

Chang Sung Corporation

Technical leader in Advanced materials



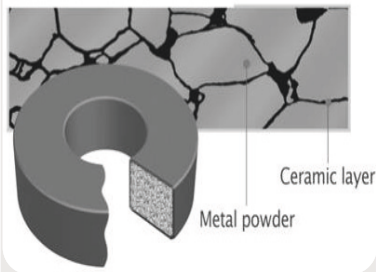
PLEASE CONTACT YOUR SPECIALIST EUROPEAN REPRESENTATIVE:

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CHANG SUNG CORPORATION'S ADVANCED TECHNOLOGY ENABLES US TO FULFILL THE DIVERSE NEEDS OF OUR CLIENTS FOR SOFT MAGNETIC POWDER CORES.

Powder cores are distributed air gap cores made from ferrous alloy powders for low losses at high frequencies. Small air gaps distributed evenly throughout the cores increase the amount of Direct Current (DC) that can be passed through the winding before core saturation occurs.

Cross Section View



Products

- MPP Cores : Ni-Fe-Mo alloy
- High Flux Cores : Ni-Fe alloy
- Sendust Cores : Fe-Si-Al alloy
- Mega Flux Cores : Fe-Si alloy
- Hybrid Cores(HS, HP, KH, KS, CF) : Fe alloy

Shapes

- Toroidal (3.5mm OD ~ 165.0mm OD)
- EE, EER, EQ+, U, UR, ER, Planner E
- Block, Big block(~180.0mm), Ellipse, Cylinder
- Other Customized shapes

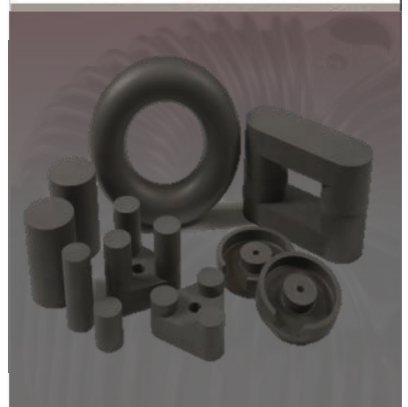
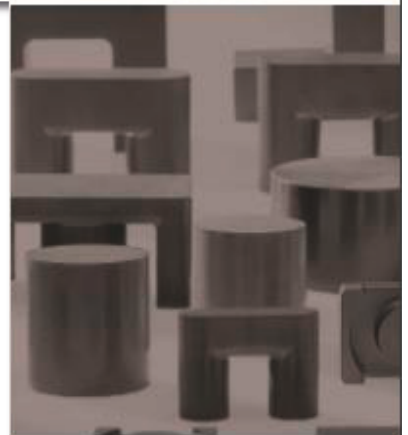
Permeabilities

- High Flux : 26 ~ 160 μ
- Mega Flux[®] : 26 ~ 90 μ
- MPP : 26 ~ 200 μ
- Sendust : 26 ~ 125 μ
- Fine Flux : 19 ~ 60 μ
- HS : 60 ~ 90 μ
- KH : 26 ~ 90 μ
- HP : 19 ~ 60 μ
- KS : 26 ~ 60 μ

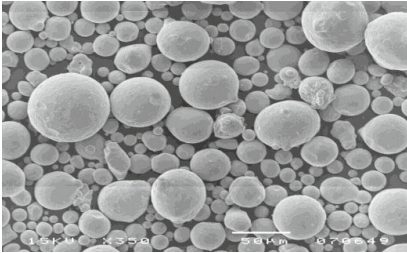
Flex Cores

- Fine Flux FCF : 19 μ , 26 μ , 50 μ
- Mega Flux FCK : 19 μ , 26 μ , 35 μ

- Break-Down voltage: 500V min.
- Remark: Core finishes are going to be changed to Black powder coating with laser marking for all materials.

