

Changsung Corp.

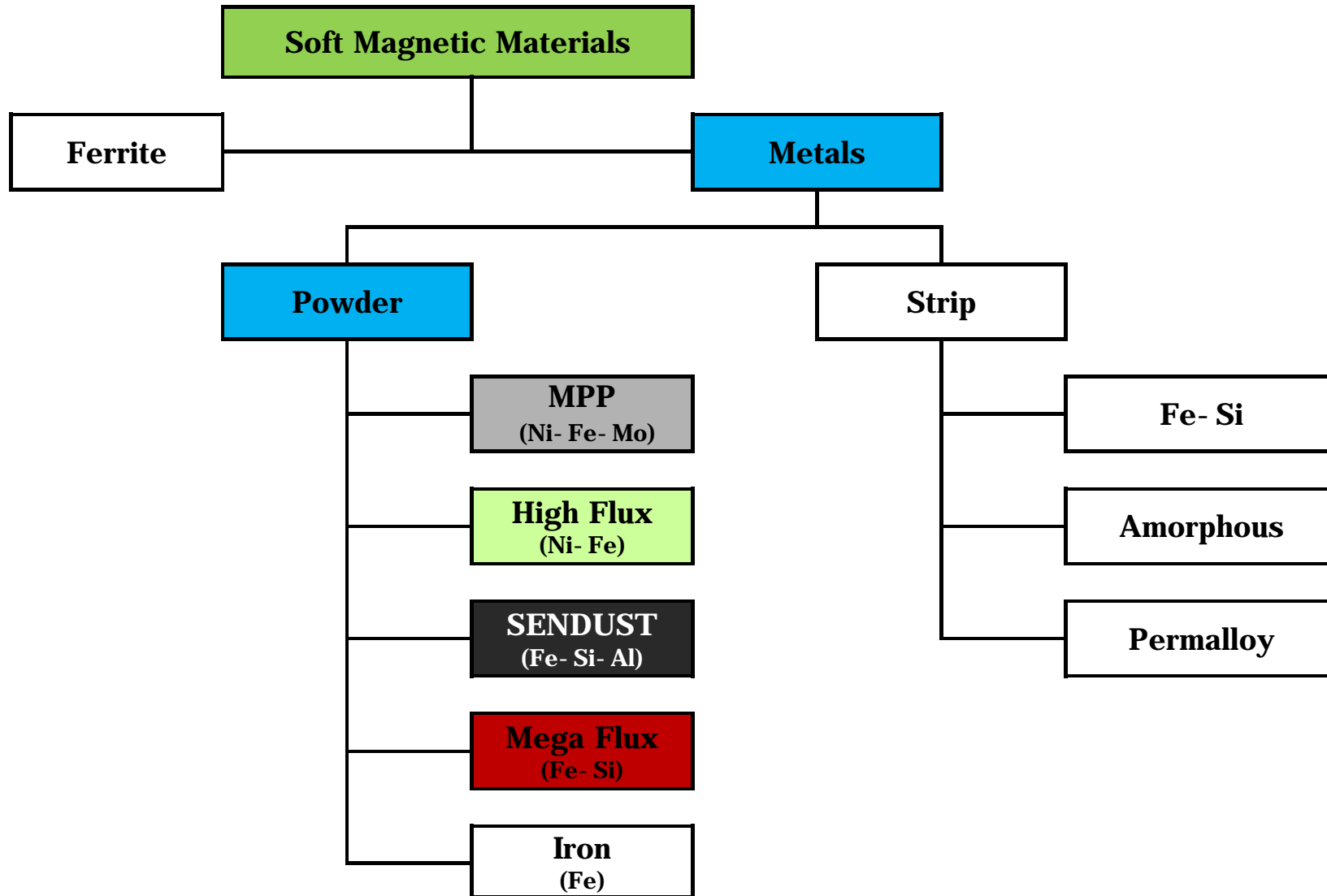
Soft Magnetic Powder Core

- 1. Toroidal Core**
- 2. Special Shape Powder Core**
- 3. Q & A**

- CSC-

1. Toroidal Core

1. Soft Magnetic Materials

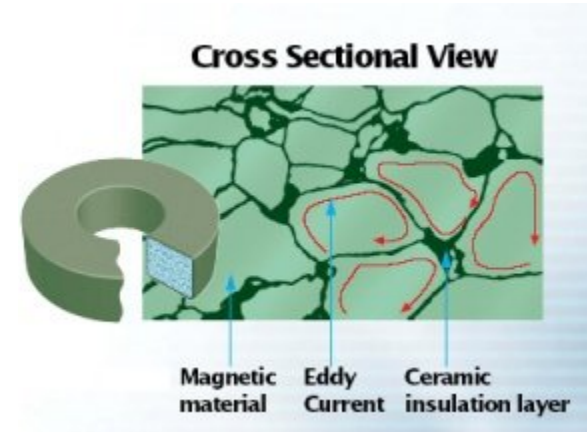


1. Toroidal Core

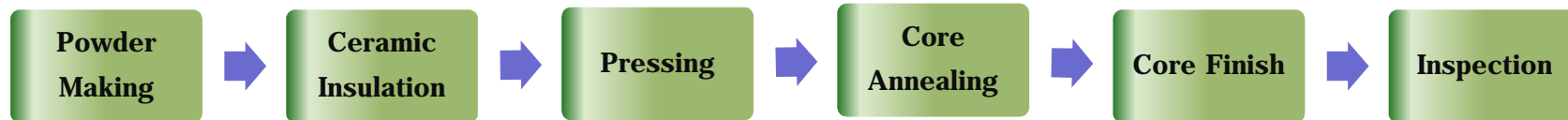
2. What is Powder Core ?

Powder Cores are **distributed air gap** cores made from ferrous alloy powders for **low losses** at elevated frequencies.

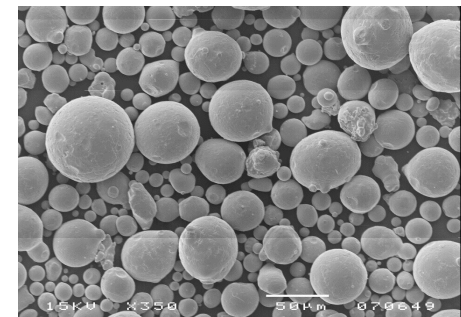
Small air gaps distributed evenly throughout the cores increase the amount of **DC** that can be passed through the winding before core saturation occurs.



3. Manufacturing process



Material	Composition
High Flux : CH	Ni + Fe Alloy
Sendust : CS	Fe + Si + Al Alloy
Mega Flux : CK	Fe + Si Alloy
MPP : CM	Ni + Fe + Mo Alloy



1. Toroidal Core

4. Material Comparison

Materials	Perm. (μ_r)	Bs (kG)	Core Loss	DC Bias	Relative Cost	Temp. Stability	Curie Temp [°C]
MPP	26- 200	7	Lower	Better	High	Best	450
High Flux	26- 160	15	Low	Best	Medium	Better	500
Sendust	26- 125	10	Low	Good	Low	Good	500
Mega Flux	26- 90	16	Medium	Best	Low	Better	700
Iron	10- 100	10	High	Poor	Lowest	Poor	770
Fe- Si Strip (Gap)		20	High	Better	Lowest	Good	740
Amorphous (Gap)		15	Low	Better	Medium	Good	399
Ferrite (Gap)		3- 5	Lowest	Poor	Lowest	Poor	100~300

1. Toroidal Core

5. Electrical Characteristics of High Flux Material

		60 μ		125 μ	
		DCB% @100 Oe	Core Loss @50kHz,1000G	DCB% @50 Oe	Core Loss @50kHz,1000G
CSC High Flux	2010	79%	240	78%	300
	2011	82%	180	81%	260
	2012 Plan	84%	160	82%	250
Markek	High Flux	78%	400	74%	340
	MPP	60%	150	51%	210

※ Main Application : High Efficiency Server Power, Solar Inverter

Telecom Power

High Power Personal Computer

1. Toroidal Core

7. Inductor Design Tool

Inductor Design

Material	OD	Core Dimension				Path length(cm)	8.15	
CH	330	OD(max)	ID(min)	HT(max)	Stack HT	Cross Section Area(mm ²)	0.672	
STACKING	1	Before coating(mm)	33.02	19.94	10.67	10.67	Window Area(mm ²)	2.93
		After coating(mm)	33.83	19.3	11.61	11.61	Volume(cc)	5.477

