Changsung Corp.

KH Series

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-CSC-

1. General Information

(1) General Information

KH Series	
Permeability(μ)	26, 40, 60, 90
Coating Color	Dark blue
Bmax(G)	15,000
Curie Temp[℃]	600
Operating temp[℃]	-40 to 150
OD BF [mm]	9.6~165

(2) Identification

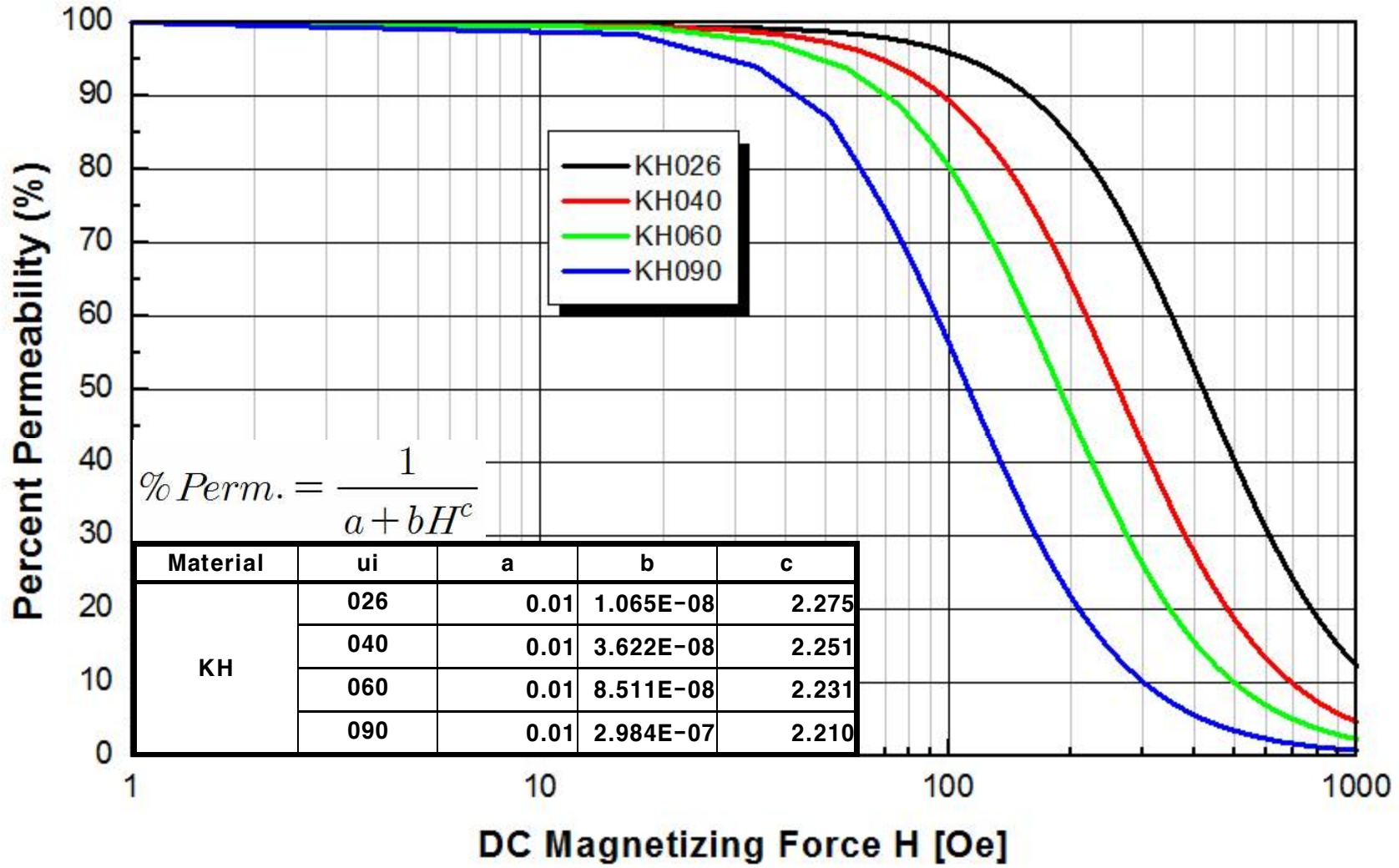
KH270060

- 060 : Permeability : 26μ, 40μ, 60μ, 90μ
- 270 : OD Size : 27.0mm Available Size : 9.6 ~ 165mm
- KH : KH Core

2. Material Comparison in CSC products

Materials	Coating Color	Perm. (μ_i)	Bs (kG)	Core Loss	DC Bias	Relative Cost	Temp. Stability	Curie Temp [℃]
KH Core	Dark Blue	26-90	15	Medium	Best	Medium	Good	600
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	High	Best	Low	Good	700

