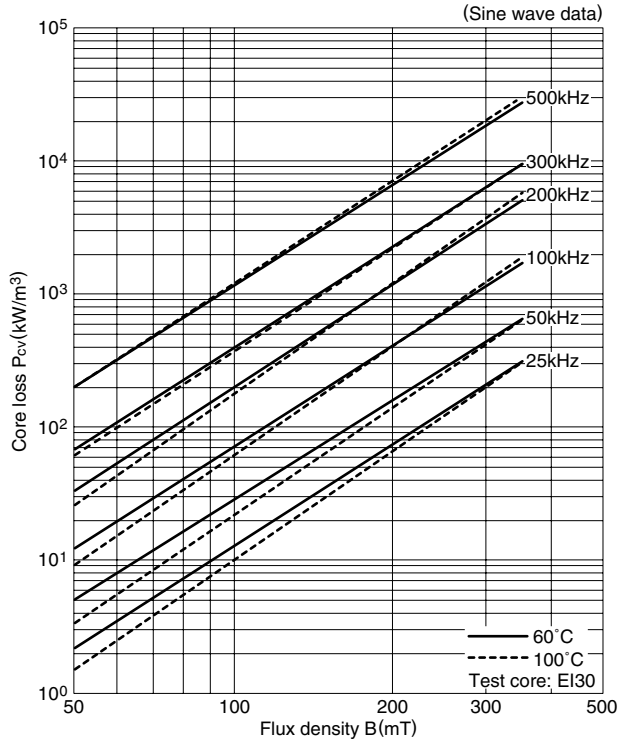


Ferrite

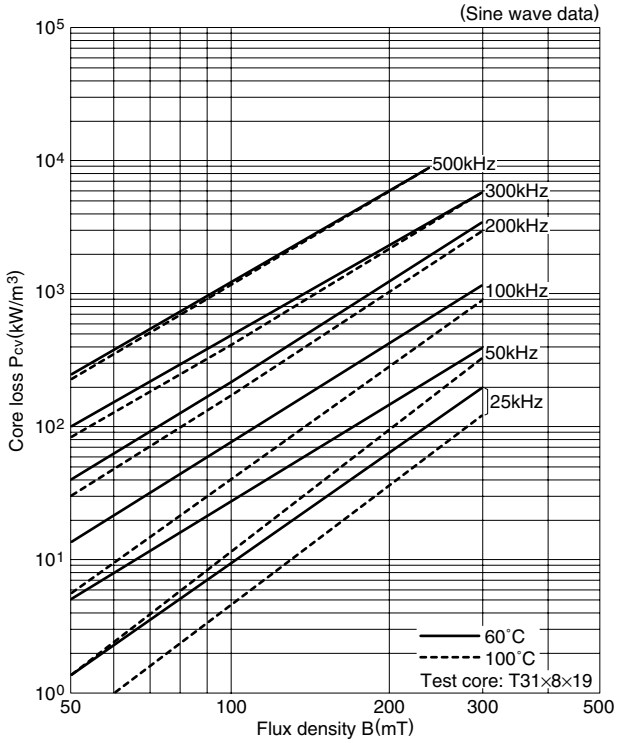
For Switching Power Supplies
Material Characteristics

Core Loss (Typical)

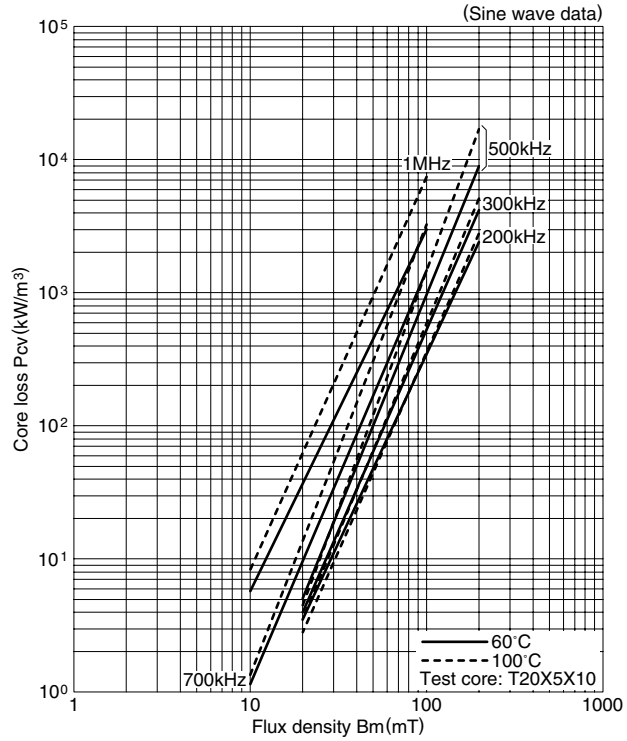
Material: PC40



Material: PC44



Material: PC50

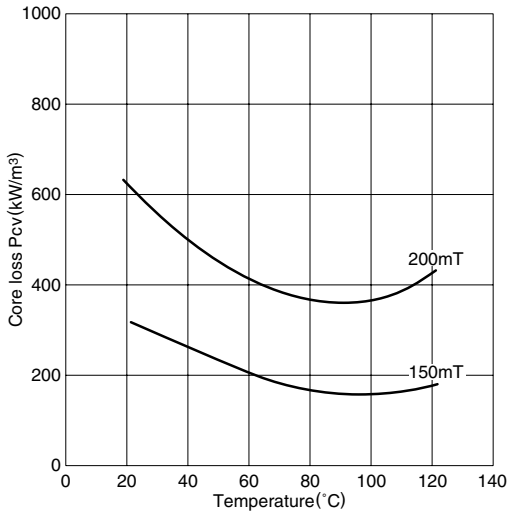


Ferrite

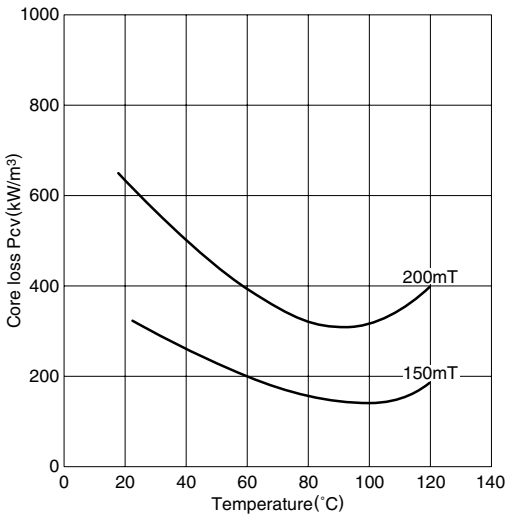
For Switching Power Supplies
Material Characteristics

Temperature Dependence of Core Loss (Typical)

Material: PC40 (Frequency: 100kHz)

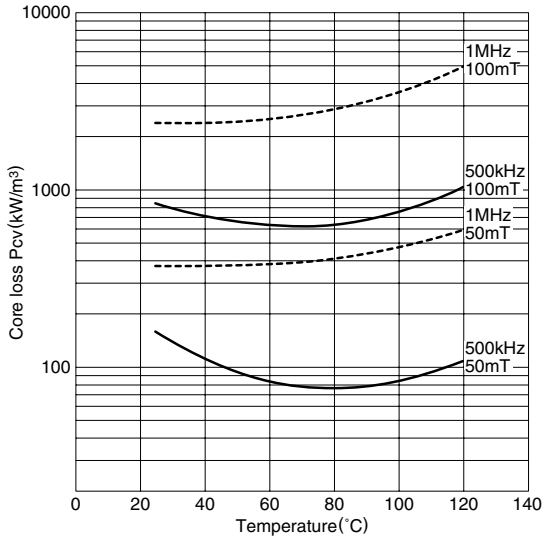


Material: PC44 (Frequency: 100kHz)



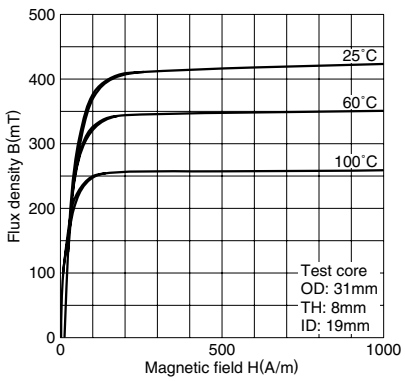
Test core: Toroidal
OD=31mm
TH=8mm
ID=19mm

Material: PC50

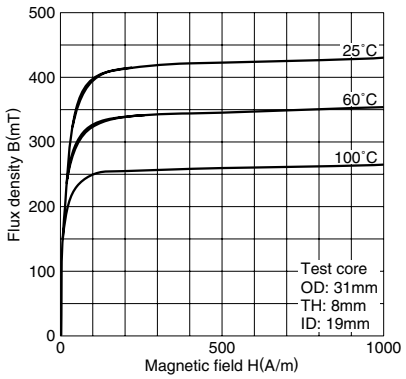


Magnetization Curves (Typical)

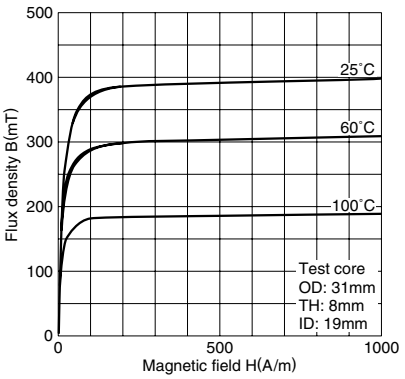
HS52



HS72



HS10

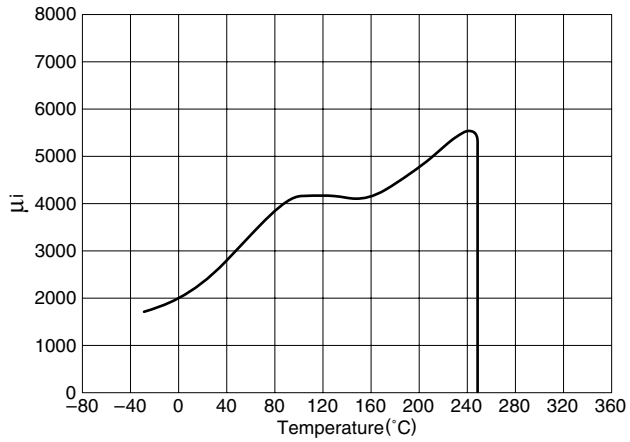


Ferrite

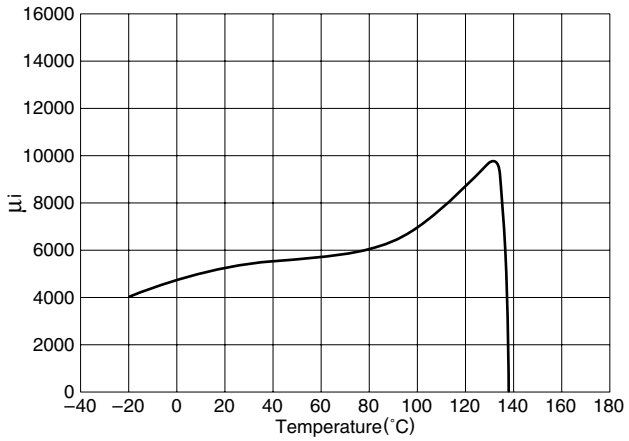
For Switching Power Supplies
Material Characteristics

μi vs. Temperature Characteristics (Typical)

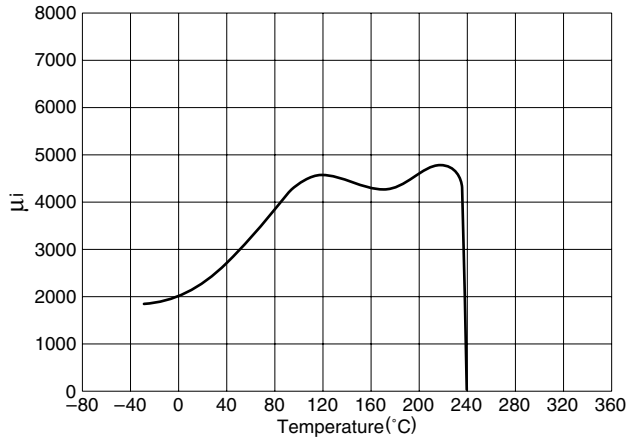
PC40



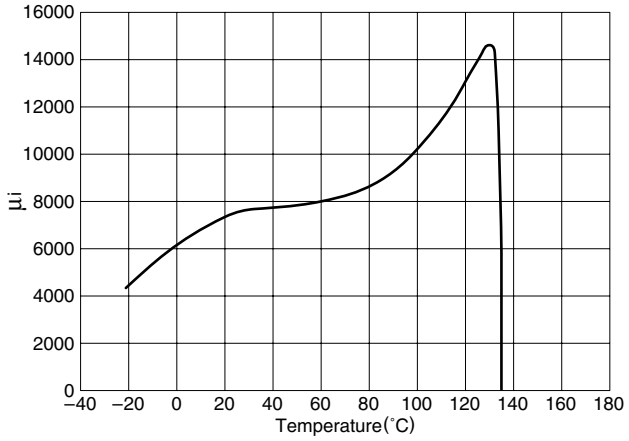
HS52



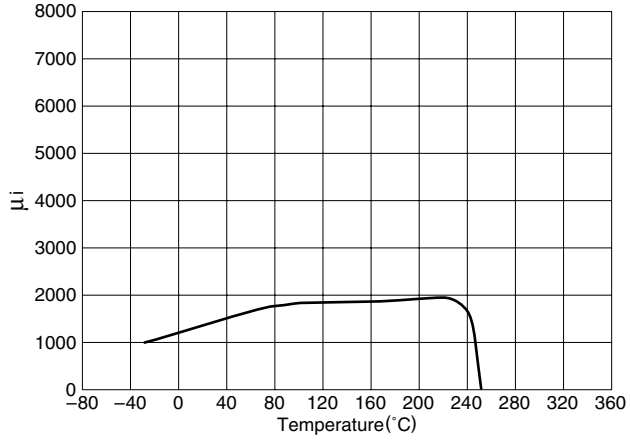
PC44



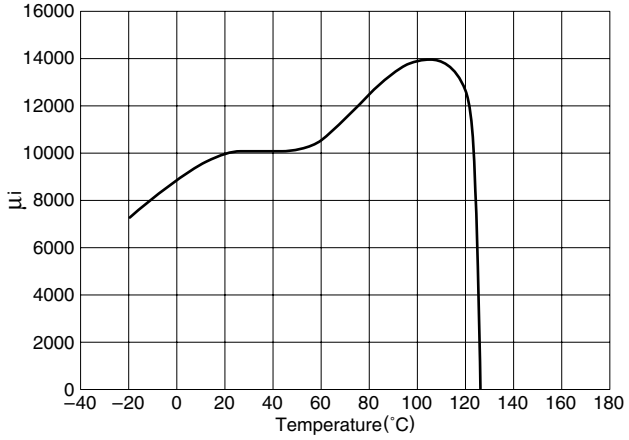
HS72



PC50



HS10



Test core: OD=31mm
TH=8mm
ID=19mm

Ferrite

PC47

For Switching Power Supplies
Low Loss Ferrite Material

PC47 has the best properties for transformers of power supplies, adapters and chargers.
The core loss and saturation magnetic flux density of PC47 are far better than PC44 and PC40 which are currently in use.

FEATURES

- Core loss: 250kW/m3 at 100kHz, 200mT, 100°C.
- Low core loss at wide frequency range 100kHz to 300kHz.
- Higher saturation flux density than PC44.

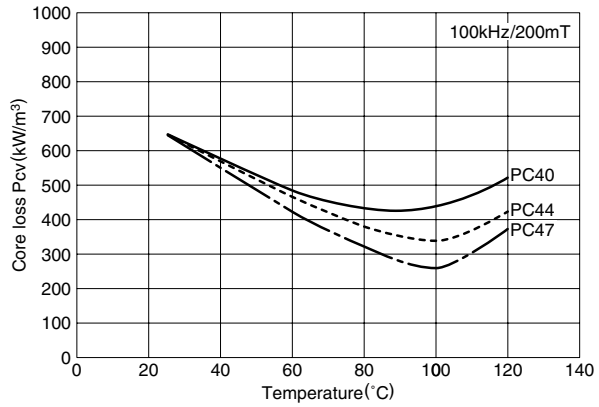
APPLICATIONS

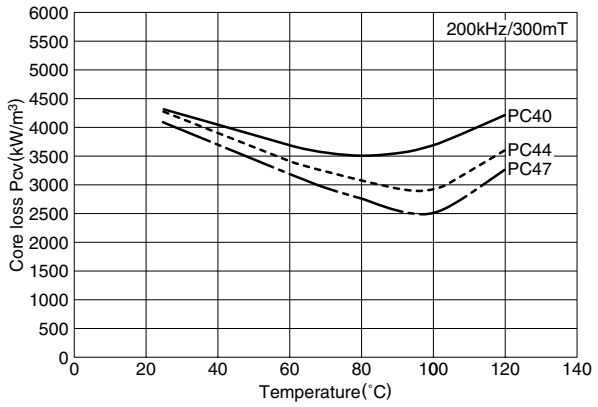
- Switching power supplies
- Adapters and chargers for notebook type pc
- CCFL LCD backlight

MATERIAL CHARACTERISTICS

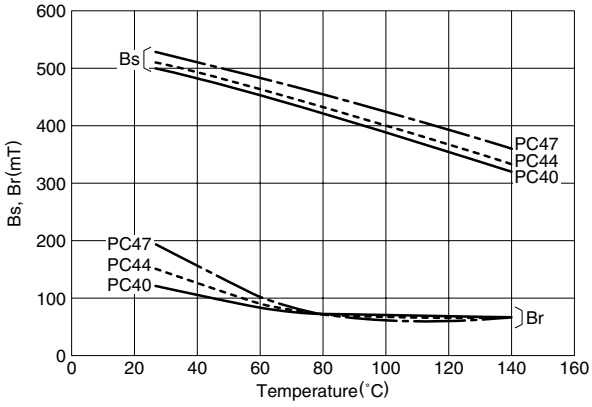
Material				PC47(NEW)	PC44	PC40
Initial permeability	μi		25°C	2500±25%	2400±25%	2300±25%
Core loss volume density [100kHz, 200mT]	Pcv	kW/m3	25°C	600	600	600
			60°C	400	400	450
			100°C	250	300	410
Saturation magnetic flux density [1000A/m]	Bs	mT	25°C	530	510	510
			100°C	420	390	390
Remanent flux density	Br	mT	25°C	180	110	95
			100°C	60	60	55
Curie temperature	Tc	°C	min.	230	215	215
Density	db	kg/m3		4.9×10³	4.8×10³	4.8×10³

Pcv TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)





Bs and Br TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)

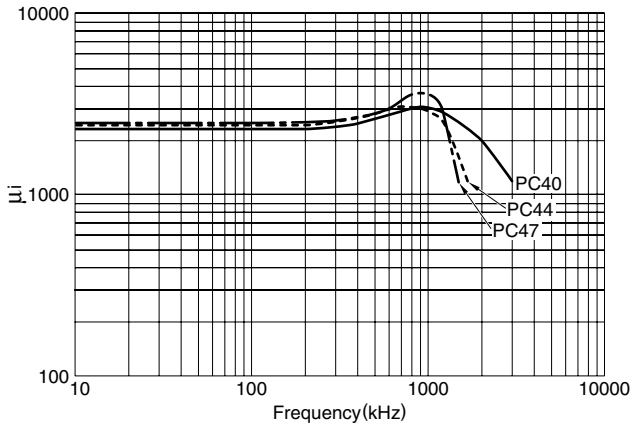


Ferrite

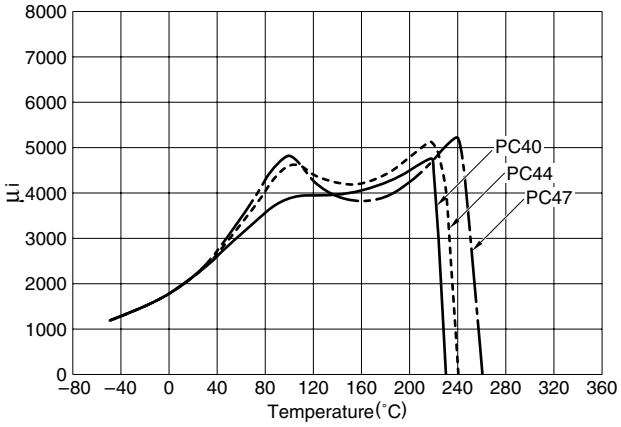
PC47

For Switching Power Supplies
Low Loss Ferrite Material

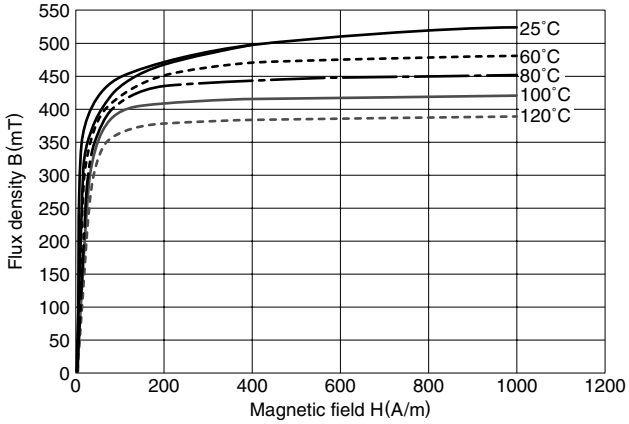
μi vs. FREQUENCY CHARACTERISTICS (Typical)



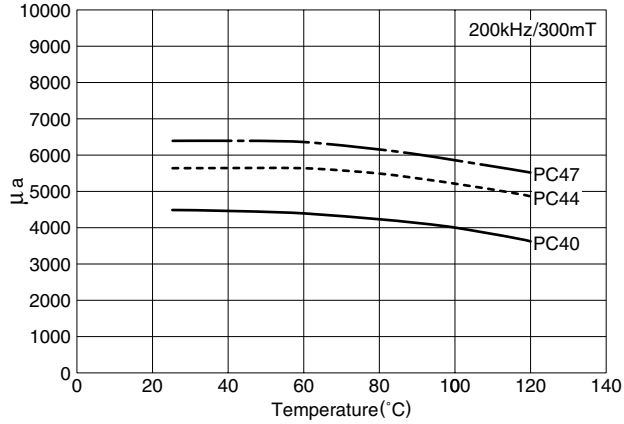
μi vs. TEMPERATURE CHARACTERISTICS (Typical)



MAGNETIZATION CURVES (Typical)
MATERIAL:PC47



μa TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)



Ferrite

For Switching Power Supplies
Low Loss Ferrite Materials

PC45 and PC46

In recent years, with the advent of notebook type pc, VCR's, digital camera's and mobile communication devices, technological demands have risen for higher performance CCFL LCD backlight units that have smaller sizes, lower profiles and higher efficiency.
The PC45 and PC46 are materials developed to achieve higher efficiency in designing minimize core loss at practical temperature ranges (PC45: 60 to 80°C and PC46: 40 to 50°C) and high saturation flux density.
They are also suitable for the transformers of DC to DC converters and adapters of notebook type pc.

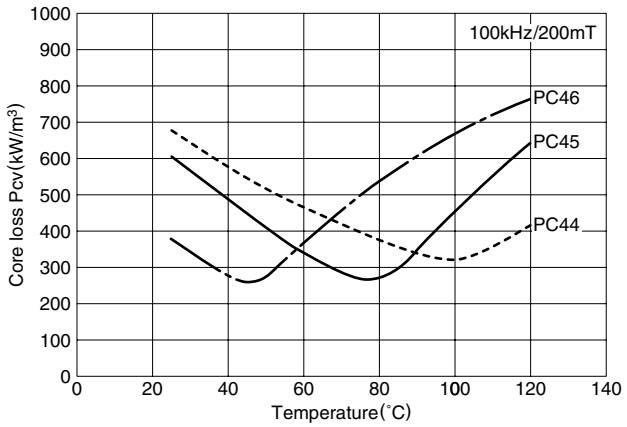
APPLICATIONS

- Switching power supplies
- Adapters and chargers for notebook type pc
- CCFL LCD backlight

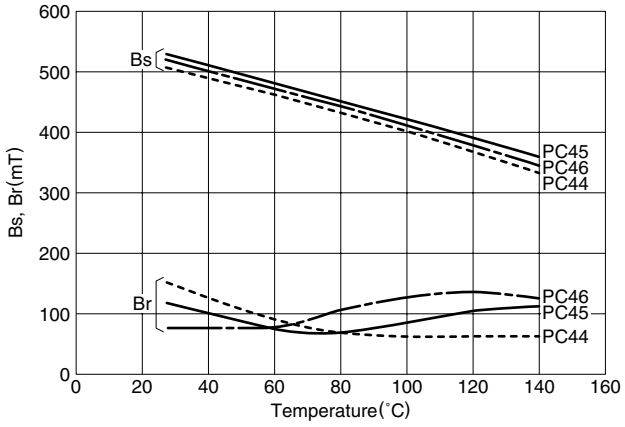
MATERIAL CHARACTERISTICS

Material				PC45(NEW)	PC46(NEW)	PC44
Initial permeability	μi		25°C	2500±25%	3200±25%	2400±25%
Core loss volume density [100kHz, 200mT]	Pcv	kW/m^3	25°C	570	350	600
			60°C	250(75°C)	250(45°C)	400
			100°C	460	660	300
Saturation magnetic flux density [1000A/m]	Bs	mT	25°C	530	530	510
			100°C	420	410	390
Remanent flux density	Br	mT	25°C	120	80	110
			100°C	80	115	60
Curie temperature	Tc	°C	min.	230	230	215
Density	db	kg/m^3		4.8×10^3	4.8×10^3	4.8×10^3

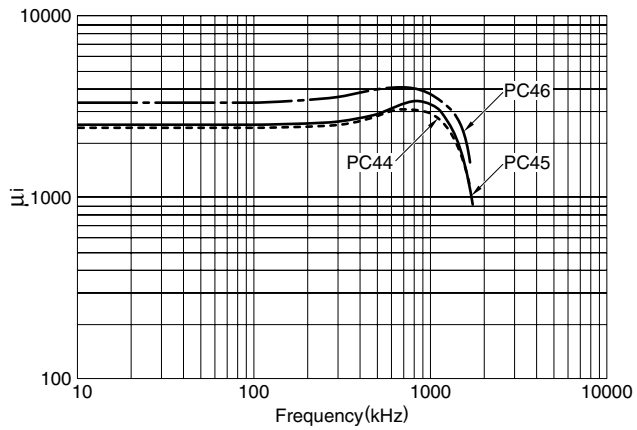
Pcv TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)



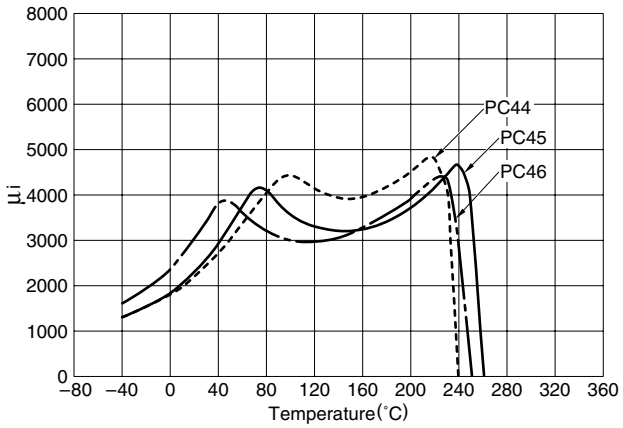
Bs and Br TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)



μi vs. FREQUENCY CHARACTERISTICS (Typical)



μi vs. TEMPERATURE CHARACTERISTICS (Typical)



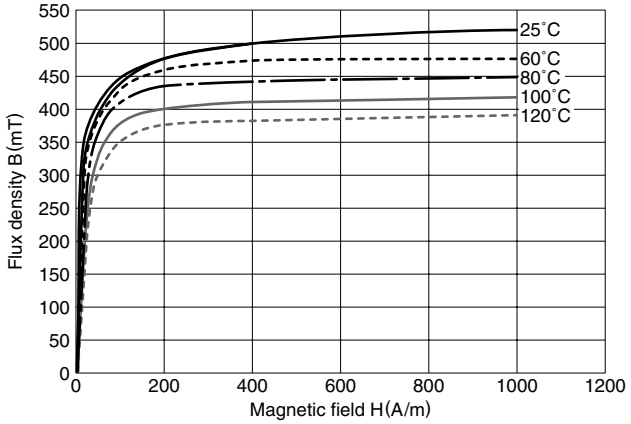
Ferrite

For Switching Power Supplies
Low Loss Ferrite Materials

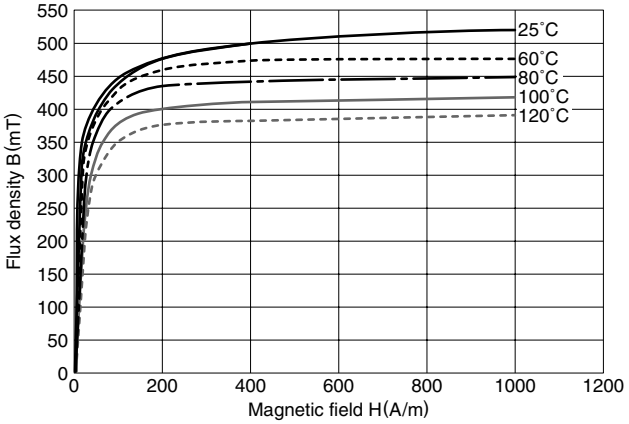
PC45 and PC46

MAGNETIZATION CURVES

MATERIAL:PC45



MATERIAL:PC46



Ferrite

PC33

For Switching Power Supplies
High Saturation Flux Density Material for Choke Coil

PC33 has the best properties for smoothing choke coil of power supplies.
The saturation magnetic flux density of PC33 is far better than PC44 and PC40 which are currently in use.