Design Parameter

Turns	77	Winding Factor(%)	39	DC R(mΩ) @ 20℃	42.83
Wire Area(mm ²)	1.50	Rated Current (A)	9.0	Temp of Copper(℃)	20
Wire Eff Area(mm ²)	1.50	Peak Current (A)	10.1	DC R(mΩ) @ T(℃)	42.83
Wire length/T(cm)	3.78	Frequency(kHz)	50	Copper loss(Watt)	3.47
Current Density	6.00 A/mm ²	Current Ripple Rate(%)	25%	Required Inductance(uH)	250.0
Wire Dia(mm)	1.38	Ripple Current(ΔI)	2.25		
Surface Area(mm ²)	31.5	Graph range	0 A	11 A	

Total Loss & Delta T

Perm	Total Loss(w)		Delta T	
	DC	AC	DC	AC
26	3.86	5.35	55	72
60	3.82	5.16	54	70
125	3.89	5.37	55	72
147	4.00	5.71	56	76
160	4.00	5.71	56	76
	#N/A	#N/A	#N/A	#N/A
	#N/A	#N/A	#N/A	#N/A

DC Bias Characteristics

A	H(Oe)	26 μ	60 μ	125 μ	147 μ	160 μ	μ	μ
0	-	166.0	361.7	753.0	889.4	966.4	#N/A	#N/A
2	27	157.5	354.4	707.8	820.6	879.4	#N/A	#N/A
5	53	156.2	341.4	599.6	654.7	674.2	#N/A	#N/A
7	80	153.8	317.5	451.0	436.3	439.9	#N/A	#N/A
9	107	150.4	285.3	319.3	271.0	274.6	#N/A	#N/A
10	120	148.3	267.5	267.0	213.8	218.4	#N/A	#N/A
Lrated / Linitial		91%	79%	42%	30%	28%		

Core Loss

perm	ΔI	L@Irated	Flux Density(G)		Core Loss(mW/cc)		Core Loss(W)	
			DC(ΔB/2)	AC(ΔB)	DC	AC	DC	AC
26	3.7	150	544	1,087	71	344	0.39	1.88
60	2.0	285	544	1,087	64	309	0.35	1.69
125	1.8	319	544	1,087	77	348	0.42	1.91
147	2.1	271	544	1,087	96	409	0.53	2.24
160	2.0	275	544	1,087	96	409	0.53	2.24
					#N/A	#N/A	#N/A	#N/A
					#N/A	#N/A	#N/A	#N/A

2. Special Shape Powder Core

Ni- Fe alloy
 Khaki Color
 Lower Core Loss, Excellent DC Bias
 Large Energy Storage Capability
 Perm 26, 60, 125, 147, 160u



EQ CORE

Ni- Fe- Mo alloy
 Gray Color
 Lowest Core Loss
 Excellent Temperature Stability
 Perm 26, 60, 125, 147, 160, 173, 200u

High Flux Cores

MPP Cores



EER CORE



BLOCK CORE



Ellipse CORE

Sendust Cores

Mega Flux Cores

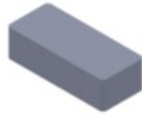






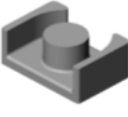

Fe- Si- Al alloy
 Black Color
 Low Core Loss
 Moderate Price
 Perm 26, 60, 75, 90, 125u



EE CORE

Fe- Si alloy
 Dark Brown Color
 Excellent DC Bias
 Large Energy Storage Capability
 Moderate Price
 Perm 26, 40, 50, 60, 75, 90u

2. Special Shape Powder Core

		Block	E	EER	EQ	Cylinder	Round Block	U	ER	Ellipse
Materials	Perm.									
MegaFlux	26μ	○	○	○	○	○	○	○	○	○
	40μ	○	○	○	○	○	○	○	○	○
	60μ	○	○	○	○	○	○	○	○	○
Sendust	26μ	○	○	○	○	○		○		
	40μ	○	○	○	○	○		○		
	60μ	○	○			○		○		
HighFlux	26μ	○		○	○	○		○	○	
	40μ	○		○	○	○		○	○	
	60μ	○		○	○	○		○	○	
Mold Size		4	10	6	6	6	5	7	5	5
Design Tool		○	○		○			○	△	○

2. Special Shape Powder Core

1. Big Toroidal Core

(1) Features

- Out Diameter 100, 132, 165mm
- MPP, High Flux, Sendust, Mega Flux
- Electrical Characteristics are Same with Small toroid cores

(2) Application

- Uninterruptible Power Supply (UPS)
- Solar Inverter
- High Power System

(3) Product Identification

CK 13 25 060

Permeability : 60 μ

Available Perm : 26, 50, 60, 125 μ

Height : 25mm

OD Size : 130mm

Available Size : 100 ~ 165mm

Mega Flux Core

CH: High Flux, CS: Sendust

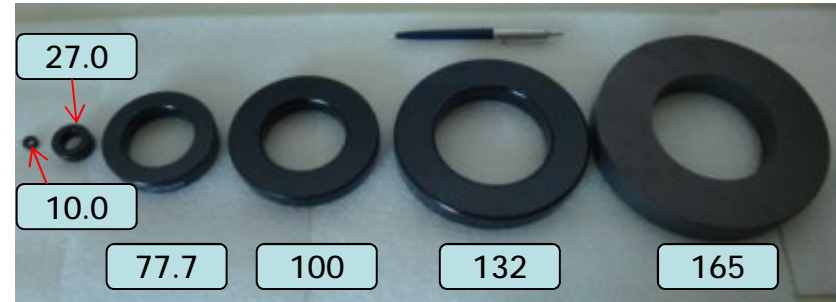


2. Special Shape Powder Core

1. Big Toroidal Core

(4) Material Comparison

Material	Advantage	Disadvantage
Mega Flux	High DCB Moderate Price	Core Loss
High Flux	High DCB Low Core Loss	Cost
SENDUST	Moderate Price Low Core Loss	DCB



(5) Dimension

Part No. (□□□ : perm.)	Dimensions(mm)						Path length (cm)	Cross Section Area (cm ²)	A _L value (nH/n ²)±8%		
	Before Finish OD(Max)xID(Min)xHT(Max)			After Finish OD(Max)xID(Min)xHT(Max)					026μ	060μ	125μ
CS1013□□□	101.6	57.2	13.6	103.1	55.7	14.9	24.27	2.972	40	92	192
CS1016□□□	101.6	57.2	16.5	103.1	55.7	17.8	24.27	3.522	48	112	228
CS1027□□□	101.6	57.2	27.2	103.1	55.7	28.5	24.27	5.944	80	184	384
CS1033□□□	101.6	57.2	33.0	103.1	55.7	34.3	24.27	7.044	96	224	456
CS1320□□□	132.5	78.6	20.3	134.2	77.0	21.7	32.42	5.347	54	124	259
CS1325□□□	132.5	78.6	25.4	134.2	77.0	26.8	32.42	6.710	68	156	325
CS1333□□□	132.5	78.6	33.0	134.2	77.0	34.4	32.42	8.717	88	202	422
CS1340□□□	132.5	78.6	40.6	134.2	77.0	42.0	32.42	10.694	108	248	518
CS1625□□□	165.0	88.9	25.4	167.2	86.9	27.3	38.65	9.460	80	184	384

2. Special Shape Powder Core

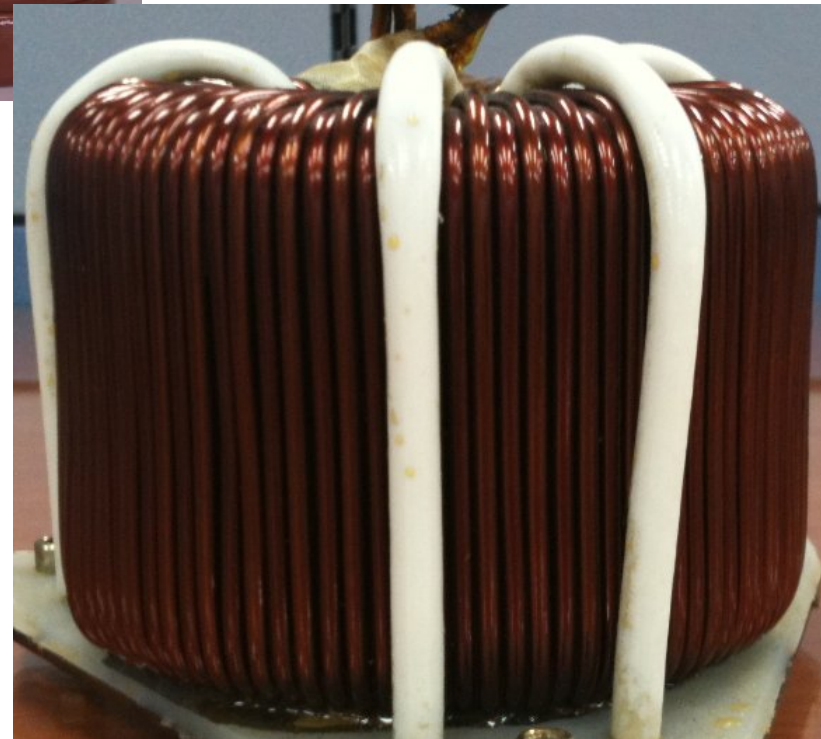
1. Big Toroidal Core

(6) Design Example



Core Stacking
(OD : 132mm)

