

Changsung Corp.

KS Series

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-CSC-

1. General Information

(1) General Information

KS Series

Permeability(μ)	26, 40, 60
Coating Color	Dark blue
Bmax(G)	14,000
Curie Temp[$^{\circ}$ C]	500
Operating temp[$^{\circ}$ C]	-40 to 150
OD BF [mm]	9.6~165



(2) Identification

KS270060

Permeability : 26 μ , 40 μ , 60 μ

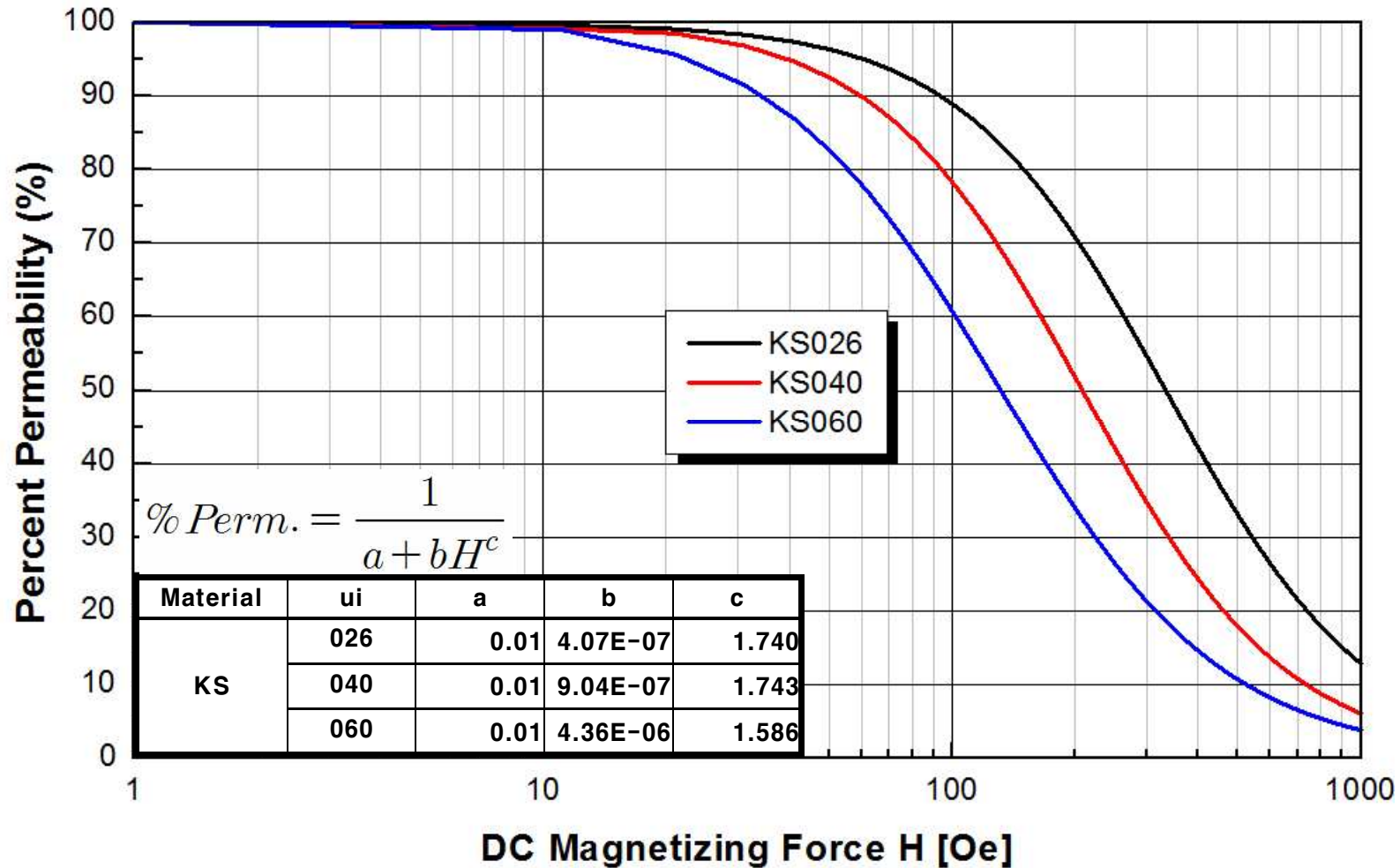
OD Size : 27.0mm Available Size : 9.6 ~ 165mm