FEATURES

- Higher saturation flux density than PC44 and PC40.
- Most suitable ferrite material for choke coils.
- Maintain high saturation magnetic flux density at high temperature.

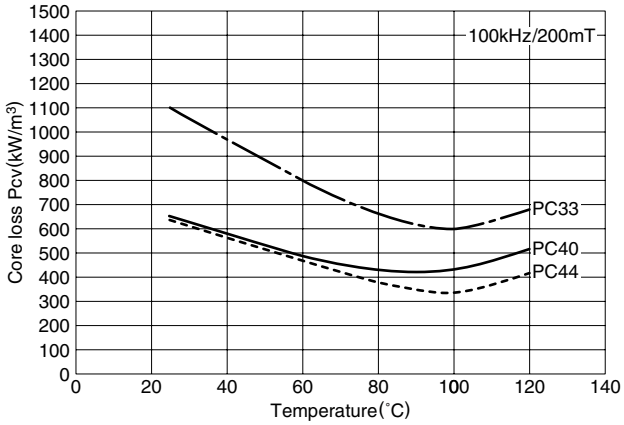
APPLICATIONS

- Power choke coils for switching power supplies
- Power choke coils for notebook type pc

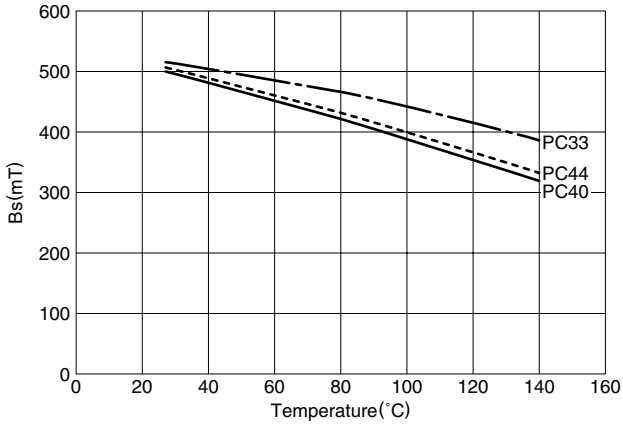
MATERIAL CHARACTERISTICS

Material				PC33(NEW)	PC44	PC40
Saturation magnetic flux density [1000A/m]	Bs	mT	25°C	510	510	510
			100°C	440	390	390
Initial permeability	μi		25°C	1400±25%	2400±25%	2300±25%
Core loss volume density [100kHz, 200mT]	Pcv	kW/m^3	25°C	1100	600	600
			60°C	800	400	450
			100°C	600	300	410
Curie temperature	Tc	°C	min.	290	215	215
Density	db	kg/m^3		4.8×10^3	4.8×10^3	4.8×10^3

Pcv TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)



Bs TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)



Ferrite

DN40 and DN70

For Switching Power Supplies
Low THD Materials for xDSL Modem Transformers

The use of xDSL technique becomes wide spread as a high broad-band access to the internet. In order to utilize such network access as sufficient as possible, low THD (Total Harmonic Distortion) of transformer for xDSL modem is quite important to transfer the significant signals.
Materials DN40 and DN70, TDK achieved such requirements recently, are developed to meet low THD over a wide temperature range(0 to 85°C) and wide frequency range(≧ 5kHz).
Therefore, They are suitable for the high performance transformer design for xDSL modem applications.
Standardization of A_L-value will help you to select the optimum core at the transformer design.

FEATURES

- Meet low THD over a wide temperature range(0 to 85°C) and wide frequency range (≧ 5kHz).

APPLICATIONS

- Transformer for xDSL modem

APPLIED CORE TYPE AND A_L-value

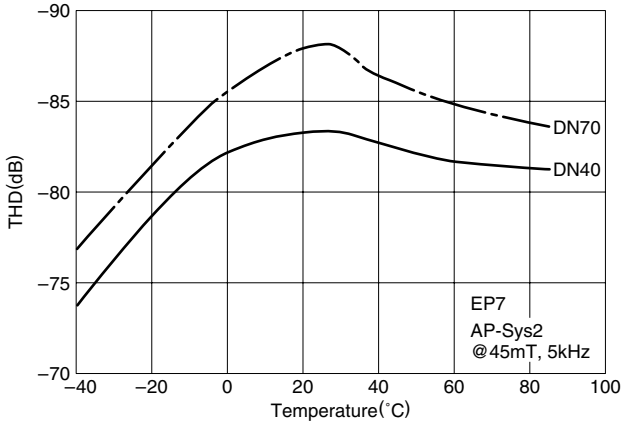
Core	Type	A_L-value
EP	EP7	40, 63, 100, 160, 250
	EP10	40, 63, 100, 160, 250
	EP13	63, 100, 160, 250, 400, 500

MATERIAL CHARACTERISTICS

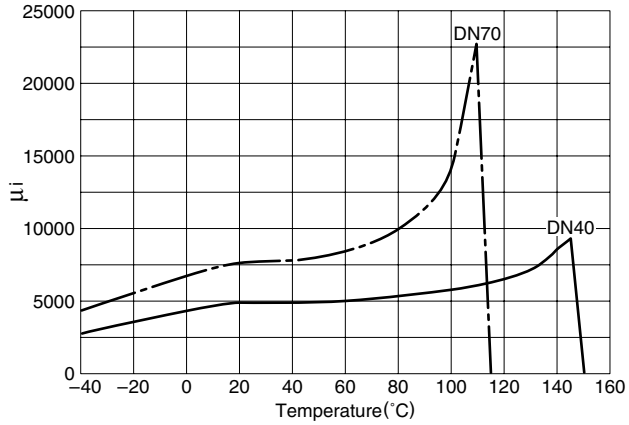
Material				**DN70(NEW)**	**DN40**
Initial permeability	μi		25°C	7500±25%	4000±25%
Relative loss factor [10kHz]	tanδ/μi	$\times10^{-6}$	25°C	<2.0	<2.5
Temperature factor of intial permeability	αμir		–30 to +20°C 20 to 70°C	–0.5 to +1.5 –0.5 to +1.5	–0.5 to 2.0 –0.5 to 2.0
Saturation magnetic flux density [1000A/m]	Bs	mT	25°C	390	405
Hysteresis material constant [25°C, 1.5 to 3.0mT, 10kMz]	η_B	$\frac{10^{-6}}{mT}$		<0.2	<0.8
Curie temperature	Tc	°C	min.	105	130
Density	db	kg/m^3		5.0×10^3	4.8×10^3
Electrical resistivity	ρv	Ω • m		0.3	1.0

• Unless otherwise specify the tolerance, the values are shown as a typical.

THD TEMPERATURE DEPENDENCE CHARACTERISTICS (Typical)



μi vs. TEMPERATURE CHARACTERISTICS (Typical)



Ferrite

For Switching Power Supplies
E Cores

EI, EE, EF, EER, ETD and EC Series

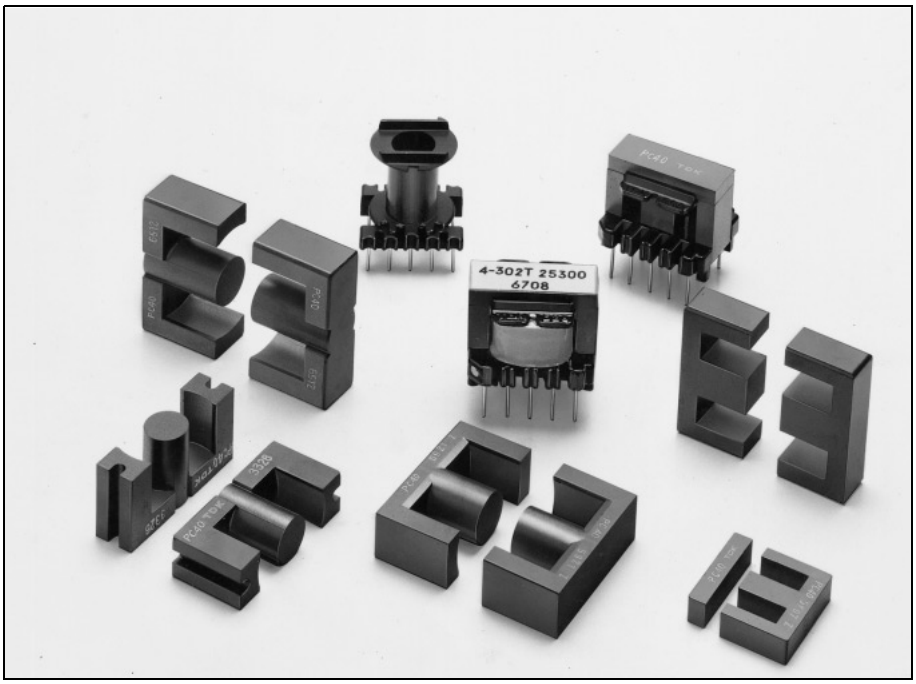
Cores

EI12.5 to EI60
EE8 to EE62.3/62/6
EF12.6 to EF32
EER25.5 to EER49
ETD19 to ETD49
EC70 to EC120

Bobbins

BE8 to BE62.3
BEER25.5 to BEER49
BETD19 to BETD24
BEC70 to BEC90

Accessories



Ordering Code System

Cores

PC40 EI 30 – Z

- PC40 — Material
- EI 30 — Size of E core
- Z — AL-value Z: without air gap
- G□: with air gap

Bobbins

B E30 – 1110 CPFR

- B — Symbol of Bobbin
- E30 — Size of E core
- 1 — Code of Bobbin Material
- 1 — Number of Section
- 0 — Number of Terminal Pin
- CPFR — Type of Terminal Pin

Accessories

F E – 30 – F

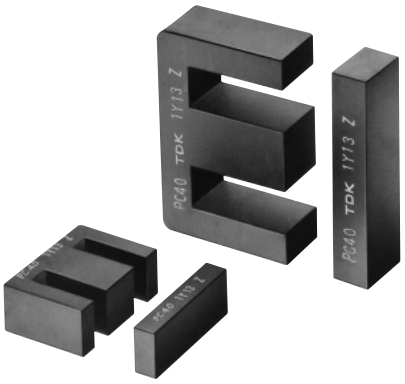
- F — Symbol of Accessory
- E – 30 — Size of E core
- F — Type of Accessory

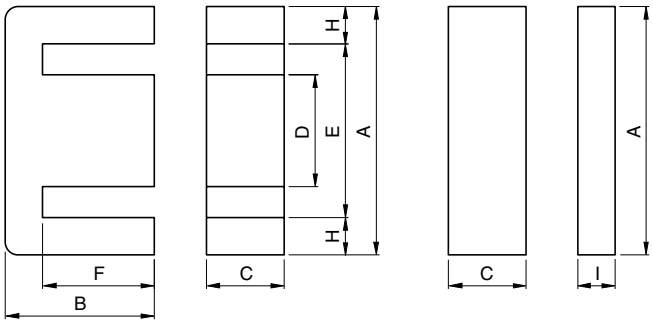
Ferrite

For Switching Power Supplies

E Cores

EI Series





Part No.	JIS	Dimensions in mm / inches						
		A	B	C	D	E min.	F	H
PC40EI12.5-Z	JIS FEI 12.5	12.4±0.3 .488±.012	7.4±0.1 .291±.004	4.85±0.15 .191±.006	2.4±0.1 .094±.004	8.8 .346	5.1±0.1 .201±.004	1.6 .063
PC40EI16-Z	JIS FEI 16	16.0±0.3 .630±.012	12.2±0.2 .480±.008	4.8±0.2 .189±.008	4.0±0.2 .157±.008	11.6 .457	10.2±0.2 .402±.008	2.05 .081
PC40EI19-Z		20.0±0.3 .787±.012	13.55±0.25 .533±.010	5.0±0.2 .197±.008	4.55±0.15 .179±.006	14.3 .563	11.15±0.15 .439±.006	2.75 .108
PC40EI22-Z		22.0±0.3 .866±.012	14.55±0.25 .573±.010	5.75±0.25 .226±.010	5.75±0.25 .226±.010	13.0 .512	10.55±0.25 .415±.010	4.5 .177
PC40EI22/19/6-Z	JIS FEI 22	22.0±0.4 .866±.016	14.7±0.2 .579±.008	5.75±0.25 .226±.010	5.75±0.25 .226±.010	15.75 .620	10.7±0.2 .421±.008	3.0 .118
PC40EI25-Z		25.3±0.5 .996±.020	15.55±0.25 .612±.010	6.75±0.25 .266±.010	6.5±0.3 .256±.012	19.0 .748	12.35±0.25 .486±.010	3.0 .118
PC40EI28-Z	JIS FEI 28	$28.0^{+0.7}_{-0.5}$ $1.102^{+.028}_{-.020}$	16.75±0.25 .659±.010	$\frac{10.6\pm0.2}{.417\pm.008}$ (E core) $\frac{10.7\pm0.3}{.421\pm.012}$ (I core)	7.2±0.3 .283±.012	18.4 .724	12.25±0.25 .482±.010	4.5 .177
PC40EI30-Z	JIS FEI 30	$30.0^{+0.7}_{-0.4}$ $1.181^{+.028}_{-.016}$	21.25±0.25 .837±.010	10.7±0.3 .421±.012	10.7±0.3 .421±0.12	19.7 .776	16.25±0.25 .640±.010	5.0 .197
PC40EI33/29/13-Z		$33.0^{+0.8}_{-0.5}$ $1.299^{+.031}_{-.020}$	23.75±0.25 .935±.010	12.7±0.3 .500±.012	9.7±0.3 .382±.012	23.4 .921	19.25±0.25 .758±.010	4.45 .175
PC40EI35-Z	JIS FEI 35	35.0±0.5 1.378±.020	24.35±0.15 .959±.006	10.0±0.3 .394±.012	10.0±0.3 .394±.012	24.5 .965	18.25±0.15 .719±.006	5.0 .197
PC40EI40-Z	JIS FEI 40	40.0±0.5 1.575±.020	27.25±0.25 1.073±.010	11.65±0.35 .459±.014	11.65±0.35 .459±.014	27.2 1.071	20.25±0.25 .797±.010	6.2 .244
PC40EI50-Z	JIS FEI 50	$50.0^{+1.2}_{-0.7}$ $1.969^{+.047}_{-.028}$	33.35±0.35 1.313±.014	14.6±0.4 .575±.016	14.6±0.4 .575±.016	33.5 1.319	24.75±0.25 .974±.010	7.7 .303
PC40EI60-Z	JIS FEI 60	$60.0^{+1.4}_{-0.8}$ $2.362^{+.055}_{-.031}$	35.85±0.35 1.411±.014	15.6±0.4 .614±.016	15.6±0.4 .614±.016	43.6 1.717	27.85±0.35 1.096±.014	7.7 .303

* Please see the next page additionally.

Ferrite

For Switching Power Supplies

E Cores

EI Series

* Please see the former page additionally.

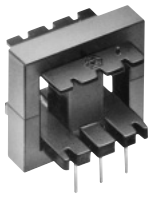
	Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
l	C_1 (mm^{-1})	Ae (mm^2)	ℓe (mm)	Ve (mm^3)	A_L-value (nH/N^2)* Without air gap	With air gap	Core loss (W) max. 100kHz, 200mT, 100°C		
1.5±0.1 .059±.004	1.48	14.4	21.3	308	1200±25%	63±7% 100±10%	0.12	1.9	BE12.5-1110CPFR
2.0±0.2 .079±.008	1.75	19.8	34.6	685	1100±25%	80±7% 160±10%	0.31	3.3	BE16-116CPFR BE16-118CPHFR BE16-1110CPNFR
2.3±0.1 .091±.004	1.65	24.0	39.6	950	1400±25%	80±7% 160±10%	0.42	5.1	BE19-116CPFR BE19-118CPHFR BE-19-5116
4.5±0.2 .177±.008	0.936	42.0	39.3	1650	2400±25%	125±7% 250±10%	0.6	9.8	BE22-1110CPFR BE22-118CPFR BE-22-5116
4.0±0.2 .157±.008	1.13	37.0	41.8	1550	2000±25%	125±7% 250±10%	0.64	8.5	BE22/19/6-118CPFR
2.7±0.2 .106±.008	1.15	41.0	47.0	1930	2140±25%	125±7% 250±10%	0.79	9.8	BE25-118CPFR BE-25-5116
3.5±0.3 .138±.012	0.57	86.0	48.2	4150	4300±25%	200±5% 400±7%	1.65	22	BE28-1110CPLFR
5.5±0.2 .217±.008	0.522	111	58.0	6440	4690±25%	200±5% 400±7%	3.1	34	BE30-1110CPFR BE30-1112CPFR BE-30-5112
5.0±0.3 .197±.012	0.567	119	67.5	8030	4400±25%	200±5% 400±7%	3.5	41	BE33-1112CPLFR
4.6±0.3 .181±.012	0.664	101	67.1	6780	3800±25%	200±5% 400±7%	2.85	36	BE35-1112CPLFR
7.5±0.3 .295±.012	0.520	148	77.0	11400	4860±25%	200±5% 400±7%	4.8	60	BE40-1112CPFR BE40-1112CPNFR BE-40-5112
9.0±0.3 .354±.012	0.409	230	94.0	21620	6110±25%	250±5% 500±7%	9.2	115	BE50-1112CPFR BE-50-5112
8.5±0.3 .335±.012	0.441	247	109	26900	5670±25%	250±5% 500±7%	12.5	139	BE60-1112CPFR BE-60-5112

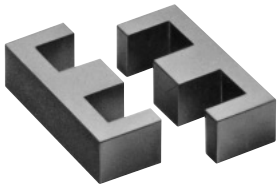
* *A_L-value: 1kHz, 0.5mA, 100Ts*

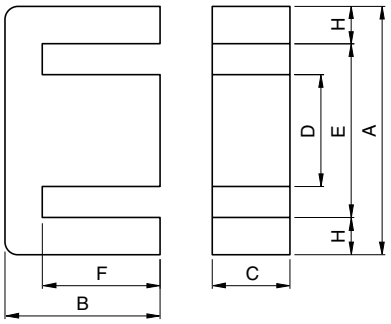
Ferrite

For Switching Power Supplies
E Cores

EE and EF Series







Type 1

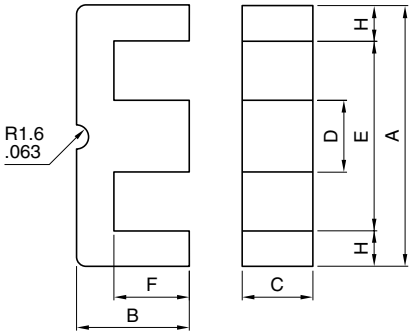
Part No.	U.S. lam. cores, DIN standard JIS	Type	Dimensions in mm inches						
			A	B	C	D	E min.	F	H
PC40EE8-Z	JIS FEE 8.3	1	8.3±0.2 .327±.008	4.0±0.1 .157±.004	3.6±0.2 .142±.008	1.85±0.15 .073±.006	6.0 .236	3.0±0.1 .118±.004	1.0 .039
PC40EE10/11-Z	JIS FEE 10.2	1	10.2±0.2 .402±.008	5.5±0.1 .217±.004	4.75±0.15 .187±.006	2.45±0.15 .096±.006	7.7 .303	4.20±0.15 .165±.006	1.1 .043
PC40EF12.6-Z	DIN 41985	1	12.7±0.4 .500±.016	6.4±0.1 .252±.004	3.6±0.2 .142±.008	3.65±0.15 .144±.006	8.8 .346	4.65±0.15 .183±.006	1.83 .072
PC40EE13-Z		1	13.0±0.2 .512±.008	6.00±0.15 .236±.006	6.15±0.15 .242±.006	2.75±0.15 .108±.006	10.0 .394	4.6±0.1 .181±.004	1.4 .055
PC40EE16-Z	JIS FEE 16A	1	16.0±0.3 .630±.012	7.15±0.15 .281±.006	4.8±0.2 .189±.008	4.0±0.2 .157±.008	11.7 .461	5.1±0.2 .201±.008	2.0 .079
PC40SEE16-Z		1	16.0±0.3 .630±.012	7.15±0.15 .281±.006	6.8±0.2 .268±.008	3.18±0.18 .125±.007	12.5 .492	5.5±0.1 .217±.004	1.6 .063
PC40EF16-Z	DIN 41985	1	16.1±0.6 .634±.024	8.05±0.15 .317±.006	4.5±0.2 .177±.008	4.55±0.15 .179±.006	11.3 .445	5.9±0.2 .232±.008	2.2 .087
PC40EE19-Z	JIS FEE 19A	1	19.1±0.3 .752±.012	7.95±0.15 .313±.006	5.0±0.2 .197±.008	4.55±0.15 .179±.006	14.2 .559	5.6±0.1 .220±.004	2.3 .091
PC40EE19/16-Z	U.S. EE-187	1	19.29±0.32 .759±.013	8.1±0.18 .319±.007	4.75±0.13 .187±.005	4.75±0.08 .187±.003	14.05 .553	5.715±0.125 .225±.005	2.46 .097
PC40EE20/20/5-Z	DIN 41295	2	20.15±0.55 .793±.022	10.0±0.2 .394±.008	5.1±0.2 .201±.008	5.0±0.2 .197±.008	12.8 .504	6.5±0.2 .256±.008	3.53 .139
PC40EF20-Z	DIN 41985	1	20.0±0.4 .787±.016	9.9±0.2 .390±.008	5.65±0.25 .222±.010	5.7±0.2 .224±.008	14.1 .555	7.2±0.2 .283±.008	2.8 .110
PC40EE22-Z		1	22.0±0.3 .866±.012	9.35±0.15 .368±.006	5.75±0.25 .226±.010	5.75±0.25 .226±.010	13.0 .512	5.35±0.15 .211±.006	4.3 .169
PC40EE25/19-Z	U.S. EE-24/25	1	25.4±0.5 1.000±.020	9.46±0.19 .372±.007	6.29±0.19 .248±.007	6.35±0.25 .250±.010	18.55 .730	6.41±0.19 .252±.007	3.11 .122
PC40EF25-Z	DIN 41985	1	25.05±0.75 .986±.030	12.55±0.25 .494±.010	7.2±0.3 .283±.012	7.25±0.25 .285±.010	17.5 .689	8.95±0.25 .352±.010	3.55 .140
PC40EE25.4-Z	JIS FEE 25.4A	1	25.4±0.76 1.000±.030	9.66±0.15 .380±.006	6.35±0.25 .250±.010	6.35±0.25 .250±.010	18.5 .728	6.48±0.15 .255±.006	3.18 .125
PC40EE30-Z	JIS FEE 30A	1	30.0±0.5 1.181±.020	13.15±0.15 .518±.006	10.7±0.3 .421±.012	10.7±0.3 .421±.012	19.7 .776	8.15±0.15 .321±.006	5.0 .197
PC40EE30/30/7-Z	DIN 41295	2	30.1±0.7 1.185±.028	15.0±0.2 .591±.008	7.05±0.25 .278±.010	6.95±0.25 .274±.010	19.5 .768	9.95±0.25 .392±.010	5.1 .201

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
E Cores

EE and EF Series



Type 2

Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
C_1 (mm^{-1})	Ae (mm^2)	ℓe (mm)	Ve (mm^3)	A_L-value (nH/N^2)* Without air gap	With air gap	Core loss (W) max. 100kHz, 200mT, 100°C		
2.75	7.0	19.2	134	610±25%	40±7% 63±10%	0.06	0.7	BE8-116CPHFR
2.16	12.1	26.1	315	850±25%	40±7% 63±10%	0.14	1.5	BE10-118CPSFR
2.28	13.0	29.6	385	810±25%	63±7% 100±10%	0.17	2.0	—
1.77	17.1	30.2	517	1130±25%	63±7% 100±10%	0.235	2.7	BE13-1110CPSFR
1.82	19.2	34.5	656	1140±25%	80±7% 160±10%	0.31	3.3	BE16-116CPFR BE16-118CPHFR BE16-1110CPNFR
1.69	21.7	36.6	795	1240±25%	80±7% 160±10%	0.37	4.1	BES16-1110CPSFR
1.87	20.1	37.6	754	1100±25%	63±7% 100±10%	0.32	3.9	—
1.71	23.0	39.4	906	1250±25%	80±7% 160±10%	0.42	4.8	BE19-116CPFR BE19-118CPHFR BE-19-5116
1.75	22.4	39.1	876	1350±25%	80±7% 160±10%	0.41	4.8	
1.38	31.0	43.0	1340	1400±25%	100±7% 160±10%	0.51	7.5	—
1.34	33.5	44.9	1500	1570±25%	100±7% 160±10%	0.69	7.4	—
0.970	41.0	39.6	1620	2180±25%	125±7% 250±10%	0.61	8.8	BE22-1110CPFR BE22-118CPFR BE-22-5116
1.22	40.0	48.7	1950	2000±25%	100±7% 200±10%	0.86	9.1	—
1.11	51.8	57.8	2990	2000±25%	100±7% 160±10%	1.40	15	—
1.21	40.3	48.7	1963	2000±25%	125±7% 250±10%	0.90	10	—
0.529	109.0	57.7	6290	4690±25%	200±5% 400±7%	2.90	32	BE30-1110CPFR BE30-1112CPFR BE-30-5112
1.12	59.7	66.9	4000	2100±25%	160±5% 250±7%	1.51	22	—

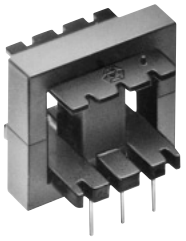
* *A_L-value: 1kHz, 0.5mA, 100Ts*

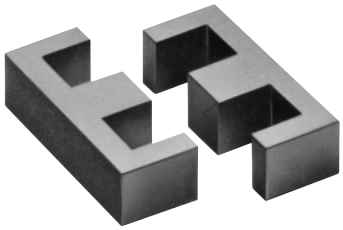
* Please see the former page additionally.