Wound Product
(Application : UPS)



2. Special Shape Powder Core

2. Block Core

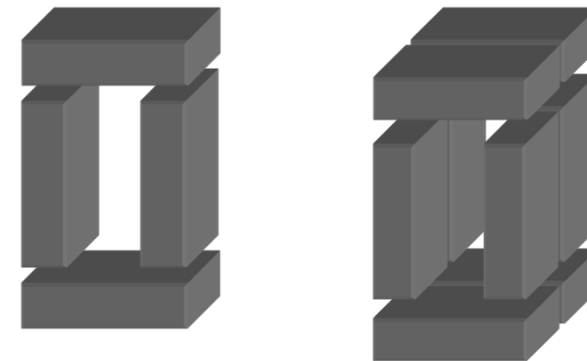
(1) Features

- Easy to Assemble
- Good Temperature Stability
- Low Core Loss
- Free From Leakage Flux
- Good Design Flexibility



(2) Application

- Solar Inverter
- Uninterruptible Power Supply (UPS)
- Hybrid, Electric Vehicle
- High Power System



(3) Product Identification

BK 6 3 20 - 060

BK	6	3	20	-	060		
						Permeability : 60 μ	Available Perm : 26, 40, 60 μ
						Height : 20mm	Available Size : 15,20mm
						Width : 30mm	
						Length : 60mm	Available Size : 50 ~ 80mm
						Mega Flux Block Core	BH: High Flux, BS: Sendust

2. Special Shape Powder Core

2. Block Core

(4) Material Comparison

Block Material	Advantage	Disadvantage	60 μ DCB%		Core Loss @25kHz, 1,000G
			@100 Oe	@200 Oe	
Mega Flux	High DCB Moderate Price	Core Loss	76%	42%	219mW/cc
High Flux	High DCB Low Core Loss	Cost	76%	43%	102mW/cc
SENDUST	Moderate Price Low Core Loss	DCB	45%	21%	106mW/cc

(5) Dimension

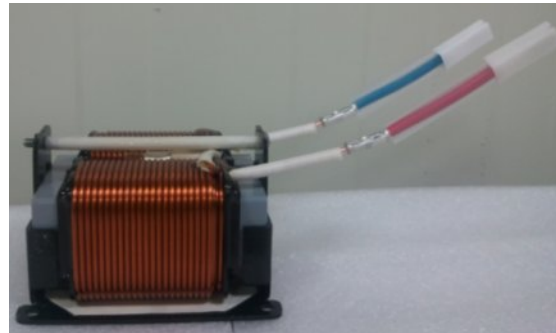
P/N	Dimensions			Path length (cm)	Cross Section Area (cm ²)	4pcs AL value (nH/n ²) \pm 12%		
	Length (mm)	Width (mm)	Height (mm)			026u	040u	060u
BK5315	50.5 \pm 0.5	30.3 \pm 0.3	15 \pm 0.2	18.71	4.5	95	121	181
BK5320	50.5 \pm 0.5	30.3 \pm 0.3	20 \pm 0.2	18.28	6	130	165	247
BK6315	60.5 \pm 0.5	30.3 \pm 0.3	15 \pm 0.2	22.71	4.5	79	100	149
BK6320	60.5 \pm 0.5	30.3 \pm 0.3	20 \pm 0.2	22.28	6	107	135	203
BK7315	70.5 \pm 0.5	30.3 \pm 0.3	15 \pm 0.2	26.71	4.5	67	85	127
BK7320	70.5 \pm 0.5	30.3 \pm 0.3	20 \pm 0.2	26.28	6	91	115	172
BK8315	80.5 \pm 0.5	30.3 \pm 0.3	15 \pm 0.2	30.71	4.5	58	74	110
BK8320	80.5 \pm 0.5	30.3 \pm 0.3	20 \pm 0.2	30.28	6	78	100	149

2. Special Shape Powder Core

2. Block Core

(6) Design Example

1) Solar Inverter



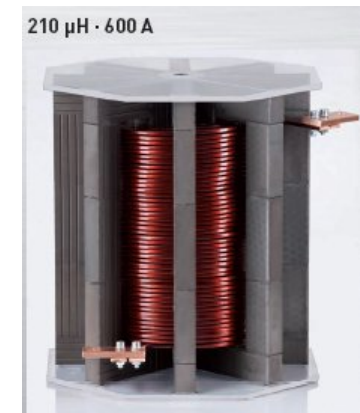
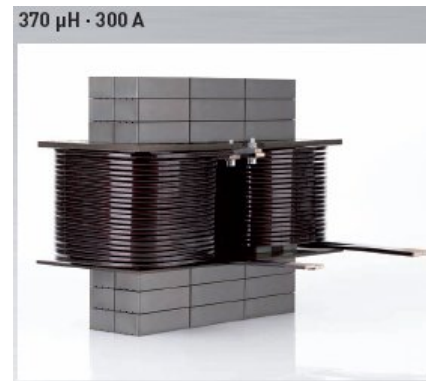
2) UPS



3) Hybrid, Electric Vehicle



4) High Power System



2. Special Shape Powder Core

3. E Core

(1) Features

- Easy Winding
- Sendust, Mega Flux Available
- Good Temperature Stability
- No Bulk Gap
- Minimized Audible Noise

(2) Application

- Solar Inverter
- PFC Choke
- Output Choke



(3) Product Identification

ES 43 21 C - 060

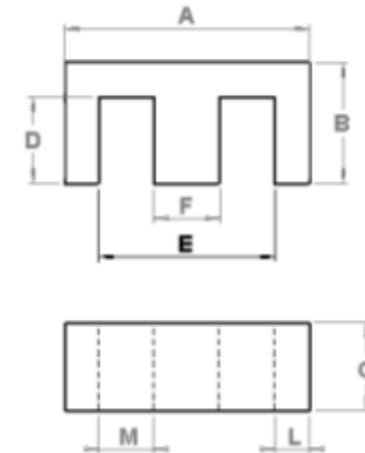
			Permeability : 60μ	Available Perm : 26, 40, 60μ
			Height	
			Width : 21mm	
			Length : 43mm	Available Size : 19 ~ 80mm
			SENDUST E Core	EK : MEGA FLUX

2. Special Shape Powder Core

3. E Core

(4) Material Comparison

Material	Advantage	Disadvantage	60 μ DCB%		Core Loss @25kHz, 1,000G
			@50 Oe	@100 Oe	
Mega Flux	High DCB Moderate Price	Core Loss	91%	76%	219mW/cc
SENDUST	Moderate Price Low Core Loss	DCB	76%	50%	106mW/cc