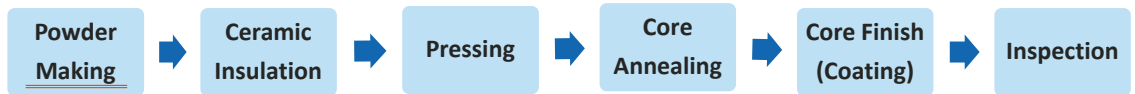


Better Efficiency Better Solutions to you

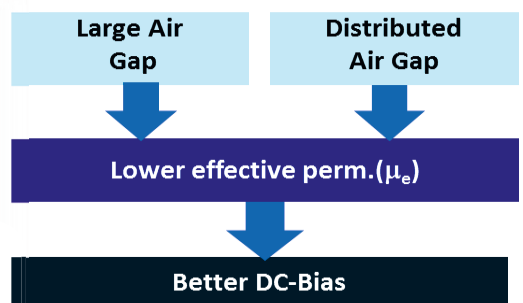
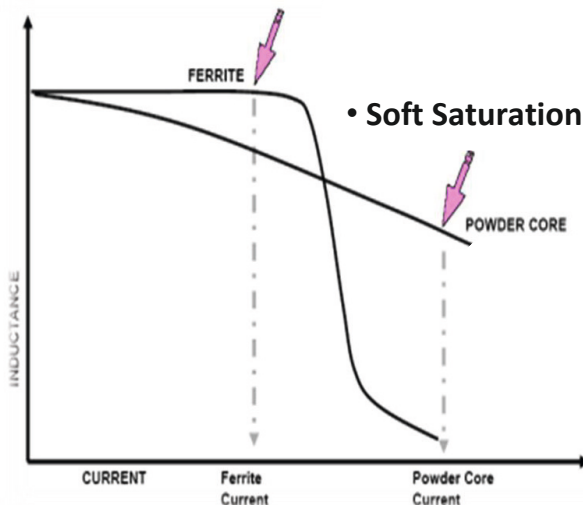
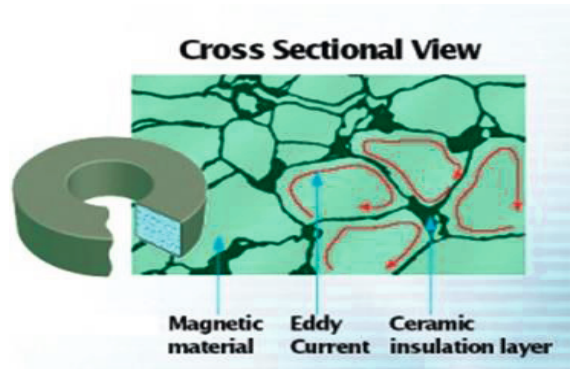


Power of Stable Quality

- In house Powder Making
- Accumulated Knowhow for various powders
- Continuous Research and Development

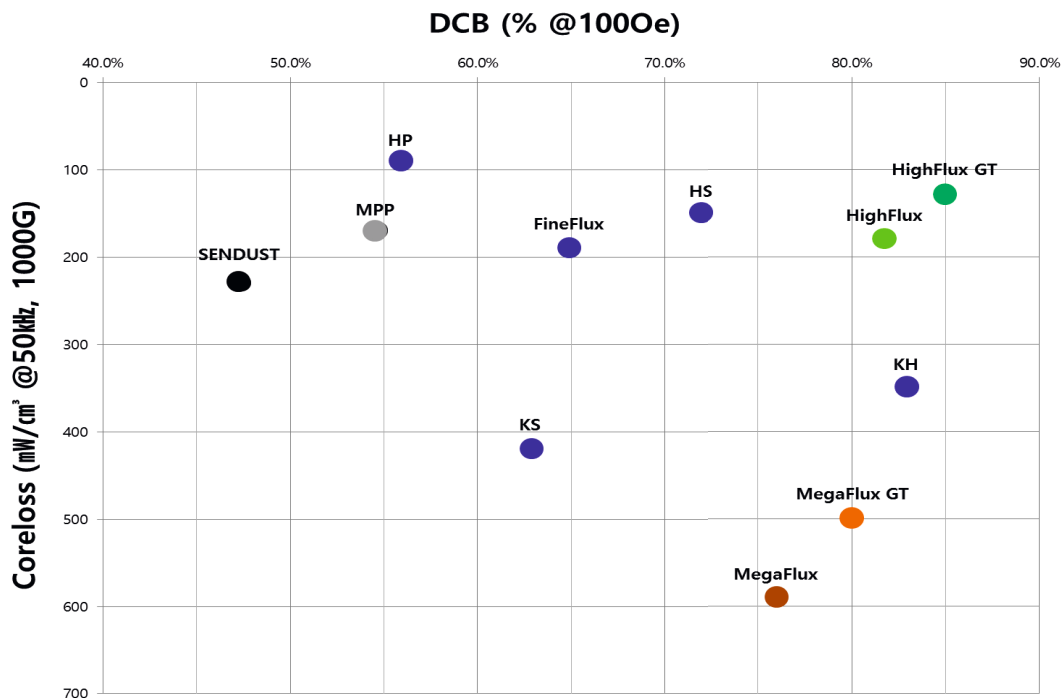


- Made from ferrous alloy powders
- Evenly distributed air gap
- Low core losses at high frequency
- Nearly no magnetic leakage flux
- High DC Bias characteristics