3. DCB – Various Permeability



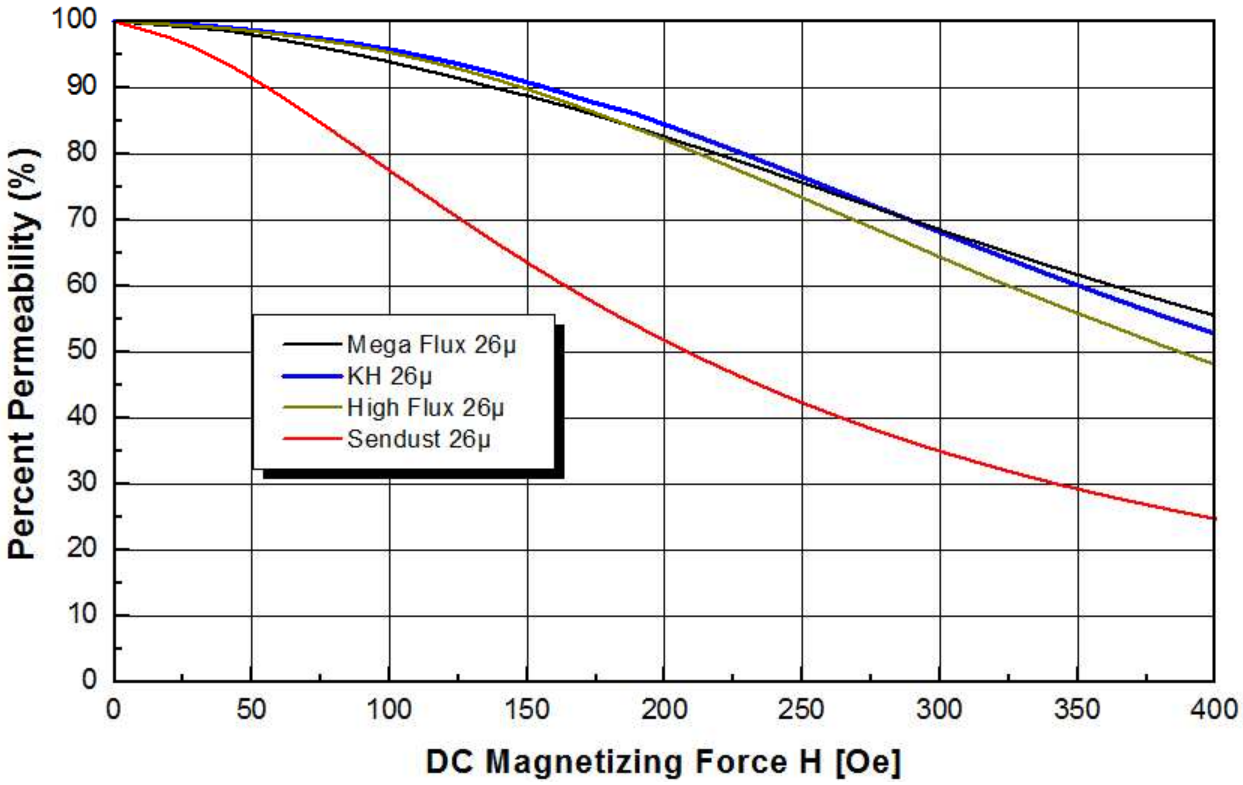
Material	ui	a	b	c
KH	026	0.01	1.065E-08	2.275
	040	0.01	3.622E-08	2.251
	060	0.01	8.511E-08	2.231
	090	0.01	2.984E-07	2.210

3. DCB – 26 μ

(1) Material Comparison

Material	26 μ DCB%		
	@200 Oe	@300 Oe	@400 Oe
KH Core	83%	68%	53%
Mega Flux	82%	68%	56%
High Flux	82%	64%	48%
Sendust	53%	35%	25%