(5) Dimension

P/N	Dimensions								Path length (cm)	Cross Section Area (cm ²)	AL value (nH/n ²) \pm 12%		
	A (mm)	B (mm)	C (mm)	D[min] (mm)	E[min] (mm)	F (mm)	L[nom] (mm)	M[min] (mm)			026u	040u	060u
ES1908A	19.3 \pm 0.3	8.1 \pm 0.2	4.8 \pm 0.2	5.5	13.9	4.8 \pm 0.2	2.3	4.7	4.01	0.228	26	35	48
ES2510A	25.1 \pm 0.3	9.6 \pm 0.2	6.5 \pm 0.2	6.2	18.8	6.1 \pm 0.2	3.0	6.3	4.85	0.385	39	52	70
ES3015A	30.1 \pm 0.3	15.0 \pm 0.2	7.1 \pm 0.2	9.7	19.5	7.0 \pm 0.2	5.1	6.4	6.56	0.601	33	46	71
ES3515A	34.5 \pm 0.3	14.1 \pm 0.2	9.3 \pm 0.2	9.6	25.3	9.3 \pm 0.2	4.4	7.9	6.94	0.840	56	75	102
ES4117A	40.9 \pm 0.6	16.5 \pm 0.3	12.5 \pm 0.3	10.4	28.3	12.5 \pm 0.3	6.0	7.9	7.75	1.520	88	119	163
ES4321A	42.8 \pm 0.7	21.1 \pm 0.4	10.8 \pm 0.3	15.0	30.4	11.7 \pm 0.3	5.9	9.5	9.84	1.280	56	76	105
ES4321B	42.8 \pm 0.7	21.1 \pm 0.4	15.4 \pm 0.3	15.0	30.4	11.7 \pm 0.3	5.9	9.5	9.84	1.830	80	108	150
ES4321C	42.8 \pm 0.7	21.1 \pm 0.4	20.0 \pm 0.3	15.0	30.4	11.7 \pm 0.3	5.9	9.5	9.84	2.370	104	140	194
ES5528A	54.9 \pm 0.8	27.6 \pm 0.4	20.6 \pm 0.4	18.5	37.5	16.8 \pm 0.4	8.4	10.3	12.30	3.500	116	157	219
ES5528B	54.9 \pm 0.8	27.6 \pm 0.4	24.6 \pm 0.4	18.5	37.5	16.8 \pm 0.4	8.4	10.3	12.30	4.170	138	187	261
ES6533A	65.1 \pm 1.0	32.5 \pm 0.5	27.0 \pm 0.4	22.2	44.2	19.7 \pm 0.4	10.0	12.1	14.70	5.400	162	230	300
ES7228A	72.4 \pm 1.1	27.9 \pm 0.5	19.0 \pm 0.4	17.8	52.6	19.1 \pm 0.4	9.5	16.9	13.70	3.680	130	173	236
ES8038A	80.0 \pm 1.2	38.1 \pm 0.6	19.8 \pm 0.4	28.1	59.3	19.8 \pm 0.4	9.9	19.8	18.50	3.890	103	145	190

2. Special Shape Powder Core

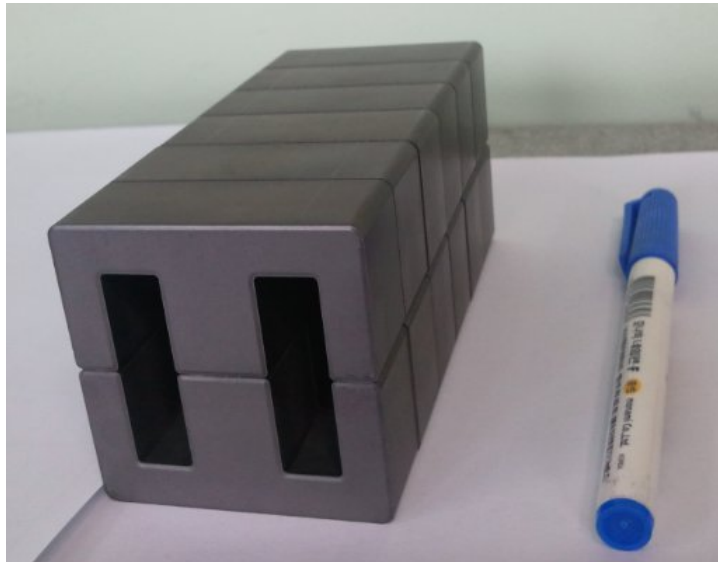
3. E Core

(6) Design Example

1) E Core Stacking

: EK5528A- 060 6Layer, AL=1314mH

55mm x 55mm x 124mm



2) Wound Product (PFC, Solar)



2. Special Shape Powder Core

4. EQ,EER,ER Core

(1) Features

- Round Center Leg
- High Flux, Mega Flux Available
- Good Temperature Stability
- No Bulk Gap
- Rectangular Winding is Possible (DCR Reduction)

(2) Application

- High Current, Low Inductance Application
- Hybrid, Electrical Vehicle
- PFC Choke
- Output Choke

(3) Product Identification

HEQ 32 22 B - 060

Permeability : 60 μ

Available Perm : 26, 40, 60 μ

Height

Width : 22mm

Length : 32mm

Available Size : 20 ~ 50mm

High Flux EQ Core

KEQ : MEGA FLUX

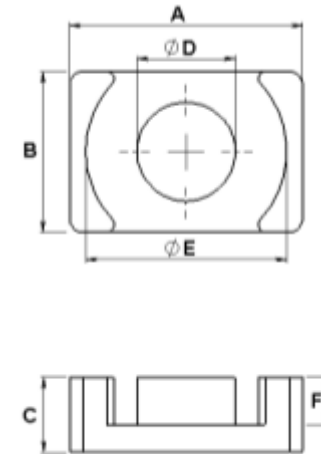


2. Special Shape Powder Core

4. EQ,EER,ER Core

(4) Material Comparison

Material	Advantage	Disadvantage	60 μ DCB%		Core Loss @25kHz, 1,000G
			@100 Oe	@200 Oe	
Mega Flux	High DCB Moderate Price	Core Loss	76%	42%	219mW/cc
High Flux	High DCB Low Core Loss	Cost	76%	43%	102mW/cc



(5) EQ Core (HEQ : HighFlux, KEQ : MegaFlux)

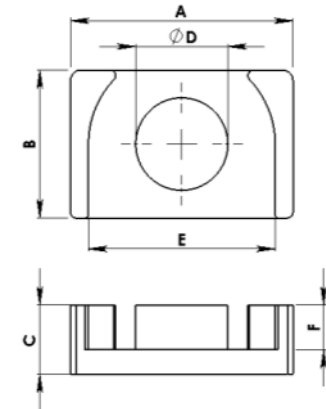
P/N	Dimensions						Path length (cm)	Cross Section Area (cm ²)	AL value (nH/n ²) \pm 12%		
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)			026u	040u	060u
HEQ2014A	20.5 \pm 0.3	14.0 \pm 0.2	8.1 \pm 0.2	8.8 \pm 0.2	18.0 \pm 0.2	5.7 \pm 0.3	4.52	0.608	44	68	101
HEQ2014B	20.5 \pm 0.3	14.0 \pm 0.2	10.1 \pm 0.2	8.8 \pm 0.2	18.0 \pm 0.2	7.7 \pm 0.3	5.32	0.608	37	57	86
HEQ2619A	26.5 \pm 0.3	19.0 \pm 0.2	10.1 \pm 0.2	12.0 \pm 0.2	22.6 \pm 0.3	6.8 \pm 0.3	5.47	1.198	72	110	165
HEQ2619B	26.5 \pm 0.3	19.0 \pm 0.2	12.4 \pm 0.2	12.0 \pm 0.2	22.6 \pm 0.3	9.1 \pm 0.3	6.39	1.198	61	94	141
HEQ3222A	32.0 \pm 0.4	22.0 \pm 0.3	10.3 \pm 0.2	13.5 \pm 0.2	27.6 \pm 0.3	6.6 \pm 0.3	6.03	1.523	83	127	190
HEQ3222B	32.0 \pm 0.4	22.0 \pm 0.3	15.2 \pm 0.2	13.5 \pm 0.2	27.6 \pm 0.3	11.5 \pm 0.3	7.99	1.523	62	96	144
HEQ3626A	36.0 \pm 0.5	26.0 \pm 0.3	17.4 \pm 0.3	14.4 \pm 0.2	32.0 \pm 0.4	13.4 \pm 0.3	9.47	1.808	62	96	144
HEQ4128A	41.5 \pm 0.5	28.0 \pm 0.4	19.9 \pm 0.3	14.9 \pm 0.2	36.5 \pm 0.4	15.4 \pm 0.3	11.52	1.997	57	87	131
HEQ5032A	50.0 \pm 0.6	32.0 \pm 0.4	25.0 \pm 0.4	20.0 \pm 0.3	44.0 \pm 0.5	19.5 \pm 0.4	13.34	3.141	77	118	178