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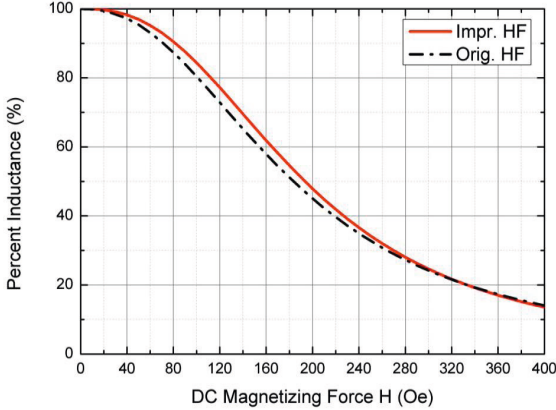
Property Map of Materials



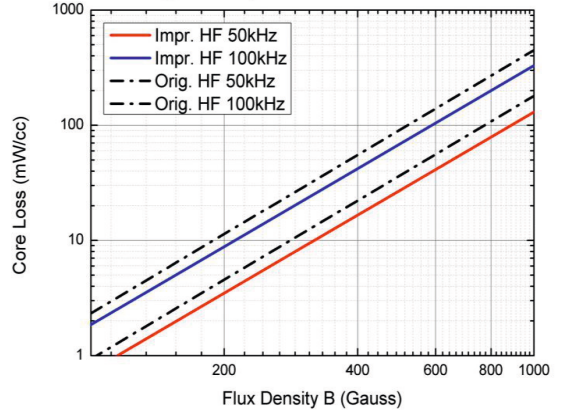
Materials	Part Number identification	Composition	Available Perm. (μ)	Max. Bs(kG)	Curie Temp. [°C]	DC Bias		Core Loss[mW/cm ³] @50kHz, 1000Gauss	
						26μ @ 200 Oe	60μ @ 100 Oe	26μ	60μ
High Flux	CH270060G	Fe-Ni	26-160	15	500	82%	82%	230	180
High Flux Titanium	CH270060GT	Fe-Ni	60	15	500	—	85%	—	130
Mega Flux	CK270060G	Fe-Si	19-90	17	700	82%	76%	661	590
Mega Flux Titanium	CK270060GT	Fe-Si	60	17	700	—	80%	—	500
MPP	CM270060G	Fe-Ni-Mo	26-200	10	450	60%	55%	170	170
KH	KH270060G	Fe-Ni-Si	26-90	16	600	85%	83%	469	350
HS	HS270060G	Fe-Ni-Si-Al	60-90	13	500	—	72%	—	150
HP	HP270060G	Fe-Si-Al	19-60	8.5	500	75%	56%	136	90
Fine Flux	CF270060G	Fe-Si-Al	26-60	12	500	74%	65%	273	190
KS	KS270060G	Fe-Si-Al	26-60	14	500	71%	63%	565	420
Sendust	CS270060G	Fe-Si-Al	26-125	10	500	50%	48%	230	230