(2) DCB Graph

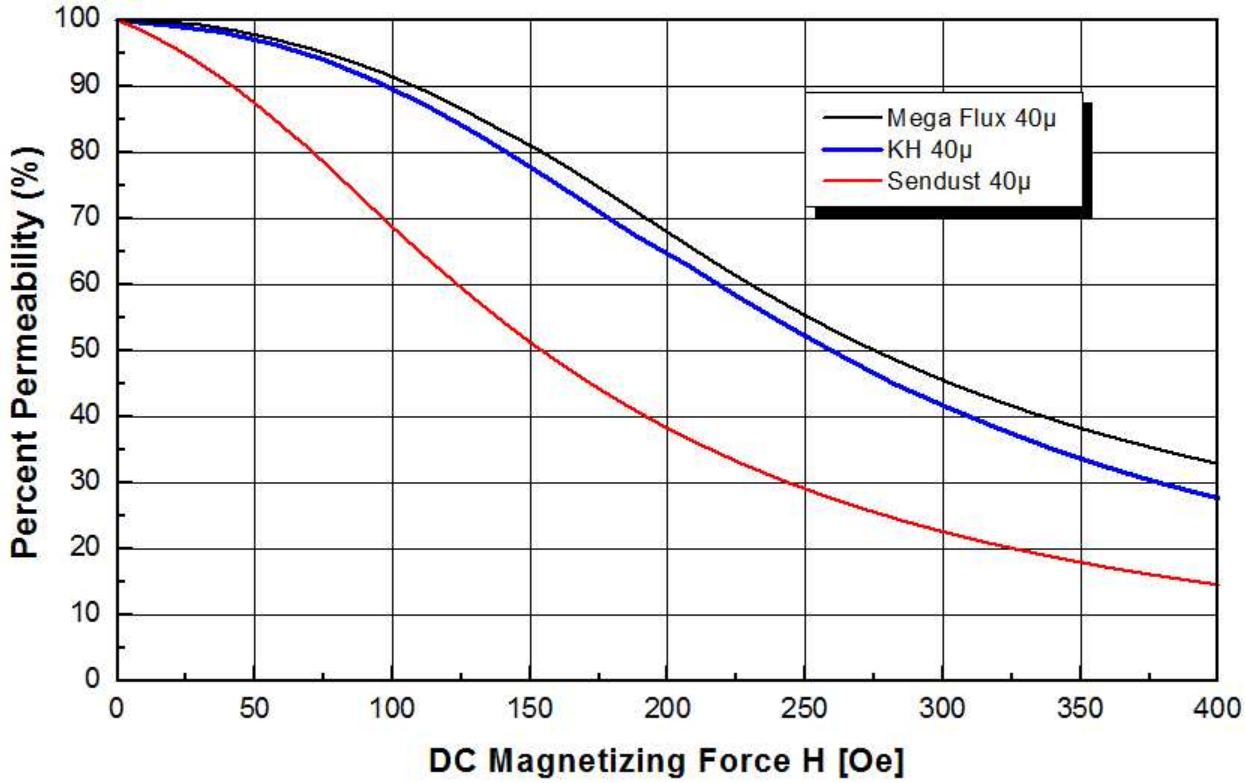


3. DCB – 40 μ

(1) Material Comparison

Material	40 μ DCB%		
	@150 Oe	@250 Oe	@350 Oe
KH Core	78%	52%	33%
Mega Flux	81%	55%	38%
SENDUST	51%	29%	17%

