CSC
Chang Sung Corporation

MHW
A POWERFUL SOLUTION™

HS SERIES POWDER CORES

A HYBRID POWDER CORE MATERIAL FROM CHANG SUNG CORP

HS Series

- Chang Sung Corp and MH&W International announce the availability of a new line of powder cores, the HS Series. The HS Series is a hybrid material comprising High Flux and Sendust powder materials. The combination of these two materials provides:
  - High B_{sat} – 14 KGauss
  - DC Bias characteristics of HS material higher than Sendust
  - Core losses for the HS material are lower than the Sendust
  - Prices for the HS material are lower than the High Flux
  - High Curie Temperature
  - Low permeability HS cores, <26µ, are design for large current applications such as Inverter Inductors and smoothing chokes for Solar Power, UPS and Electric Vehicles. The HS 19µ especially is designed for higher effective permeability at high DC magnetization of >400 Oe.
  - High Permeability HS cores with >60µ are an economical solution for applications requiring high efficiency such as high power desktop PC, Server PC, automotive and Solar Power

General Information

(1) General Information

HS Series	
Permeability(μ)	19, 26, 60, 75, 90
Coating Color	Dark blue
Bmax(G)	14,000
Curie Temp[℃]	500
Operating temp[℃]	-40 to 150
OD BF [mm]	9.6~165

(2) Identification

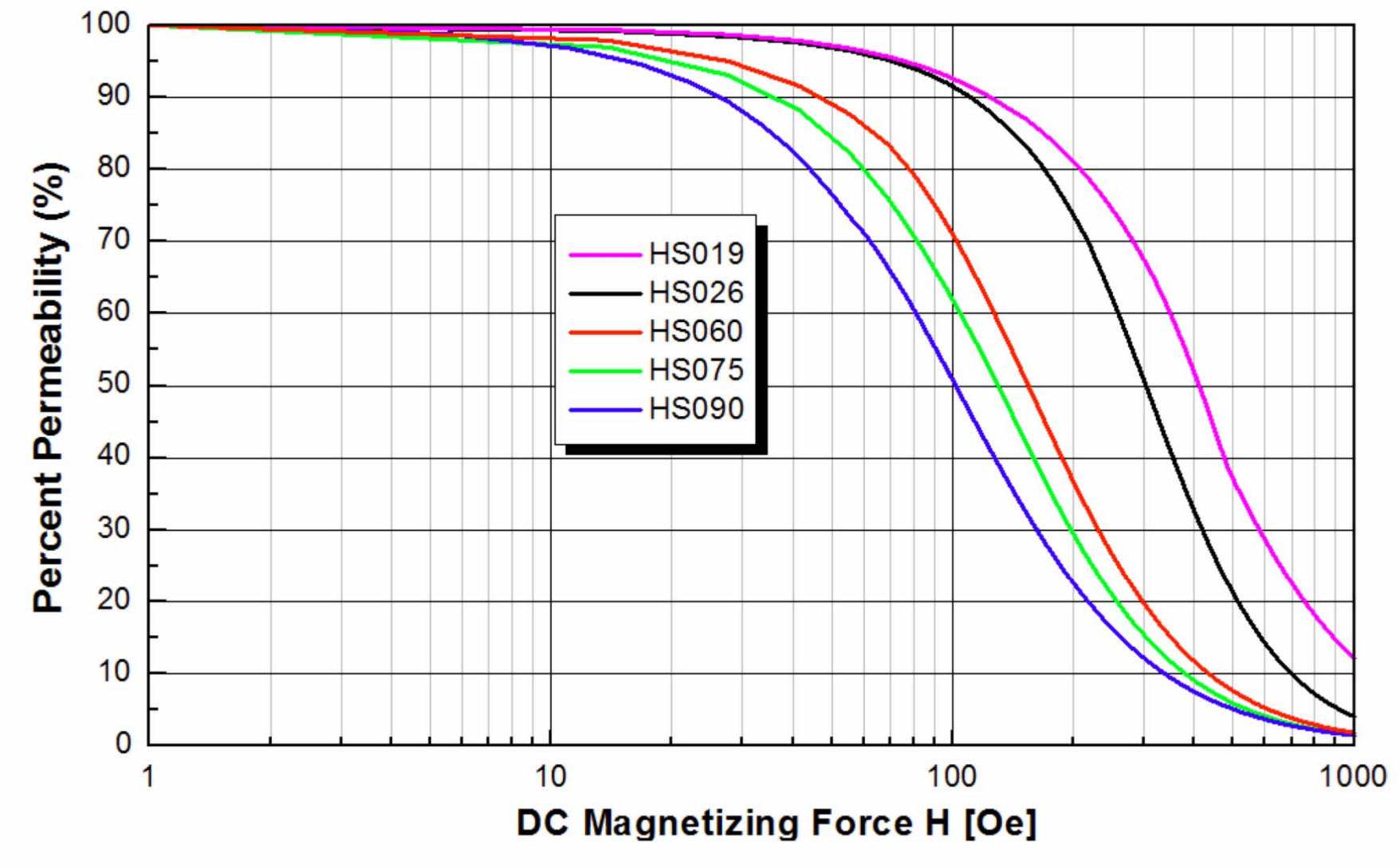
HS 270 060

- 060 — Permeability : 19μ, 26μ, 60μ, 75μ, 90μ
- 270 — OD Size : 27.0mm Available Size : 9.6 ~ 165mm
- HS — HS Core