Property of Titanium Line (GT) High Flux 60 μ & Mega Flux 60 μ

High Flux 60 μ DCB Characteristics

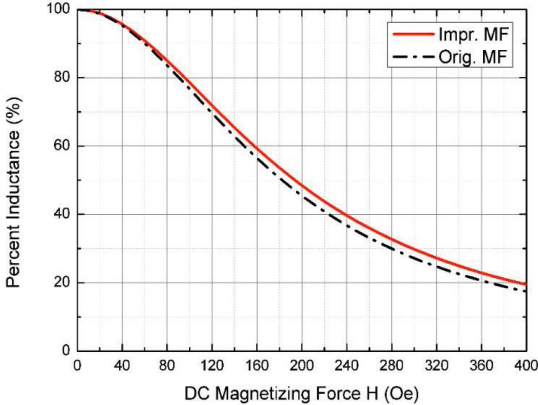


High Flux 60 μ Core Loss Characteristics

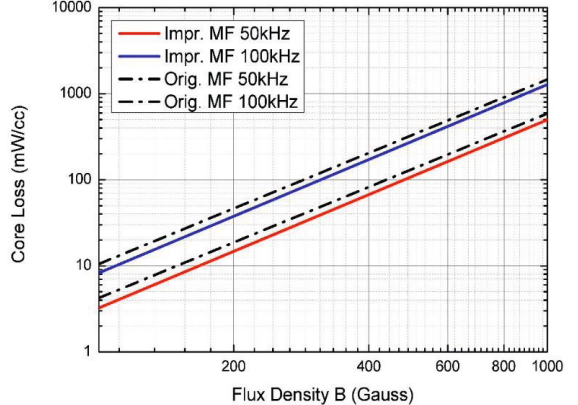


Material	DC-Bias (%)			Coreloss (mW/cm ³)		
	@50 Oe	@100 Oe	@200 Oe	@50 kHz, 500 G	@50 kHz, 1000 G	@100 kHz, 1000G
High Flux GT	97%	85%	48%	27.4	130	330

Mega Flux 60 μ DCB Characteristics



Mega Flux 60 μ Core Loss Characteristics

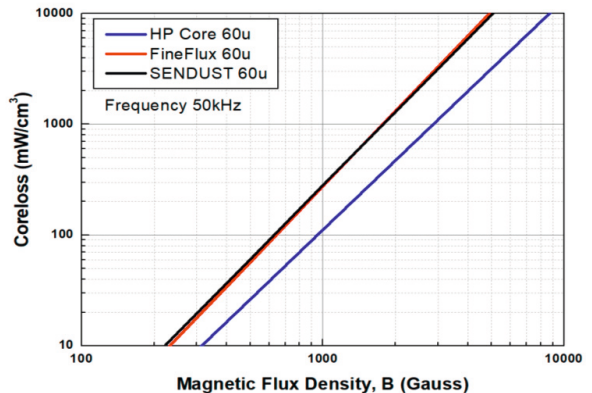
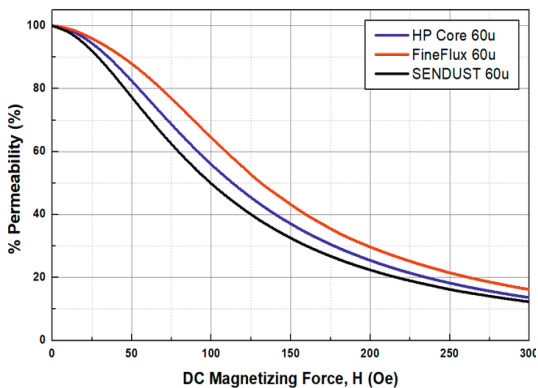
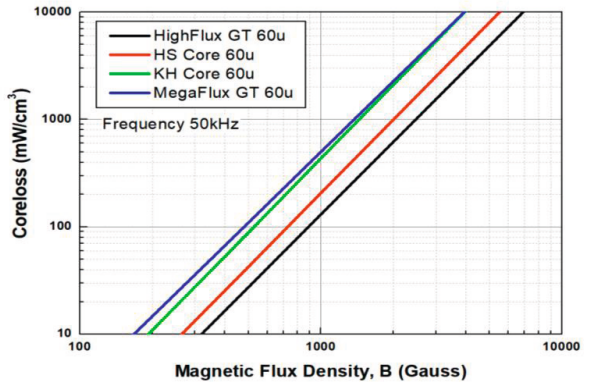
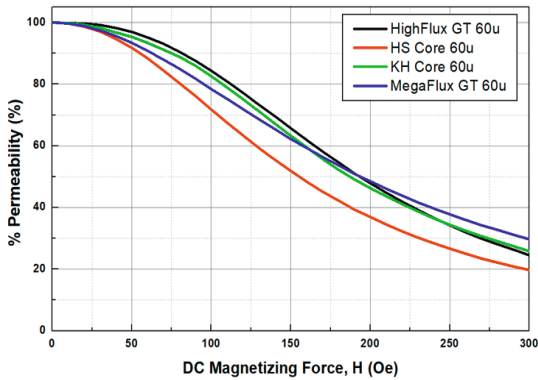


Material	DC-Bias (%)			Coreloss (mW/cm ³)		
	@50 Oe	@100 Oe	@200 Oe	@50 kHz, 500 G	@50 kHz, 1000 G	@100 kHz, 1000G
Mega Flux GT	93%	80%	48%	109.5	500	1280

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❖ 60μ comparison data

Materials	DCB (%)			Core Loss (mW/cm ³)	
	50 Oe	100 Oe	200 Oe	50kHz, 1000G	100kHz, 500G
HF GT	97	85	48	130	70
HF	95	82	45	180	90
HS	91	72	37	150	80
KH	95	83	46	350	180
MF GT	93	80	48	500	280
MF	93	76	49	590	330
Fine Flux	88	65	30	190	100
HP	82	56	25	90	60
SD	77	48	22	230	120