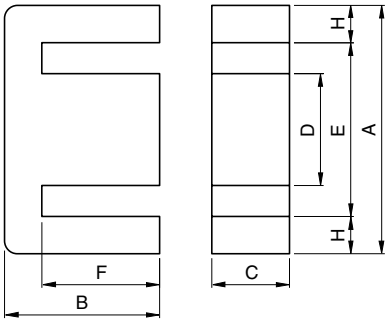
Ferrite

For Switching Power Supplies
E Cores

EE and EF Series







Type 1

Part No.	U.S. lam. cores, DIN standard JIS		Type	Dimensions in mm inches						
				A	B	C	D	E min.	F	H
PC40EF32-Z	DIN 41985		1	32.1±0.8 1.264±.031	16.1±0.3 .634±.012	9.15±0.35 .360±.014	9.2±0.3 .362±.012	22.7 .894	11.6±0.3 .457±.012	4.4 .173
PC40EE35/28B-Z	U.S. EE-375		1	34.6±0.5 1.362±.020	14.27±0.37 .562±.014	9.31±0.30 .367±.012	9.4±0.3 .370±.012	25.0 .984	9.78±0.25 .385±.010	4.5 .177
PC40EE35-Z	JIS FEE35B		1	34.54±1.0 1.360±.039	14.35±0.35 .564±.014	9.53±0.38 .375±.015	9.39±0.27 .370±.011	24.89 .980	9.71±0.28 .382±.011	4.75 .187
PC40EE40-Z	JIS FEE40A		1	40.0±0.5 1.575±.020	17.0±0.3 .669±.012	10.7±0.3 .421±.012	10.7±0.3 .421±.012	27.4 1.079	10.25±0.25 .404±.010	6.0 .236
PC40EE41/33C-Z	U.S. EE-21		1	41.07±0.8 1.617±.031	16.78±0.4 .661±.016	12.57±0.38 .495±.015	12.64±0.45 .498±.018	28.55 1.124	10.38±0.3 .409±.012	6.0 .236
PC40EE42/42/15-Z	DIN 41295	JIS FEE42A	1	42.15±0.85 1.659±.033	21.0±0.2 .827±.008	14.95±0.25 .589±.010	11.95±0.25 .470±.010	29.5 1.161	15.15±0.35 .596±.014	6.025 .237
PC40EE42/42/20-Z	DIN 41295	JIS FEE42B	1	42.15±0.85 1.659±.033	21.0±0.2 .827±.008	19.7±0.3 .776±.012	11.95±0.25 .470±.010	29.5 1.161	15.15±0.35 .596±.014	6.025 .237
PC40EE47/39-Z	U.S. EE-625		1	47.12±0.48 1.855±.0.19	19.63±0.2 .773±.008	15.62±0.25 .615±.010	15.62±0.25 .615±.010	31.72 1.249	12.2±0.13 .480±.005	7.49 .295
PC40EE50-Z	JIS FEE50A		1	$50.0^{+1.0}_{-0.7}$ $1.969^{+.039}_{-.028}$	21.3±0.3 .839±.012	14.6±0.4 .575±.016	14.6±0.4 .575±.016	34.2 1.346	12.75±0.25 .502±.010	7.5 .295
PC40EE55/55/21-Z	DIN 41295	JIS FEE55	1	55.15±1.05 2.17±.041	27.5±0.3 1.083±.012	20.7±0.3 .815±.012	16.95±0.25 .667±.010	37.5 1.476	18.8±0.3 .740±.012	8.53 .336
PC40EE57/47-Z	U.S. EE-75		1	56.57±1.00 2.227±.039	23.60±0.23 .929±.009	18.8±0.25 .740±.010	18.80±0.25 .740±.010	38.1 1.500	14.63±0.15 .576±.006	9.02 .355
PC40EE60-Z	JIS FEE60A		1	$60.0^{+1.1}_{-0.8}$ $2.362^{+.043}_{-.031}$	22.3±0.3 .878±.012	15.6±0.4 .614±.016	15.6±0.4 .614±.016	43.8 1.724	14.05±0.25 .553±.010	7.7 .303
PC40EE50.3/51/6-Z			1	50.3±0.8 1.980±.031	25.6±0.25 1.008±.010	$6.1^{+0.4}_{-0.2}$ $.240^{+.016}_{-.008}$	19.9±0.35 .783±.014	29.5 1.161	15.9±0.25 .626±.010	10 .394
PC40EE62.3/62/6-Z			1	62.3±1.2 2.453±.047	31.0±0.25 1.220±.010	$6.1^{+0.4}_{-0.2}$ $.240^{+.016}_{-.008}$	25.3±0.5 .996±.020	35.9 1.413	18.7±0.25 .736±.010	12.6 .496

* Please see the next page additionally.

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For Switching Power Supplies

E Cores

EE and EF Series

* Please see the former page additionally.

Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
C_1 (mm^{-1})	Ae (mm^2)	ℓe (mm)	Ve (mm^3)	A_L-value (nH/N^2)* Without air gap	With air gap	Core loss (W) max. 100kHz, 200mT, 100°C		
0.893	83.2	74.3	6180	2590±25%	160±5% 250±7%	2.90	32	—
0.819	84.9	69.6	5907	2950±25%	200±5% 400±7%	2.33	28	—
0.774	89.3	69.2	6179	3170±25%	200±5% 400±7%	3.00	33	—
0.606	128	77.3	9890	4150±25%	200±5% 400±7%	4.20	50	BE40-1112CPFR BE40-1112CPNFR BE-40-5112
0.495	157	77.6	12165	5060±25%	200±5% 400±7%	5.80	64	—
0.547	178	97.4	17400	4700±25%	250±5% 400±7%	8.00	80	—
0.415	235	97.4	22900	6100±25%	250±5% 400±7%	10.4	116	—
0.374	242	90.6	21930	6660±25%	250±5% 400±7%	9.70	108	—
0.425	226	95.8	21600	6110±25%	250±5% 400±7%	9.40	116	BE50-1112CPFR BE-50-5112
0.348	354	123	43700	7100±25%	250±5% 400±7%	11.0**	234	—
0.297	344	102	35100	8530±25%	250±5% 400±7%	8.5**	190	—
0.446	247	110	27100	5670±25%	250±5% 500±7%	12.5	135	BE60-1112CPFR BE-60-5112
0.868	121	105	12700	2900±25%	200±5% 400±7%	5.83	68	BE50.3-1112CPHFR
0.823	153	126	19300	3100±25%	200±5% 400±7%	8.85	102	BE62.3-1112CPHFR

** A_L-value: 1kHz, 0.5mA, 100Ts*

*** Core loss: 100kHz, 150mT, 100°C*

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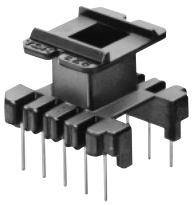
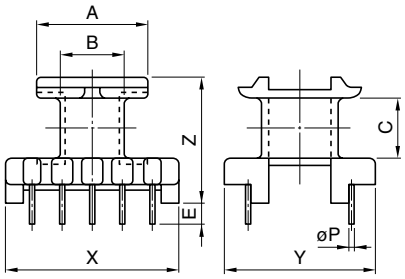
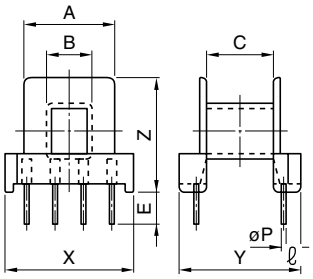
For Switching Power Supplies
E Cores

EE and EI Bobbins

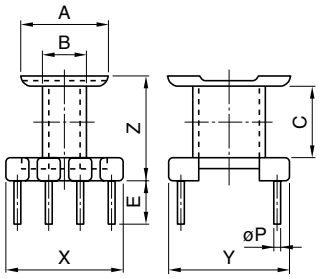




Type 1



Type 2



Type 3

Part No.	Type	Dimensions in mm inches						
		A	B	C	E	X	Y	Z
BE8-116CPHFR	2	5.8 .228	3.0 .118	4.78 .188	2.7 .106	8.0 .315	8.8 .346	8.4 .331
BE10-118CPSFR	3	7.2 .283	3.5 .138	6.6 .260	3.85 .152	10.2 .402	10.2 .402	9.0 .354
BE12.5-1110CPFR	1	8.5 .335	3.6 .142	3.5 .138	3.25 .128	12.35 .486	12.35 .486	8.3 .327
BE13-1110CPSFR	3	10.0 .394	4.0 .157	7.4 .291	3.7 .146	12.1 .476	12.5 .492	10.4 .409
BE16-116CPFR	3	11.5 .453	5.15 .203	8.5 .335	3.8 .150	11.5 .453	13.0 .512	11.5 .453
BE16-118CPHFR	2	11.4 .449	5.15 .203	8.6 .339	4.0 .157	15.0 .591	13.4 .528	13.4 .528
BE16-1110CPNFR	1	11.35 .447	5.65 .222	8.15 .321	3.8 .150	16.0 .630	13.0 .512	13.85 .545
BES-16-1110CPSFR	3	12.2 .480	4.6 .181	8.7 .343	5.0 .197	15.9 .426	14.0 .551	11.7 .461
BE19-116CPFR	3	13.8 .543	5.8 .228	9.1 .358	5.0 .197	13.8 .543	16.5 .650	12.0 .472
BE19-118CPHFR	2	14.0 .551	6.65 .262	9.0 .354	6.0 .236	20.0 .787	16.2 .638	18.6 .732
BE22-118CPFR	1	12.5 .492	7.9 .311	8.45 .332	6.0 .236	22.0 .866	17.0 .669	17.5 .689
BE22/19/6-118CPFR	1	15.2 .598	7.9 .311	8.45 .332	6.0 .236	22.0 .866	17.0 .669	17.3 .681
BE25-118CPFR	1	18.1 .713	9.1 .358	9.8 .386	6.0 .236	25.0 .984	18.0 .709	19.3 .760
BE28-1110CPLFR	1	18.1 .713	9.9 .390	9.6 .378	7.0 .276	28.0 1.102	25.0 .984	20.6 .811
BE30-1110CPFR	1	19.2 .756	13.1 .516	13.7 .539	7.0 .276	30.0 1.181	25.0 .984	25.6 1.008
BE30-1112CPFR	1	19.4 .764	13.1 .516	13.7 .539	7.0 .276	30.0 1.181	25.0 .984	25.6 1.008
BE33-1112CPLFR	1	23.1 .909	12.4 .488	16.6 .654	7.0 .276	33.0 1.299	28.0 1.102	28.6 1.126
BE35-1112CPLFR	1	24.0 .945	12.7 .500	15.7 .618	7.0 .276	35.0 1.378	25.0 .984	28.7 1.130
BE40-1112CPFR	1	26.5 1.043	14.0 .551	17.3 .681	7.0 .276	36.0 1.417	30.0 1.181	30.5 1.201
BE40-1112CPNFR	1	26.5 1.043	14.0 .551	17.3 .681	7.0 .276	36.0 1.417	30.0 1.181	30.5 1.201
BE50-1112CPFR	1	33.2 1.307	17.2 .677	21.3 .839	9.0 .354	50.0 1.969	36.0 1.417	36.65 1.443
BE60-1112CPFR	1	43.3 1.705	18.5 .728	23.8 .937	10.0 .394	56.0 2.205	45.0 1.772	38.9 1.531
BE50.3-1112CPHFR	4	29.1 1.146	22.3 .878	28.25 1.112	4.5 .177	51.0 2.008	74.79 2.944	16.2 .638
BE62.3-1112CPHFR	4	35.1 1.382	28.3 1.114	33.85 1.333	4.5 .177	63.0 2.480	85.6 3.370	16.2 .638

* Please see the next page additionally.

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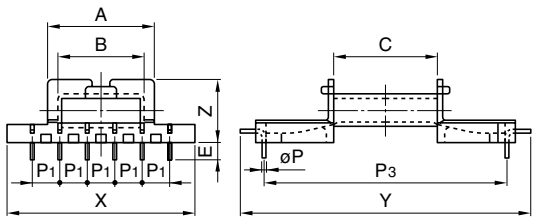
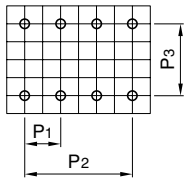
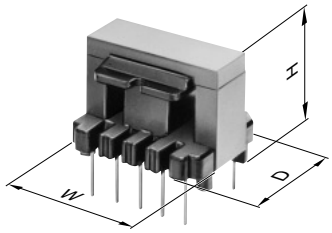
For Switching Power Supplies
E Cores

EE and EI Bobbins



Type 4





* Please see the former page additionally.

t*	øP (mm)	P1 (mm)	P2 (mm)	P3 (mm)	Terminal pins	W / D (mm) / H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)	Accessory item
0.35 .014	0.6	2.5	5.0	7.0	6	8.3 / 8.0 / 8.0	5.3	19.9	0.26	—
0.40 .016	0.5	2.5	7.7	8.0	8	10.4 / 10.2 / 11.2	12.2	23.8	0.34	—
0.325 .013	0.6	(2.5, 2.6)	10.0	7.5	10	12.7 / 12.5 / 9.1	8.6	27.2	0.64	—
0.40 .016	0.6	2.5	10.0	8.5	10	13.2 / 12.7 / 12.3	22.2	31.3	0.63	—
0.375 .015	0.6	3.1	6.2	9.2	6	16.3 / 13.1 / 14.6	27.3	32.5	0.63	—
0.325 .013	0.6	3.0	9.0	11.0	8	16.5 / 14.6 / 13.6	26.7	33.1	0.84	—
0.55 .022	0.6	3.25	13.0	10.5	10	16.3 / 13.1 / 15.6	23.2	33.0	1.2	—
0.40 .016	0.6	3.3	13.2	11.0	10	16.3 / 14.1 / 16.3	33.1	37.1	1.0	—
0.35 .014	□0.5	4.0	8.0	12.5	6	20.3 / 16.7 / 16.2	36.4	36.8	0.95	—
0.80 .031	0.8	5.08	15.24	12.7	8	20.3 / 16.2 / 18.8	33.1	39.1	2.4	—
0.80 .031	0.8	5.0	15.0	12.5	8	22.3 / 17.1 / 20.1	20.0	38.6	2.3	—
0.80 .031	0.8	5.0	15.0	12.5	8	22.4 / 17.1 / 19.1	31.5	42.8	2.7	—
0.75 .030	0.8	5.0	15.0	12.5	8	25.8 / 18.1 / 20.5	42.5	49.4	3.5	—
0.80 .031	0.8	5.0	20.0	17.5	10	28.5 / 25.1 / 22.7	39.4	59.1	5.0	—
0.80 .031	0.8	5.0	20.0	20.0	10	30.4 / 25.1 / 28.6	44.5	61.0	4.9	FE-30-F FE-30-G
0.80 .031	0.8	5.0	25.0	20.0	12	30.4 / 25.1 / 28.6	43.2	58.0	6.2	
0.80 .031	0.8	5.0	25.0	22.5	12	33.5 / 28.1 / 31.2	88.8	72.3	6.8	—
0.80 .031	0.8	5.0	25.0	20.0	12	35.5 / 25.1 / 30.9	88.7	68.5	7.7	—
0.80 .031	1.0	5.0	25.0	25.0	12	40.5 / 30.2 / 35.8	108.0	76.0	9.7	FE-40-F FE-40-G
0.80 .031	1.0	5.0	25.0	22.5	12	40.5 / 30.2 / 35.7	108.1	75.6	9.8	
0.80 .031	1.0	7.5	37.5	27.5	12	50.7 / 36.2 / 43.6	170.0	94.0	17	FE-50-F FE-50-G
0.80 .031	1.0	7.5	37.5	35.0	12	50.8 / 45.2 / 45.1	294.0	113.0	29	FE-60-F FE-60-G
0.80 .031	0.9	7.5	37.5	60	12	52 / 77 / 16.2	96.05	76	16	—
0.80 .031	0.9	7.5	37.5	72.5	12	64 / 88 / 16.2	115.09	88	22	—

UL Grade: 94V-0, Material: FR phenol, Pin material: Steel wire (Solder plated)

Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".

* *Minimum thickness of bobbin inside which core is placed, including flanges.*

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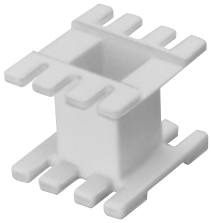
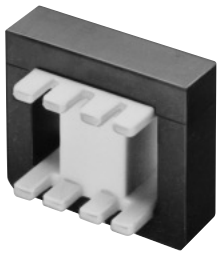
For Switching Power Supplies
E Cores

EE and EI Bobbins





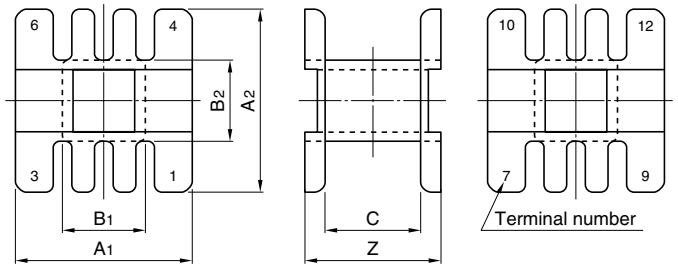
Part No.	Dimensions in mm / inches					
	A_1	A_2	B_1	B_2	C	Z
BE-19-5116	13.7 .539	14.8 .583	6.4 .252	7.15 .281	9.33 .367	11.93 .470
BE-22-5116	12.5 .492	13.0 .512	7.7 .303	8.0 .315	8.68 .342	11.28 .444
BE-25-5116	18.1 .713	19.1 .752	8.7 .343	9.2 .362	10.2 .402	14.6 .575
BE-30-5112	18.85 .742	20.8 .819	13.0 .512	13.0 .512	13.95 .549	18.5 .728
BE-40-5112	26.35 1.037	29.1 1.146	14.4 .567	14.4 .567	17.6 .693	23.55 .927
BE-50-5112	32.75 1.289	35.55 1.400	17.4 .685	17.4 .685	22.1 .870	30.1 1.185
BE-60-5112	42.75 1.683	45.75 1.801	19.5 .768	19.5 .768	24.1 .949	34.1 1.343

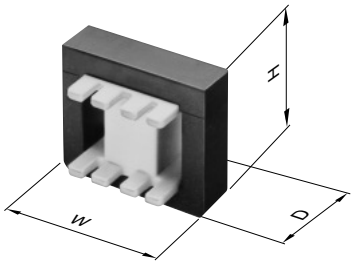
* Please see the next page additionally.

Ferrite

For Switching Power Supplies
E Cores

EE and EI Bobbins





		Parameter				
t*	**W D (mm) H**	**Aw (mm^2)**	**ℓw (mm)**	**Wt (g)**	**Material**	**Accessory item**
0.60 .024	20.3 14.9 16.2	35.7	37.9	0.55	6-Nylon	
0.575 .023	22.3 13.1 19.5	21.7	38.2	0.45	6-Nylon	
0.725 .029	25.8 19.2 18.7	47.6	50.6	1.3	6-Nylon	
0.60 .024	30.4 21.1 27.2	47.6	66.0	1.5	6-Nylon	FE-30-F FE-30-G
0.80 .031	40.5 29.4 35.3	110.0	85.0	3.8	6-Nylon	FE-40-F FE-40-G
0.80 .031	50.7 35.8 43.0	178.0	100.0	6.6	6-Nylon	FE-50-F FE-50-G
1.30 .051	60.8 46.0 45.0	289.0	128.0	15	6-Nylon	FE-60-F FE-60-G

UL Grade: 94V-0

Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".

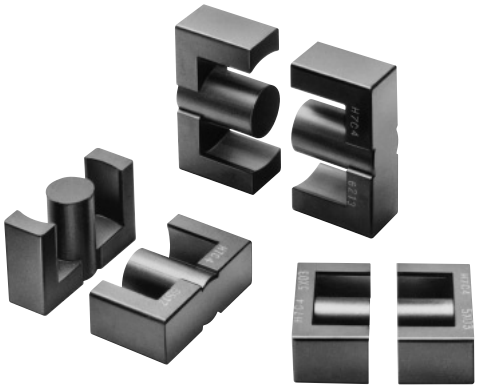
* *Minimum thickness of bobbin inside which core is placed, including flanges.*

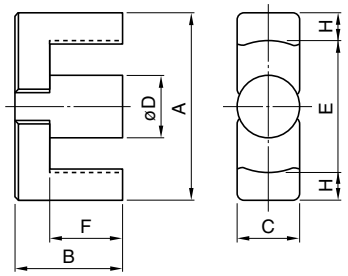
* Please see the former page additionally.

Ferrite

For Switching Power Supplies
E Cores

EER Series





Type 1

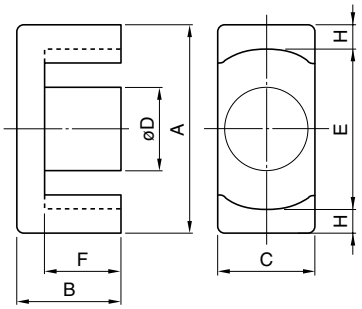
Part No.	U.S. lam. cores, DIN standard JIS	Type	Dimensions in mm / inches						
			A	B	C	D	E min.	F	H
PC40EER25.5-Z	JIS FEER25.5A	1	25.5±0.5 1.004±.020	9.3±0.2 .366±.008	7.5±0.2 .295±.008	7.5±0.15 .295±.006	19.8 .779	6.2±0.2 .244±.008	2.6 .102
PC40EER28-Z	JIS FEER28.5A	2	28.55±0.55 1.124±.022	14.0±0.2 .551±.008	11.4±0.25 .499±.010	9.9±0.25 .390±.010	21.2 .835	9.65±0.25 .380±.010	3.4 .134
PC40EER28L-Z	JIS FEER28.5B	2	28.55±0.55 1.124±.022	16.9±0.25 .665±.010	11.4±0.25 .499±.010	9.9±0.25 .390±.010	21.2 .835	12.53±0.28 .493±.011	3.4 .134
PC40EER35-Z	JIS FEER35A	1	35.0±0.5 1.378±.020	20.7±0.2 .815±.008	11.3±0.2 .445±.008	11.3±0.15 .445±.006	25.6 1.009	14.7±0.3 .579±.012	4.43 .174
PC40EER40-Z		1	40.0±0.5 1.575±.020	22.4±0.2 .882±.008	13.3±0.25 .524±.010	13.3±0.25 .524±.010	29.0 1.142	15.4±0.3 .606±.012	5.28 .208
PC40EER42-Z	JIS FEER42	1	42.0±0.6 1.654±.024	22.4±0.2 .882±.008	15.5±0.25 .610±.010	15.5±0.25 .610±.010	29.4 1.157	15.4±0.3 .606±.012	6.0 .236
PC40EER42/42/20-Z		2	42.15±0.65 1.659±.026	21.2±0.2 .835±.008	19.60±0.4 .772±.016	17.3±0.25 .681±.010	31.8 1.252	15.25±0.25 .600±.010	4.93 .194
PC40EER49-Z		1	49.0±0.8 1.929±.031	19.0±0.3 .748±.012	17.2±0.4 .677±.016	17.2±0.25 .677±.010	36.4 1.433	12.4±0.2 .488±.008	6.0 .236

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
E Cores

EER Series



Type 2

Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
C_1 (mm^{-1})	**Ae (mm^2)**	**ℓe (mm)**	**Ve (mm^3)**	**A_L-value (nH/N^2)***		**Core loss (W) max.**		
				Without air gap	**With air gap**	**100kHz, 200mT, 100°C**		
1.08	44.8	48.2	2160	1920±25%	100±5% 200±7%	0.98	11	BEER25.5-118CPFR
0.780	82.1	64.0	5250	2870±25%	200±5% 400±7%	2.30	28	BEER28-1110CPFR BEER28-1112CPHFR
0.928	81.4	75.5	6150	2520±25%	160±5% 315±7%	2.70	33	BEER28L-1110CPFR BEER28L-1112CPHFR
0.849	107	90.8	9720	2770±25%	200±5% 400±7%	4.20	52	BEER35-1112CPFR BEER35-1116CPHFR
0.658	149	98.0	14600	3620±25%	200±5% 400±7%	6.30	78	BEER40-1112CPFR BEER40-1116CPHFR
0.509	194	98.8	19200	4690±25%	250±5% 500±7%	8.60	102	BEER42-1114CPFR BEER42-1116CPHFR
0.411	240	98.6	23700	5340±25%	250±5% 500±7%	10.7	116	BEER42/20-1112CPFR
0.395	231	91.3	21100	6250±25%	250±5% 500±7%	5.4**	110	BEER49-1118CPFR

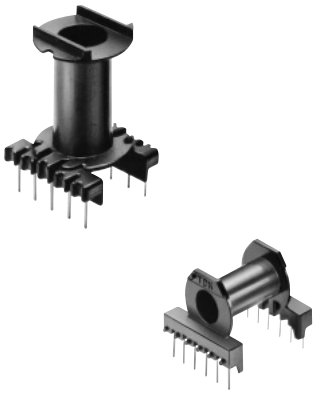
* *A_L-value: 1kHz, 0.5mA, 100Ts*
** *Core loss: 100kHz, 150mT, 100°C*

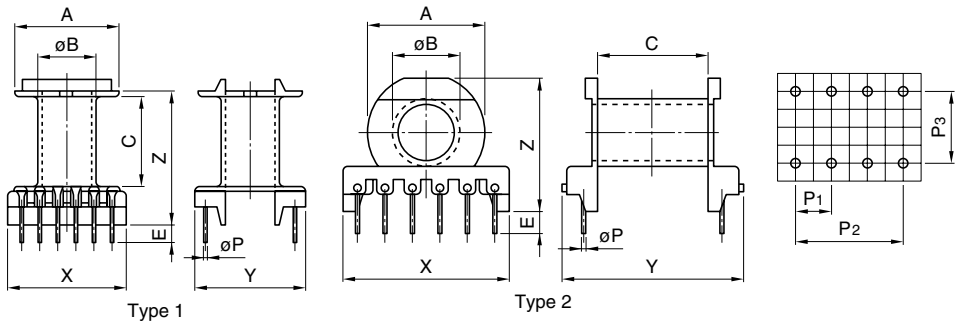
* Please see the former page additionally.

Ferrite

For Switching Power Supplies
E Cores

EER Bobbins





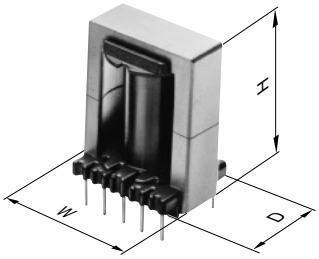
Part No.	Type	Dimensions in mm inches						
		A	**øB**	**C**	**E**	**X**	**Y**	**Z**
BEER25.5-118CPFR	1	19.53 .769	9.9 .390	10.05 .396	4.5 .177	22.0 .866	19.6 .772	19.05 .750
BEER28-1110CPFR	1	20.9 .823	12.3 .484	16.7 .657	4.5 .177	24.8 .976	23.0 .906	26.6 1.047
BEER28L-1110CPFR	1	20.9 .823	12.3 .484	22.4 .882	4.5 .177	24.8 .976	23.0 .906	32.3 1.272
BEER35-1112CPFR	1	25.4 1.000	13.7 .539	26.1 1.028	5.5 .217	30.0 1.181	28.5 1.122	39.3 1.547
BEER40-1112CPFR	1	28.7 1.130	15.8 .622	27.5 1.083	5.0 .197	32.0 1.260	30.0 1.181	41.7 1.642
BEER42-1114CPFR	1	29.1 1.146	17.95 .707	27.5 1.083	5.0 .197	38.0 1.496	30.0 1.181	42.7 1.681
BEER42/20-1112CPFR	1	31.5 1.240	19.8 .780	27.3 1.075	5.0 .197	43.5 1.713	37.0 1.457	42.5 1.673
BEER49-1118CPFR	1	35.95 1.415	20.3 .799	21.45 .844	4.5 .177	49.0 1.929	37.0 1.457	39.45 1.553
BEER28-1112CPHFR	2	20.9 .823	12.0 .472	16.1 .634	5.0 .197	30.0 1.181	31.3 1.232	25.0 .984
BEER28L-1112CPHFR	2	20.9 .823	12.0 .472	21.8 .858	5.0 .197	30.0 1.181	37.0 1.457	25.0 .984
BEER35-1116CPHFR	2	25.2 .992	13.6 .535	26.4 1.039	4.5 .177	40.0 1.575	45.5 1.791	29.0 1.142
BEER40-1116CPHFR	2	28.6 1.126	15.7 .618	27.5 1.083	4.2 .165	40.0 1.575	44.0 1.732	31.8 1.252
BEER42-1116CPHFR	2	29.0 1.142	18.0 .709	27.3 1.075	5.0 .197	40.0 1.575	44.0 1.732	34.5 1.358

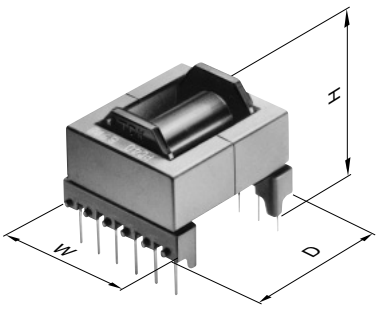
* Please see the next page additionally.