2. Special Shape Powder Core

4. EQ,EER,ER Core

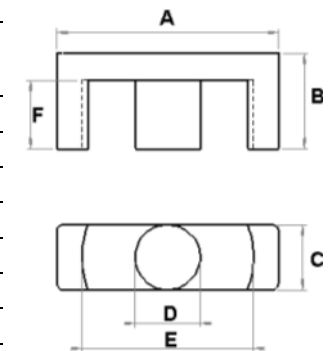
(6) ER Core (RH : HighFlux, RK : MegaFlux)

P/N	Dimensions						Path length (cm)	Cross Section Area (cm ²)	AL value (nH/n ²)±12%		
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)			026u	040u	060u
									RH1911A	18.8±0.3	11.0±0.2
RH2314A	23.4±0.3	14.0±0.2	8.7±0.2	9.2±0.2	19.4±0.2	6.2±0.2	4.91	0.670	45	69	103
RH2518A	25.0±0.3	18.0±0.2	8.4±0.2	11.0±0.2	21.0±0.3	5.4±0.2	4.97	0.960	63	97	146
RH2518B	25.0±0.3	18.0±0.2	10.8±0.2	11.0±0.2	21.0±0.3	7.8±0.2	5.93	0.960	53	81	122
RH3020A	30.0±0.4	20.0±0.3	9.2±0.2	12.0±0.2	25.6±0.3	5.9±0.2	5.81	1.140	64	99	148
RH3020B	30.0±0.4	20.0±0.3	11.8±0.2	12.0±0.2	25.6±0.3	8.5±0.2	6.85	1.140	54	84	125
RH3222A	32.0±0.4	22.0±0.3	10.3±0.2	13.5±0.2	27.0±0.3	6.6±0.2	6.25	1.430	75	115	172
RH3222B	32.0±0.4	22.0±0.3	13.4±0.2	13.5±0.2	27.0±0.3	9.7±0.2	7.49	1.430	62	96	144
RH3222C	32.0±0.4	22.0±0.3	15.2±0.2	13.5±0.2	27.0±0.3	11.5±0.2	8.21	1.430	57	88	131
RH3624A	36.2±0.4	24.0±0.3	11.2±0.2	15.0±0.2	30.4±0.4	7.2±0.2	6.78	1.770	85	131	197
RH3624B	36.2±0.4	24.0±0.3	14.4±0.2	15.0±0.2	30.4±0.4	10.4±0.2	8.06	1.770	72	110	166
RH4225A	42.0±0.5	25.0±0.3	12.3±0.2	16.2±0.3	35.2±0.4	7.9±0.2	7.61	2.060	88	136	204
RH4225B	42.0±0.5	25.0±0.3	15.8±0.2	16.2±0.3	35.2±0.4	11.4±0.2	9.01	2.060	75	115	172



(7) EER Core (HER : HighFlux, KER : MegaFlux)

P/N	Dimensions						Path length (cm)	Cross Section Area (cm ²)	AL value (nH/n ²)±12%		
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)			026u	040u	060u
									HER2507A	25.5±0.3	9.3±0.2
HER2507B	25.5±0.3	11.0±0.2	7.5±0.2	7.5±0.2	19.8±0.2	7.9	5.78	0.450	34	47	65
HER3010A	30.6±0.3	15.8±0.2	9.8±0.2	9.8±0.2	22.0±0.2	11	8.66	0.754	38	53	72
HER3511A	35.0±0.4	15.8±0.2	11.3±0.2	11.3±0.2	25.6±0.3	9.8	8.30	1.078	57	78	108
HER3511B	35.0±0.4	20.7±0.2	11.3±0.2	11.3±0.2	25.6±0.3	14.7	10.27	1.078	46	63	87
HER4013A	40.0±0.5	17.4±0.3	13.3±0.3	13.3±0.3	29.0±0.4	10.4	9.13	1.491	72	99	135
HER4013B	40.0±0.5	22.4±0.3	13.3±0.3	13.3±0.3	29.0±0.4	15.4	11.13	1.491	59	81	111
HER4215A	42.0±0.6	22.4±0.4	15.5±0.4	15.5±0.4	29.4±0.5	15.4	10.64	2.026	84	115	158
HER4215B	42.0±0.6	25.4±0.4	15.5±0.4	15.5±0.4	29.4±0.5	18.4	11.84	2.026	75	103	142
HER4917A	49.0±0.7	18.8±0.5	17.2±0.5	17.2±0.5	36.5±0.6	12.2	9.57	2.353	99	136	185
HER4917B	49.0±0.7	24.7±0.5	17.2±0.5	17.2±0.5	36.5±0.6	18.1	11.93	2.353	79	109	149



2. Special Shape Powder Core

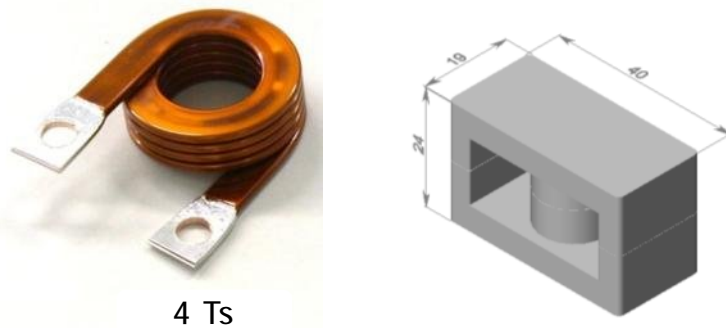
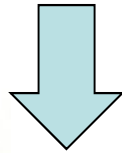
4. EQ,EER,ER Core

(6) Design Example

1) HEV Application



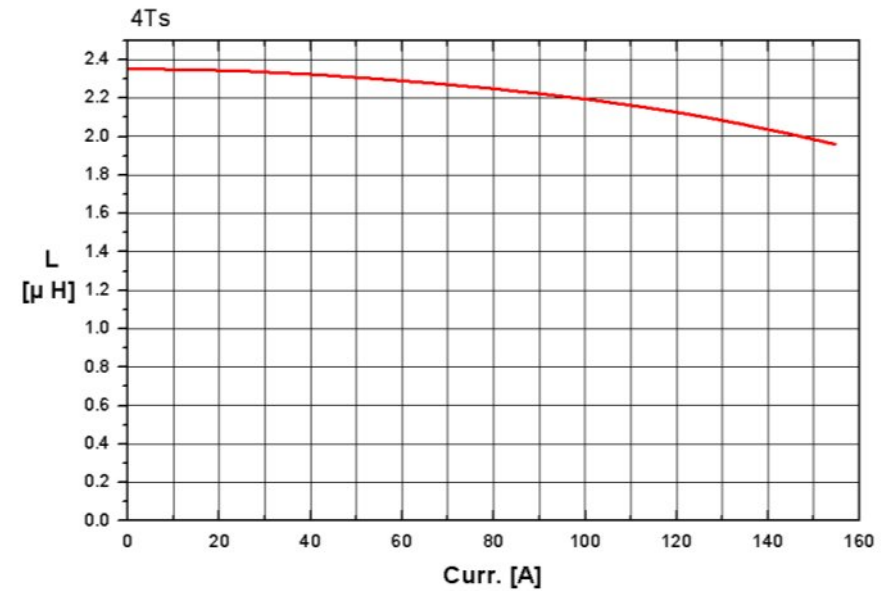
<Gap Ferrite>



<MegaFlux EER Core>

2) DCB Graph

: $L(120A) = 2\mu H$



2. Special Shape Powder Core

5. U Core

(1) Features

- Same Size with C Core
- High Flux, Sendust, Mega Flux
- Good Temperature Stability
- No Bulk Gap
- Minimized Audible Noise

(2) Application

- Uninterruptible Power Supply
- Photovoltaic Power Generation
- Hybrid, Electrical Vehicle
- High Power Industrial Power System



(3) Product Identification

UK 41 41 C - 060

			Permeability : 60μ	Available Perm : 26, 40, 60μ
			Height	
			Width : 41mm	Available Size : 36 ~ 65mm
			Length : 41mm	Available Size : 35 ~ 79mm
			Mega Flux U Core	UH: High Flux, US: Sendust