Available Permeability of Toroidal Cores

Materials	Line	Available Size	Available Permeability											
			019μ	026u	040u	060u	075u	090u	125μ	147μ	160μ	173μ	200μ	
MPP	G	096-572												
		596~1625												
HighFlux	G	All												
	GT													
MegaFlux	G	All												
	GT													
HS	G	096-888												
		1013-1016												
KH	G	096-888												
		1013-1016												
FineFlux	G	096-888												
		1013-1016												
HP	G	096-1625												
SENDUST	G	All												
KS	G	All												

Size	Before Finish Dimensions			After Finish Dimensions			Path length (cm)	Cross Section Area (cm²)	AL value (nH/n²)										
	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX			019μ	026u	040u	060u	075u	090u	125μ	147μ	160μ	173μ	200μ
096	9.65	4.78	3.18	10.29	4.27	3.81	2.18	0.075		11	17	25	31	38	52	61	67	72	83
097	9.65	4.78	3.96	10.29	4.27	4.57	2.18	0.095		14	21	32	40	48	67	78	85	92	107
102	10.16	5.08	3.96	10.8	4.57	4.57	2.38	0.100		14	21	32	40	48	67	78	85	92	107
112	11.18	6.35	3.96	11.9	5.89	4.72	2.69	0.091		11	17	26	33	39	54	64	69	75	87
127	12.7	7.62	4.75	13.46	6.99	5.51	3.12	0.114		12	18	27	34	41	56	66	72	78	90
147	14.70	8.90	5.60	15.50	8.20	6.40	3.63	0.154		14	21	32	40	48	67	78	85	92	107
166	16.51	10.16	6.35	17.40	9.53	7.11	4.11	0.192		15	23	35	44	53	73	86	93	101	117
172	17.27	9.65	6.35	18.03	9.02	7.11	4.14	0.232		19	29	43	54	65	90	105	115	124	143
203	20.32	12.70	6.35	21.10	12.07	7.11	5.09	0.226		14	21	32	40	48	67	78	85	92	107
229	22.86	13.97	7.62	23.62	13.39	8.38	5.67	0.331		19	29	43	54	65	90	105	115	124	143
234	23.57	14.40	8.89	24.30	13.77	9.70	5.88	0.388		22	34	51	64	77	106	125	136	147	170
252	25.20	14.60	10.00	26.00	13.90	10.80	6.10	0.504	20	27	42	62	78	93	130	153	166	180	208
270	26.92	14.73	11.18	27.70	14.10	11.99	6.35	0.654	24	33	50	75	94	113	156	184	200	216	250
300	30.00	17.40	10.90	30.80	16.70	11.80	7.27	0.652	21	29	45	68	85	101	141	166	180	195	225
330	33.02	19.94	10.67	33.83	19.30	11.61	8.15	0.672	19	26	41	61	76	92	127	149	163	176	203
343	34.29	23.37	8.89	35.20	22.60	9.83	8.95	0.454	12	16	25	38	48	57	79	93	101	110	127
358	35.81	22.35	10.46	36.70	21.50	11.28	8.98	0.678	18	24	37	56	70	84	117	137	149	161	187
378	37.80	23.20	12.50	38.70	22.30	13.40	9.40	0.867	22	30	46	70	87	104	145	170	186	201	232
400	39.88	24.13	14.48	40.70	23.30	15.37	9.84	1.072	26	35	54	81	101	122	169	198	216		
434	43.40	26.40	16.20	44.30	25.50	17.10	10.74	1.308	29	40	61	92	115	138	191	225	245		
467	46.74	24.13	18.03	47.60	23.30	18.92	10.74	1.990	43	59	90	135	169	203	281	331	360		
468	46.74	28.70	15.24	47.60	27.90	16.13	11.63	1.340	27	37	57	86	108	129	179	211	229		
488	48.80	27.90	15.80	49.70	27.00	16.70	11.74	1.569	32	44	67	101	126	151	210	247	269		
508	50.80	31.75	13.46	51.70	30.90	14.35	12.73	1.250	23	32	49	73	91	110	152	179	195		
540	54.00	29.00	14.40	54.90	28.10	15.30	12.63	1.710	32	44	68	102	128	153	213	250	272		
571	57.15	26.39	15.24	58.00	25.60	16.10	12.50	2.290	44	60	92	138	173	207	288	338	368		
572	57.15	35.56	13.97	58.00	34.70	14.86	14.30	1.444	24	33	50	75	94	113	156	184	200		
596	59.60	34.00	19.50	60.60	33.00	20.50	14.33	2.371	40	54	83	125	156	187	260				
610	62.00	32.60	25.00	63.10	31.37	26.27	14.37	3.675	61	83	128	192	240	288	400				
640	64.00	40.00	21.00	65.10	39.00	22.10	16.04	2.394	36	49	75	113	141	169	234				
680	68.00	36.00	20.00	69.10	35.00	21.10	15.81	3.008	45	62	96	143	179	215	299				
740	74.10	45.30	35.00	75.20	44.07	36.27	18.39	4.788	65	89	137	206	258	309	429				
777	77.80	49.23	12.70	78.90	48.00	13.97	20.00	1.770	22	29	45	68	85	102	142				
778	77.80	49.23	15.90	78.90	48.00	17.02	20.00	2.270	27	37	57	85	106	128	177				
888	88.90	66.00	15.90	90.00	64.74	17.20	24.01	1.830	18	25	38	57	71	86	119				
1013	101.6	57.2	13.6	103.1	55.7	14.9	24.27	2.972	29	40	61	92			192				
1016	101.6	57.2	16.5	103.1	55.7	17.8	24.27	3.522	35	49	75	112			228				
1027	101.6	57.2	27.2	103.1	55.7	28.5	24.27	5.944	58	80	123	184			384				
1033	101.6	57.2	33.0	103.1	55.7	34.3	24.27	7.044	71	97	149	224			456				
1320	132.5	78.6	20.3	134.2	77.0	21.7	32.42	5.347	39	54	83	124			259				
1325	132.5	78.6	25.4	134.2	77.0	26.8	32.42	6.710	49	68	104	156			325				
1333	132.5	78.6	33.0	134.2	77.0	34.4	32.42	8.717	64	88	135	202			422				
1340	132.5	78.6	40.6	134.2	77.0	42.0	32.42	10.694	79	107	165	248			518				
1625	165.0	88.9	25.4	167.2	86.9	27.3	38.65	9.460	58	80	123	184			384				