KS Core

2. Material Comparison in CSC products

Materials	Coating Color	Perm. (μ_1)	Bs (kG)	Core Loss	DC Bias	Relative Cost	Temp. Stability	Curie Temp [°C]
KS Core	Dark Blue	26-60	14	medium	Better	low	good	500
MPP	Gray	14-200	7	lowest	medium	highest	Best	450
High Flux	Khaki	26-160	15	lowest	Best	high	Best	500
Sendust	Black	26-125	10	low	good	lowest	good	500
Mega Flux	Dark Brown	26-90	16	medium	Best	low	good	700

3. DCB – Various Permeability

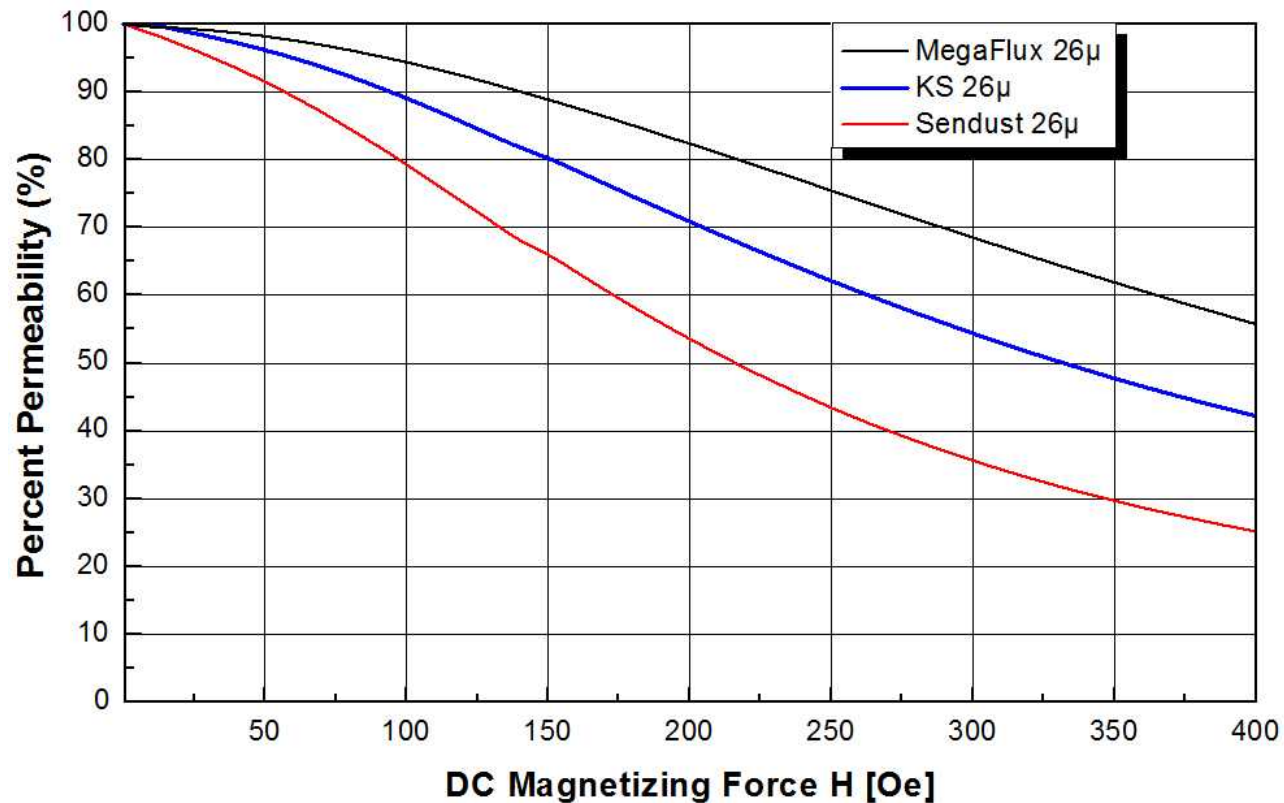


3. DCB – 26 μ

(1) Material Comparison

Material	26 μ DCB%		
	@200 Oe	@300 Oe	@400 Oe
Mega Flux	82%	68%	56%
KS Core	70%	54%	42%
SENDUST	53%	35%	25%