(2) DCB Graph

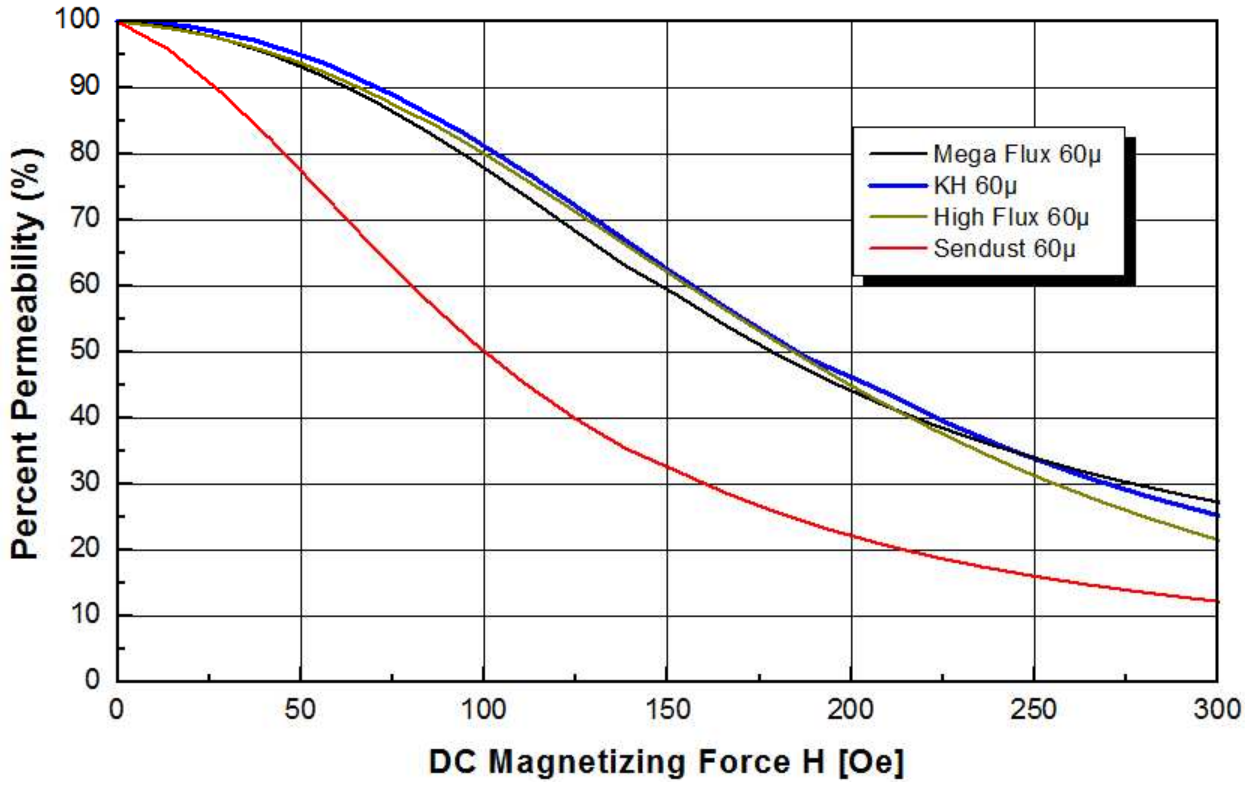


3. DCB – 60 μ

(1) Material Comparison

Material	60 μ DCB%		
	@100 Oe	@150 Oe	@200 Oe
KH Core	81%	62%	46%
Mega Flux	78%	59%	44%
High Flux	80%	62%	45%
SENDUST	50%	32%	22%

(2) DCB Graph

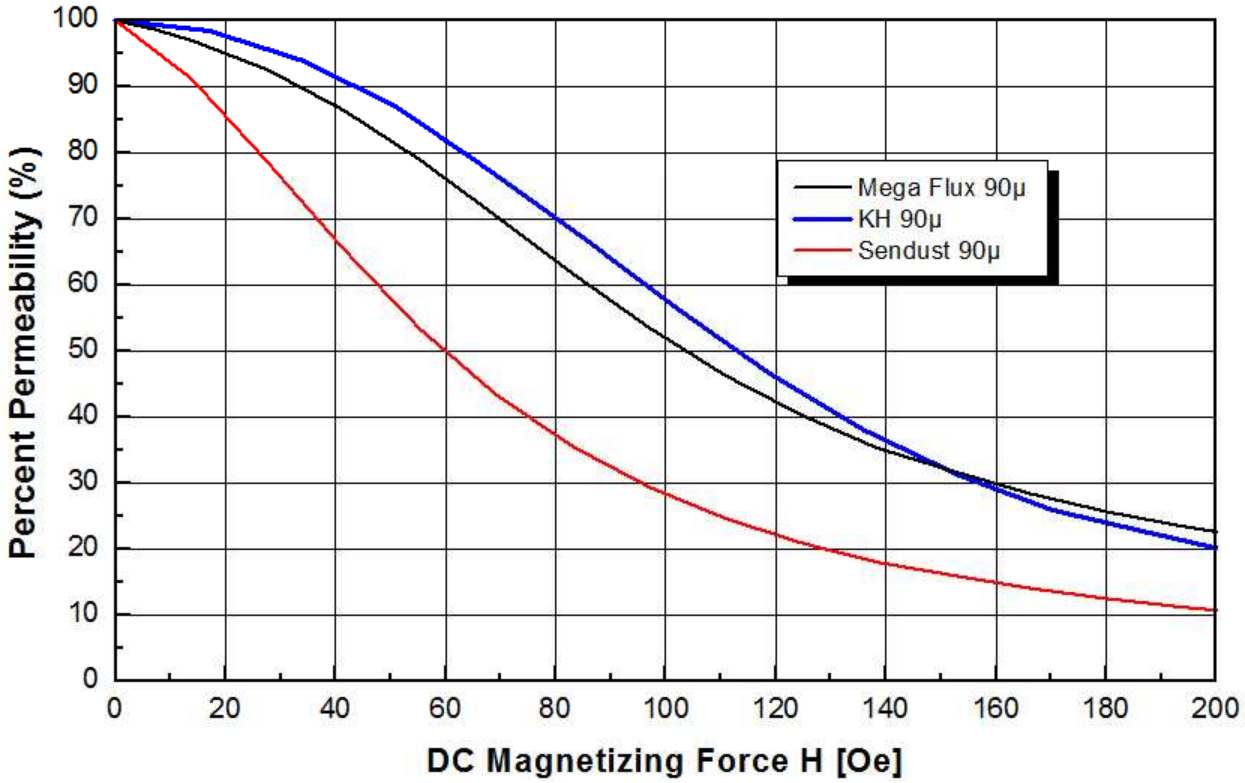


3. DCB – 90 μ

(1) Material Comparison

Material	90 μ DCB%		
	@60 Oe	@120 Oe	@180 Oe
KH Core	82%	46%	24%
Mega Flux	76%	42%	26%
SENDUST	50%	22%	12%