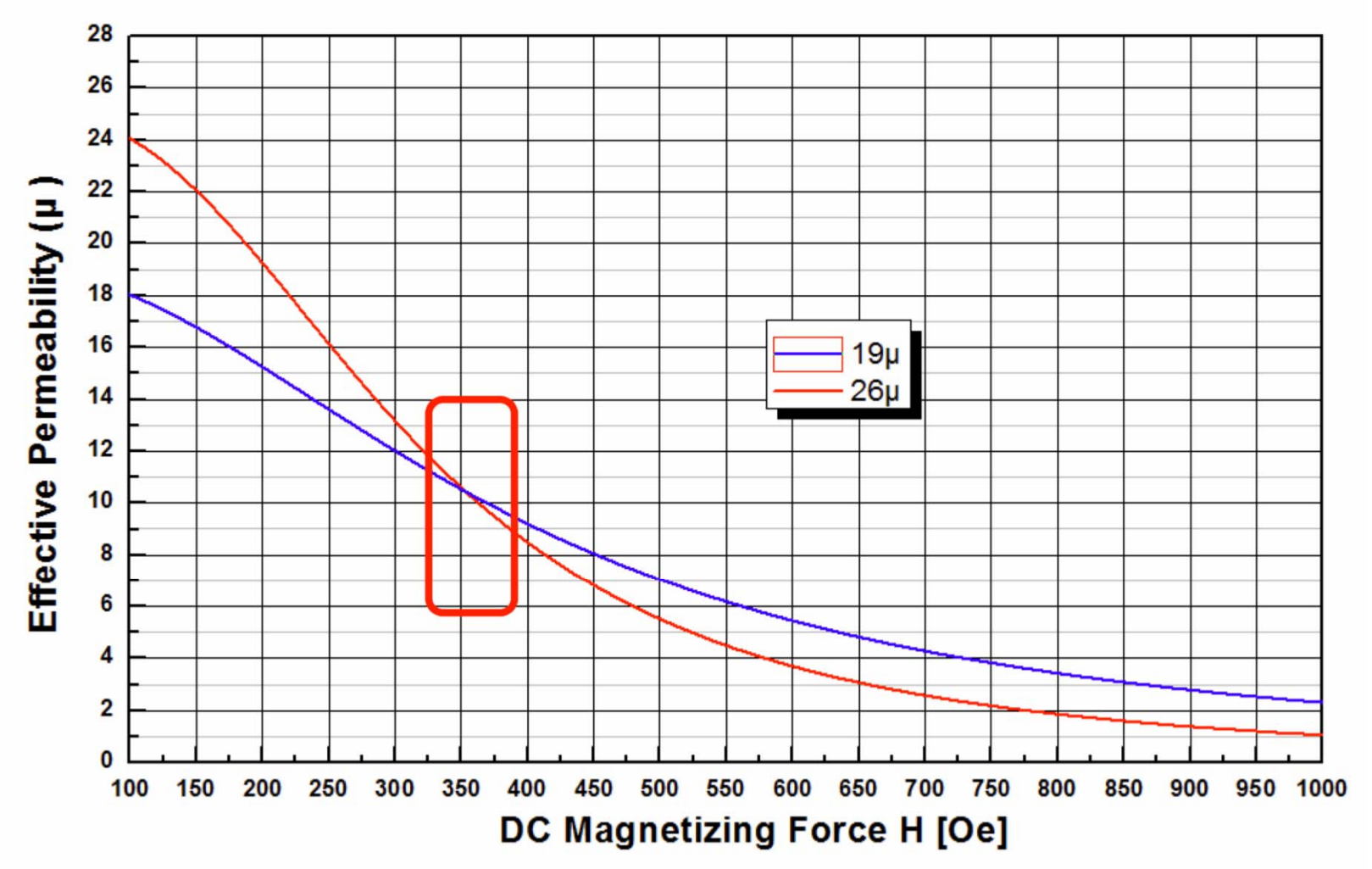
Material Comparison Between CSC Products