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❖ Available Height for Toroidal Core

- Up to 1.5 times of standard height
- Less than 30mm

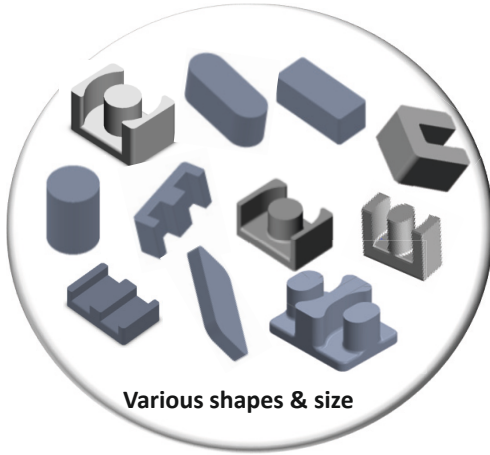
Max HT P/N	Normal HT (mm)	Before Finish Dimensions			After Finish Dimensions			Path length (cm)	Cross Section Area (mm ²)	A Lvalue(nH/n ²)	
		OD(mm) MAX	ID(mm) MIN	HT(mm) MAX	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX			060u	125u
166G12.7	6.35	16.51	10.16	12.7	17.4	9.53	13.46	4.11	0.384	70	144
172G12.7	6.35	17.27	9.65	12.7	18.03	9.02	13.46	4.14	0.464	86	178
203G12.7	6.35	20.32	12.7	12.7	21.1	12.07	13.46	5.09	0.452	64	136
229G15.2	7.62	22.86	13.97	15.2	23.62	13.39	15.96	5.67	0.662	86	180
234G14	8.89	23.57	14.4	14	24.3	13.77	15	5.88	0.611	80	165
270G18	11.18	26.92	14.73	18	27.7	14.1	19	6.35	1.053	120	252
330G18	10.67	33.02	19.94	18	33.83	19.3	19	8.15	1.133	103	214
343G14	8.89	34.29	23.37	14	35.2	22.6	15	8.95	0.715	60	124
358G16.5	10.46	35.81	22.35	16.5	36.7	21.5	17.3	8.98	1.069	88	184
400G20	14.48	39.88	24.13	20	40.7	23.3	20.89	9.84	1.481	112	232
467G25	18.03	46.74	24.13	25	47.6	23.3	25.89	10.74	2.759	187	389
468G25	15.24	46.74	28.7	25	47.6	27.9	25.89	11.63	2.198	141	292
508G21	13.46	50.8	31.75	21	51.7	30.9	21.89	12.73	1.95	114	237
571G24	15.24	57.15	26.39	24	58	25.6	24.86	12.5	3.61	217	452
572G24	13.97	57.15	35.56	24	58	34.7	24.89	14.3	2.48	128	268
777G25.4	12.70	77.8	49.23	25.4	78.9	48	26.67	20	3.54	136	284

❖ Available Height of Special Shape Core

- Please note that the new mold will be required if the bottom thickness changes.