(2) DCB Graph



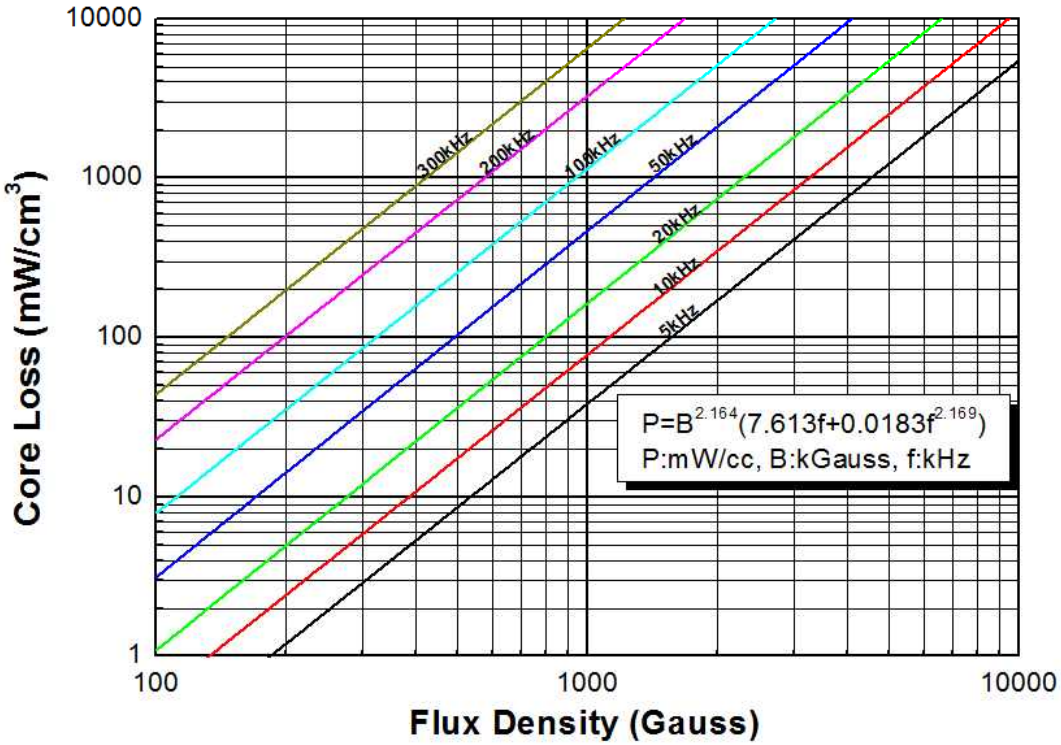
4. Core loss -26 μ

(1) Material Comparison

Unit : [mW/cc]

Material	26 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@20kHz,1000G	@50kHz,1,000G
KH Core	$P=B^{2.164}(7.613f+0.0183f^{2.169})$	164	469
Mega Flux	$P=B^{2.166}(9.918f+0.0519f^{2.061})$	223	661
High Flux	$P=B^{2.252}(4.081f+0.0006f^{2.736})$	84	229
SENDUST	$P=B^{2.048}(4.245f+0.0215f^{1.990})$	93	264