Ferrite

For Switching Power Supplies
E Cores

EER Bobbins





t*	øP (mm)	P1 (mm)	P2 (mm)	P3 (mm)	Terminal pins	W / D (mm) / H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)
0.8	0.8	5.0	15	12.5	8	26 / 20 / 21	48.4	46.2	2.7
0.8	0.8	5.0	20	17.5	10	29 / 23 / 29	71.8	52.2	3.5
0.8	0.8	5.0	20	17.5	10	29 / 23 / 35	96.3	52.2	3.9
0.8	1.0	5.0	25	22.5	12	36 / 29 / 44	152.7	61.4	7.7
0.8	1.0	5.0	25	25	12	41 / 30 / 46	178.8	69.9	8.9
0.8	1.0	5.0	30	25	14	43 / 30 / 47	153.3	73.9	9.8
0.8	1.0	7.5	37.5	30	12	43 / 37 / 46	159.7	80.6	12
0.9	0.8	5.0	40	30	18	50 / 37 / 43	167.8	88.4	15
0.8	0.8	5.0	25	25	12	31 / 32 / 26	71.6	51.6	5.2
0.8	0.8	5.0	25	30	12	31 / 38 / 26	97.0	51.7	5.5
0.8	□0.75	5.0	35	35	16	41 / 46 / 31	154.4	60.8	11
0.8	1.0	5.0	35	35	16	41 / 45 / 32	170.6	69.9	11
0.8	1.0	5.0	35	35	16	43 / 46 / 35	148.5	73.8	12

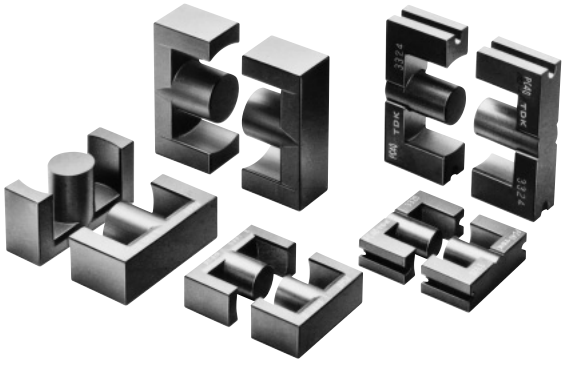
UL Grade: 94V-0, Material: FR phenol, Pin material: Steel wire (Solder plated)
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
** Minimum thickness of bobbin inside which core is placed, including flanges.*

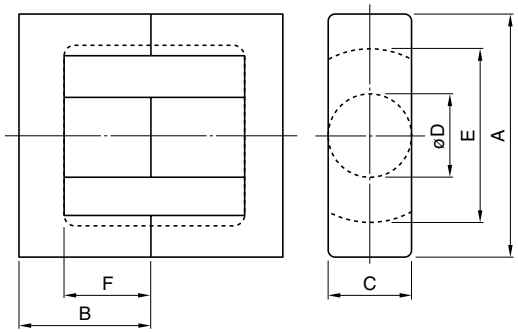
* Please see the former page additionally.

Ferrite

For Switching Power Supplies
E Cores

ETD and EC Series





Type 1

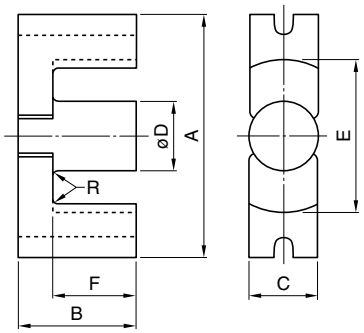
Part No.	JIS	Type	Dimensions in mm inches					
			A	B	C	øD	E	F
PC40ETD19-Z		1	19.6±0.5 .771±.020	13.65±0.15 .537±.006	7.4±0.2 .291±.008	7.4±0.2 .291±.008	14.9±0.5 .586±.020	9.4±0.2 .370±.008
PC40ETD24-Z		1	24.4±0.6 .960±.024	14.45±0.15 .569±.006	8.5±0.4 .335±.016	8.5±0.2 .335±.008	18.6±0.6 .732±.024	10.1±0.2 .398±.008
PC40ETD29-Z		1	29.8±0.8 1.173±.031	15.80±0.15 .622±.006	9.5±0.3 .374±.012	9.5±0.3 .374±.012	22.7±0.7 .893±.028	11.0±0.3 .433±.012
PC40ETD34-Z	JIS FEER 34.2	1	34.2±0.8 1.346±.031	17.3±0.2 .681±.008	10.88±0.38 .428±.015	10.8±0.3 .425±.012	26.3±0.7 1.035±.028	12.1±0.3 .476±.012
PC40ETD39-Z	JIS FEER 39.1	1	39.1±0.9 1.539±.035	19.8±0.2 .780±.008	12.58±0.38 .495±.015	12.5±0.3 .492±.012	30.1±0.8 1.185±.031	14.6±0.4 .575±.016
PC40ETD44-Z	JIS FEER 44	1	44.0±1.0 1.732±.039	22.3±0.2 .878±.008	14.9±0.5 .587±.020	14.8±0.4 .583±.016	33.3±0.8 1.311±.031	16.5±0.4 .650±.016
PC40ETD49-Z	JIS FEER 48.7	1	48.7±1.1 1.917±.043	24.7±0.2 .972±.008	16.4±0.5 .646±.020	16.3±0.4 .642±.016	37.0±0.9 1.457±.035	18.1±0.4 .713±.016
PC40EC70-Z		2	70.0±1.7 2.756±.067	34.5±0.15 1.358±.006	16.4±0.4 .646±.016	16.4±0.4 .646±.016	44.5±1.2 1.752±.047	22.75±0.45 .896±.018
PC40EC90-Z		2	90.0±1.8 3.543±.071	45.0±1.3 1.772±.051	30.0±1.0 1.181±.039	30.0±1.0 1.181±.039	70.0±1.5 2.756±.059	35.5±0.5 1.398±.020
PC40EC120-Z		2	120±2.0 4.724±.079	50.5±1.0 1.988±.039	30.0±1.0 1.181±.039	30.0±1.0 1.181±.039	95.0±1.7 3.740±.067	35.5±0.5 1.398±.020

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
E Cores

ETD and EC Series



Type 2

Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
C_1 (mm^{-1})	**Ae (mm^2)**	**ℓe (mm)**	**Ve (mm^3)**	**A_L-value (nH/N^2)***		**Core loss (W) max.**		
				Without air gap	**With air gap**	**100kHz, 200mT, 100°C**		
1.32	41.3	54.6	2260	1720±25%	80±5% 160±7%	1.1	14	BETD19-1111CPHFR
1.100	56.3	61.9	3480	2125±25%	100±5% 200±7%	1.6	20	BETD24-1112CPHFR
0.959	73.6	70.6	5170	2500±25%	200±5% 400±10%	2.4	28	—
0.810	97.1	78.6	7630	2780±25%	200±5% 400±7%	3.31	40	—
0.737	125	92.1	11500	3150±25%	200±5% 400±7%	5.3	60	—
0.589	175	103	18000	4000±25%	250±5% 400±7%	8.3	94	—
0.535	213	114	24300	4440±25%	250±5% 400±7%	11.2	124	—
0.514	279	144	40100	4800±25%	100±5% 200±5%	14.0	256	BEC-70-5116
0.346	624	216	135000	6000 min.		2.8**	698	BEC-90-0112
0.332	753	250	188250	6300 min.		3.5**	780	—

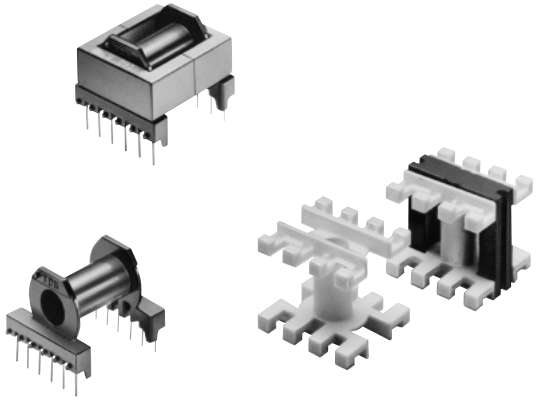
* *A_L-value: 1kHz, 0.5mA, 100Ts*
** *Core loss: 25kHz, 200mT, 100°C*

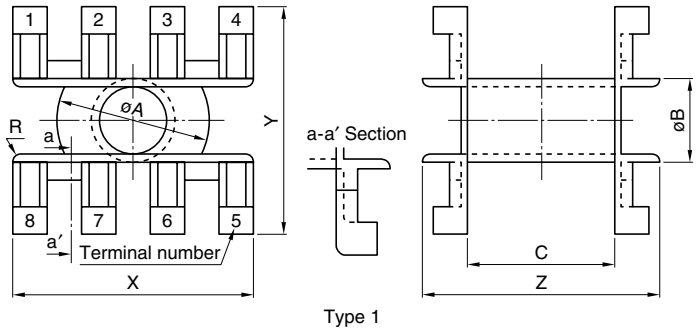
* Please see the former page additionally.

Ferrite

For Switching Power Supplies
E Cores

ETD and EC Bobbins





Type 1

Part No.	Type	Dimensions in mm / inches					
		øA	**øB**	**C**	**X**	**Y**	**Z**
BEC-70-5116	1	42.7 1.681	19.5 .768	41.45 1.632	70.0 2.756	56.25 2.214	57.8 2.276
BEC-90-0112	1	67.6 2.661	35.4 1.394	65.3 2.571	80.0 3.150	77.0 3.031	89.8 3.535

Part No.	Type	Dimensions in mm / inches						
		øA	**øB**	**C**	**E**	**X**	**Y**	**Z**
BETD19-1111CPHFR	2	14.0 .551	9.7 .382	16.0 .630	5.0 .197	23.4 .921	31.0 1.220	18.15 .715
BETD24-1112CPHFR	2	17.5 .689	10.9 .429	17.2 .677	5.0 .197	29.0 1.142	33.6 1.223	21.65 .852

* Please see the next page additionally.

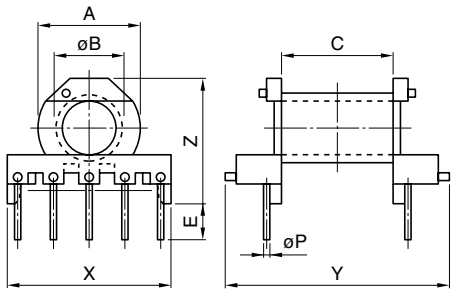
Ferrite

For Switching Power Supplies
E Cores

ETD and EC Bobbins

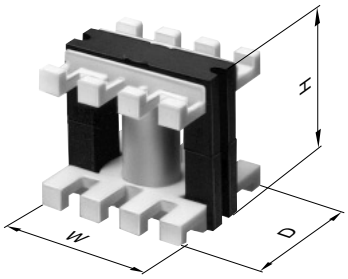
* Please see the former page additionally.

Bobbin-core assembly dimensions

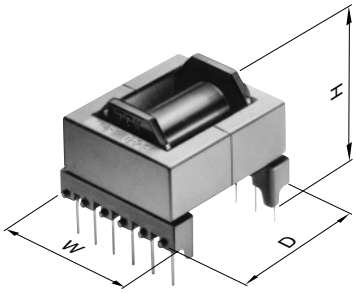


Type 2

EC cores



ETD cores



t*	W D (mm) H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)	Material	Accessory item
1.13	72 57 70	471.4	98	18	6-Nylon	—
1.90	92 77 93	1046.5	162	82	6-Nylon	—

t*	øP (mm)	P1 (mm)	P2 (mm)	P3 (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)
0.9	0.8	5.08	20.32	20.32	10	23.55 31.0 18.15	37.3	33.2	3.3
0.9	0.8	5.08	25.4	22.86	12	29.0 33.6 21.65	44.7	55.5	4.8

UL Grade: 94V-0, Material: FR phenol, Pin material: Steel wire (Solder plated)
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
* *Minimum thickness of bobbin inside which core is placed, including flanges.*

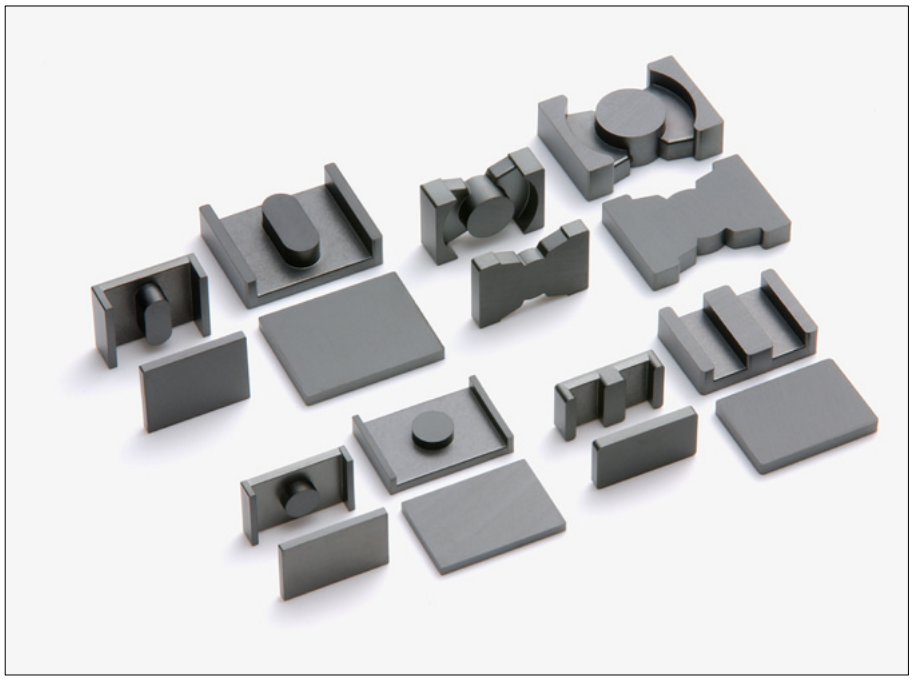
Ferrite

For Switching Power Supplies
Planar Cores

EL, ELT, PQI, EIR, ER and EI Series

Cores

EL11/4 to EL25/8.6
ELT11/3 to ELT25/8.6
PQI16/7.8 to PQI26/11.5
EIR14/4.5/9 to EIR22/5.5/15
ER14/4.5/9 to ER22/5.5/15
EI14/5/5 to EI22/8/16



Ordering Code System

Cores

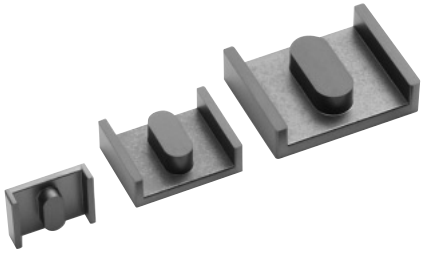
PC44 EL 11/4 Z – 12

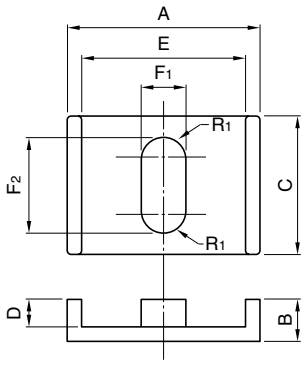
- PC44: Material
- EL 11/4: Size of EL core
- Z: A_L-value Z: without air gap; G□: with air gap
- 12: Type
- Number of Lead Slot

Ferrite

For Switching Power Supplies
Planar Cores

EL Series





Part No.	Dimensions in mm / inches							
	A	**B**	**C**	**D**	**E**	**F_1**	**F_2**	**R_1**
PC44EL11/4-Z								
PC47EL11/4-Z	11.0±0.2	2.01±0.10	8.8±0.2	1.0±0.1	9.17±0.20	2.78±0.10	6.40±0.15	0.3
PC50EL11/4-Z	.433±.008	.079±.004	.346±.008	.039±.004	.361±.008	.109±.004	.252±.006	.012
PC33EL11/4-Z								
PC44EL13/4.4-Z								
PC47EL13/4.4-Z	13.00±0.25	2.19±0.10	10.4±0.2	1.0±0.1	10.83±0.20	3.29±0.10	7.56±0.15	0.3
PC50EL13/4.4-Z	.512±.010	.086±.004	.409±.008	.039±.004	.426±.008	.130±.004	.298±.006	.012
PC33EL13/4.4-Z								
PC44EL15.5/5.8-Z								
PC47EL15.5/5.8-Z	15.5±0.3	2.92±0.10	12.40±0.25	1.5±0.1	12.92±0.25	3.92±0.10	9.01±0.20	0.3
PC50EL15.5/5.8-Z	.610±.012	.115±.004	.488±.010	.059±.004	.509±.010	.154±.004	.355±.008	.012
PC33EL15.5/5.8-Z								
PC44EL18/7.3-Z								
PC47EL18/7.3-Z	18.0±0.3	3.65±0.10	14.40±0.25	2.0±0.1	15.0±0.3	4.55±0.10	10.47±0.20	0.3
PC50EL18/7.3-Z	.709±.012	.144±.004	.567±.010	.079±.004	.591±.012	.179±.004	.412±.008	.012
PC33EL18/7.3-Z								
PC44EL20/7.7-Z								
PC47EL20/7.7-Z	20.00±0.35	3.83±0.10	16.0±0.3	2.0±0.1	16.67±0.30	5.06±0.15	11.63±0.20	0.5
PC50EL20/7.7-Z	.787±.014	.151±.004	.630±.012	.079±.004	.656±.012	.199±.006	.458±.008	.020
PC33EL20/7.7-Z								
PC44EL22/8-Z								
PC47EL22/8-Z	22.0±0.4	4.02±0.10	17.6±0.3	2.0±0.1	18.33±0.35	5.56±0.15	12.79±0.25	0.5
PC50EL22/8-Z	.866±.016	.158±.004	.693±.012	.079±.004	.722±.014	.219±.006	.504±.010	.020
PC33EL22/8-Z								
PC44EL25/8.6-Z								
PC47EL25/8.6-Z	25.00±0.45	4.29±0.10	20.00±0.35	2.0±0.1	20.83±0.35	6.32±0.15	14.54±0.25	0.5
PC50EL25/8.6-Z	.984±.018	.169±.004	.787±.014	.079±.004	.820±.014	.249±.006	.572±.010	.020
PC33EL25/8.6-Z								

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Planar Cores

EL Series

* Please see the former page additionally.

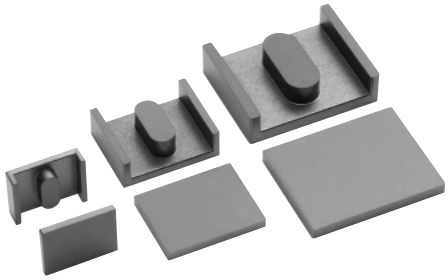
Effective parameter							Electrical characteristics	
C_1 (mm^{-1})	**ℓ_e (mm)**	**Ae (mm^2)**	**Ve (mm^3)**	**Amin. (mm^2)**	**Acw (mm^2)**	**Wt (g)**	**A_L-value (nH/N^2)***	
							Without air gap	**With air gap**
0.825	13.7	16.6	227	16.1	6.39	1.4	1760±25%	50±3%
							1790±25%	80±5%
							1310±25%	125±7%
							1310±25%	
0.666	15.4	23.2	358	22.5	7.55	2.2	2310±25%	63±3%
							2360±25%	100±5%
							1690±25%	160±7%
							1690±25%	
0.597	19.6	32.9	645	32.0	13.5	3.9	2880±25%	63±3%
							2950±25%	100±5%
							2050±25%	160±7%
							2050±25%	
0.538	23.8	44.3	1060	43.1	20.9	6.3	3460±25%	80±3%
							3550±25%	125±5%
							2400±25%	200±5%
							2400±25%	
0.467	25.6	54.7	1400	53.2	23.2	8.3	4090±25%	80±3%
							4200±25%	125±5%
							2820±25%	200±5%
							2820±25%	
0.413	27.3	66.3	1810	64.4	25.5	10.8	4740±25%	100±3%
							4870±25%	160±3%
							3240±25%	250±5%
							3240±25%	
0.350	85.7	30.0	2570	83.2	29.0	15.3	5770±25%	100±3%
							5930±25%	160±3%
							3900±25%	250±5%
							3900±25%	

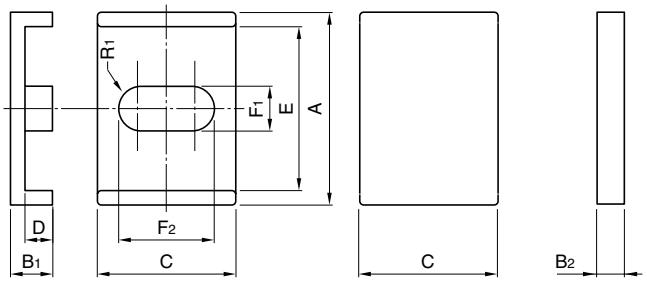
* *A_L-value: 1kHz, 0.5mA, 100Ts*

Ferrite

For Switching Power Supplies
Planar Cores

ELT Series





Part No.	Dimensions in mm / inches								
	A	**B1**	**B2**	**C**	**D**	**E**	**F1**	**F2**	**R1**
PC44ELT11/3-Z									
PC47ELT11/3-Z	11.0±0.2	2.01±0.10	1.01±0.05	8.8±0.2	1.0±0.1	9.17±0.20	2.78±0.10	6.40±0.15	0.3
PC50ELT11/3-Z	.433±.008	.079±.004	.040±.002	.346±.008	.039±.004	.361±.008	.109±.004	.252±.006	.012
PC33ELT11/3-Z									
PC44ELT11/4-Z									
PC47ELT11/4-Z	11.0±0.2	3.01±0.10	1.01±0.05	8.8±0.2	2.0±0.1	9.17±0.20	2.78±0.10	6.40±0.15	0.3
PC50ELT11/4-Z	.433±.008	.119±.004	.040±.002	.346±.008	.079±.004	.361±.008	.109±.004	.252±.006	.012
PC33ELT11/4-Z									
PC44ELT13/3.4-Z									
PC47ELT13/3.4-Z	13.00±0.25	2.19±0.10	1.19±0.05	10.4±0.2	1.0±0.1	10.83±0.20	3.29±0.10	7.56±0.15	0.3
PC50ELT13/3.4-Z	.512±.010	.086±.004	.047±.002	.409±.008	.039±.004	.426±.008	.130±.004	.298±.006	.012
PC33ELT13/3.4-Z									
PC44ELT13/4.4-Z									
PC47ELT13/4.4-Z	13.00±0.25	3.19±0.10	1.19±0.05	10.4±0.2	2.0±0.1	10.83±0.20	3.29±0.10	7.56±0.15	0.3
PC50ELT13/4.4-Z	.512±.010	.126±.004	.047±.002	.409±.008	.079±.004	.426±.008	.130±.004	.298±.006	.012
PC33ELT13/4.4-Z									
PC44ELT15.5/4.3-Z									
PC47ELT15.5/4.3-Z	15.5±0.3	2.92±0.10	1.42±0.10	12.40±0.25	1.5±0.1	12.92±0.25	3.92±0.10	9.01±0.20	0.3
PC50ELT15.5/4.3-Z	.610±.012	.115±.004	.056±.004	.488±.010	.059±.004	.509±.010	.154±.004	.355±.008	.012
PC33ELT15.5/4.3-Z									
PC44ELT15.5/5.8-Z									
PC47ELT15.5/5.8-Z	15.5±0.3	4.42±0.10	1.42±0.10	12.4±0.25	3.0±0.1	12.92±0.25	3.92±0.10	9.01±0.20	0.3
PC50ELT15.5/5.8-Z	.610±.012	.174±.004	.056±.004	.488±.010	.118±.004	.509±.010	.154±.004	.355±.008	.012
PC33ELT15.5/5.8-Z									
PC44ELT18/5.3-Z									
PC47ELT18/5.3-Z	18.0±0.3	3.65±0.10	1.65±0.10	14.4±0.25	2.0±0.1	15.0±0.3	4.55±0.10	10.47±0.20	0.3
PC50ELT18/5.3-Z	.709±.012	.144±.004	.065±.004	.567±.010	.079±.004	.591±.012	.179±.004	.412±.008	.012
PC33ELT18/5.3-Z									
PC44ELT18/7.3-Z									
PC47ELT18/7.3-Z	18.0±0.3	5.65±0.10	1.65±0.10	14.4±0.25	4.00±0.15	15.0±0.3	4.55±0.10	10.47±0.20	0.3
PC50ELT18/7.3-Z	.709±.012	.222±.004	.065±.004	.567±.010	.157±.006	.591±.012	.179±.004	.412±.008	.012
PC33ELT18/7.3-Z									
PC44ELT20/5.7-Z									
PC47ELT20/5.7-Z	20.00±0.35	3.83±0.10	1.83±0.10	16.0±0.3	2.0±0.1	16.67±0.30	5.06±0.15	11.63±0.20	0.5
PC50ELT20/5.7-Z	.787±.014	.151±.004	.072±.004	.630±.012	.079±.004	.656±.012	.199±.006	.458±.008	.020
PC33ELT20/5.7-Z									
PC44ELT20/7.7-Z									
PC47ELT20/7.7-Z	20.00±0.35	5.83±0.15	1.83±0.10	16.0±0.3	4.00±0.15	16.67±0.30	5.06±0.15	11.63±0.20	0.5
PC50ELT20/7.7-Z	.787±.014	.230±.006	.072±.004	.630±.012	.157±.006	.656±.012	.199±.006	.458±.008	.020
PC33ELT20/7.7-Z									

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Planar Cores

ELT Series

* Please see the former page additionally.