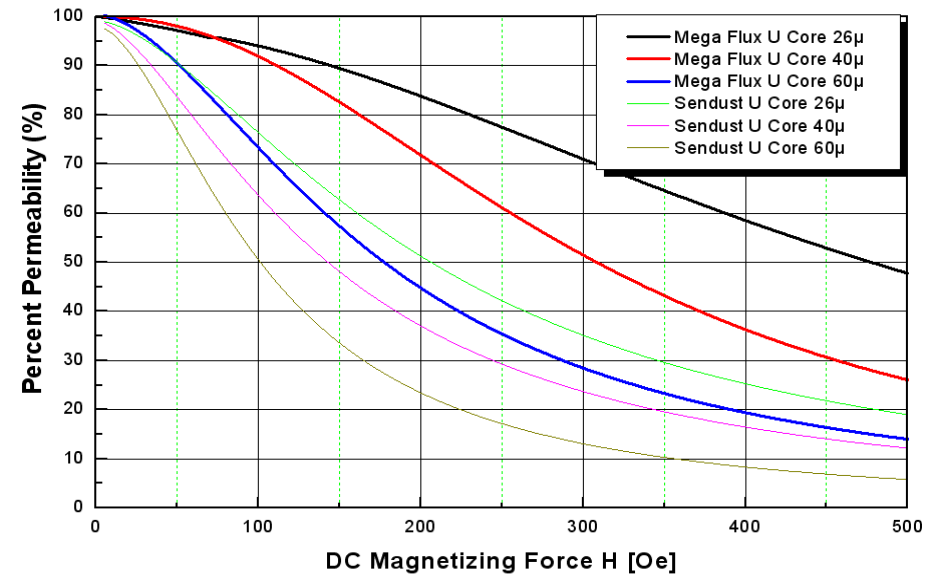
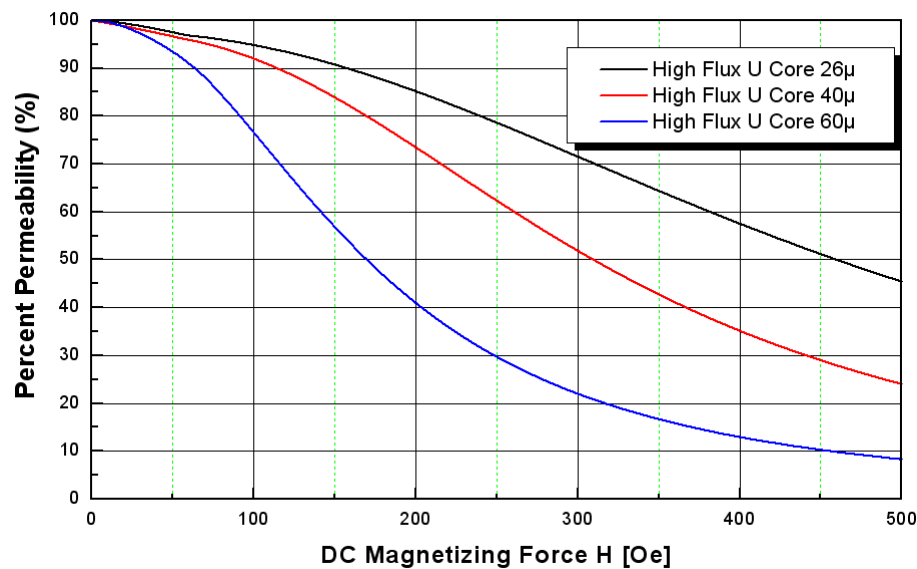
2. Special Shape Powder Core

5. U Core

(4) DCB Comparison

Material	60 μ DCB%		
	@100 Oe	@150 Oe	@200 Oe
UH (High Flux U Core)	75%	56%	41%
UK (Mega Flux U Core)	73%	57%	44%
US (Sendust U Core)	50%	33%	23%

(5) DCB Graph



2. Special Shape Powder Core

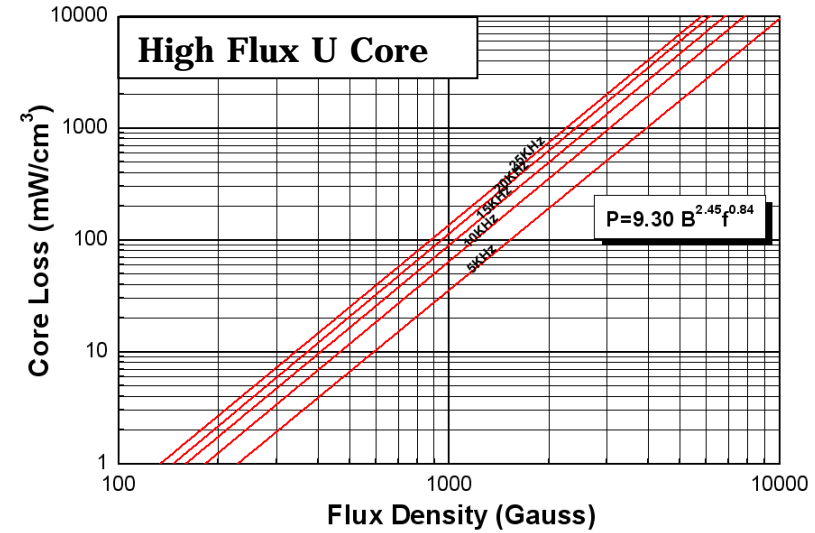
5. U Core

(6) Core Loss Comparison

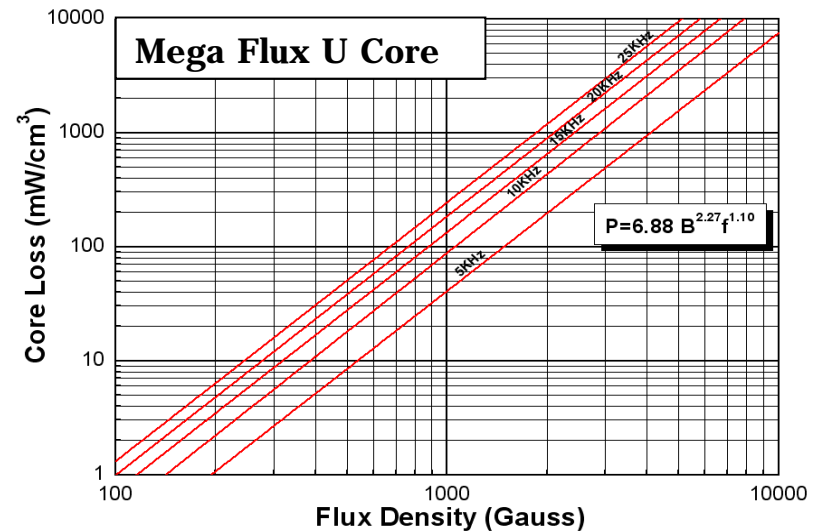
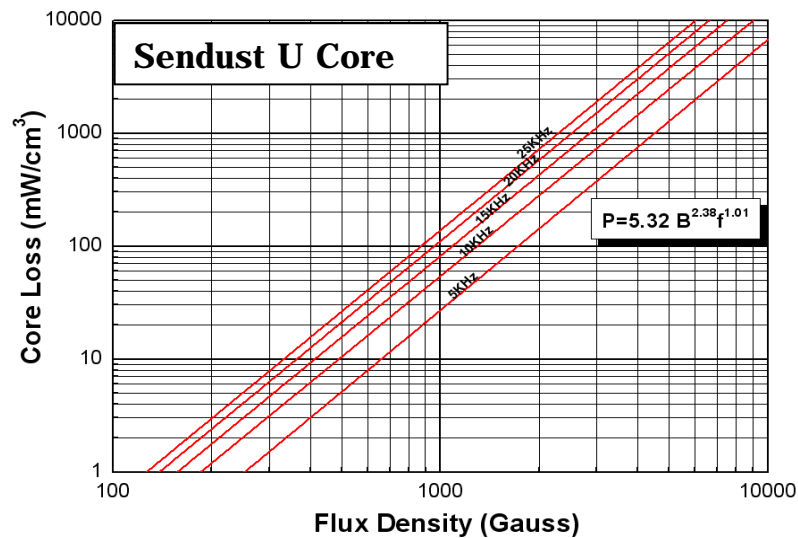
Unit : [mW/cc]

Material	Core Loss	
	@25kHz 500G	@25kHz 1,000G
UH (High Flux U Core)	25	136
UK (Mega Flux U Core)	49	239
US (Sendust U Core)	26	137