MATERIALS		COATING COLOR	PERM	B_{sat}	CORE LOSS mW/cc 60 µ	CORE LOSS mW/cc 60 µ	DC BIAS	DC BIAS	CURIE TEMP	Price Ranking
			µ	Kgauss	50KHz-500G	50KHz-1KG	60 µ @ 200 Oe	60 µ @ -3db	° C	
MPP		**Gray**	14 - 173	7	38	170	20%	80 Oe	450	7
High Flux		**Khaki**	26 - 160	15	37	180	45%	160 Oe	500	6
Sendust		**Black**	26 - 125	10	61	279	22%	55 Oe	500	1
Mega Flux		**Dark Brown**	26 - 90	16	132	590	44%	130 Oe	700	4
HS	High Flux - Sendust	**Dark Blue**	19 - 90	14	43	206	41%	110 Oe	500	3
KS	Mega Flux - Sendust	**Dark Blue**	26 - 60	14	102	478	33%	70 Oe	500	2
KH	Mega flux - High Flux	**Dark Blue**	26 - 90	15	92	433	46%	160 Oe	600	5

DC Bias @ Various Permeability



DC Bias - 19µ vs 26µ

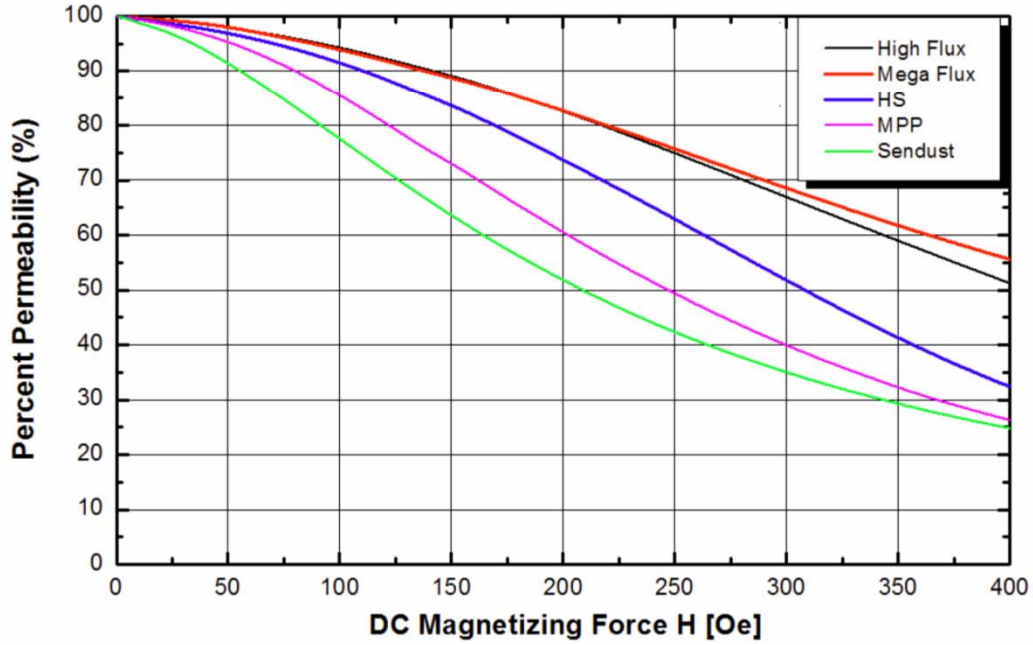


DC Bias - 26μ

(1) Material Comparison

Material	26 μ DCB%		
	@200 Oe	@300 Oe	@400 Oe
High Flux	82%	66%	51%
Mega Flux	82%	67%	55%
HS Core	72%	51%	32%
MPP	60%	40%	26%
SENDUST	52%	35%	24%