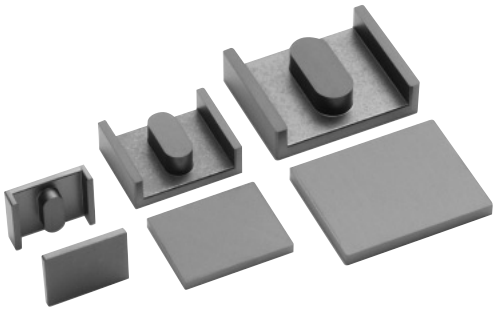
Effective parameter							Electrical characteristics	
C_1 (mm^{-1})	ℓe (mm)	Ae (mm^2)	Ve (mm^3)	Amin. (mm^2)	Acw (mm^2)	Wt (g)	A_L-value (nH/N^2)* Without air gap	With air gap
0.701	11.7	16.7	194	16.1	3.19	1.6	1890±25% 1930±25% 1440±25% 1440±25%	50±3% 80±5% 125±7%
1.073	17.7	16.5	291	16.1	12.8	1.8	1530±25% 1570±25% 1110±25% 1110±25%	50±3% 80±5% 125±7%
0.577	13.4	23.3	313	22.5	3.77	2.5	2480±25% 2530±25% 1850±25% 1850±25%	63±3% 100±5% 160±7%
0.843	19.4	23.0	448	22.5	15.1	2.8	2040±25% 2080±25% 1450±25% 1450±25%	63±3% 100±5% 160±7%
0.503	16.6	33.0	550	32.0	6.75	4.0	3170±25% 3240±25% 2300±25% 2300±25%	63±3% 100±5% 160±7%
0.784	25.6	32.7	837	32.0	27.0	4.8	2450±25% 2510±25% 1680±25% 1680±25%	63±3% 100±5% 160±7%
0.445	19.8	44.5	883	43.1	10.5	6.2	3880±25% 3970±25% 2750±25% 2750±25%	80±3% 125±5% 200±5%
0.723	31.8	44.0	1400	43.1	41.8	7.5	2860±25% 2940±25% 1920±25% 1920±25%	80±3% 125±5% 200±5%
0.392	21.6	55.0	1190	53.2	11.6	8.2	4560±25% 4670±25% 3200±25% 3200±25%	80±3% 125±5% 200±5%
0.617	33.6	54.4	1830	53.2	46.4	9.8	3400±25% 3500±25% 2270±25% 2270±25%	80±3% 125±5% 200±5%

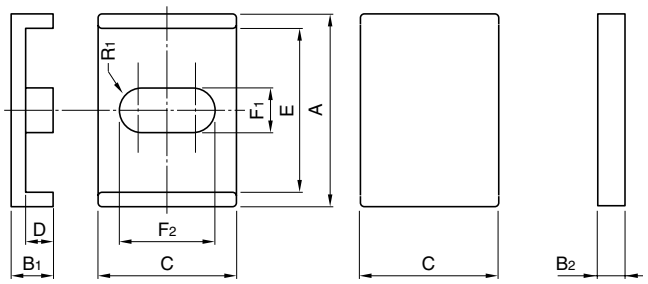
* *A_L-value: 1kHz, 0.5mA, 100Ts*

Ferrite

For Switching Power Supplies
Planar Cores

ELT Series





Part No.	Dimensions in mm inches								
	A	**B1**	**B2**	**C**	**D**	**E**	**F_1**	**F_2**	**R_1**
PC44ELT22/6-Z									
PC47ELT22/6-Z	22.0±0.4	4.02±0.10	2.02±0.10	17.6±0.3	2.0±0.1	18.33±0.35	5.56±0.15	12.79±0.25	0.5
PC50ELT22/6-Z	.866±.016	.158±.004	.080±.004	.693±.012	.079±.004	.722±.014	.219±.006	.504±.010	.020
PC33ELT22/6-Z									
PC44ELT22/8-Z									
PC47ELT22/8-Z	22.0±0.4	6.02±0.15	2.02±0.10	17.6±0.3	4.00±0.15	18.33±0.35	5.56±0.15	12.79±0.25	0.5
PC50ELT22/8-Z	.866±.016	.237±.006	.080±.004	.693±.012	.157±.006	.722±.014	.219±.006	.504±.010	.020
PC33ELT22/8-Z									
PC44ELT25/6.6-Z									
PC47ELT25/6.6-Z	25.00±0.45	4.29±0.10	2.29±0.10	20.00±0.35	2.0±0.1	20.83±0.35	6.32±0.15	14.54±0.25	0.5
PC50ELT25/6.6-Z	.984±.018	.169±.004	.090±.004	.787±.014	.079±.004	.820±.014	.249±.006	.572±.010	.020
PC33ELT25/6.6-Z									
PC44ELT25/8.6-Z									
PC47ELT25/8.6-Z	25.00±0.45	6.29±0.15	2.29±0.10	20.00±0.35	4.00±0.15	20.83±0.35	6.32±0.15	14.54±0.25	0.5
PC50ELT25/8.6-Z	.984±.018	.248±.006	.090±.004	.787±.014	.157±.006	.820±.014	.249±.006	.572±.010	.020
PC33ELT25/8.6-Z									

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Planar Cores

ELT Series

* Please see the former page additionally.

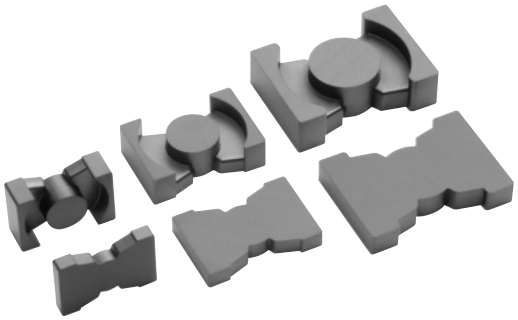
Effective parameter							Electrical characteristics	
C_1 (mm^{-1})	**ℓ_e (mm)**	**Ae (mm^2)**	**Ve (mm^3)**	**Amin. (mm^2)**	**Acw (mm^2)**	**Wt (g)**	**A_L-value (nH/N^2)***	
							Without air gap	**With air gap**
0.351	23.3	66.6	1550	64.4	12.8	10.6	5250±25%	100±3%
							5390±25%	160±3%
							3660±25%	250±5%
							3660±25%	
0.536	35.3	65.9	2330	64.4	51.1	12.6	3970±25%	100±3%
							4090±25%	160±3%
							2640±25%	250±5%
							2640±25%	
0.302	26.0	86.1	2240	83.2	14.5	15.1	6350±25%	100±3%
							6520±25%	160±3%
							4370±25%	250±5%
							4370±25%	
0.446	38.0	85.2	3230	83.2	58.0	17.7	4870±25%	100±3%
							5020±25%	160±3%
							3220±25%	250±5%
							3220±25%	

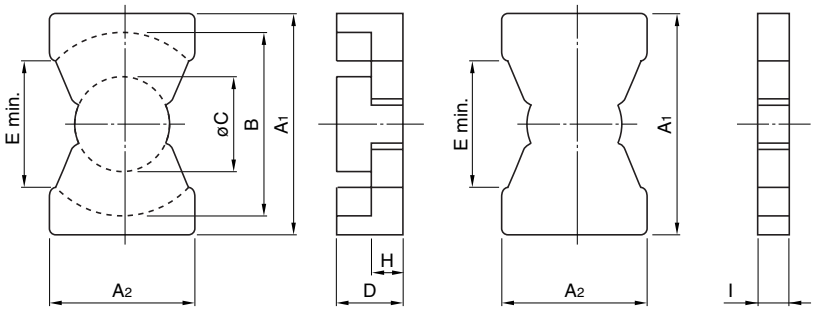
* *A_L-value: 1kHz, 0.5mA, 100Ts*

Ferrite

For Switching Power Supplies
Planar Cores

PQI Series





Part No.	Dimensions in mm / inches							
	A1	**A2**	**B**	**øC**	**D**	**E**	**H**	**I**
PC44PQI16/7.8Z-12								
PC47PQI16/7.8Z-12	16.4±0.3	11.2±0.3	14.4±0.3	7.0±0.2	5.4±0.1	9.6min.	3.05±0.15	2.35±0.10
PC50PQI16/7.8Z-12	.646±.012	.441±.012	.567±.012	.276±.008	.213±.004	.378min.	.120±.006	.093±.004
PC33PQI16/7.8Z-12								
PC44PQI20/9Z-12								
PC47PQI20/9Z-12	20.5±0.4	14.0±0.4	18.0±0.4	8.8±0.2	6.0±0.1	12.0min.	3.05±0.15	2.95±0.10
PC50PQI20/9Z-12	.807±.016	.551±.016	.709±.016	.346±.008	.236±.004	.472min.	.120±.006	.116±.004
PC33PQI20/9Z-12								
PC44PQI26/11.5Z-12								
PC47PQI26/11.5Z-12	26.50±0.45	19.00±0.45	22.50±0.45	12.0±0.2	7.3±0.1	15.5min.	3.10±0.15	4.2±0.1
PC50PQI26/11.5Z-12	1.043±.018	.748±.018	.886±.018	.472±.008	.287±.004	.610min.	.122±.006	.165±.004
PC33PQI26/11.5Z-12								

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Planar Cores

PQI Series

* Please see the former page additionally.

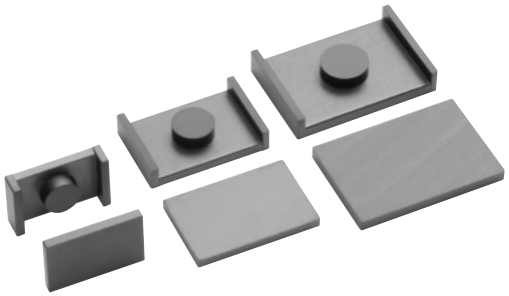
Effective parameter							Electrical characteristics	
C_1 (mm^{-1})	**ℓ_e (mm)**	**Ae (mm^2)**	**Ve (mm^3)**	**Amin. (mm^2)**	**Acw (mm^2)**	**Wt (g)**	**A_L-value (nH/N^2)***	
							Without air gap	**With air gap**
0.465	19.5	42.0	818	38.5	11.3	5.0	3600±25%	63±3%
							3710±25%	100±5%
							2590±25%	160±7%
							2590±25%	
0.346	22.9	66.0	1509	60.8	14.0	9.0	5600±25%	100±3%
							5660±25%	160±5%
							3670±25%	250±7%
							3670±25%	
0.224	27.7	123.0	3415	113.0	16.3	19.0	9700±25%	100±3%
							9700±25%	160±5%
							5990±25%	250±7%
							5990±25%	

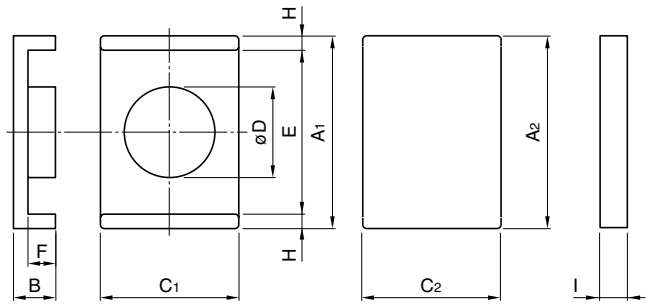
* *A_L-value: 1kHz, 0.5mA, 100Ts*

Ferrite

For Switching Power Supplies
Planar Cores

EIR Series





Part No.	Dimensions in mm inches									
	A1	**B**	**C1**	**øD**	**E**	**F**	**H**	**A2**	**C2**	**I**
PC44EIR14/4.5/9-Z										
PC47EIR14/4.5/9-Z	13.85±0.25	3.2±0.1	9.0±0.2	5.2±0.1	11.35±0.15	1.9±0.1	1.2	14.0±0.2	9.2±0.2	1.3±0.1
PC50EIR14/4.5/9-Z	.545±.010	.126±.004	.354±.008	.205±.004	.447±.006	.075±.004	.047	.551±.008	.362±.008	.051±.004
PC33EIR14/4.5/9-Z										
PC44EIR18/5/12-Z										
PC47EIR18/5/12-Z	18.15±0.30	3.5±0.1	12.0±0.2	6.0±0.1	15.75±0.25	2.0±0.1	1.2	18.20±0.25	12.2±0.2	1.5±0.1
PC50EIR18/5/12-Z	.715±.012	.138±.004	.472±.008	.236±.004	.620±.010	.079±.004	.047	.717±.010	.480±.008	.059±.004
PC33EIR18/5/12-Z										
PC44EIR22/5.5/15-Z										
PC47EIR22/5.5/15-Z	22.10±0.35	3.75±0.10	15.25±0.25	6.8±0.1	19.7±0.3	2.0±0.1	1.2	22.2±0.3	15.5±0.2	1.75±0.10
PC50EIR22/5.5/15-Z	.870±.014	.148±.004	.600±.010	.268±.004	.776±.012	.079±.004	.047	.874±.012	.610±.008	.069±.004
PC33EIR22/5.5/15-Z										

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Planar Cores

EIR Series

* Please see the former page additionally.

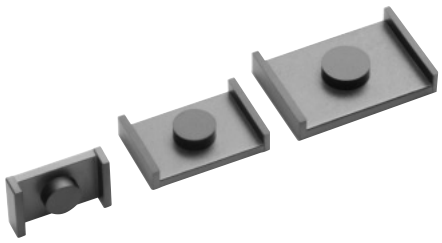
Effective parameter							Electrical characteristics	
C_1 (mm^{-1})	**ℓ_e (mm)**	**Ae (mm^2)**	**Ve (mm^3)**	**Amin. (mm^2)**	**Acw (mm^2)**	**Wt (g)**	**A_L-value (nH/N^2)**	
							Without air gap	**With air gap**
0.690	15.4	22.5	348	21.2	5.84	2.0	2400±25%	63±3%
							2400±25%	100±5%
							1800±25%	160±7%
							1800±25%	
0.600	19.7	32.8	646	28.3	9.75	3.8	2900±25%	63±3%
							2950±25%	100±5%
							2100±25%	160±7%
							2100±25%	
0.500	23.2	46.1	1071	36.3	12.9	6.5	3400±25%	63±3%
							3430±25%	100±5%
							2500±25%	160±7%
							2500±25%	

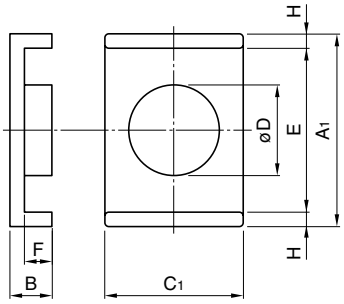
* *A_L-value: 1kHz, 0.5mA, 100Ts*

Ferrite

For Switching Power Supplies
Planar Cores

ER Series





Part No.	Dimensions in mm / inches						
	A1	**B**	**C1**	**øD**	**E**	**F**	**H**
PC44ER14/4.5/9-Z							
PC47ER14/4.5/9-Z	13.85±0.25	2.25±0.10	9.0±0.2	5.2±0.1	11.35±0.15	0.95±0.10	1.2
PC50ER14/4.5/9-Z	.545±.010	.089±.004	.354±.008	.205±.004	.447±.006	.037±.004	.047
PC33ER14/4.5/9-Z							
PC44ER18/5/12-Z							
PC47ER18/5/12-Z	18.15±0.30	2.5±0.1	12.0±0.2	6.0±0.1	15.75±0.25	1.0±0.1	1.2
PC50ER18/5/12-Z	.715±.012	.098±.004	.472±.008	.236±.004	.620±.010	.039±.004	.047
PC33ER18/5/12-Z							
PC44ER22/5.5/15-Z							
PC47ER22/5.5/15-Z	22.10±0.35	2.75±0.10	15.25±0.25	6.8±0.1	19.7±0.3	1.0±0.1	1.2
PC50ER22/5.5/15-Z	.870±.014	.108±.004	.600±.010	.268±.004	.776±.012	.039±.004	.047
PC33ER22/5.5/15-Z							

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Planar Cores

ER Series

* Please see the former page additionally.

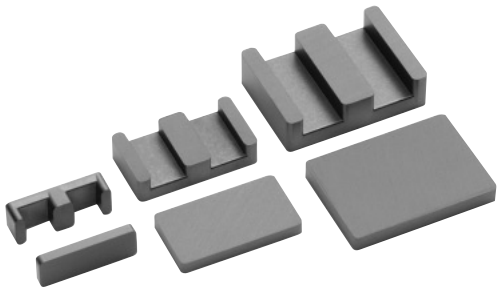
Effective parameter							Electrical characteristics	
C_1 (mm^{-1})	**ℓ_e (mm)**	**Ae (mm^2)**	**Ve (mm^3)**	**Amin. (mm^2)**	**Acw (mm^2)**	**Wt (g)**	**A_L-value (nH/N^2)***	
							Without air gap	**With air gap**
0.690	15.4	22.5	348	21.2	5.84	2.0	2400±25%	63±3%
							2400±25%	100±5%
							1640±25%	160±7%
							1640±25%	
0.602	19.7	32.8	646	28.3	9.75	3.8	2900±25%	63±3%
							3000±25%	100±5%
							1960±25%	160±7%
							1960±25%	
0.505	23.2	46.1	1071	36.3	12.9	6.5	3400±25%	63±3%
							3430±25%	100±5%
							2390±25%	160±7%
							2390±25%	

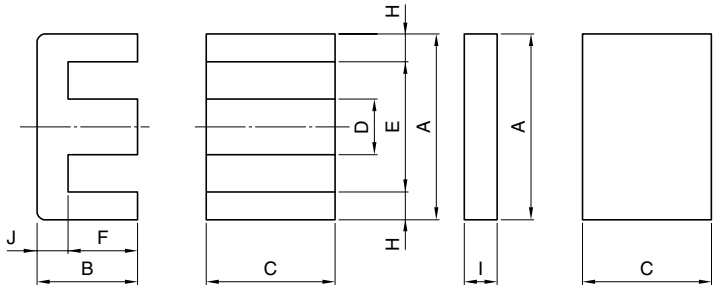
* *A_L-value: 1kHz, 0.5mA, 100Ts*

Ferrite

For Switching Power Supplies
Planar Cores

EI Series





Part No.	Dimensions in mm inches								
	A	**B**	**C**	**D**	**E**	**F**	**H**	**I**	**J**
PC44EI14/5/5-Z									
PC47EI14/5/5-Z	14.0±0.3	3.5±0.1	5.0±0.1	3.0±0.1	11.00±0.25	2.0±0.1	1.5	1.50±0.05	1.5
PC50EI14/5/5-Z	.551±.012	.138±.004	.197±.004	.118±.004	.433±.010	.079±.004	.059	.059±.002	.059
PC33EI14/5/5-Z									
PC44EI18/6/10-Z									
PC47EI18/6/10-Z	18.15±0.35	4.0±0.1	10.0±0.2	4.0±0.1	14.0±0.3	2.0±0.1	2.0	2.00±0.05	2.0
PC50EI18/6/10-Z	.715±.014	.157±.004	.394±.008	.157±.004	.551±.012	.079±.004	.079	.079±.002	.079
PC33EI18/6/10-Z									
PC44EI22/8/16-Z									
PC47EI22/8/16-Z	21.80±0.4	5.7±0.1	15.8±0.3	5.0±0.1	16.8±0.4	3.2±0.1	2.5	2.50±0.05	2.5
PC50EI22/8/16-Z	.858±.016	.224±.004	.622±.012	.197±.004	.661±.016	.126±.004	.098	.098±.002	.098
PC33EI22/8/16-Z									

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Planar Cores

EI Series

* Please see the former page additionally.

Effective parameter							Electrical characteristics	
C_1 (mm^{-1})	**ℓ_e (mm)**	**Ae (mm^2)**	**Ve (mm^3)**	**Amin. (mm^2)**	**Acw (mm^2)**	**Wt (g)**	**A_L-value (nH/N^2)***	
							Without air gap	**With air gap**
1.114	16.7	15.0	251	15.0	8.00	2.0	1400±25%	63±3%
							1450±25%	100±5%
							1020±25%	160±7%
							1020±25%	
0.507	20.3	40.0	811	40.0	10.0	6.0	3480±25%	100±3%
							3560±25%	160±5%
							2450±25%	250±7%
							2450±25%	
0.330	26.1	79.0	2060	79.0	18.9	14.3	5900±25%	160±3%
							5900±25%	250±3%
							4300±25%	315±3%
							4300±25%	

* *A_L-value: 1kHz, 0.5mA, 100Ts*

Ferrite

For Switching Power Supplies
Original Cores

PQ, LP, EPC and EP Series

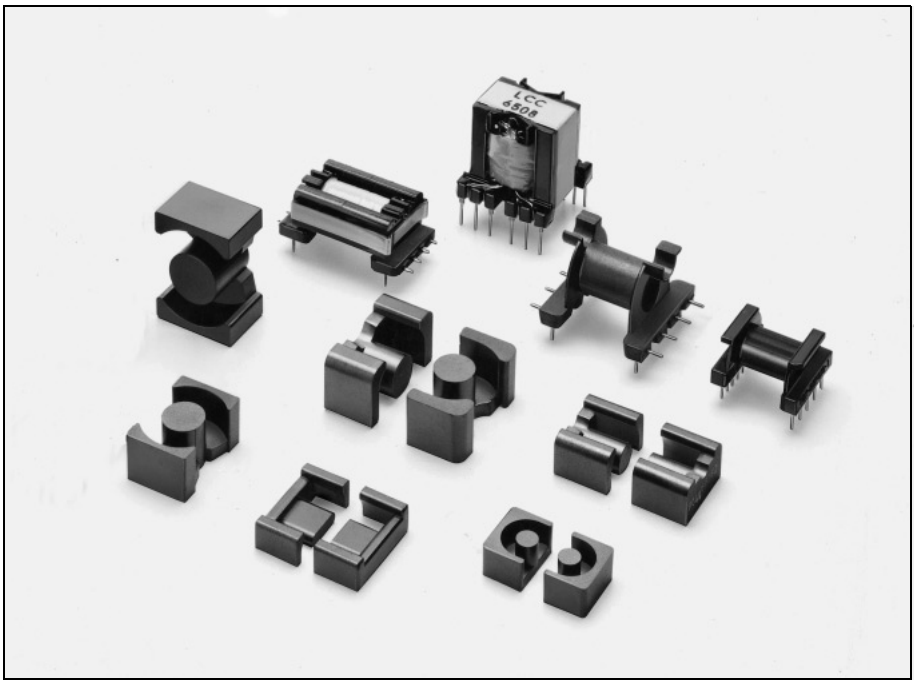
Cores

PQ20/16 to PQ50/50
LP23/8 to LP32/13
EPC10 to EPC30
EP7 to EP20

Bobbins

BPQ20/16 to BPQ50/50
BLP23/8 to BLP32/13
BEPC10 to BEPC30
BEP7 to BEP20

Accessories



Ordering Code System

Cores

PC44 PQ 26/25 Z – 12

- PC44: Material
- PQ 26/25: Size of PQ core
- Z: AL-value Z: without air gap; G□: with air gap
- 12: Type
- Number of Lead Slot

Bobbins

B PQ 26/25 – 1112CPFR

- B: Symbol of Bobbin
- PQ 26/25: Size of PQ core
- 1: Code of Bobbin Material
- 1: Number of Section
- 2: Number of Terminal Pin
- CPFR: Type of Terminal Pin

Accessories

F PQ 26/25 – A

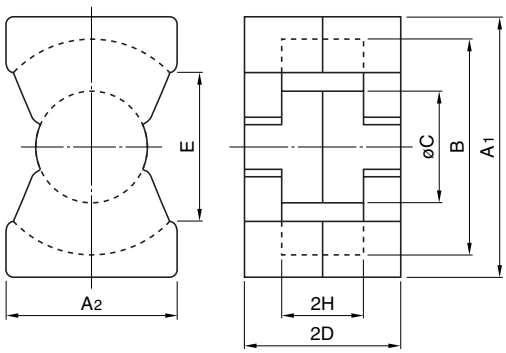
- F: Symbol of Accessory
- PQ 26/25: Size of PQ core
- A: Type of Accessory

Ferrite

For Switching Power Supplies
Original Cores

PQ Series

DE. PAT. 2,944,583
DE. DES. 15,655
EP. PAT. 26,104(DE, FR, GB, NL)
GB. PAT. 2,035,706
GB. DES. 990,685
JP. U. M 1,589,580
JP. U. M 1,621,895
JP. U. M PUB.
85(60)-3556 1,647,781
JP. U. M PUB.
86(61)-5779 1655608
JP. DES. 580,081
JP. DES. 649,618
KR. U. M 23,487
NL. PAT. 178,826
NL. DES. 5,777
US. PAT. 4,352,080
US. DES. 264,959



Part No.	Dimensions in mm / inches						
	A_1	**A_2**	**B**	**øC**	**2D**	**E min.**	**2H**
PC44PQ20/16Z-12	20.5±0.4 .807±.016	14.0±0.4 .551±.016	18.0±0.4 .709±.016	8.8±0.2 .346±.008	16.2±0.2 .638±.008	12.0 .472	10.3±0.3 .406±.012
PC44PQ20/20Z-12	20.5±0.4 .807±.016	14.0±0.4 .551±.016	18.0±0.4 .709±.016	8.8±0.2 .346±.008	20.2±0.2 .795±.008	12.0 .472	14.3±0.3 .563±.012
PC50PQ20/20Z-12	20.5±0.4 .807±.016	14.0±0.4 .551±.016	18.0±0.4 .709±.016	8.8±0.2 .346±.008	20.2±0.2 .795±.008	12.0 .472	14.3±0.3 .563±.012
PC44PQ26/20Z-12	26.5±0.45 1.043±.018	19.0±0.45 .748±.018	22.5±0.45 .886±.018	12.0±0.2 .472±.008	20.15±0.25 .793±.010	15.5 .610	11.5±0.3 .453±.012
PC44PQ26/25Z-12	26.5±0.45 1.043±.018	19.0±0.45 .748±.018	22.5±0.45 .886±.018	12.0±0.2 .472±.008	24.75±0.25 .974±.010	15.5 .610	16.1±0.3 .634±.012
PC50PQ26/25Z-12	26.5±0.45 1.043±.018	19.0±0.45 .748±.018	22.5±0.45 .886±.018	12.0±0.2 .472±.008	24.75±0.25 .974±.010	15.5 .610	16.1±0.3 .634±.012
PC44PQ32/20Z-12	32.0±0.5 1.260±.020	22.0±0.5 .866±.020	27.5±0.5 1.083±.020	13.45±0.25 .530±.010	20.55±0.25 .809±.010	19.0 .748	11.5±0.3 .453±.012
PC44PQ32/30Z-12	32.0±0.5 1.260±.020	22.0±0.5 .866±.020	27.5±0.5 1.083±.020	13.45±0.25 .530±.010	30.35±0.25 1.195±.010	19.0 .748	21.3±0.3 .839±.012
PC44PQ35/35Z-12	35.1±0.6 1.382±.024	26.0±0.5 1.024±.020	32.0±0.5 1.260±.020	14.35±0.25 .565±.010	34.75±0.25 1.368±.010	23.5 .925	25.0±0.3 .984±.012
PC44PQ40/40Z-12	40.5±0.9 1.594±.035	28.0±0.6 1.102±.024	37.0±0.6 1.457±.024	14.9±0.3 .587±.012	39.75±0.25 1.565±.010	28.0 1.102	29.5±0.3 1.161±.012
PC44PQ50/50Z-12	50.0±0.7 1.969±.028	32.5±0.5 1.260±.020	44.0±0.7 1.732±.028	20.0±0.35 .787±.014	49.95±0.25 1.967±.010	31.5 1.240	36.1±0.3 1.421±.012

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Original Cores

PQ Series

* Please see the former page additionally.

Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
C_1 (mm^{-1})	Ae (mm^2)	ℓe (mm)	Ve (mm^3)	A_L-value (nH/N^2)* Without air gap	With air gap	Core loss (W) max. 100kHz, 200mT, 100°C		
0.603	62	37.4	2320	3880±25%	100±5% 250±7% 400±10%	0.84	13	BPQ20/16-1114CPFR
0.732	62	45.4	2810	3150±25%	100±5% 250±7% 400±10%	1.02	15	BPQ20/20-1114CPFR
0.732	62	45.4	2810	2000±25%	100±5% 160±5% 250±7%	0.33***	15	BPQ20/20-1114CPFR
0.389	119	46.3	5510	6170±25%	160±5% 315±5% 630±10%	1.94	31	BPQ26/20-1112CPFR
0.470	118	55.5	6550	5250±25%	160±5% 315±5% 630±10%	2.32	36	BPQ26/25-1112CPFR
0.470	118	55.5	6550	3200±25%	100±5% 250±5% 400±7%	0.76***	36	BPQ26/25-1112CPFR
0.326	170	55.5	9440	7310±25%	160±5% 315±5% 630±7%	2.92	42	BPQ32/20-1112CPFR
0.463	161	74.6	12000	5140±25%	160±5% 315±5% 630±7%	3.92	55	BPQ32/30-1112CPFR
0.448	196	87.9	17200	4860±25%	160±5% 315±5% 630±7%	5.27	73	BPQ35/35-1112CPFR
0.507	201	102	20500	4300±25%	160±5% 315±5% 630±7%	6.56	95	BPQ40/40-1112CPFR
0.346	328	113	37238	6720±25%	250±5% 400±5% 630±5%	6.10**	195	BPQ50/50-1112CPFR

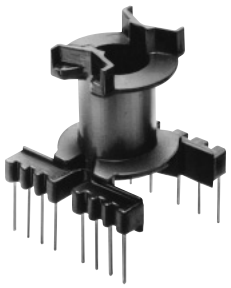
* *A_L-value: 1kHz, 0.5mA, 100Ts*
** *Core loss: 100kHz, 150mT, 100°C*
*** *Core loss: 500kHz, 50mT, 100°C*

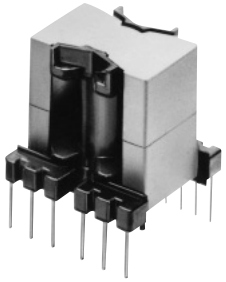
Ferrite

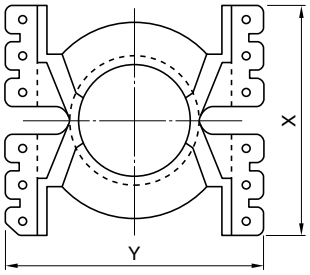
For Switching Power Supplies
Original Cores

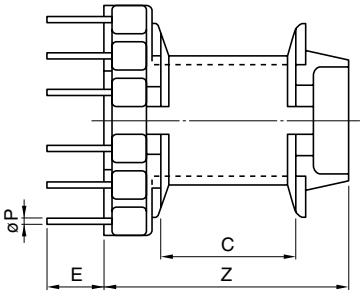
PQ Bobbins

Bobbins



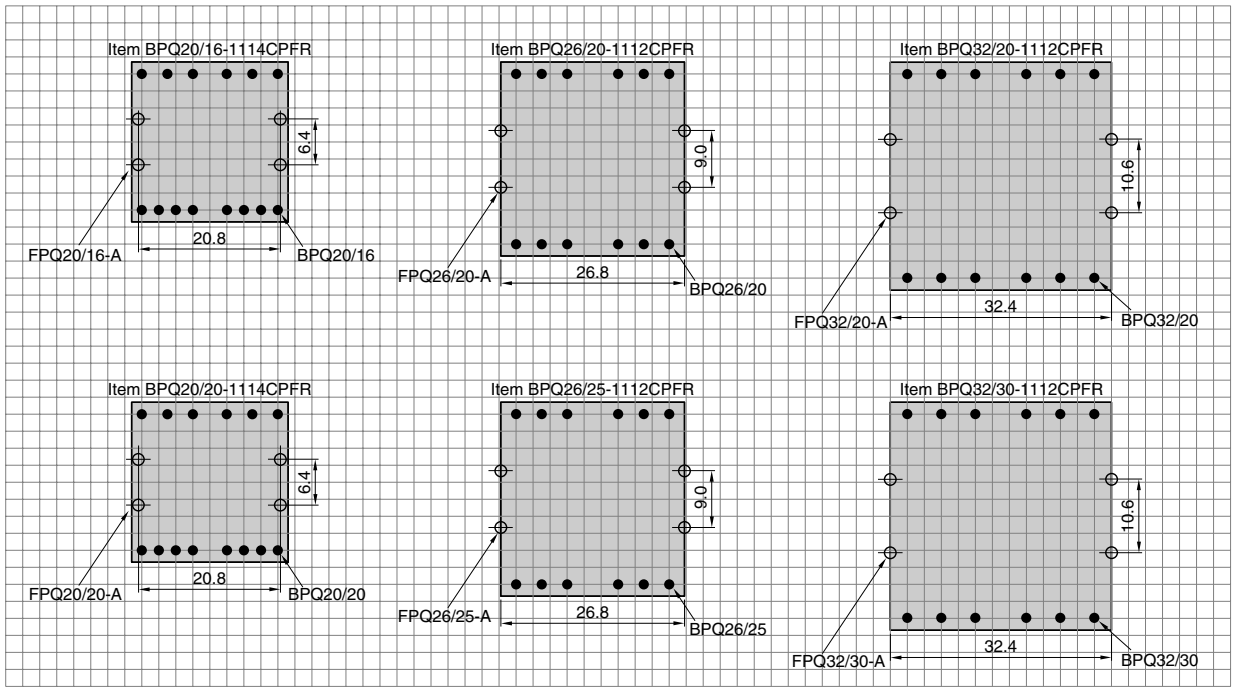






Part No.	Dimensions in mm / inches						
	A	**øB**	**C**	**E**	**X**	**Y**	**Z**
BPQ20/16-1114CPFR	17.2 .677	10.95 .431	8.0 .315	6.5 .256	23.0 .906	23.0 .906	18.3 .720
BPQ20/20-1114CPFR	17.2 .677	10.95 .431	12.0 .472	6.5 .256	23.0 .906	23.0 .906	22.3 .878
BPQ26/20-1112CPFR	21.6 .850	14.3 .563	9.2 .362	6.5 .256	26.5 1.043	29.3 1.154	21.5 .846
BPQ26/25-1112CPFR	21.6 .850	14.3 .563	13.9 .547	3.5 .138	26.5 1.043	29.3 1.154	29.1 1.146
BPQ32/20-1112CPFR	26.6 1.047	16.0 .630	9.0 .354	7.0 .276	32.0 1.260	34.0 1.339	22.5 .886
BPQ32/30-1112CPFR	26.6 1.047	16.0 .630	18.6 .732	7.0 .276	32.0 1.260	34.0 1.339	32.1 1.264
BPQ35/35-1112CPFR	31.1 1.224	16.9 .665	22.4 .882	7.5 .295	35.0 1.378	39.0 1.535	37.4 1.472
BPQ40/40-1112CPFR	36.0 1.417	17.5 .689	26.8 1.055	6.5 .256	40.0 1.575	42.0 1.654	44.8 1.764
BPQ50/50-1112CPFR	42.9 1.689	23.2 .913	32.4 1.276	10.0 .394	51.0 2.008	51.0 2.008	52.0 2.047

Connecting Pin Patterns (2.54mm/0.1 inch grids) View in mounting direction

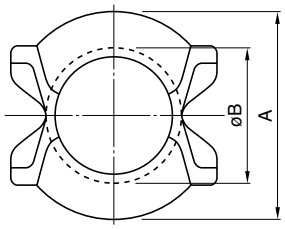


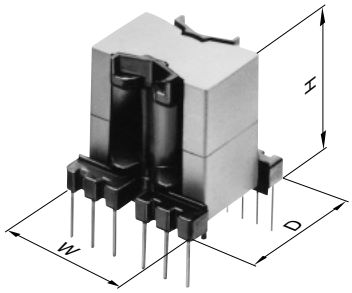
* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Original Cores

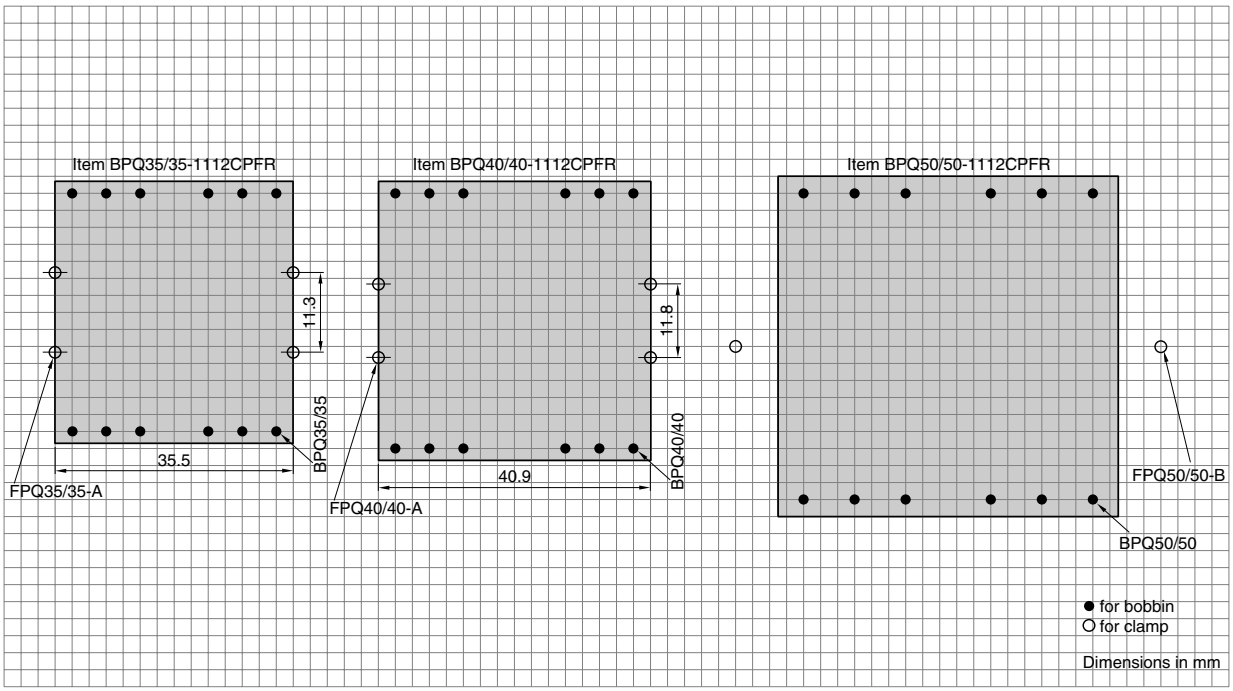
PQ Bobbins





t*	øP (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)	Accessory item
0.8	0.6	14	23.0 23.0 18.3	23.4	44	2.7	FPQ20/16-A
0.8	0.6	14	23.0 23.0 22.3	36.2	44	2.8	FPQ20/20-A
0.8	0.8	12	26.5 29.3 21.5	30.7	56.2	4.3	FPQ26/20-A
0.8	0.8	12	26.5 29.3 29.1	47.7	56.2	4.9	FPQ26/25-A
0.9	1.0	12	32.0 34.0 22.5	42.9	67.1	6.6	FPQ32/20-A
0.9	1.0	12	32.0 34.0 32.1	95.3	67.1	7.4	FPQ32/30-A
0.9	1.0	12	35.0 39.0 37.4	154.2	75.2	11	FPQ35/35-A
0.9	1.0	12	40.0 42.0 44.8	240.0	83.9	14	FPQ40/40-A
1.0	1.2	12	51.0 51.0 52.0	313.0	104	22	FPQ50/50-B

UL Grade: 94V-0, Material: FR phenol, Pin material: Steel wire (Solder plated)
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
* *Minimum thickness of bobbin inside which core is placed, including flanges.*



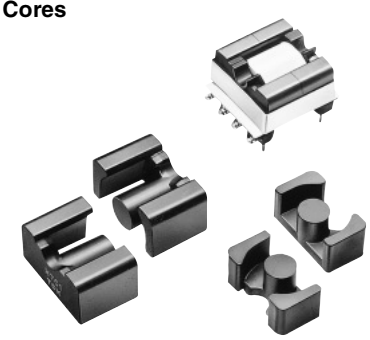
* Please see the former page additionally.

Ferrite

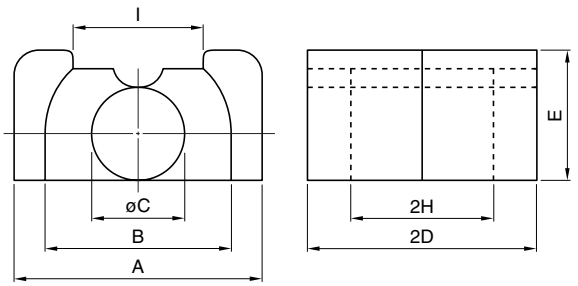
For Switching Power Supplies
Original Cores

LP Series

Cores

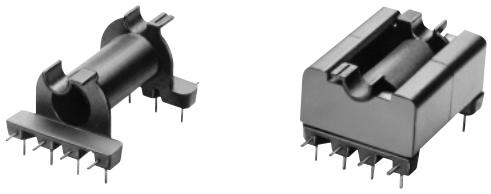


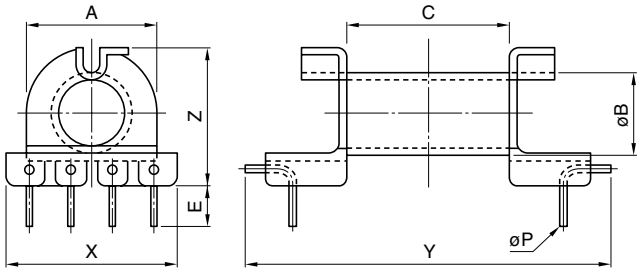
DE. DES. 19,581
EP. PAT. 68,745(DE, FR, GB, NL)
FR. DES. 201,586
GB. DES. 1,007,200
JP. U. M PRO. PUB. 82(57)-201,824
JP. DES. 630,754
NL. DES. 9,767
US. PAT. 4,424,504
US. DES. 280,810



Part No.	Dimensions in mm / inches						
	A	B	øC	2D	E	2H	I
PC44LP23/8Z-12	16.5±0.3 .650±.012	12.5±0.3 .492±.012	5.7±0.1 .224±.004	23.4±0.2 .921±.008	8.7±0.2 .343±.008	17.4±0.2 .685±.008	9.0±0.5 .354±.020
PC44LP22/13Z-12	25.0±0.4 .984±.016	19.0±0.3 .748±.012	8.6±0.2 .339±.008	22.4±0.2 .882±.008	12.9±0.3 .508±.012	16.4±0.3 .646±.012	13.5±0.5 .531±.020
PC44LP32/13Z-12	25.0±0.4 .984±.016	19.0±0.3 .748±.012	8.6±0.2 .339±.008	31.8±0.2 1.252±.008	12.9±0.3 .508±.012	24.1±0.3 .949±.012	13.5±0.5 .531±.020

Bobbins



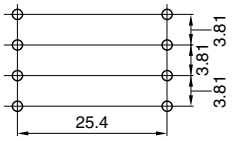


Type 1

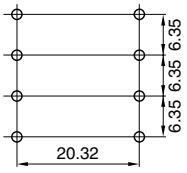
Part No.	Type	Dimensions in mm / inches						
		A	B	C	E	X	Y	Z
BLP23/8-018CPLFR	1	12.0 .472	7.7 .303	15.2 .598	4.0 .157	16.5 .650	34.0 1.358	12.5 .492
BLP22/13-018CPLFR	1	17.6 .693	10.7 .421	14.1 .555	4.0 .157	25.0 .984	31.5 1.240	17.6 .693
BLP22/13-1110CPLFR*	2	17.6 .693	10.78 .424	13.4 .528	4.0 .157	25.0 .984	32.3 1.272	19.1 .752
BLP32/13-018CPLFR	1	17.6 .693	10.7 .421	21.8 .858	4.0 .157	25.0 .984	40.4 1.591	17.6 .693
BLP32/13-1110CPLFR*	2	17.6 .693	10.82 .426	21.1 .835	4.0 .157	25.0 .984	40.6 1.598	19.1 .752

* *Include 2 pieces of insulating dividers (see next page).*

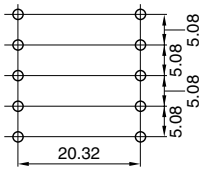
Pin layout
Item BLP23/8-018CPLFR



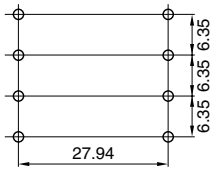
Pin layout
Item BLP22/13-018CPLFR



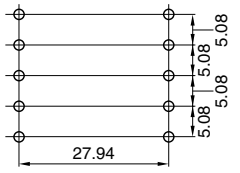
Pin layout
Item BLP22/13-1110CPLFR



Pin layout
Item BLP32/13-018CPLFR



Pin layout
Item BLP32/13-1110CPLFR



Dimensions in mm

* Please see the next page additionally.

Ferrite

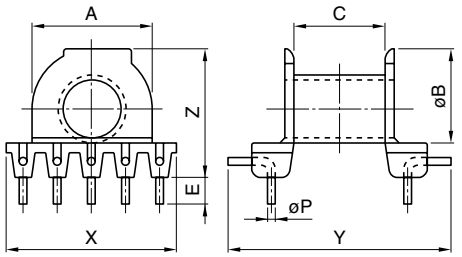
For Switching Power Supplies
Original Cores

LP Series

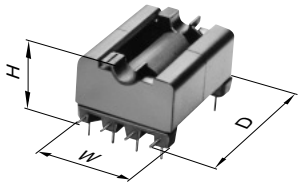
* Please see the former page additionally.

Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
C_1 (mm^{-1})	Ae (mm^2)	ℓe (mm)	Ve (mm^3)	A_L-value (nH/N^2)* Without air gap	With air gap	Core loss (W) max. 100kHz, 200mT, 100°C		
1.41	31.3	44.1	1380	1600±25%	63±5% 100±7% 250±13%	0.42	9.6	BLP23/8-018PFR
0.721	67.9	49.0	3330	3310±25%	100±5% 200±7% 400±10%	1.05	21	BLP22/13-1110CPLFR
0.909	70.3	64.0	4500	2630±25%	100±5% 200±7% 400±10%	1.38	30	BLP32/13-1110CPLFR

* *A_L-value: 1kHz, 0.5mA, 100Ts*



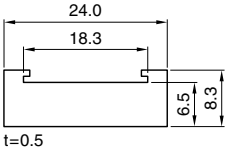
Type 2



t*	øP (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm^2)	Parameter ℓw (mm)	Wt (g)	Material	Clamp item
0.8	0.6	8	17.2 34.2 12.5	31.9	30.9	1.9	PPS	FLP23/8-A
0.8	0.8	8	27 32 17.8	51.5	45.8	3.2	PPS	FLP22/13-A
0.8	0.8	10	25.9 32.3 19.2	45.7	44.5	3.1	FR Phenol	FLP22/13-A
0.8	0.8	8	27 41 17.8	79.6	45.8	3.7	PPS	FLP32/13-A
0.8	0.8	10	25.9 40.6 19.2	72.0	44.5	3.7	FR Phenol	FLP32/13-A

UL Grade: 94V-0, Pin material: Phosphor bronze wire/Steel wire for "-1110-CPLFR" (Solder plated), Insulating divider's material: NOMEX®
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
* *Minimum thickness of bobbin inside which core is placed, including flanges.*

Insulating divider for BLP22/13-1110CPLFR
Part No.: ILP22/13



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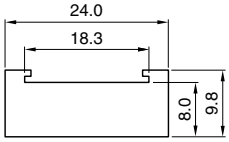
Insulating divider for BLP32/13-1110CPLFR
Part No.: ILP32/13



t=0.5

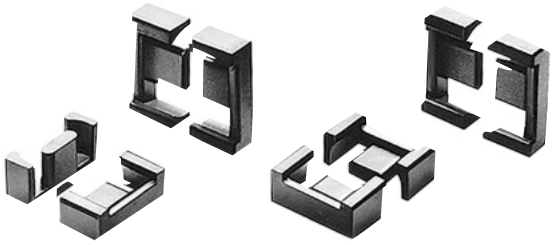
Dimensions in mm

Ferrite

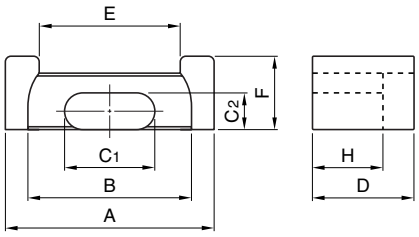
For Switching Power Supplies
Original Cores

EPC Series

Cores



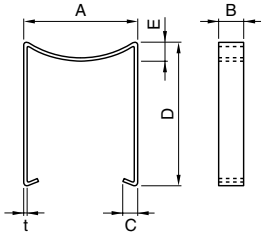
US. PAT. 4,760,366
EP. PAT. 245,083(DE, FR, GB, NL)
KS. UM 50,836
TW. UM 39,406
JP. PENDING



Type 1

Part No.	Type	Dimensions in mm / inches						
		A	B min.	C_1	C_2	D	E min.	F
PC44EPC10-Z **PC50EPC10-Z**	3	10.2±0.2 .402±.008	7.6 .299	5.0±0.1 .197±.004	1.9±0.1 .075±.004	4.05±0.10 .159±.004	5.3 .209	3.4±0.1 .139±.004
PC44EPC13-Z **PC50EPC13-Z**	1	13.25±0.30 .522±.012	10.5 .413	5.60±0.15 .220±.006	2.05±0.10 .081±.004	6.6±0.2 .026±.008	8.3 .327	4.60±0.15 .181±.006
PC44EPC17-Z **PC50EPC17-Z**	1	17.6±0.4 .693±.016	14.3 .563	7.70±0.15 .303±.006	2.8±0.1 .110±.004	8.55±0.20 .337±.008	11.5 .453	6.00±0.15 .236±.006
PC44EPC19-Z **PC50EPC19-Z**	1	19.1±0.4 .752±.016	15.8 .622	8.50±0.15 .335±.006	2.5±0.1 .098±.004	9.75±0.20 .384±.008	13.1 .516	6.00±0.15 .236±.006
PC44EPC25-Z **PC50EPC25-Z**	1	25.1±0.5 .988±.020	20.65 .813	11.5±0.2 .453±.008	4.0±0.1 .157±.004	12.5±0.2 .492±.008	17.1 .673	8.0±0.2 .315±.008
PC44EPC25B-Z **PC50EPC25B-Z**	2	25.1±0.5 .988±.020	20.4 .803	13.8±0.2 .543±.008	2.50±0.15 .098±.006	11.4±0.15 .449±.006	16.5 .650	6.5±0.2 .266±.008
PC44EPC27-Z **PC50EPC27-Z**	1	27.1±0.5 1.067±.020	21.6 .850	13.0±0.3 .512±.012	4.0±0.1 .157±.004	16.0±0.2 .630±.008	18.5 .728	8.0±0.2 .315±.008
PC44EPC27N-Z	4	27.0±0.4 1.063±.016	20.8 .819	13.85±0.15 .545±.006	2.2±0.1 .087±.004	13.0±0.1 .512±.004	19.0 .748	5.1±0.1 .201±.004
PC44EPC30-Z **PC50EPC30-Z**	1	30.1±0.5 1.185±.020	23.6 .929	15.0±0.3 .591±.012	4.0±0.1 .157±.004	17.5±0.2 .689±.008	20.0 .787	8.0±0.2 .315±.008

Accessory Part No.	Dimensions in mm / inches A	B	C	D	E	t	Material
FEPC-10-A	10.8 .425	2.8 .110	1.5 .059	8.0 .315	0.8 .031	0.2 .008	Stainless steel
FEPC-13-A	13.7 .541	2.8 .110	2.9 .114	14.75 .581	2.65 .104	0.25 .010	Stainless steel
FEPC-17-A	18.1 .713	3.8 .150	2.9 .114	19.1 .752	3.0 .118	0.3 .012	Stainless steel
FEPC-19-A	19.9 .783	3.8 .150	2.9 .114	21.5 .846	3.0 .118	0.3 .012	Stainless steel
FEPC-25-A	26.0 1.024	5.6 .220	2.9 .114	27.0 1.063	3.0 .118	0.3 .012	Stainless steel
FEPC-25B-A	26.0 1.024	5.0 .197	2.9 .114	24.5 .965	3.0 .118	0.3 .012	Stainless steel
FEPC-27-A	28.0 1.102	5.6 .220	2.9 .114	34.0 1.339	3.0 .118	0.3 .012	Stainless steel
FEPC-30-A	31.0 1.220	5.6 .220	2.9 .114	37.0 1.457	3.0 .118	0.3 .012	Stainless steel

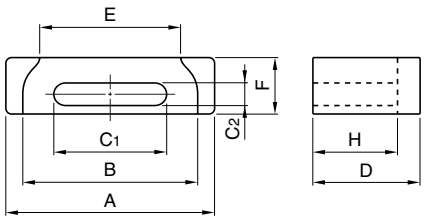


* Please see the next page additionally.

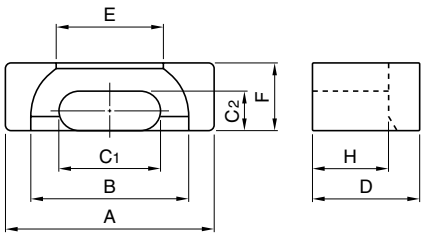
Ferrite

For Switching Power Supplies
Original Cores

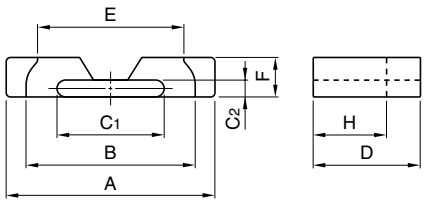
EPC Series



Type 2



Type 3



Type 4

	Effective parameter				Electrical characteristics			Wt	Bobbin item
H	**C_1 (mm^{-1})**	**Ae (mm^2)**	**ℓe (mm)**	**Ve (mm^3)**	**A_L-value (nH/N^2)***		**Core loss (W) max.**	**(g)**	
					Without air gap	**With air gap**	**100kHz, 200mT, 100°C**		
2.65±0.10 .104±.004	1.89	9.39	17.8	167	1000±25% 660±25%	40±7% 63±10%	0.072 0.025**	1.1	BEPC10-118GAFR
4.5±0.2 .177±.008	2.45	12.5	30.6	382	870±25% 560±25%	40±4% 63±5%	0.14 0.039**	2.1	BEPC13-1110CPHFR BEPC13-1110GAFR
6.05±0.20 .238±.008	1.76	22.8	40.2	917	1150±25% 740±25%	80±4% 125±5%	0.35 0.1**	4.5	BEPC17-1110CPHFR BEPC17-119GAFR
7.25±0.20 .285±.008	2.03	22.7	46.1	1050	940±25% 680±25%	80±4% 125±5%	0.4 0.12**	5.3	BEPC19-1111CPHFR BEPC19-1110GAFR
9.0±0.3 .354±.012	1.28	46.4	59.2	2750	1560±25% 1080±25%	125±5% 200±7%	1.11 0.32**	13	BEPC25-1111CPHFR
8.75±0.15 .344±.006	1.39	33.3	46.2	1540	1560±25% 1080±25%	80±5% 125±7%	0.65 0.22**	11	BEPC25B-1111GAFR
12.0±0.3 .472±.012	1.34	54.6	73.1	4000	1540±25% 1030±25%	125±5% 200±7%	1.56 0.46**	18	BEPC27-1111CPHFR
8.5±0.1 .335±.004	1.70	33.0	55.9	1840	1400±25%	80±5% 125±7%	0.73	10	BEPC27N-1114CPHFR
13.0±0.3 .512±.012	1.34	61.0	81.6	4980	1570±25% 1060±25%	125±5% 200±7%	2.03 0.58**	23	BEPC30-1112CPHFR

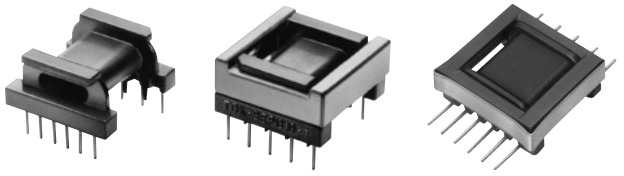
** A_L-value: 1kHz, 0.5mA, 100Ts*
*** Core loss: 500kHz, 50mT, 100°C*

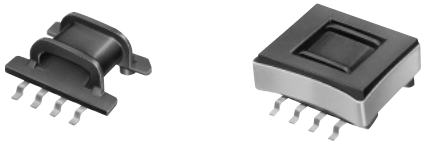
* Please see the former page additionally.

Ferrite

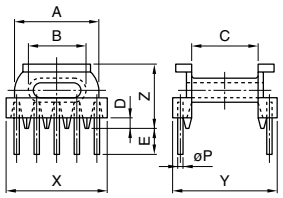
For Switching Power Supplies
Original Cores

EPC Bobbins and Accessories

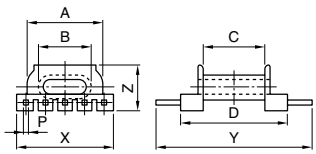




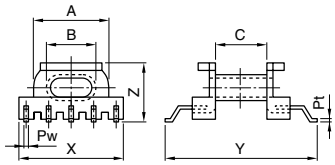
Lead through type



Drop in type



SMD type



Bobbin (Lead through type) Part No.	Dimensions in mm / inches							
	A	**B**	**C**	**D**	**E**	**X**	**Y**	**Z**
BEPC13-1110CPHFR	10.22 .402	6.93 .273	6.88 .271	0.9 .035	2.5 .098	13.2 .520	13.2 .520	7.5 .295
BEPC17-1110CPHFR	14.07 .554	9.88 .389	9.55 .376	2.5 .098	4.5 .177	17.2 .677	17.5 .689	11.9 .469
BEPC19-1111CPHFR	15.57 .613	10.78 .424	11.95 .470	2.5 .098	4.5 .177	18.7 .736	19.0 .748	11.9 .469
BEPC25-1111CPHFR	20.37 .802	13.73 .541	14.7 .579	3.0 .118	4.5 .177	25.0 .984	25.0 .984	16.0 .630
BEPC27-1111CPHFR	21.32 .839	15.33 .604	20.7 .815	3.0 .118	4.5 .177	27.0 1.063	32.0 1.260	16.0 .630
BEPC27N-1114CPHFR	20.5 .807	15.9 .623	16.5 .650	0.3 .012	3.5 .138	28.5 1.122	29.8 1.173	8.7 .343
BEPC30-1112CPHFR	23.32 .918	17.33 .682	22.7 .894	3.0 .118	4.5 .177	30.0 1.181	35.0 1.378	16.0 .630

Bobbin (SMD type) Part No.	Dimensions in mm / inches							
	A	**B**	**C**	**D**	**E**	**X**	**Y**	**Z**
BEPC10-118GAFR	7.5 .295	5.95 .234	3.9 .154	—	—	10.8 .425	11.5 .453	4.85 .193
BEPC13-1110GAFR	10.3 .406	6.93 .273	6.9 .272	—	—	14.0 .551	20.4 .803	7.02 .276
BEPC17-119GAFR	14.1 .555	9.9 .390	9.6 .378	—	—	17.5 .689	23.0 .906	9.8 .386
BEPC19-1110GAFR	15.4 .606	10.7 .421	12.0 .472	—	—	20.0 .787	25.0 .984	9.75 .384
BEPC25B-1111GAFR	20.1 .791	15.7 .618	14.7 .579	—	—	25.0 .984	28.7 1.130	9.8 .386

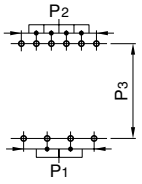
Bobbin (Drop in type) Part No.	Dimensions in mm / inches							
	A	**B**	**C**	**D**	**E**	**X**	**Y**	**Z**
BEPC19-1110SAFR	15.6 .611	10.7 .413	12.0 .480	18.6 .835	—	20.0 .768	26.0 1.228	9.55 .337
BEPC25B-1111SFR	20.2 .795	16.0 .630	14.7 .579	21.7 .854	—	25.0 .984	37.7 1.484	9.40 .370

* Please see the next page additionally.