(7) Core Loss Graph



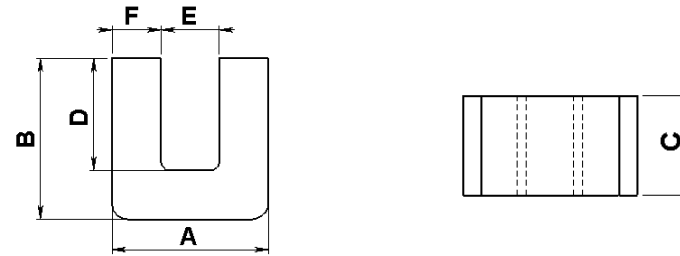
P:mW/cc, B:kGauss, f:kHz



2. Special Shape Powder Core

5. U Core

(8) Part List



P/N	Dimensions						Inner Radius (mm)	Path length (cm)	Cross Section Area (cm ²)	AL value (nH/n ²) ± 12%		
	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	F (mm)				026u	040u	060u
UH3536A	35.0±0.5	36.0±0.5	20.0±0.5	25.0	13.0	11.0±0.3	2	16.90	2.200	43	65	98
UH3536B	35.0±0.5	36.0±0.5	25.0±0.5	25.0	13.0	11.0±0.3	2	16.90	2.750	53	82	123
UH4141A	41.0±0.6	41.0±0.6	20.0±0.5	28.0	15.0	13.0±0.3	2	19.30	2.600	44	68	102
UH4141B	41.0±0.6	41.0±0.6	25.0±0.5	28.0	15.0	13.0±0.3	2	19.30	3.250	55	85	127
UH4141C	41.0±0.6	41.0±0.6	30.0±0.5	28.0	15.0	13.0±0.3	2	19.30	3.900	66	102	152
UH5251A	52.0±0.7	51.0±0.7	25.0±0.5	35.0	20.0	16.0±0.4	2.5	24.30	4.000	54	83	124
UH5251B	52.0±0.7	51.0±0.7	30.0±0.5	35.0	20.0	16.0±0.4	2.5	24.30	4.800	65	99	149
UH6361A	63.0±0.8	60.5±0.8	30.0±0.5	41.5	25.0	19.0±0.4	3	29.10	5.700	64	98	148
UH6361B	63.0±0.8	60.5±0.8	35.0±0.5	41.5	25.0	19.0±0.4	3	29.10	6.650	75	115	172
UH7965A	79.0±1.0	64.5±1.0	30.0±0.5	42.5	35.0	22.0±0.5	4	32.60	6.600	66	102	153
UH7965B	79.0±1.0	64.5±1.0	35.0±0.5	42.5	35.0	22.0±0.5	4	32.60	7.700	77	119	178

2. Special Shape Powder Core

6. Ellipse Core

(1) General Information

Ellipse Core(LK Series)

Permeability(μ)	26, 40, 60
Bmax(G)	16,000
Curie Temp[$^{\circ}$ C]	700
Operating temp[$^{\circ}$ C]	- 40 to 150



(2) Identification

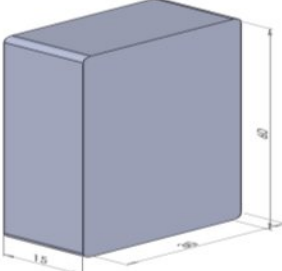
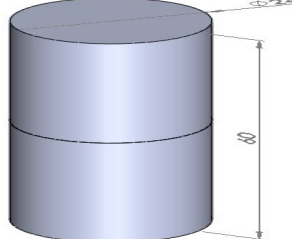
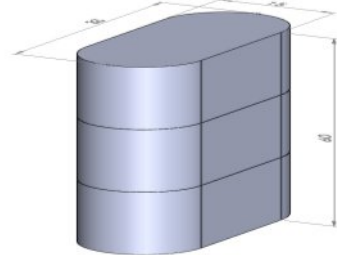
LK 70 35 A - 060

	Permeability : 60 μ	Available Perm : 26, 40, 60 μ
	Height :	Available Size : A=13.5,B=18.5mm
	Width : 35mm	
	Length : 70mm	Available Size : 60 ~ 70mm
	Ellipse Core	LK: Mega Flux

2. Special Shape Powder Core

6. Ellipse Core

(3) Advantage

Post Core Type	 <p>Block Cores</p>	 <p>Cylinder Cores</p>	 <p>Ellipse Cores</p>
Cross sectional Area(cm ²)	4.5	4.5	4.5
Size	30mm x 15mm	φ24mm	33mm x 15mm (Corner 7.5R)
Wire length per turn(cm)	9	7.53	8.31
Reference	1)Easy assembly	1)Smaller window area	1) Wider window area than assembled blocks with cylinders 2) Wire length of 1 turn 8% decreased than a block core

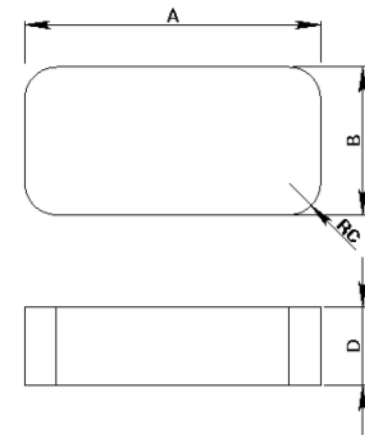
2. Special Shape Powder Core

6. Ellipse Core

(4) Part List

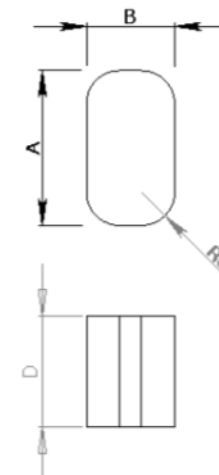
1) Plates

P/N	Dimensions				Cross Section Area (cm ²)
	A Length (mm)	B Width (mm)	RC Radius (mm)	D Height (mm)	
LK6035A	60.5±0.5	35.3±0.3	7.5±0.2	13.5±0.2	4.77
LK6035B	60.5±0.5	35.3±0.3	7.5±0.2	18.5±0.2	6.52
LK7035A	70.5±0.5	35.3±0.3	7.5±0.2	13.5±0.2	4.77
LK7035B	70.5±0.5	35.3±0.3	7.5±0.2	18.5±0.2	6.52



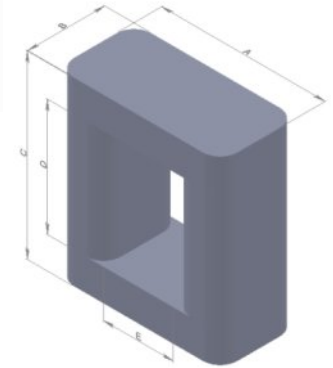
2) Posts

P/N	Dimensions				Cross Section Area (cm ²)
	A Length (mm)	B Width (mm)	RC Radius (mm)	D Height (mm)	
LK3515A	35.3±0.3	15.2±0.2	7.5±0.2	20.0±0.2	4.77
LK3515B	35.3±0.3	15.2±0.2	7.5±0.2	25.0±0.2	4.77
LK3520A	35.3±0.3	20.2±0.2	7.5±0.2	20.0±0.2	6.52
LK3520B	35.3±0.3	20.2±0.2	7.5±0.2	25.0±0.2	6.52



2. Special Shape Powder Core

6. Ellipse Core



(5) Assembling

PLATE P/N	POST		Dimensions					Path Length (cm)	Cross Section Area (cm ²)	Window Area (cm ²)	AL value (nH/n ²) ± 12%		
	P/N	1 LEG STACK	A Length (mm)	B Width (mm)	C Height (mm)	D Inner Height (mm)	E Inner Length (mm)				026u	040u	060u
LK6035A	LK3515A	2	60.5±0.5	35.3±0.3	67.0±0.5	40.0±0.4	30.0±0.4	18.47	4.77	12	101	130	195
	LK3515B	2	60.5±0.5	35.3±0.3	77.0±0.5	50.0±0.4	30.0±0.4	20.47	4.77	15	91	117	176
	LK3515A	3	60.5±0.5	35.3±0.3	87.0±0.5	60.0±0.4	30.0±0.4	22.47	4.77	18	83	107	160
LK6035B	LK3520A	2	60.5±0.5	35.3±0.3	77.0±0.5	40.0±0.4	20.0±0.4	18.04	6.52	8	141	182	273
	LK3520B	2	60.5±0.5	35.3±0.3	87.0±0.5	50.0±0.4	20.0±0.4	20.04	6.52	10	127	164	245
	LK3520A	3	60.5±0.5	35.3±0.3	97.0±0.5	60.0±0.4	20.0±0.4	22.04	6.52	12	115	149	223
LK7035A	LK3515A	2	70.5±0.5	35.3±0.3	67.0±0.5	40.0±0.4	40.0±0.4	20.47	4.77	16	91	117	176
	LK3515B	2	70.5±0.5	35.3±0.3	77.0±0.5	50.0±0.4	40.0±0.4	22.47	4.77	20	83	107	160
	LK3515A	3	70.5±0.5	35.3±0.3	87.0±0.5	60.0±0.4	40.0±0.4	24.47	4.77	24	76	98	147
LK7035B	LK3520A	2	70.5±0.5	35.3±0.3	77.0±0.5	40.0±0.4	30.0±0.4	20.04	6.52	12	127	164	245
	LK3520B	2	70.5±0.5	35.3±0.3	87.0±0.5	50.0±0.4	30.0±0.4	22.04	6.52	15	115	149	223
	LK3520A	3	70.5±0.5	35.3±0.3	97.0±0.5	60.0±0.4	30.0±0.4	24.04	6.52	18	106	136	204