(2) Core Loss Graph



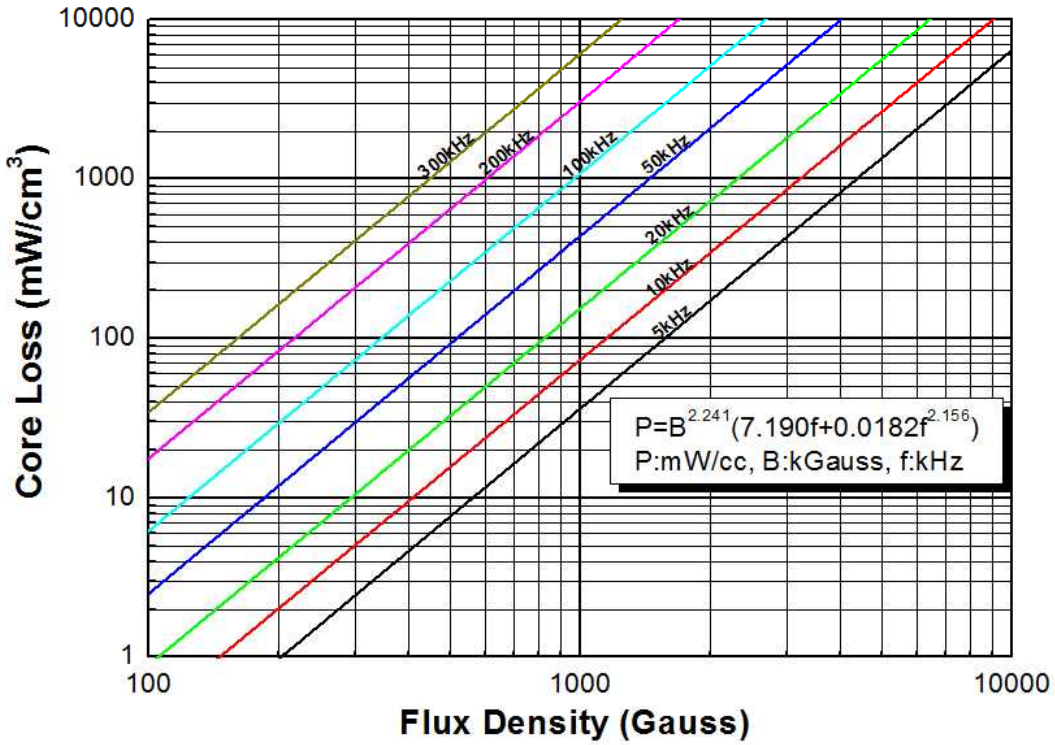
4. Core loss -40 μ

(1) Material Comparison

Unit : [mW/cc]

Material	40 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@20kHz,1000G	@50kHz,1,000G
KH Core	$P=B^{2.241}(7.190f+0.0182f^{2.156})$	155	443
MegaFlux	$P=B^{2.145}(9.667f+0.0689f^{1.980})$	219	590
SENDUST	$P=B^{2.207}(4.518f+0.0244f^{1.967})$	99	279

(2) Core Loss Graph



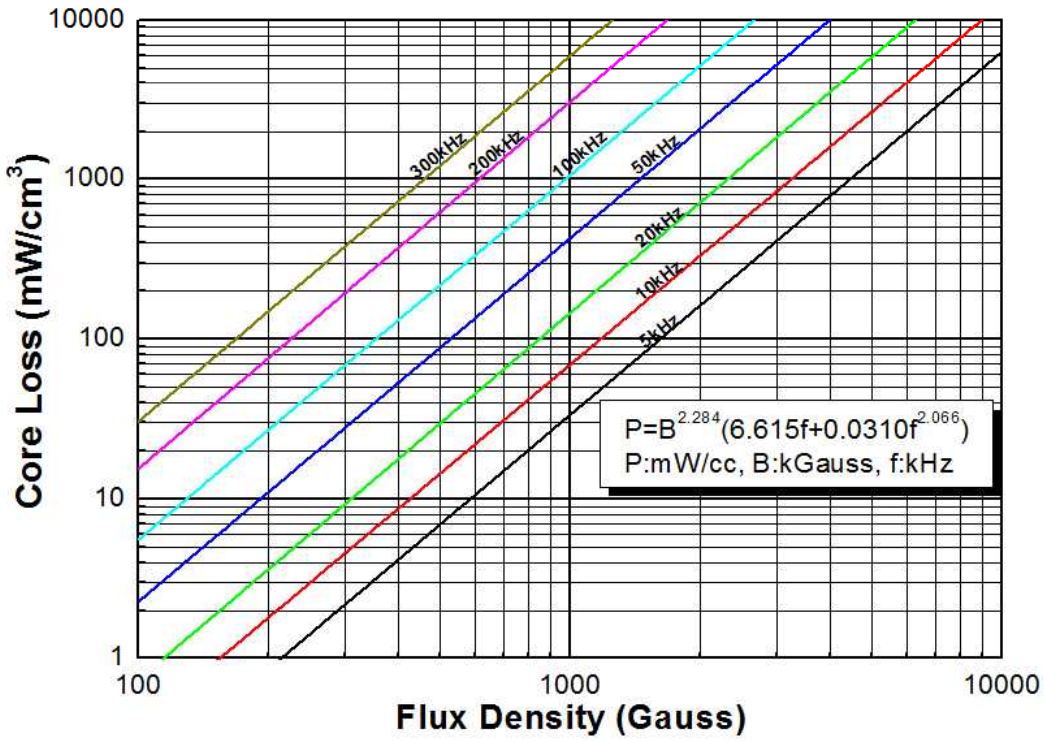
4. Core loss -60 μ

(1) Material Comparison

Unit : [mW/cc]

Material	60 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@20kHz,1000G	@50kHz,1,000G
KH Core	$P=B^{2.284}(6.615f+0.0310f^{2.066})$	147	431
MegaFlux	$P=B^{2.145}(8.874f+0.0632f^{1.980})$	201	590
High Flux	$P=B^{2.284}(3.050f+0.0023f^{2.397})$	84	180
SENDUST	$P=B^{2.207}(4.518f+0.0244f^{1.967})$	99	279