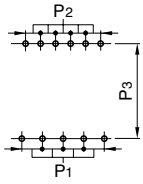
Ferrite

For Switching Power Supplies
Original Cores

EPC Bobbins and Accessories



Type 1



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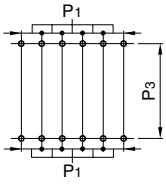

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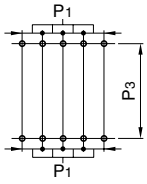

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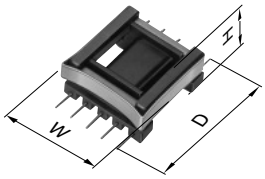
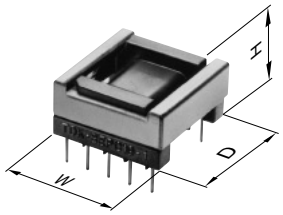
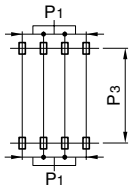
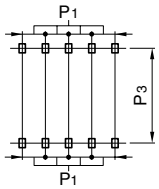


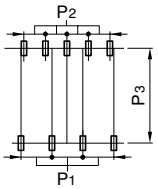




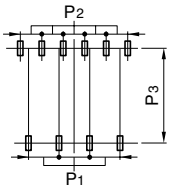
Type 6



Type 7



Type 8



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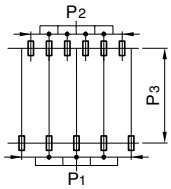
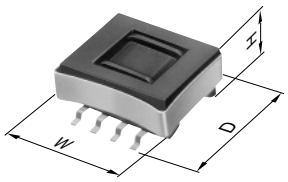


Type 10



t*	øP (mm)	P1 (mm)	P2 (mm)	P3 (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)	Connecting pin pattern
0.5	□0.49	2.5	—	10.5	10	13.9 14.8 7.7	11.2	23.0	0.57	Type 4
0.9	□0.49	3.75	2.5	15.0	10	18.2 19.1 12.1	20.1	32.1	1.5	Type 1
0.9	□0.49	3.75	2.5	16.25	11	20.0 21.5 12.1	29.3	34.4	1.6	Type 2
0.9	0.8	5.0	3.75	20.0	11	26.1 27.0 16.2	54.4	45.0	3.9	Type 2
0.9	0.8	5.0	3.75	27.5	11	28.1 34.0 16.2	62.1	47.2	4.7	Type 2
0.8	0.8	3.75	—	25.0	14	29.0 36.5 9.0	32.4	43.7	3.1	Type 3
0.9	1.0	5.0	—	30.0	12	31.1 37.0 16.2	68.1	51.1	6.0	Type 3

t*	Pt×Pw (mm)	P1 (mm)	P2 (mm)	P3 (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)	Connecting pin pattern
0.35	0.3×0.5	2.0	—	10.8	8	11.0 11.7 5.2	3.2	17.5	0.14	Type 6
0.5	0.4×0.7	3.0	—	18.5	10	14.2 20.6 7.3	11.6	23.1	0.6	Type 7
0.8	0.4×0.7	5.0	3.5	21.8	9	18.2 23.2 9.9	20.1	32.1	1.1	Type 8
0.8	0.4×0.7	5.0	3.5	23.8	10	20.2 25.2 9.9	28.2	34.4	1.3	Type 9
0.8	0.4×0.8	5.0	3.5	27.5	11	26.1 28.9 9.9	32.3	44.3	1.9	Type 10

t*	Pt×Pw (mm)	P1 (mm)	P2 (mm)	P3 (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)	Connecting pin pattern
0.8	0.4×0.7	5.0	3.5	24.0	10	20.2 26.2 9.8	28.2	34.4	1.3	Type 9
0.8	□0.49	5.0	3.5	34.7	11	26.0 37.9 9.5	30.9	50.5	2.1	Type 10

UL Grade: 94V-0, Material: FR phenol, Pin material: Steel wire (Solder plated), Phosphor bronze (Solder plated) for BEPC25B-1111GAFR only.
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
* *Minimum thickness of bobbin inside which core is placed, including flanges.*

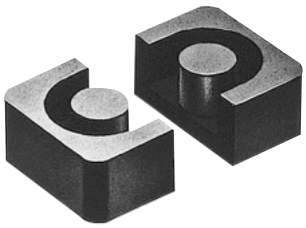
* Please see the former page additionally.

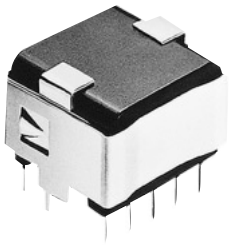
Ferrite

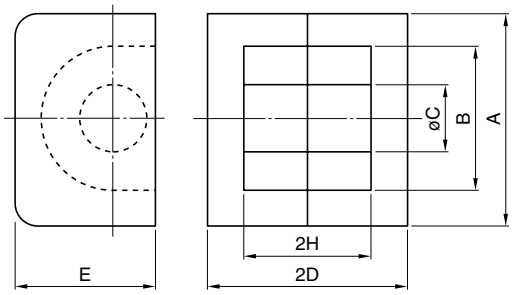
For Switching Power Supplies
Original Cores

EP Series

Cores

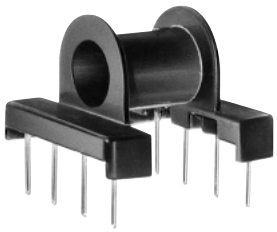


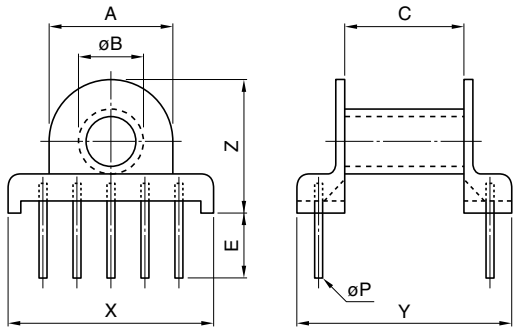




Part No.	Dimensions in mm / inches					
	A	B	øC	2D	E	2H
PC40EP7-Z	9.2±0.2 .362±.008	7.4±0.2 .291±.008	3.3±0.1 .130±.004	7.4±0.1 .291±.004	6.35±0.15 .250±.006	5.2±0.2 .205±.008
PC40EP10-Z PC50EP10-Z	11.5±0.3 .453±.012	9.4±0.2 .370±.008	3.3±0.15 .130±.006	10.2±0.2 .402±.008	7.65±0.2 .301±.008	7.4±0.2 .291±.008
PC40EP13-Z PC50EP13-Z	12.5±0.3 .492±.012	10.0±0.3 .394±.012	4.35±0.15 .171±.006	12.85±0.15 .506±.006	8.8±0.2 .346±.008	9.2±0.2 .362±.008
PC40EP17-Z	18.0±0.4 .709±.016	12.0±0.4 .472±.016	5.68±0.18 .224±.007	16.8±0.2 .661±.008	11.0±0.25 .433±.010	11.3±0.3 .445±.012
PC40EP20-Z	24.0±0.5 .945±.020	16.5±0.4 .650±.016	8.75±0.25 .344±.010	21.4±0.2 .843±.008	14.95±0.35 .589±.014	14.3±0.3 .563±.012

Bobbins





Part No.	Dimensions in mm / inches						
	A	øB	C	E	X	Y	Z
BEP7-316DFR	7.0 .276	4.5 .177	3.1 .122	3.0 .118	9.2 .362	7.4 .291	8.25 .325
BEP10-318DFR	8.8 .346	4.8 .189	5.6 .220	5.2 .205	11.0 .433	11.0 .433	10.2 .402
BEP13-3110DFR	9.6 .378	5.7 .224	7.7 .303	5.3 .209	13.2 .520	13.5 .531	10.75 .423
BEP17-318DFR	11.4 .449	7.2 .283	9.4 .370	5.0 .197	19.0 .748	19.0 .748	13.2 .520
BEP20-8110DFR	15.9 .626	10.2 .402	12.4 .488	5.0 .197	24.7 .972	21.5 .846	16.6 .654

* Please see the next page additionally.

Ferrite

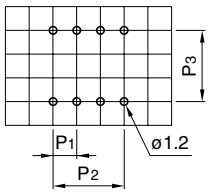
For Switching Power Supplies
Original Cores

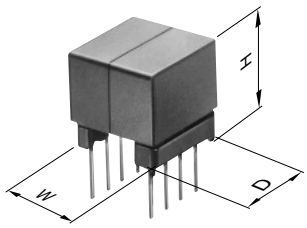
EP Series

* Please see the former page additionally.

Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
C_1 (mm^{-1})	Ae (mm^2)	ℓe (mm)	Ve (mm^3)	A_L-value (nH/N^2)* Without air gap	With air gap	Core loss (W) max. 100kHz, 200mT, 100°C		
1.52	10.3	15.7	162	830 min.	63±5% 100±7%	0.065	1.4	BEP7-316DFR
1.70	11.3	19.2	217	800 min. 800±25%	63±5% 100±7%	0.08 0.02**	2.8	BEP10-318DFR
1.24	19.5	24.2	472	1170 min. 1100±25%	100±5% 160±7%	0.17 0.044**	5.1	BEP13-3110DFR
0.84	33.9	28.5	966	1840 min.	100±5% 250±7%	0.33	12	BEP17-318DFR
0.508	78	39.8	3120	3200 min.	100±5% 250±7%	1.1	28	BEP20-8110DFR

* *A_L-value: 1kHz, 0.5mA, 100Ts*
** *Core loss: 500kHz, 50mT, 100°C*





t*	øP (mm)	P_1 (mm)	P_2 (mm)	P_3 (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm^2)	Parameter ℓw (mm)	Wt (g)	Accessory item
0.25	0.6	2.5	5.0	5.0	6	9.4 7.5 9.6	3.85	18.1	0.3	FEP-7-C
0.40	0.6	2.5	7.5	7.5	8	11.8 11.2 11.8	11.7	21.7	0.65	FEP-10-C
0.35	0.6	2.5	10.0	10.0	10	13.4 13.7 12.7	16.6	23.9	0.74	FEP-13-C
0.45	0.6	5.0	15.0	15.0	8	19.25 19.25 15.7	19.0	29.1	1.3	FEP-17-C
0.325	0.6	5.0	20.0	17.5	10	25.0 21.8 19.6	33.2	40.8	1.8	FEP-20-C

UL Grade: 94V-0, Material: FR phenol, Pin material: Phosphor bronze (Solder plated)
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
* *Minimum thickness of bobbin inside which core is placed, including flanges.*

Ferrite

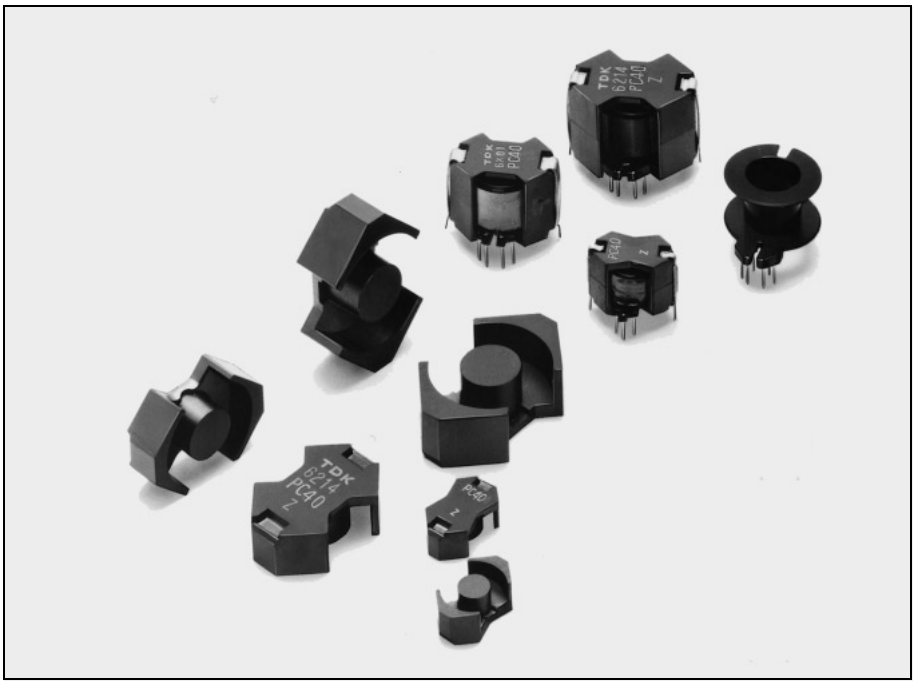
RM Series

For Switching Power Supplies
RM Cores

Cores
RM4 to RM14

Bobbins
BRM4 to BRM14

Accessories
FRM4 to FRM14



Ordering Code System

Cores

PC40 RM6 A160 – 12

- PC40 — Material
- RM6 — Size of RM core
- A160 — AL-value(Z: without air gap)
- 12 — Number of Lead Slot / Type

Bobbins

B RM6 – 714 CPFR

- B — Symbol of Bobbin
- RM6 — Size of RM core
- 7 — Code of Bobbin Material
- 14 — Number of Section
- CPFR — Type of Terminal Pin / Number of Terminal Pin

Accessories

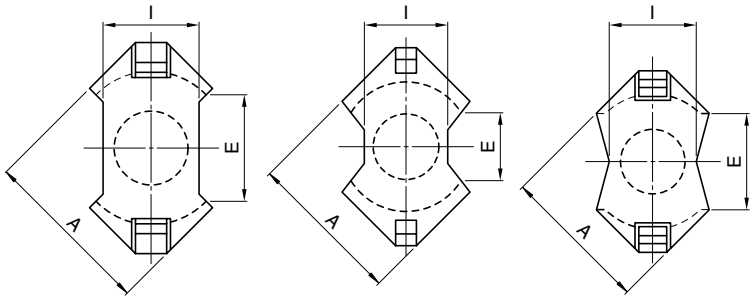
F RM6 – AFR

- F — Symbol of Accessory
- AFR — Type of Accessory
- RM6 — Size of RM core

Ferrite

For Switching Power Supplies
RM Cores

RM Series



Type 1 Type 2 Type 3

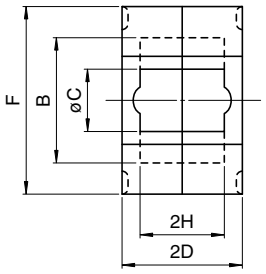
Part No.	Type	Dimensions in mm inches						
		A	**B**	**øC**	**2D**	**E min.**	**F**	**2H**
PC40RM4Z-12 **PC50RM4Z-12**	1	9.63±0.18 .379±.007	8.15±0.2 .321±.008	3.8±0.1 .150±.004	10.4±0.1 .409±.004	5.8 .228	10.8±0.2 .425±.008	7.2±0.2 .283±.008
PC40RM5Z-12 **PC50RM5Z-12**	1	12.05±0.25 .474±.010	10.4±0.2 .409±.008	4.8±0.1 .189±.004	10.4±0.1 .409±.004	6.0 .236	14.3±0.3 .563±.012	6.5±0.2 .256±.008
PC40RM6Z-12 **PC50RM6Z-12**	3	14.4±0.3 .567±.012	12.65±0.25 .498±.010	6.3±0.1 .248±.004	12.4±0.1 .488±.004	8.4 .331	17.6±0.3 .693±.012	8.2±0.2 .323±.008
PC40RM8Z-12	2	19.35±0.35 .762±.014	17.3±0.3 .681±.012	8.4±0.15 .331±.006	16.4±0.1 .646±.004	9.8 .386	22.75±0.45 .896±.018	11.0±0.2 .433±.008
PC40RM10Z-12	2	24.15±0.55 .951±.022	21.65±0.45 .852±.018	10.7±0.2 .421±.008	18.6±0.1 .732±.004	11.3 .445	27.85±0.65 1.096±.026	12.7±0.3 .500±.012
PC40RM12Z-12	2	29.25±0.55 1.152±.022	25.5±0.5 1.004±.020	12.6±0.2 .496±.008	23.5±0.1 .925±.004	12.9 .508	36.75±0.65 1.447±.026	17.1±0.3 .673±.012
PC40RM14Z-12	1	34.2±0.5 1.346±.020	29.5±0.5 1.161±.020	14.75±0.25 .581±.010	28.8±0.2 1.134±.008	17.0 .669	41.6±0.6 1.638±.024	21.1±0.3 .831±.012

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
RM Cores

RM Series



	Effective parameter				Electrical characteristics			Wt (g)	Bobbin item
l	**C_1 (mm^{-1})**	**Ae (mm^2)**	**ℓe (mm)**	**Ve (mm^3)**	**A_L-value (nH/N^2)***		**Core loss (W) max.**		
					Without air gap	**With air gap**	**100kHz, 200mT, 100°C**		
4.45±0.15 .175±.006	1.62	14.0	22.7	318	680 min. 960±25%	63±3% 100±3% 160±3%	0.12 0.036**	1.7	BRM4-714SDFR BRM4-716SDFR
6.6±0.2 .260±.008	0.940	23.7	22.4	530	1250 min. 1340±25%	63±3% 100±3% 160±3%	0.18 0.053**	3.0	BRM5-714CPFR BRM5-716CPFR
8.0±0.2 .315±.008	0.781	36.6	28.6	1050	1830 min. 1700±25%	100±3% 160±3% 250±3%	0.41 0.11**	5.5	BRM6-714CPFR BRM6-716CPFR
10.8±0.2 .425±.008	0.594	64.0	38.0	2430	1950 min.	100±3% 160±3% 250±3%	0.97	13	BRM8-718CPFR BRM8-7112CPFR
13.25±0.25 .522±.010	0.450	98.0	44.0	4310	3630 min.	160±3% 250±3% 400±3%	1.8	23	BRM10-7110SDNFR BRM10-7112SDFR
16.0±0.3 .630±.012	0.406	140	56.9	7970	4150 min.	160±3% 250±3% 400±3%	3.3	42	BRM12-7111CPFR BRM12-7112CPFR
18.7±0.3 .736±.012	0.393	178	70.0	12500	4600 min.	160±3% 250±3% 400±3%	4.75	70	BRM14-7110CPFR BRM14-7112CPFR

* *A_L-value: 1kHz, 0.5mA, 100Ts*
** *Core loss: 500kHz, 50mT, 100°C*

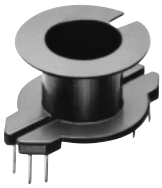
* Please see the former page additionally.

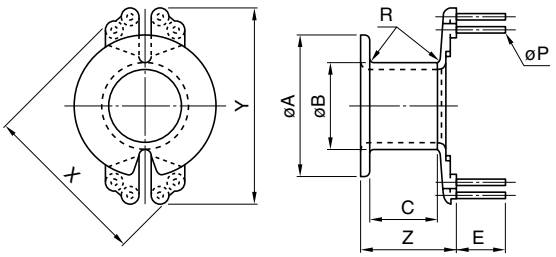
Ferrite

For Switching Power Supplies
RM Cores

RM Bobbins

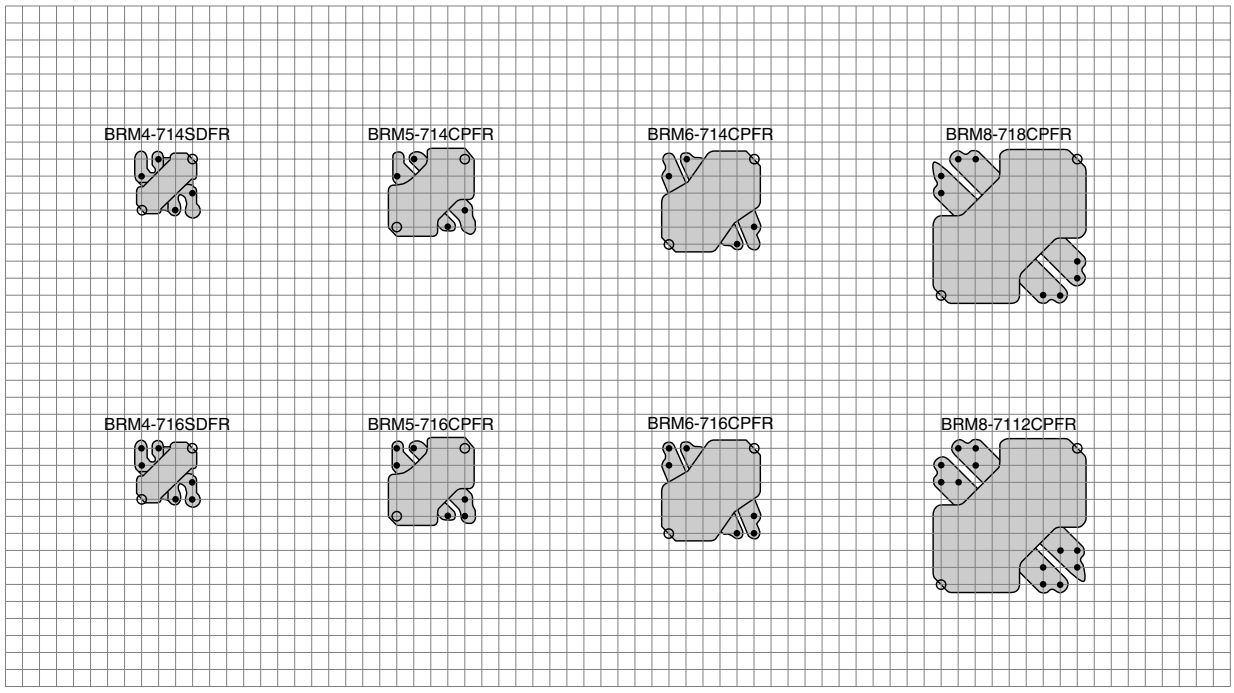
Bobbins





Part No.	Dimensions in mm / inches						
	øA	**øB**	**C**	**E**	**X**	**Y**	**Z**
BRM4-716SDFR	7.7 .303	4.9 .193	5.9 .232	5.25 .207	10.0 .394	4.3 .169	8.0 .315
BRM5-716CPFR	10.1 .398	5.95 .234	4.9 .193	5.0 .197	12.5 .492	16.2 .638	7.9 .311
BRM6-716CPFR	12.3 .484	7.45 .293	6.4 .252	4.5 .177	15.0 .591	20.0 .787	9.6 .378
BRM8-718CPFR	16.9 .665	9.95 .392	9.15 .360	5.6 .220	20.0 .787	24.6 .967	12.7 .500
BRM10-7112SDFR	21.0 .827	12.5 .492	10.75 .423	4.78 .118	22.5 .886	28.0 1.102	13.5 .531
BRM12-7112CPFR	24.7 .972	14.5 .571	14.8 .583	6.35 .250	30.0 1.181	38.0 1.496	18.9 .744
BRM14-7112CPFR	28.8 1.134	16.8 .661	18.8 .740	6.35 .250	35.6 1.402	41.9 1.650	22.9 .902

Connecting Pin Patterns (2.54mm/0.1 inch grids) View in mounting direction

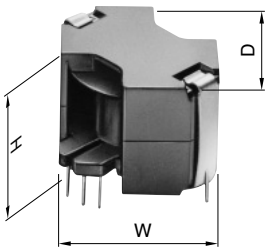


* Please see the next page additionally.

Ferrite

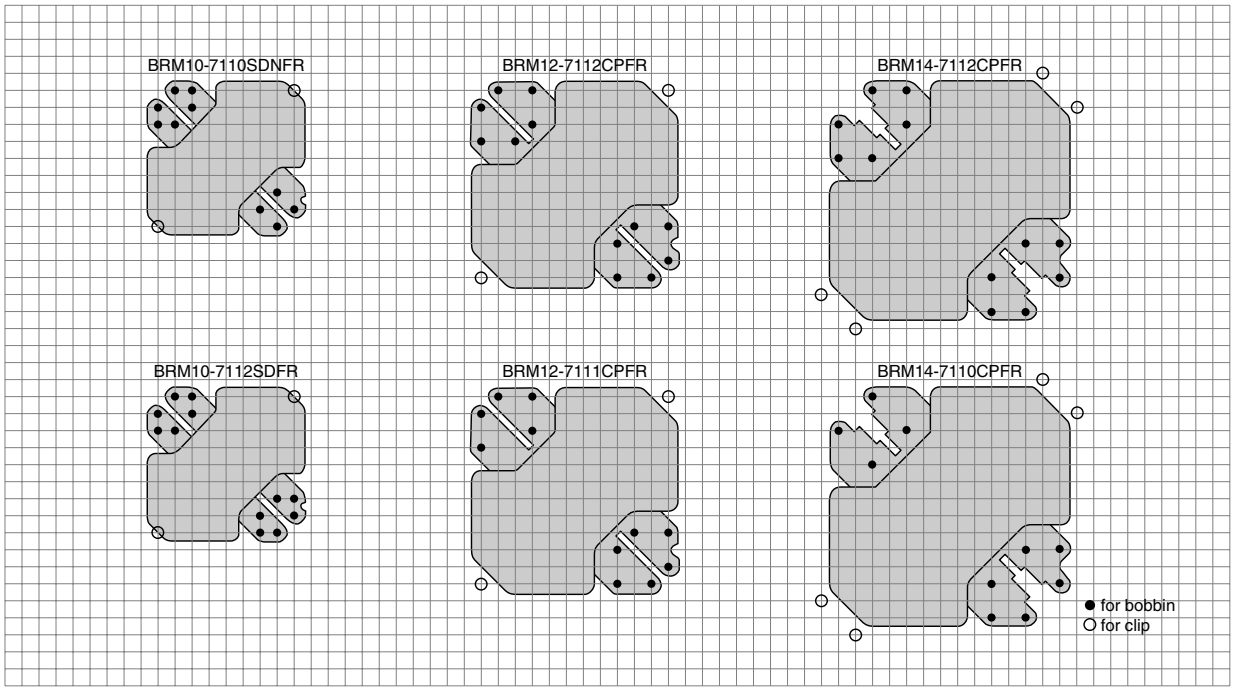
For Switching Power Supplies
RM Cores

RM Bobbins



t*	øP (mm)	Terminal pins	W D (mm) H	Parameter Aw (mm²)	Parameter ℓw (mm)	Wt (g)	Other bobbins' item	Accessory item
0.25	□0.45	4	10.0 10.0 10.5	8.05	19.8	0.23	BRM4-714SDFR	FRM4-AFR
0.35	0.5	6	12.5 12.5 10.5	10.1	25	0.26	BRM5-714CPFR	FRM5-AFR
0.3	0.6	6	15.0 15.0 12.5	15.5	31	0.43	BRM6-714CPFR	FRM6-AFR
0.425	0.6	8	20.0 20.0 16.5	31.0	42	1.00	BRM8-7112CPFR	FRM8-AFR
0.5	□0.51	12	24.7 24.7 18.7	45.7	53	1.6	BRM10-7110SDNFR	FRM10-AFR
0.55	0.8	12	30.0 30.0 23.6	75.5	55	2.7	BRM12-7111CPFR	FRM12-AFR
0.6	0.83	12	35.6 35.6 29.0	113	72	3.8	BRM14-7110CPFR	FRM14-AFR

UL Grade: 94V-0, Material: FR phenol, Pin material: Steel wire (Solder plated)
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
* *Minimum thickness of bobbin inside which core is placed, including flanges.*



* Please see the former page additionally.