(2) DCB Graph

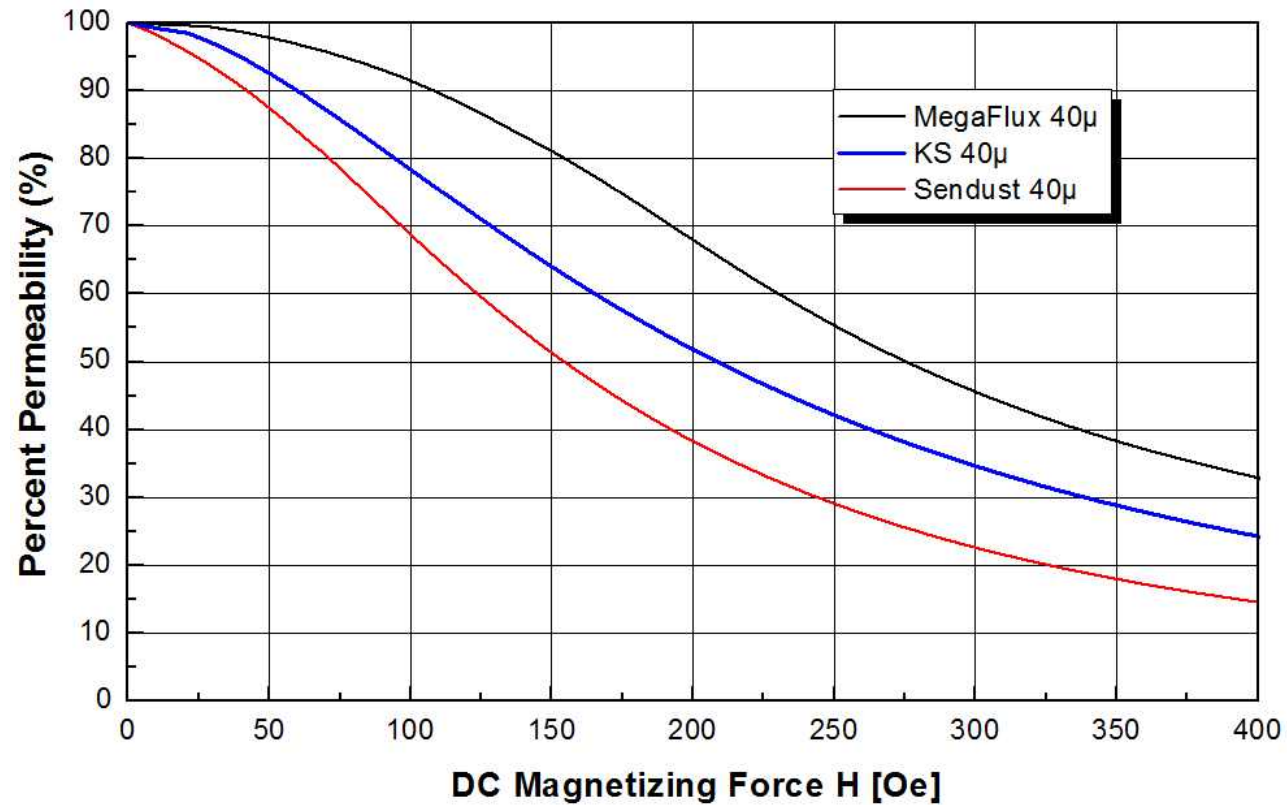


3. DCB – 40 μ

(1) Material Comparison

Material	40 μ DCB%		
	@150 Oe	@250 Oe	@350 Oe
Mega Flux	81%	55%	38%
KS Core	64%	42%	28%
SENDUST	51%	29%	17%