(2) Core Loss Graph



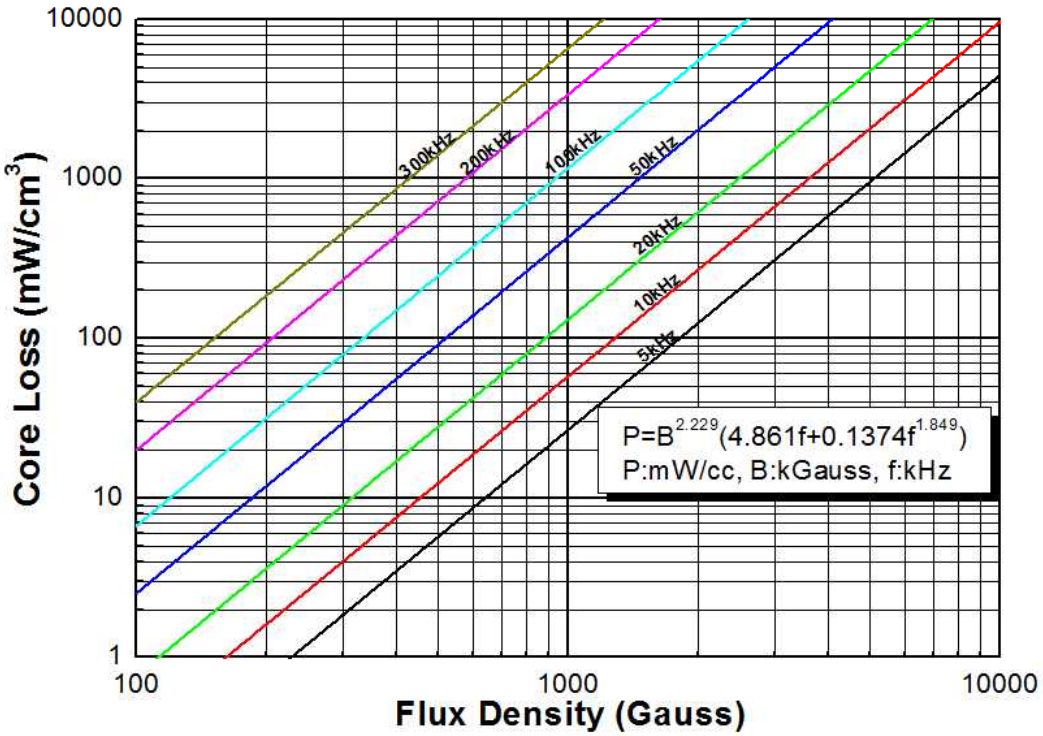
4. Core loss -90 μ

(1) Material Comparison

Unit : [mW/cc]

Material	60 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@20kHz,1000G	@50kHz,1,000G
KH Core	$P=B^{2.229}(4.861f+0.1374f^{1.849})$	132	433
MegaFlux	$P=B^{2.145}(8.874f+0.0632f^{1.980})$	201	590
SENDUST	$P=B^{2.207}(4.518f+0.0244f^{1.967})$	99	279

(2) Core Loss Graph



5. Design Example – UPS

(1) Information

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

5. Design Example – UPS

(1) Core Selection – Same Core Size for L(34A)=260 μH

- KH : KH572060 x 2pcs
- MegaFlux : CK572060 x 2pcs
- High Flux : CH572060 x 2pcs
- Sendust : CS571026 x 2pcs

Size	OD [mm]	ID [mm]	HT [mm]
Φ571	58.00	25.60	16.10
Φ572	58.00	34.70	14.86

(2) Wire & Winding (Same Wire Weight)

Material	Core P/N Stacking	Current Density	Wire Size	Wire Eff. Area	Turns	Wire Weight	Winding Factor
KH	KH572060 2pcs	5.00 A/㎟	Φ2.47 mm	4.80㎟	57	223g	29%
Mega Flux	CK572060 2pcs	5.00 A/㎟	Φ2.47 mm	4.80㎟	57	223g	29%
High Flux	CH572060 2pcs	5.00 A/㎟	Φ2.47 mm	4.80㎟	57	223g	29%
Sendust	CS571026 2pcs	7.40 A/㎟	Φ2.03 mm	3.24㎟	71	223g	45%

5. Design Example – UPS

(3) Inductance

Material	Core P/N Stacking	Wire Size	Turns	L(0A)	L(24A)	L(34A) Spec=260μH min
KH	KH572060 2pcs	Φ2.47 mm	57	487μH	361μH	274μH
Mega Flux	CK572060 2pcs	Φ2.47 mm	57	487μH	343μH	263μH
High Flux	CH572060 2pcs	Φ2.47mm	57	487μH	359μH	269μH
Sendust	CS571026 2pcs	Φ2.03 mm	71	604μH	351μH	263μH