Ferrite

EE, ER and EEM Series

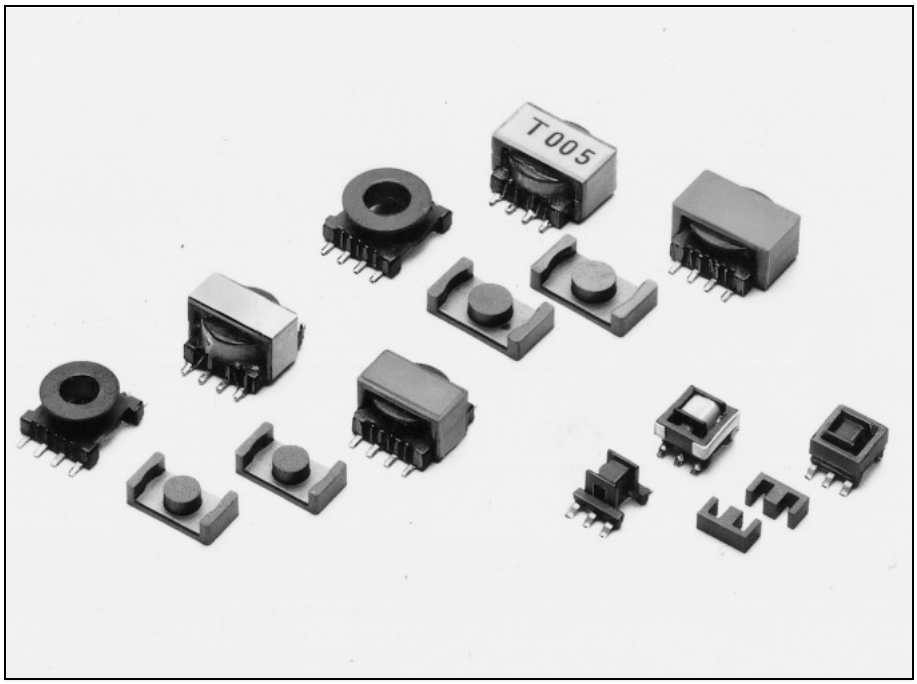
For Switching Power Supplies
SMD Cores

Cores

EE5, EE8.9/8
ER9.5/5, ER11/3.9, ER11/5
ER14.5/6
EEM12.7/13.7

Bobbins

BE5, BE8.9/8
BER9.5/5, BER11/3.9, BER11/5
BER14.5/6
BEM12.7



Ordering Code System

Cores

PC44 EE 5 – Z

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

Bobbins

B E 5 – 916 FFR

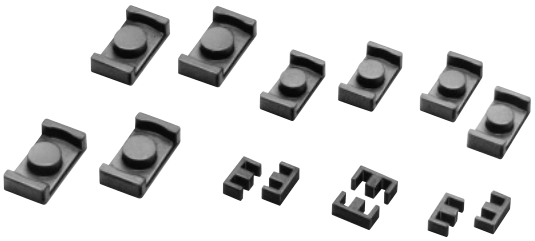
Symbol of Bobbin
Size of E core
Code of Bobbin Material
Type of Terminal Pin
Number of Terminal Pin
Number of Section

Ferrite

For Switching Power Supplies
SMD Cores

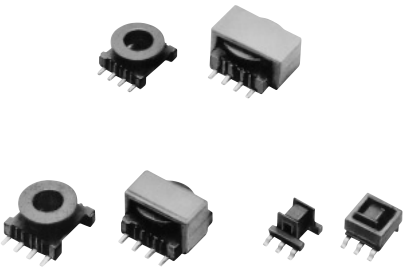
EE, ER and EEM Series

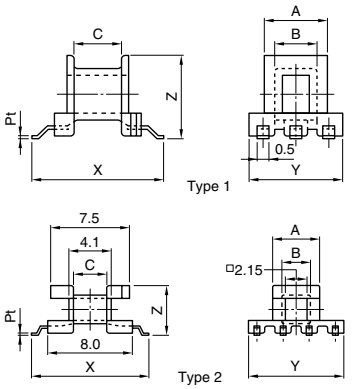
Cores

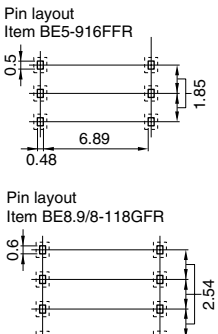


Part No.	Type	Dimensions in mm / inches						
		A	2B	C_1	C_2	E	F	2H
PC44EE5-Z	1	5.25±0.05 .207±.002	5.3±0.1 .209±.004	1.35±0.05 .053±.002		0.70±0.05 .028±.002	1.95±0.05 .077±.002	4.0 .157
PC44EE8.9/8-Z	1	8.86±0.20 .349±.008	8.0±0.3 .315±.012	1.90±0.12 .075±.005		1.91±0.20 .075±.008	1.90±0.12 .075±.008	4.5±0.3 .177±.012
PC44ER9.5/5-Z **PC50ER9.5/5-Z**	2	9.35±0.15 .368±.006	4.9±0.1 .193±.004	3.4±0.1 .134±.004			4.9±0.1 .193±.004	3.35±0.15 .132±.004
PC44ER11/3.9-Z **PC50ER11/3.9-Z**	2	10.83±0.18 .426±.007	3.85±0.10 .152±.004	4.13±0.13 .163±.005			5.9±0.1 .232±.004	2.10±0.15 .083±.006
PC44ER11/5-Z **PC50ER11/5-Z**	2	10.83±0.18 .426±.007	4.9±0.1 .193±.004	4.13±0.13 .163±.005			5.9±0.1 .232±.004	3.15±0.15 .124±.006
PC44ER14.5/6-Z **PC50ER14.5/6-Z**	2	14.5±0.2 .571±.008	5.9±0.1 .232±.004	4.7±0.1 .185±.004			6.7±0.1 .264±.004	3.3±0.2 .130±.008
PC44EEM12.7/13.7-Z **PC50EEM12.7/13.7-Z**	3	12.75±0.25 .502±.010	13.7±0.3 .539±.012	6.0±0.1 .236±.004	1.85±0.10 .073±.004	1.7±0.1 .067±.004	3.30±0.15 .130±.006	9.1±0.3 .358±.012

Bobbins







Part No.	Type	Dimensions in mm / inches					
		A	B	C	X	Y	Z
BE5-916FFR **BE5-926F1FR**	1	3.5 .138	2.3 .091	2.7 .106	7.85 .309	5.2 .205	4.65 .183
BE8.9/8-118GFR	2	4.5 .177	2.7 .016	3.1 .122	11.2 .441	9.2 .362	4.75 .187
BEM12.7-118GAFR	3	8.9 .350	6.9 .272	7.5 .295	16.7 .657	12.8 .504	4.9 .193
BER9.5/5-118GAFR	4	7.3 .287	4.45 .175	2.15 .085	11.5 .452	8.6 .339	4.45 .175
BER11/3.9-1110GAFR	4	8.5 .335	5.2 .205	1.05 .041	12.45 .490	10.5 .413	3.4 .134
BER11/5-1110GAFR**	4	8.5 .335	5.2 .205	1.95 .077	12.2 .480	10.5 .413	4.70 .185
BER14.5/6-1110GAFR	4	11.4 .449	5.9 .232	2.0 .079	16.0 .630	14.0 .551	5.75 .226

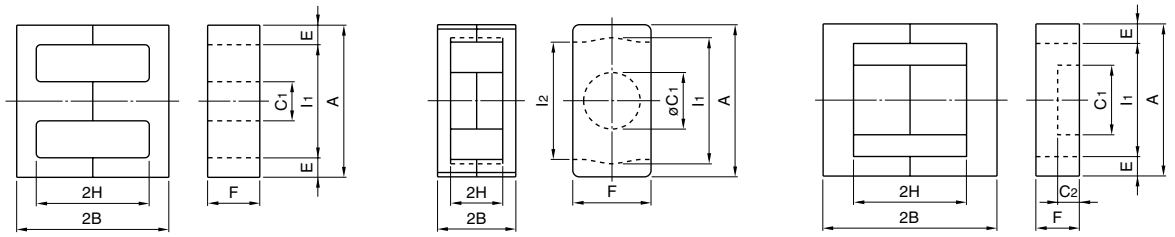
** 8-pin is available (Part No. BER11/5-118GAFR).*

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
SMD Cores

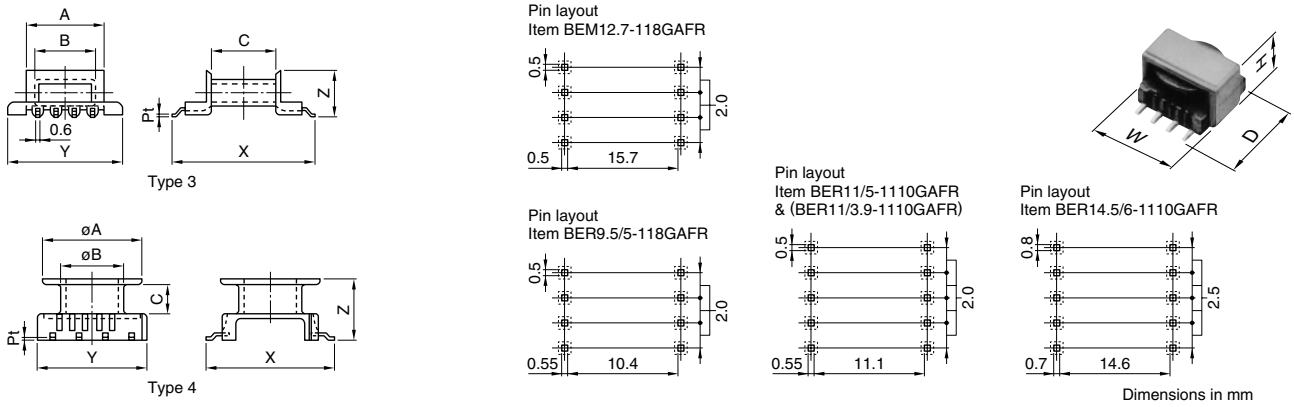
EE, ER and EEM Series



Type 1 Type 2 Type 3

Effective parameter						Electrical characteristics		Wt (g)	Bobbin item
l_1	l_2	C_1 (mm^{-1})	Ae (mm^2)	ℓe (mm)	Ve (mm^3)	A_L-value (nH/N^2)* Without air gap	With air gap		
3.85 .152		4.72	2.67	12.6	33.6	200 min.		0.2	BE5-916FFR
5.08 min. .200 min.		3.15	4.96	15.6	77.4	480±25%		0.6	BE8.9/8-118GFR
7.63±0.13 .300±.005	7.0 min. .276 min.	1.68	8.47	14.2	120	610 min. 750±25%	63±5% 100±7%	0.6	BER9.5/5-118GAFR
8.85±0.15 .348±.006	7.9 min. .311 min.	1.08	11.7	12.6	147	1040 min. 1100±25%	63±5% 100±7%	0.8	BER11/3.9-1110GAFR
8.85±0.15 .348±.006	7.9 min. .311 min.	1.24	11.9	14.7	175	870 min. 960±25%	63±5% 100±7%	1.0	BER11/5-1110GAFR
11.8±0.2 .465±.008	11.8±0.2 .465±.008	1.08	17.6	19.0	334	1280 min. 1150±25%	100±5% 160±7%	1.8	BER14.5/6-1110GAFR
9.0 min. .354 min.		2.28	12.0	27.3	328	820±25% 580±25%	40±5% 63±7%	1.9	BEM12.7-118GAFR

* *A_L-value: 1kHz, 0.5mA, 100Ts*



Dimensions in mm

Parameter							Wt (g)	Accessory item
t*	Pt×Pw (mm)	Terminal pins	W D (mm) H	Aw (mm^2)	ℓw (mm)	Material		
0.4	0.2×0.5	6	5.7 7.8 4.8	1.62	12.4	Diallyl Phtalate	0.03 0.07	FE-5-A
0.2	0.2×0.6	6	9.3 11.3 4.8	2.79	14.4	FR Phenol	0.17	—
0.35	0.3×0.5	8	13.6 16.8 5.0	7.5	22.4	FR Phenol	0.31	FEM12.7/13.7-A
0.4	0.3×0.5	8	9.9 11.7 5.9	3.06	18.5	FR Phenol	0.16	FER9.5/5-A
0.4	0.25×0.7	10	11.0 12.6 4.7	1.73	21.5	FR Phenol	0.21	FER11/3.9-A
0.4	0.3×0.5	10	11.5 12.3 6.4	3.22	21.5	FR Phenol	0.21	FER11/5-A
0.4	0.3×0.8	10	15.1 16.2 7.3	5.5	27.2	FR Phenol	0.55	FER14.5/6-A

UL Grade: 94V-0, Material of pins: F, G types are Phosphor bronze wire (Solder plated), GA type is Steel wire (Solder plated).
Maximum number of turns N that can be wound on bobbins, see section of "Maximum number of Turns on Bobbins".
* *Minimum thickness of bobbin.*

* Please see the former page additionally.

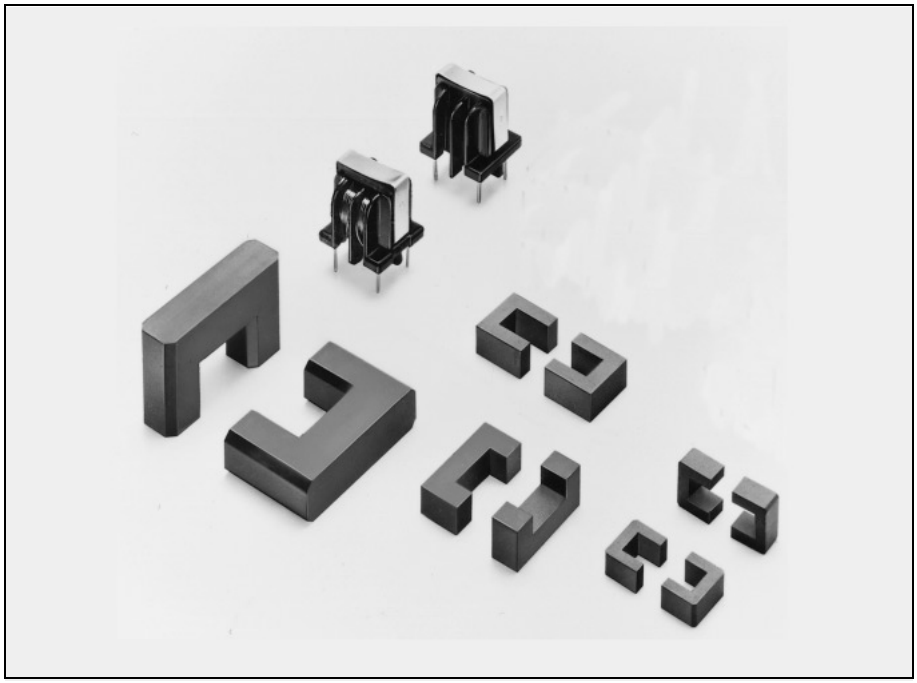
Ferrite

For Switching Power Supplies
ET, UU and FT Cores

ET, UU and FT Series

Cores

ET20 to 35
UU10.1 to UU19.7B
FT20.6



Ordering Code System

Cores

HS72 UU 10.1

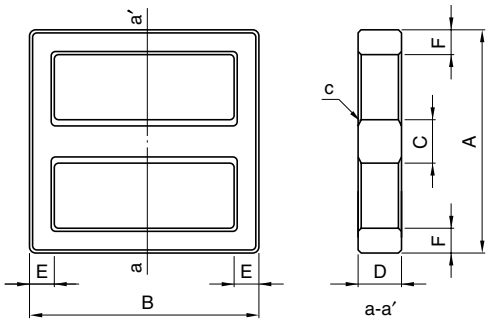
Material — HS72
Size of U core — UU
Size — 10.1

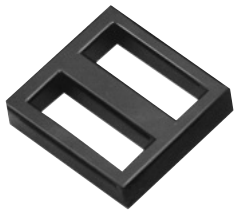
Ferrite

For Switching Power Supplies
ET and UU Cores

ET and UU Series

ET Cores

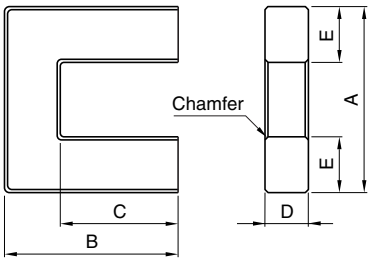


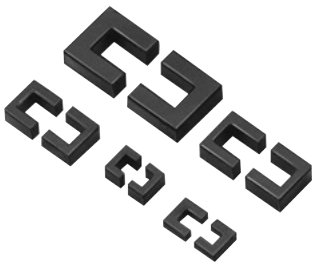


Part No.	A_L-value* (nH/N²)	Dimensions in mm / inches A	B	C	D	E	F	Ae (mm²)	ℓe (mm)
HS72ET20	$3100^{+40\%}_{-25\%}$	20.1±0.4 .791±.016	20.1±0.4 .791±.016	4.0±0.2 .157±.008	4.4±0.2 .173±.008	2.00±0.15 .079±.006	2.00±0.15 .079±.006	17.6	50.6
HS72ET24	$2600^{+40\%}_{-25\%}$	24.2±0.5 .953±.020	24.2±0.5 .953±.020	4.0±0.2 .157±.008	4.0±0.3 .157±.012	2.40±0.15 .094±.006	2.40±0.15 .094±.006	17.8	61.0
HS72ET28	$3550^{+40\%}_{-25\%}$	28.45±0.55 1.120±.022	28.45±0.55 1.120±.022	5.0±0.2 .197±.008	5.0±0.3 .197±.012	2.90±0.15 .114±.006	2.90±0.15 .114±.006	27.4	71.4
HS10ET28	4835±30%	28.45±0.55 1.120±.022	28.45±0.55 1.120±.022	5.0±0.2 .197±.008	5.0±0.3 .197±.012	2.90±0.15 .114±.006	2.90±0.15 .114±.006	27.4	71.4
HS72ET35	$6000^{+40\%}_{-25\%}$	35.3±0.6 1.390±.024	35.3±0.6 1.390±.024	7.5±0.3 .295±.012	7.5±0.3 .295±.012	4.0±0.2 .157±.008	4.0±0.2 .157±.008	58.6	86.7

* *A_L-value: 1kHz, 0.25A/m, 10Ts*

UU Cores





Part No.	A_L-value* (nH/N²)	Dimensions in mm / inches A	B	C	D	E	Ae (mm²)	ℓe (mm)
HS72UU10.1	1005±25%	10.1±0.3 .398±.012	7.5±0.25 .295±.010	4.5±0.25 .177±.010	2.9±0.15 .114±.006	2.95±0.15 .116±.006	8.6	35.7
HS72UU10.5	1500±25%	10.5±0.3 .413±.012	7.80±0.2 .307±.008	5.25±0.3 .207±.012	5.00±0.20 .197±.008	2.5±0.20 .098±.008	12.5	40.3
HS72UU15.7	2600±25%	15.7±0.4 .618±.016	9.70±0.25 .382±.010	6.00±0.30 .236±.012	6.00±0.30 .236±.012	4.50 .177	24.8	50.0
HS72UU19.7B	2650±25%	19.7±0.4 .776±.016	17.7±0.3 .697±.012	11.7±0.3 .461±.012	6.00±0.30 .236±.012	6.00±0.30 .236±.012	35.7	81.1

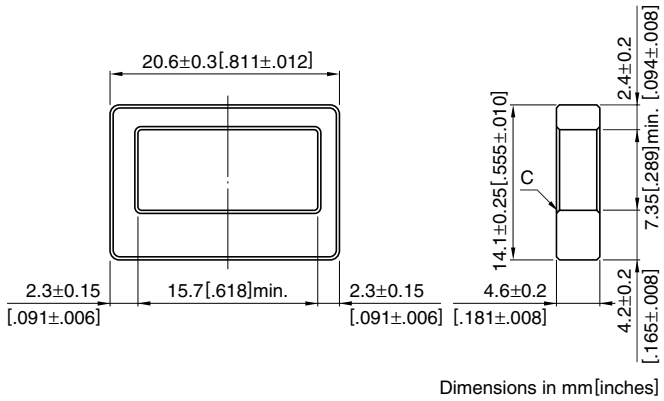
* *A_L-value: 1kHz, 0.25A/m, 10Ts*

Ferrite

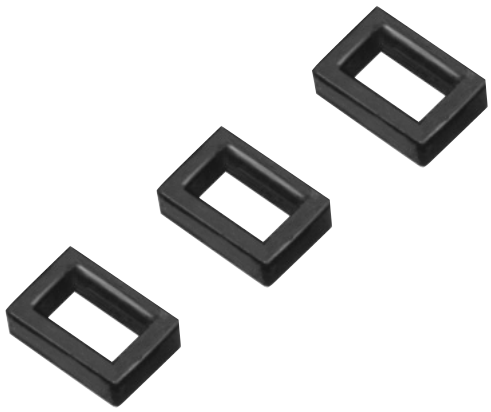
FT Series

For Switching Power Supplies
FT Cores

FT Cores



Dimensions in mm[inches]



Part No.	A_L-value* (nH/N²)	Ae (mm²)	ℓe (mm)
HS72FT20.6	$2200^{+40\%}_{-30\%}$	12.1	52.9
HS10FT20.6	2690±30%	12.1	52.9

** A_L-value: 1kHz, 0.25A/m, 10Ts*

Ferrite

T Series

For Switching Power Supplies
Toroidal Cores

TDK's toroidal cores are available in a number of sizes.
Therefore, by selecting the ferrite material which corresponds to the application, it is possible to design stable transformers, inductors, etc. to cover a wide band range.

FEATURES

- Selection of core material to correspond to the application is possible as a result of standard ferrite materials with μi=3300 to 15000.
- Epoxy and paraxylylene insulation coating is available.

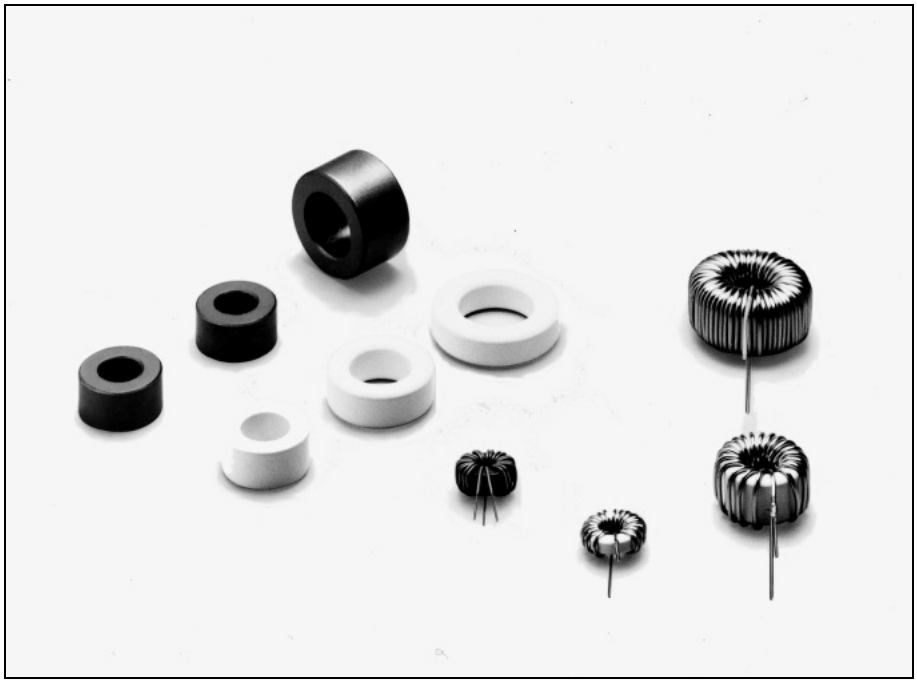
APPLICATIONS

Pulse transformers, choke coils, filters, current sensors, EMI/RFI filters, balun transformers.

Toroidal Cores

For Common mode choke
T14 to T44.5
Material: HS52, HS72, HS10

For General Use
T3.05 to T44.5
Material: H5A, H5B2, H5C2, H5C3, HP5



Ordering Code System

Cores

HS52 T 22 × 6.5 × 14

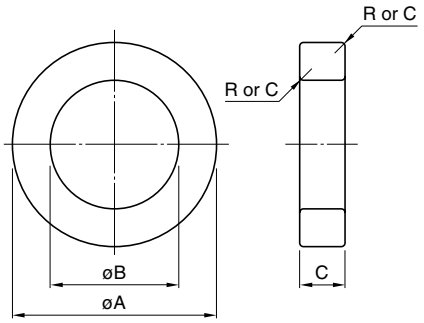
- HS52: Material
- T: Symbol of Toroidal core
- 22: Outside Diameter
- 6.5: Thickness
- 14: Inside Diameter

Ferrite

For Switching Power Supplies
Toroidal Cores

T Series

Cores



Part No.	JIS C 2569	Dimensions in mm / inches			Effective parameter	
		øA	**øB**	**C**	**C_1 (mm^{-1})**	**Ae (mm^2)**
T14×7×8		14.0±0.3 .551±.012	8.0±0.3 .315±.012	7.0±0.3 .276±.012	1.60	20.5
T18×10×10	FOR-18-10-10	18.0±0.3 .709±.012	10.0±0.3 .394±.012	10.0±0.3 .394±.012	1.07	38.9
T16×8×12		16.0±0.3 .630±.012	12.0±0.3 .472±.012	8.0±0.3 .315±.012	2.73	15.9
T20×10×12	FOR-20-10-12	20.0±0.4 .787±.016	12.0±0.4 .472±.016	10.0±0.3 .394±.012	1.23	39.1
T22×6.5×14		22.0±0.4 .866±.016	14.0±0.4 .551±.016	6.5±0.3 .256±.012	2.14	25.6
T25×13×15		25.0±0.4 .984±.016	15.0±0.4 .591±.016	13.0±0.3 .512±.012	0.946	63.6
T28×13×16	FOR-28-13-16	28.0±0.4 1.102±.016	16.0±0.4 .630±.016	13.0±0.3 .512±.012	0.864	76.0
T31×8×19		31.0±0.5 1.220±.020	19.0±0.5 .748±.020	8.0±0.3 .315±.012	1.60	47.1
T38×14×22		38.0±0.5 1.496±.020	22.0±0.5 .866±.020	14.0±0.4 .551±.016	0.821	109
T44.5×13×30	FOR-45-13-30	44.5±0.5 1.752±.020	30.0±0.5 1.181±.020	13.0±0.4 .512±.016	1.23	93

* Please see the next page additionally.

Ferrite

For Switching Power Supplies
Toroidal Cores

T Series

Can be coated with epoxy. If epoxy-coated products are desired, please suffix E to part No. when ordering.
Ex. HS52 T22 × 6.5 × 12E*

* *Dielectric breakdown voltage 1000Vd.c. min.*

* Please see the former page additionally.

			AL-value (nH/N²)			Wt
ℓe (mm)	**Ve (mm³)**	**R or C**	**Material HS52***	**HS72****	**HS10*****	**(g)**
32.8	671	C0.5	3800±25%	5100±25%	6800±30%	3.4
41.5	1610	C0.5	6400±25%	8800±25%	10150±30%	8.3
43.4	689	C1.0	2500±25%	3400±25%	4500±30%	3.4
48.1	1880	C0.5	5600±25%	7600±25%	10000±30%	9.5
54.7	1400	C0.5	3200±25%	4400±25%	5750±30%	6.9
60.2	3830	C1.0	7300±25%	9900±25%	13000±30%	19
65.6	4990	C0.5	8000±25%	10700±25%	14200±30%	26
75.5	3550	C1.0	4300±25%	5800±25%	7700±30%	17
89.7	9800	C1.0	8400±25%	10700±25%	—	50
114	10600	C0.5	5600±25%	7100±25%	—	53

* *AL-value: 100kHz, 100mV, 10Ts*
** *AL-value: 100kHz, 10mV, 5Ts*
*** *AL-value: 10kHz, 10mV, 10Ts*