(2) DCB Graph

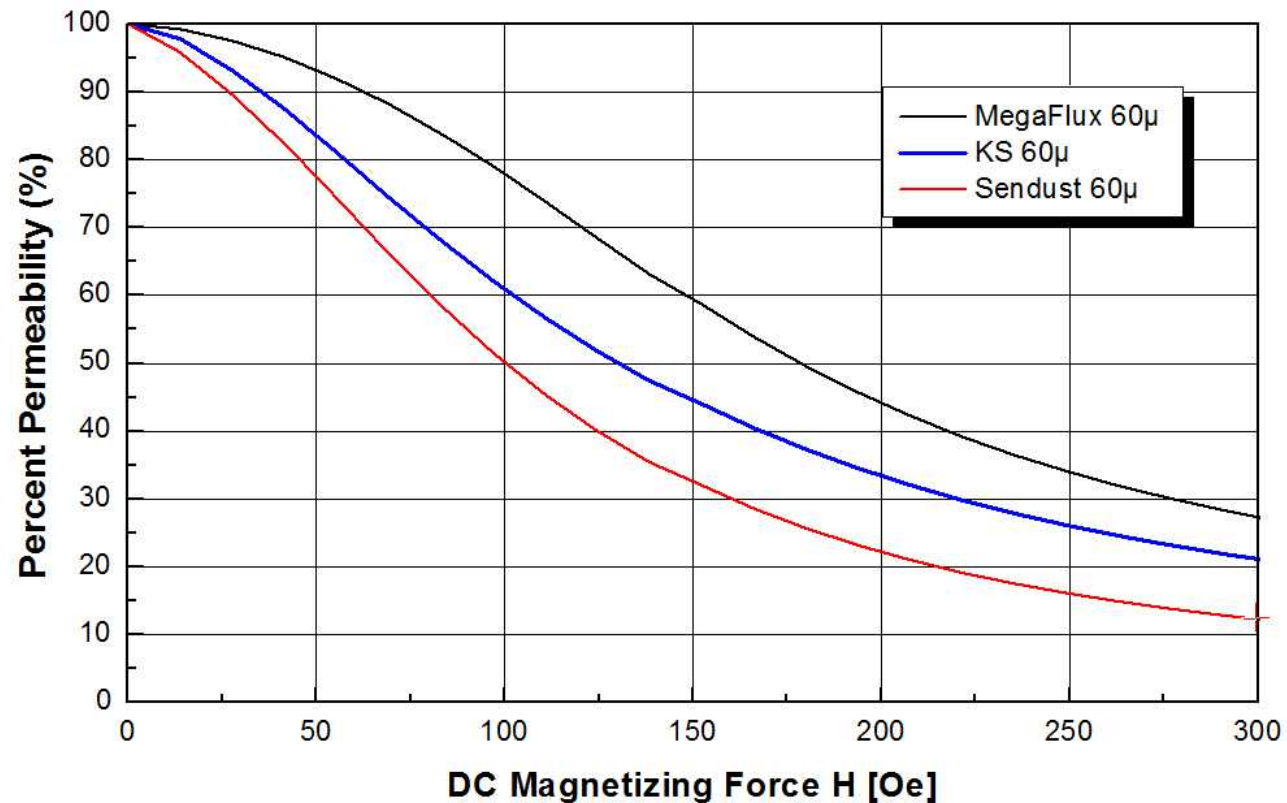


3. DCB – 60 μ

(1) Material Comparison

Material	60 μ DCB%		
	@100 Oe	@150 Oe	@200 Oe
Mega Flux	78%	59%	44%
KS Core	61%	44%	33%
SENDUST	50%	32%	22%