(4) ⊿T & Loss

Material	Core P/N Stacking	Wire Size	Turns	⊿T	DCR@20℃	Core Loss	Copper Loss	Total Loss
KH	KH572060 2pcs	Φ2.47 mm	57	81℃	18.4mΩ	10.4W	13.1W	23.5W
MegaFlux	CK572060 2pcs	Φ2.47 mm	57	92℃	18.4mΩ	13.7W	13.6W	27.3W
High Flux	CH572060 2pcs	Φ2.47mm	57	61℃	18.4mΩ	4.5W	12.3W	16.8W
Sendust	CS571026 2pcs	Φ2.03 mm	71	100℃	39.6mΩ	2.1W	30.0W	32.1W

6. Part List – Toroidal Core

P/N	Before Finish Dimensions			After Finish Dimensions			Path length (㎝)	Cross Section Area (㎠)	AL value (nH/N^2)			
	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX			026	040	060	090
KH096	9.65	4.78	3.18	10.29	4.27	3.81	2.18	0.0752	11	17	25	38
KH097	9.65	4.78	3.96	10.29	4.27	4.57	2.18	0.0945	14	21	32	48
KH102	10.16	5.08	3.96	10.80	4.57	4.57	2.38	0.1000	14	21	32	48
KH112	11.18	6.35	3.96	11.90	5.89	4.72	2.69	0.0906	11	17	26	38
KH127	12.70	7.62	4.75	13.46	6.99	5.51	3.12	0.114	12	18	27	40
KH166	16.51	10.16	6.35	17.4	9.53	7.11	4.11	0.192	15	23	35	52
KH172	17.27	9.65	6.35	18.03	9.02	7.11	4.14	0.232	19	29	43	64
KH203	20.32	12.7	6.35	21.1	12.07	7.11	5.09	0.226	14	21	32	49
KH229	22.86	13.97	7.62	23.62	13.39	8.38	5.67	0.331	19	29	43	65
KH234	23.57	14.4	8.89	24.3	13.77	9.7	5.88	0.388	22	34	51	76
KH270	26.92	14.73	11.18	27.7	14.1	11.99	6.35	0.654	32	50	75	113
KH330	33.02	19.94	10.67	33.83	19.3	11.61	8.15	0.672	28	41	61	91
KH343	34.29	23.37	8.89	35.2	22.6	9.83	8.95	0.454	16	25	38	57
KH358	35.81	22.35	10.46	36.7	21.5	11.28	8.98	0.678	24	37	56	84
KH400	39.88	24.13	14.48	40.7	23.3	15.37	9.84	1.072	35	54	81	121
KH467	46.74	24.13	18.03	47.6	23.3	18.92	10.74	1.990	59	90	135	202
KH468	46.74	28.7	15.24	47.6	27.9	16.13	11.63	1.340	37	57	86	128
KH508	50.8	31.75	13.46	51.7	30.9	14.35	12.73	1.250	32	49	73	109
KH571	57.15	26.39	15.24	58	25.6	16.1	12.50	2.290	60	92	138	206
KH572	57.15	35.56	13.97	58	34.7	14.86	14.30	1.444	33	50	75	112
KH610	62	32.6	25	63.1	31.37	26.27	14.37	3.675	83	128	192	288
KH740	74.1	45.3	35	75.2	44.07	36.27	18.38	5.040	89	137	206	309
KH777	77.8	49.23	12.7	78.9	48	13.97	20.00	1.770	30	45	68	102
KH778	77.8	49.23	15.9	78.9	48	17.02	20.00	2.270	37	57	85	128
KH888	88.9	66	15.9	90	64.74	17.2	24.01	1.830	24	38	57	85

7. Part List – Big Toroidal Core

P/N	Before Finish Dimensions			After Finish Dimensions			Path length (㎝)	Cross Section Area (㎠)	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
KH1013	101.6	57.2	13.6	103.1	55.7	14.9	24.27	2.972	40	61	92
KH1016	101.6	57.2	16.5	103.1	55.7	17.8	24.27	3.522	48	75	112
KH1027	101.6	57.2	27.2	103.1	55.7	28.5	24.27	5.944	80	123	184
KH1033	101.6	57.2	33.0	103.1	55.7	34.3	24.27	7.044	96	149	224
KH1320	132.5	78.6	20.3	134.2	77.0	21.7	32.42	5.347	54	83	124
KH1325	132.5	78.6	25.4	134.2	77.0	26.8	32.42	6.710	68	104	156
KH1333	132.5	78.6	33.0	134.2	77.0	34.4	32.42	8.717	88	135	202
KH1340	132.5	78.6	40.6	134.2	77.0	42.0	32.42	10.694	108	165	248
KH1625	165.0	88.9	25.4	167.2	86.9	27.3	38.65	9.460	80	123	184

Thank You !