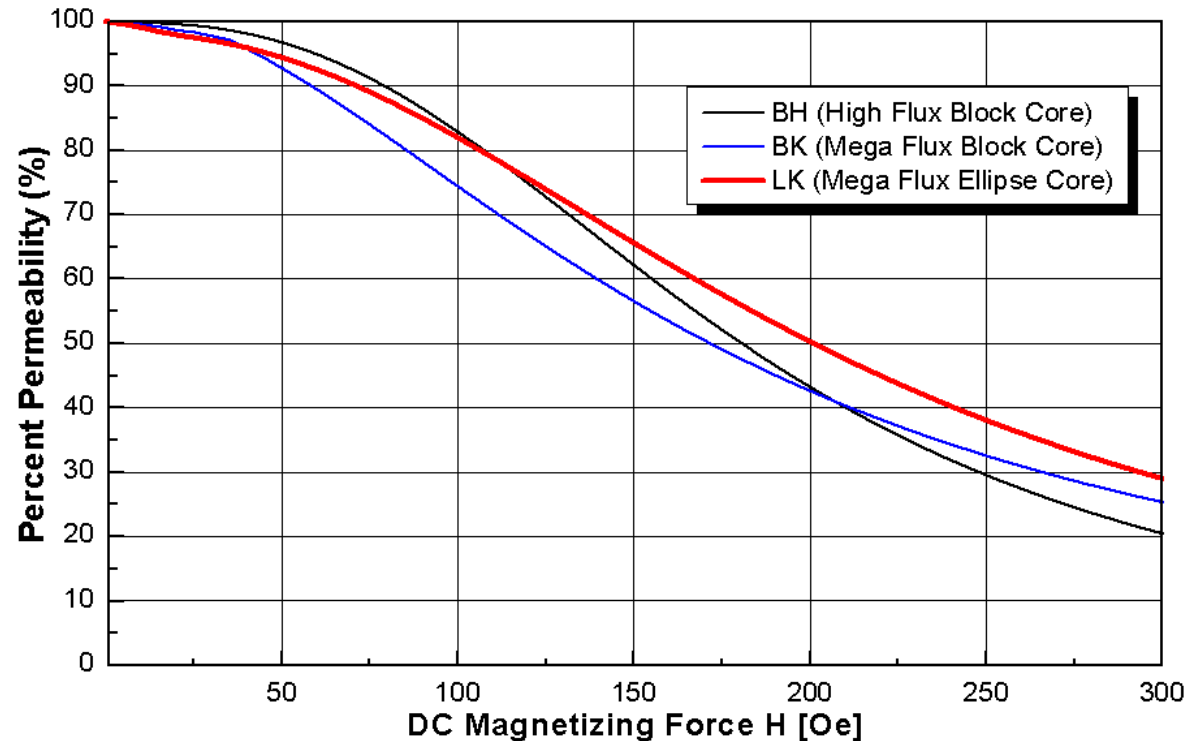
2. Special Shape Powder Core

6. Ellipse Core

(6) Material Comparison

Material	60 μ DCB%		
	@100 Oe	@150 Oe	@200 Oe
BH (High Flux Block)	83%	62%	43%
LK (Mega Flux Ellipse)	82%	66%	50%
BK (Mega Flux Block)	74%	56%	42%

(7) DCB Graph

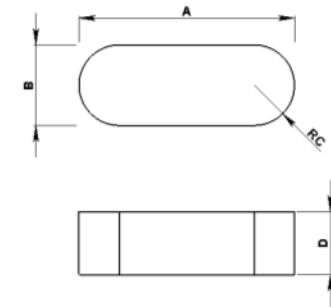


2. Special Shape Powder Core

7 Round blocks + Cylinder cores

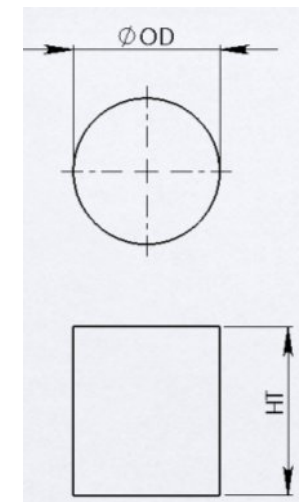
(1) Plate : Round Block Core

P/N	Dimensions				Cross Section Area (cm ²)	POST
	A Length (mm)	B Width (mm)	RC Radius (mm)	D Height (mm)		
RBK5420A	54.5±0.5	20.2±0.3	10.0±0.2	15.7±0.2	3.14	CK2020
RBK6424A	64.5±0.5	24.2±0.3	12.0±0.2	18.8±0.2	4.52	CK2424
RBK6725A	67.5±0.5	25.2±0.3	12.5±0.2	19.6±0.2	4.91	CK2525
RBK7428A	74.5±0.5	27.5±0.3	13.7±0.2	21.7±0.2	6.00	CK2828
RBK8030A	80.5±0.5	30.2±0.3	15.0±0.2	23.5±0.2	7.07	CK3030



(2) Post : Cylinder Core

P/N	Dimensions		1 Turn length (mm)	Cross Section Area (cm ²)	PLATE
	OD (mm)	HT (mm)			
CK2020	20.2±0.3	20.0±0.2	62.80	3.14	RBK5420A
CK2424	24.2±0.3	24.0±0.2	75.40	4.52	RBK6424A
CK2525	25.2±0.3	25.0±0.2	78.50	4.91	RBK6725A
CK2828	27.5±0.3	27.5±0.2	86.40	6.00	RBK7428A
CK3030	30.2±0.3	30.0±0.2	94.20	7.07	RBK8030A



2. Special Shape Powder Core

7 Round blocks + Cylinder cores

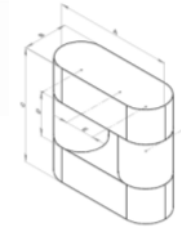


PLATE P/N	POST		Dimensions					Path Length (cm)	Cross Section Area (cm ²)	Window Area (cm ²)	AL value (nH/n ²) ± 12%		
	P/N	1 LEG STACK	A Length (mm)	B Width (mm)	C Height (mm)	D Inner Height (mm)	E Inner Length (mm)				026u	040u	060u
RBK5420A	CK2020	1	54	20	51.4	20	14	12.41	3.14	2.8	99	127	191
		2	54	20	71.4	40	14	16.41	3.14	5.6	75	96	144
		3	54	20	91.4	60	14	20.41	3.14	8.4	60	77	116
RBK6424A	CK2424	1	64	24	61.6	24	16	14.72	4.52	3.84	120	154	232
		2	64	24	85.6	48	16	19.52	4.52	7.68	90	116	175
		3	64	24	109.6	72	16	24.32	4.52	11.52	72	93	140
RBK6725A	CK2525	1	67	25	64.2	25	17	15.41	4.91	4.25	124	160	240
		2	67	25	89.2	50	17	20.41	4.91	8.5	94	121	181
		3	67	25	114.2	75	17	25.41	4.91	12.75	75	97	146
RBK7428A	CK2828	1	74	27.5	71.4	28	19	17.13	6.00	5.32	136	176	264
		2	74	27.5	99.4	56	19	22.73	6.00	10.64	103	133	199
		3	74	27.5	127.4	84	19	28.33	6.00	15.96	83	106	160
RBK8030A	CK3030	1	80	30	77	30	20	18.4	7.07	6	150	193	290
		2	80	30	107	60	20	24.4	7.07	12	113	146	218
		3	80	30	137	90	20	30.4	7.07	18	91	117	175