(2) DCB Graph



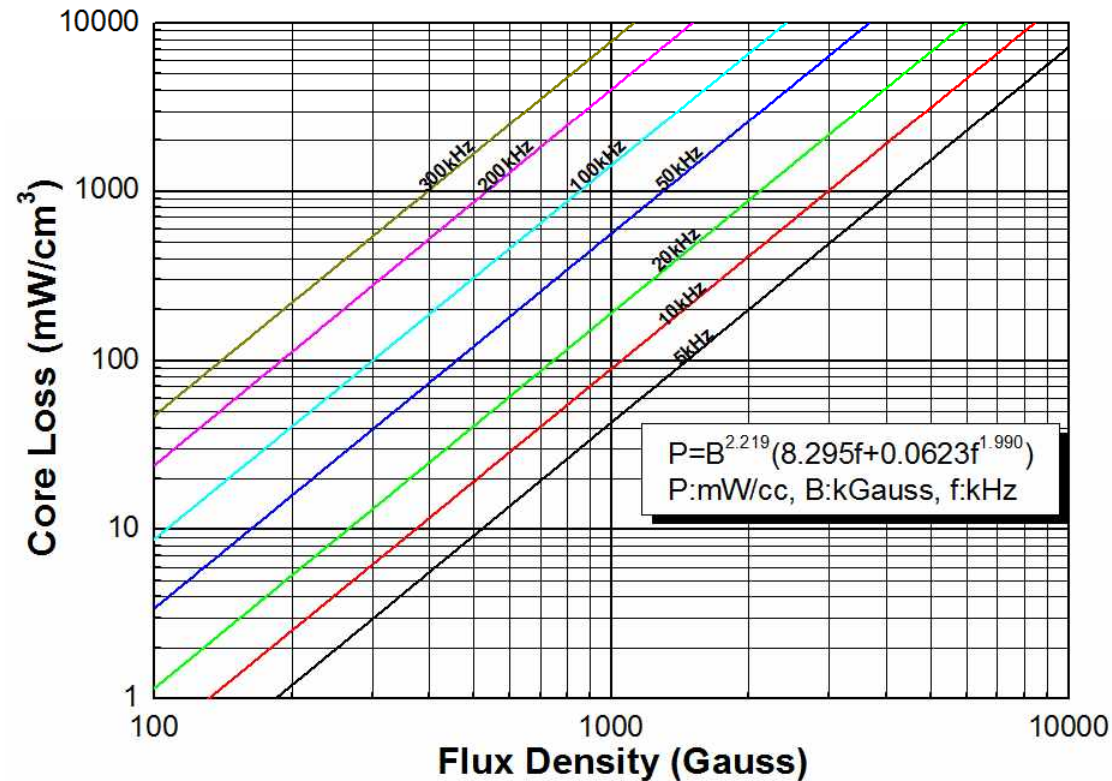
4. Core loss -26 μ

(1) Material Comparison

Unit : [mW/cc]

Material	26 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@20kHz, 1000G	@50kHz, 500G
MegaFlux	$P=B^{2.166}(9.918f+0.0519f^{2.061})$	223	147
KS Core	$P=B^{2.219}(8.295f+0.0623f^{1.990})$	190	121
SENDUST	$P=B^{2.048}(4.245f+0.0215f^{1.990})$	93	64