Shape	EQ		ER		EE		EER		Block		U		Ellipse		Cylinder	
Size	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)	Min (mm)	Max (mm)
	2014	5032	1911	4628	1908	8038	2057	4917	5020	8020	3536	7965	5035	8035	20	80
Normal Height	8.1±0.2	25.0±0.4	6.0±0.2	19.4±0.4	4.8±0.2	19.8±0.4	7.5±0.2	17.2±0.5	15±0.2	25±0.2	20.0±0.5	35.0±0.5	13.5±0.2	18.5±0.2	20.0±0.2	30.0±0.5
Max Height	10.1±0.2	25.0±0.4	8.0±0.2	21.5±0.4	4.8±0.2	19.8±0.4	11.0±0.2	24.7±0.5	25±0.2	25±0.2	25.0±0.5	35.0±0.5	18.5±0.2	25.0±0.2	22.0±0.2	35.0±0.4

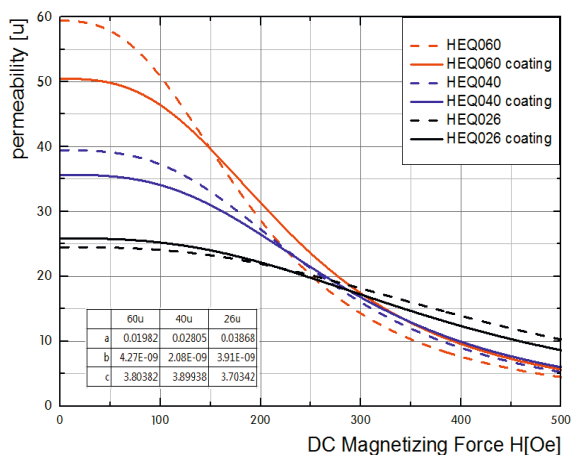
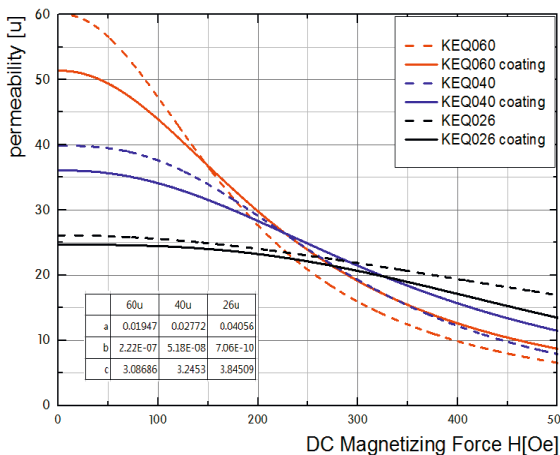
Type of Special shape cores



- ❖ Small volume with high DC Bias
- ❖ Automatic winding – High productivity
- ❖ Low wire usage
- ❖ Customized distinctive design

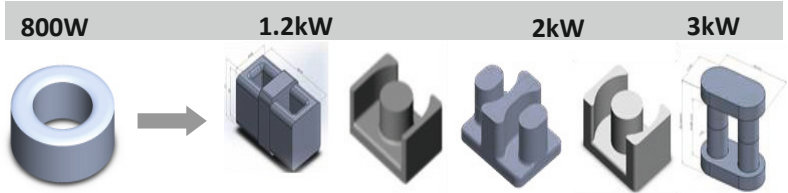


- Uncoated and AQ cores show same DC Bias performance
- Coated cores have anti-rust function



Better Efficiency Better Solutions to you

Telecom/Server Power



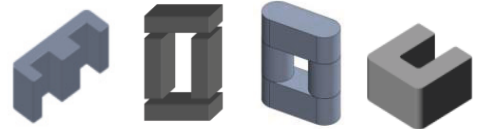
- High Efficiency
- PFC / Output Choke
- 600W~3kW