(2) Core Loss Graph



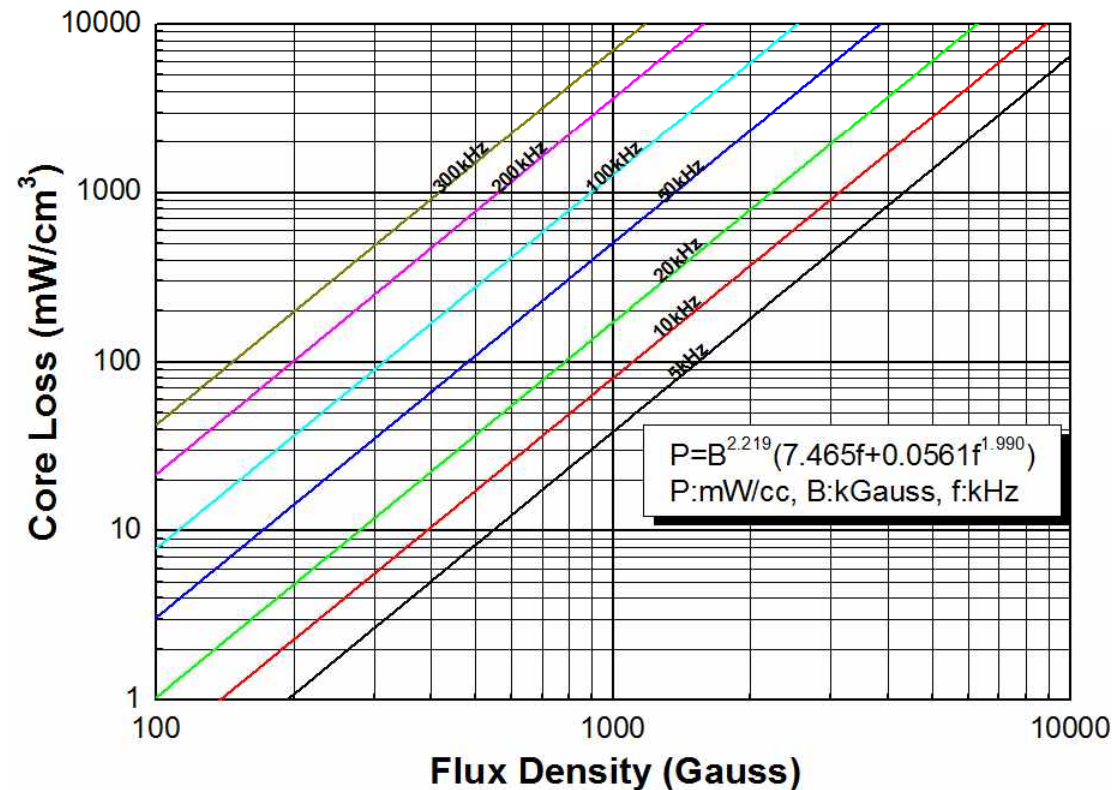
4. Core loss -40 μ

(1) Material Comparison

Unit : [mW/cc]

Material	40 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@20kHz, 1000G	@50kHz, 500G
MegaFlux	$P=B^{2.145}(9.667f+0.0689f^{1.980})$	219	145
KS Core	$P=B^{2.219}(7.465f+0.0561f^{1.990})$	171	109
SENDUST	$P=B^{2.207}(4.518f+0.0244f^{1.967})$	99	60

(2) Core Loss Graph



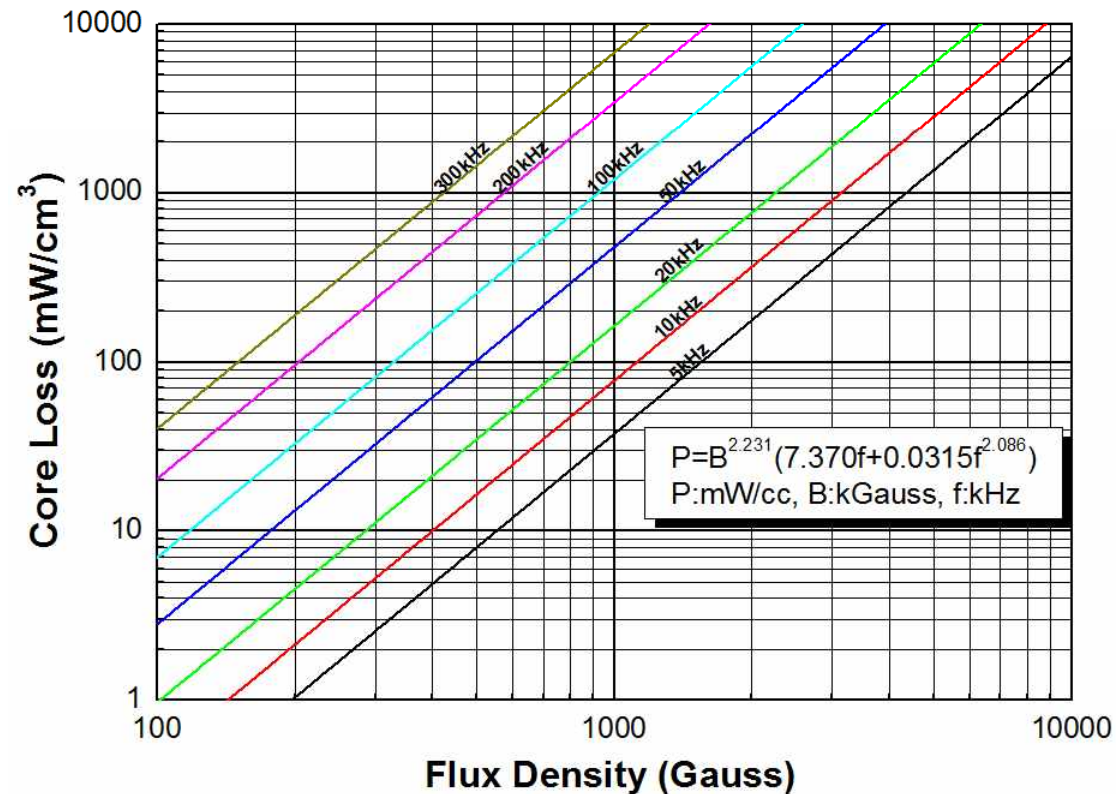
4. Core loss -60 μ

(1) Material Comparison

Unit : [mW/cc]

Material	60 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@20kHz, 1000G	@50kHz, 500G
MegaFlux	$P=B^{2.145}(8.874f+0.0632f^{1.980})$	201	132
KS Core	$P=B^{2.231}(7.370f+0.0315f^{2.086})$	163	102
SENDUST	$P=B^{2.207}(4.518f+0.0244f^{1.967})$	99	60