Suitable for Lower Rack(1U)
High Density & Lower Heating

Solar



- High Power Density
- Long Warranty
- 3~50kW
- 100kW~1MW
- ESS* Inverter



Flexible Capacity with easy assembly

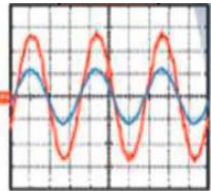
*ESS : Energy storage system

UPS/Modular UPS

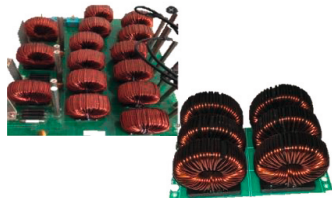


- High Efficiency and high Power Density
- Container type (~500 kVA)
- Modular type (~125 kVA)

APF (Active Power Filter)

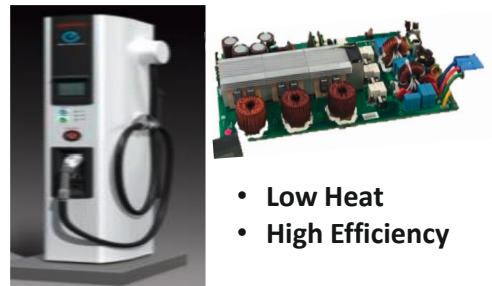


PF + Harmonic Correction
THDi = 3.9% PF = 1.00



• Power Quality Improvement

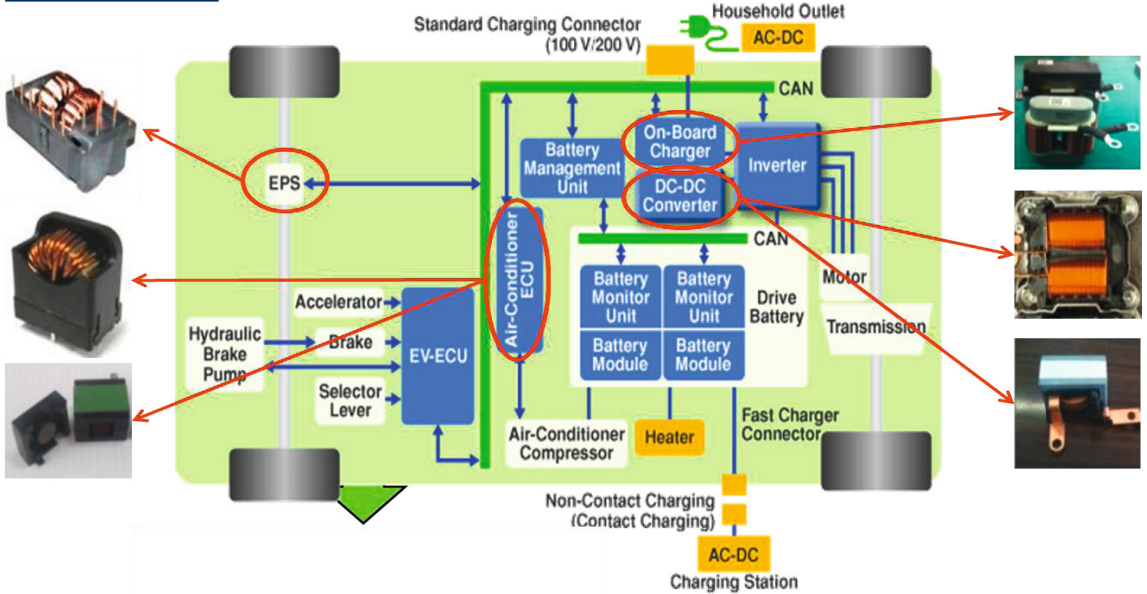
Industrial



- Low Heat
- High Efficiency

Better Efficiency Better Solutions to you

Automotive



Application	Power	Material
OBC	3.3kW ~ 11kW	High Power Density with small size Temperature Stability High Reliability
LDC	1.7kW ~ 2kW	
HDC	20kW ~ 70kW	
EM Filter	1.7kW ~ 10kW	

※ Example

OBC

PFC Choke: RBK54xxA-060

Noise Filter: RK40xxB-060

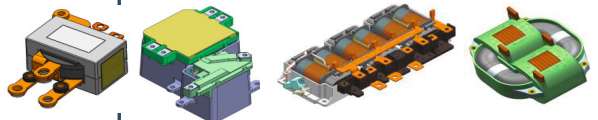
LDC

Smoothing Choke: RK12xx60NH

Smoothing Choke: KEQ4128N-060A

Electric A/C Compressor

Noise Filter: RH1911A-060



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C O M P O N E N T S

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