(2) Core Loss Graph



5. Design Example – Solar Inverter

(1) Information

- Application : 9kW Solar Inverter AC Filter Inductor
- Switching Frequency : 17kHz
- I rms : 13A
- I peak : 21A
- ΔI : 6.3A
- Inductance : 700 μ H @21A

5. Design Example – Solar Inverter

(1) Core Selection – Same Core Size for $L(21A)=700 \mu H$

- MegaFlux : CK610060
- KS : KS610040
- Sendust : CS610026

(2) Wire & Winding (Same Core Size, Same Winding Factor)

Material	Core P/N	Current Density	Wire Size	Wire Eff. Area	Turns	Wire Weight	Winding Factor
MegaFlux	CK610060	3.42 A/mm ²	ϕ 2.2 mm	3.80 mm ²	77	245g	38%
KS	KS610040	4.36 A/mm ²	ϕ 1.95 mm	2.98 mm ²	99	245g	38%
Sendust	CS610026	6.50 A/mm ²	ϕ 1.6 mm	2.01 mm ²	146	245g	38%

5. Design Example – Solar Inverter

(3) Inductance

Material	Core P/N	Wire Size	Turns	L(0A)	L(13A)	L(21A) Spec=700 μ H min
MegaFlux	CK610060	ϕ 2.2 mm	77	1,138 μ H	927 μ H	711 μ H
KS	KS610040	ϕ 1.95 mm	99	1,254 μ H	940 μ H	705 μ H
Sendust	CS610026	ϕ 1.6 mm	146	1,769 μ H	1,060 μ H	703 μ H

(4) ΔT & Loss

Material	Core P/N	Wire Size	Turns	ΔT	DCR@20 $^{\circ}$ C	Core Loss	Copper Loss	Total Loss
MegaFlux	CK610060	ϕ 2.2 mm	77	96 $^{\circ}$ C	31.9m Ω	23.0W	7.0W	30.0W
KS	KS610040	ϕ 1.95 mm	99	75 $^{\circ}$ C	52.3m Ω	11.5W	10.8W	22.3W
Sendust	CS610026	ϕ 1.6 mm	146	89 $^{\circ}$ C	114.7m Ω	2.80W	24.6W	27.5W

6. Design Example – UPS

(1) Information

- Application : 20KVA UPS Inductor
- Switching Frequency : 20kHz
- I rms : 24A
- I peak : 34A
- ΔI : 8.0A
- Inductance : 260 μ H @34A

6. Design Example – UPS

(1) Core Selection – Same Core Size for $L(34A)=260 \mu H$

- MegaFlux : CK571060 x 2pcs
- KS : KS571040 x 2pcs
- Sendust : CS571026 x 2pcs

(2) Wire & Winding (Same Core Size, Same Winding Factor)

Material	Core P/N Stacking	Current Density	Wire Size	Wire Eff. Area	Turns	Wire Weight	Winding Factor
MegaFlux	CK571060 2pcs	3.90 A/mm ²	ϕ 2.80 mm	6.15 mm ²	38	223g	45%
KS	KS571040 2pcs	5.10 A/mm ²	ϕ 2.45 mm	4.71 mm ²	49	220g	45%
Sendust	CS571026 2pcs	7.40 A/mm ²	ϕ 2.03 mm	3.24 mm ²	71	220g	45%

6. Design Example – UPS

(3) Inductance

Material	Core P/N Stacking	Wire Size	Turns	L(0A)	L(24A)	L(34A) Spec=260 μ H min
MegaFlux	CK571060 2pcs	ϕ 2.80 mm	38	398 μ H	317 μ H	263 μ H
KS	KS571040 2pcs	ϕ 2.45 mm	49	442 μ H	322 μ H	263 μ H
Sendust	CS571026 2pcs	ϕ 2.03 mm	71	604 μ H	351 μ H	263 μ H

(4) Δ T & Loss

Material	Core P/N Stacking	Wire Size	Turns	Δ T	DCR@20 $^{\circ}$ C	Core Loss	Copper Loss	Total Loss
MegaFlux	CK571060 2pcs	ϕ 2.80 mm	38	81 $^{\circ}$ C	11.2m Ω	16.9W	8.0W	24.9W
KS	KS571040 2pcs	ϕ 2.45 mm	49	71 $^{\circ}$ C	18.8m Ω	8.3W	13.0W	21.3W
Sendust	CS571026 2pcs	ϕ 2.03 mm	71	100 $^{\circ}$ C	39.6m Ω	2.1W	30.0W	32.1W

7. Part List – Toroidal Core

P/N	Before Finish Dimensions			After Finish Dimensions			Path length (cm)	Cross Section Area (cm ²)	AL value (nH/n ²)		
	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX			026u	040μ	060u
KS096	9.65	4.78	3.18	10.29	4.27	3.81	2.18	0.0752	11	17	25
KS097	9.65	4.78	3.96	10.29	4.27	4.57	2.18	0.0945	14	21	32
KS102	10.16	5.08	3.96	10.80	4.57	4.57	2.38	0.1000	14	21	32
KS112	11.18	6.35	3.96	11.90	5.89	4.72	2.69	0.0906	11	17	26
KS127	12.70	7.62	4.75	13.46	6.99	5.51	3.12	0.114	12	18	27
KS166	16.51	10.16	6.35	17.4	9.53	7.11	4.11	0.192	15	23	35
KS172	17.27	9.65	6.35	18.03	9.02	7.11	4.14	0.232	19	29	43
KS203	20.32	12.7	6.35	21.1	12.07	7.11	5.09	0.226	14	21	32
KS229	22.86	13.97	7.62	23.62	13.39	8.38	5.67	0.331	19	29	43
KS234	23.57	14.4	8.89	24.3	13.77	9.7	5.88	0.388	22	34	51
KS270	26.92	14.73	11.18	27.7	14.1	11.99	6.35	0.654	32	50	75
KS330	33.02	19.94	10.67	33.83	19.3	11.61	8.15	0.672	28	41	61
KS343	34.29	23.37	8.89	35.2	22.6	9.83	8.95	0.454	16	25	38
KS358	35.81	22.35	10.46	36.7	21.5	11.28	8.98	0.678	24	37	56
KS400	39.88	24.13	14.48	40.7	23.3	15.37	9.84	1.072	35	54	81
KS467	46.74	24.13	18.03	47.6	23.3	18.92	10.74	1.990	59	90	135
KS468	46.74	28.7	15.24	47.6	27.9	16.13	11.63	1.340	37	57	86
KS508	50.8	31.75	13.46	51.7	30.9	14.35	12.73	1.250	32	49	73
KS571	57.15	26.39	15.24	58	25.6	16.1	12.50	2.290	60	92	138
KS572	57.15	35.56	13.97	58	34.7	14.86	14.30	1.444	33	50	75
KS610	62	32.6	25	63.1	31.37	26.27	14.37	3.675	83	128	192
KS740	74.1	45.3	35	75.2	44.07	36.27	18.38	5.040	89	137	206
KS777	77.8	49.23	12.7	78.9	48	13.97	20.00	1.770	30	45	68
KS778	77.8	49.23	15.9	78.9	48	17.02	20.00	2.270	37	57	85
KS888	88.9	66	15.9	90	64.74	17.2	24.01	1.830	24	38	57

7. Part List – Big Toroidal Core

P/N	Before Finish Dimensions			After Finish Dimensions			Path length (cm)	Cross Section Area (cm ²)	AL value (nH/n ²)		
	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX			026u	040μ	060u
KS1013	101.6	57.2	13.6	103.1	55.7	14.9	24.27	2.972	40	61	92
KS1016	101.6	57.2	16.5	103.1	55.7	17.8	24.27	3.522	48	75	112
KS1027	101.6	57.2	27.2	103.1	55.7	28.5	24.27	5.944	80	123	184
KS1033	101.6	57.2	33.0	103.1	55.7	34.3	24.27	7.044	96	149	224
KS1320	132.5	78.6	20.3	134.2	77.0	21.7	32.42	5.347	54	83	124
KS1325	132.5	78.6	25.4	134.2	77.0	26.8	32.42	6.710	68	104	156
KS1333	132.5	78.6	33.0	134.2	77.0	34.4	32.42	8.717	88	135	202
KS1340	132.5	78.6	40.6	134.2	77.0	42.0	32.42	10.694	108	165	248
KS1625	165.0	88.9	25.4	167.2	86.9	27.3	38.65	9.460	80	123	184



Thank You !