(2) DCB Graph

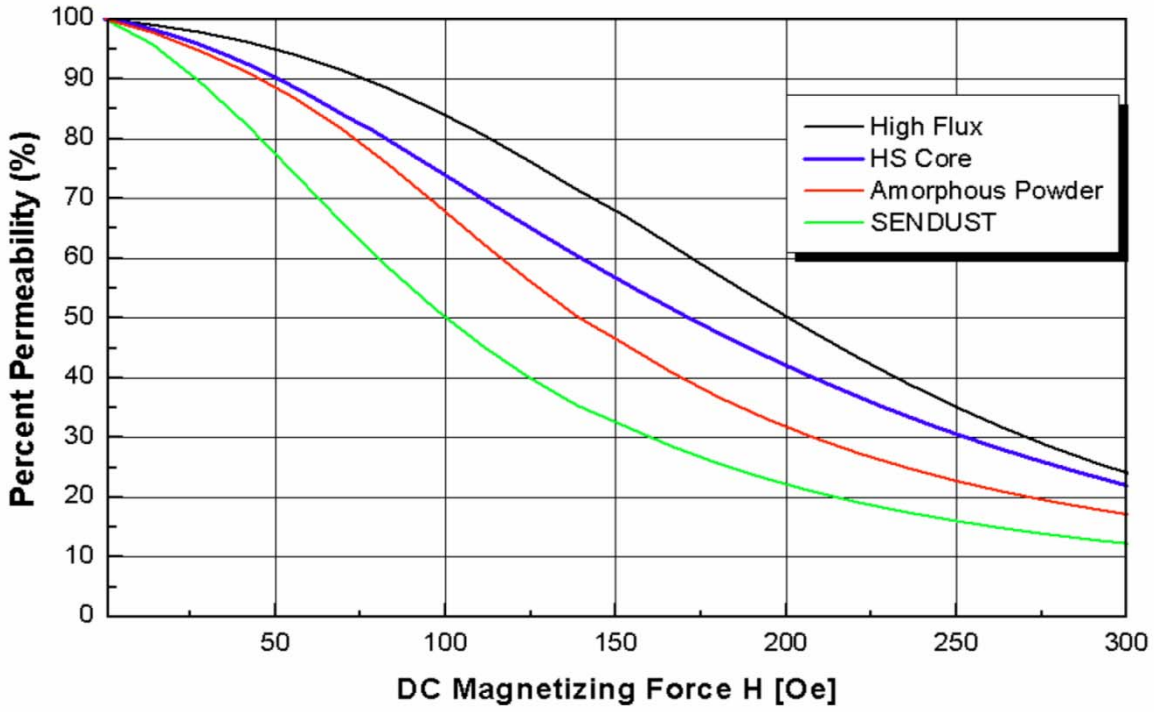


DC Bias - 60µ

(1) Material Comparison

Material	60 μ DCB%		
	@100 Oe	@150 Oe	@200 Oe
High Flux	83%	68%	50%
HS Core	72%	56%	41%
Amorphous Powder	68%	47%	32%
SENDUST	50%	32%	22%

(2) DCB Graph

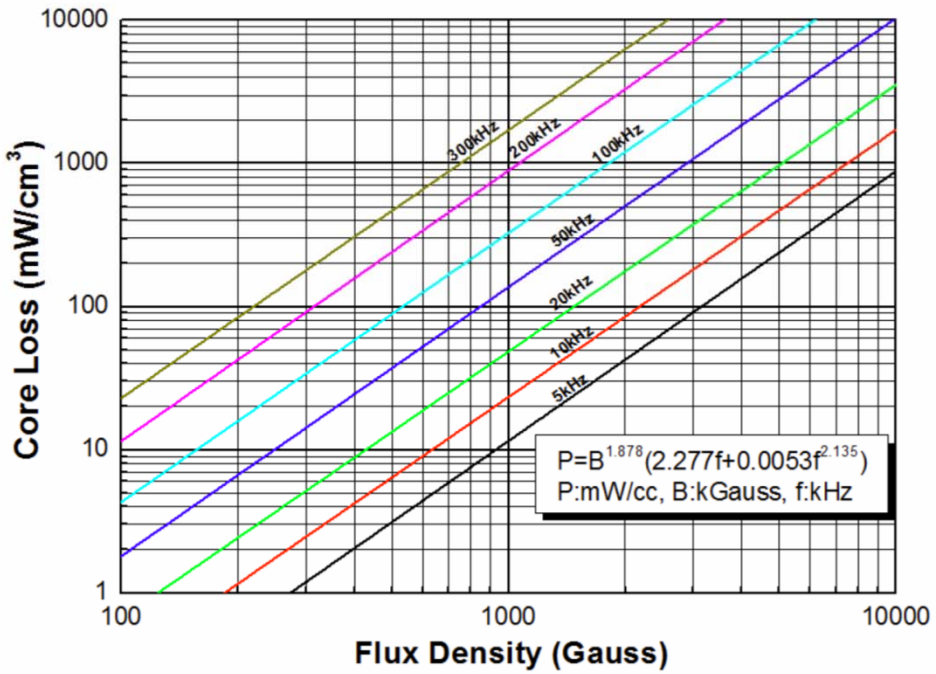


Core Loss - 19μ & 26μ

Unit : [mW/cc]

Material	19 μ , 26 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@50kHz,500G	@50kHz,1,000G
HS Core	$P=B^{1.878}(2.277f+0.0053f^{2.135})$	37	136
MPP	$P=B^{2.183}(2.485f+0.0125f^{2.099})$	38	170
High Flux	$P=B^{2.252}(4.081f+0.0006f^{2.736})$	48	228
SENDUST	$P=B^{2.048}(4.245f+0.0215f^{1.990})$	64	264

(2) Core Loss Graph

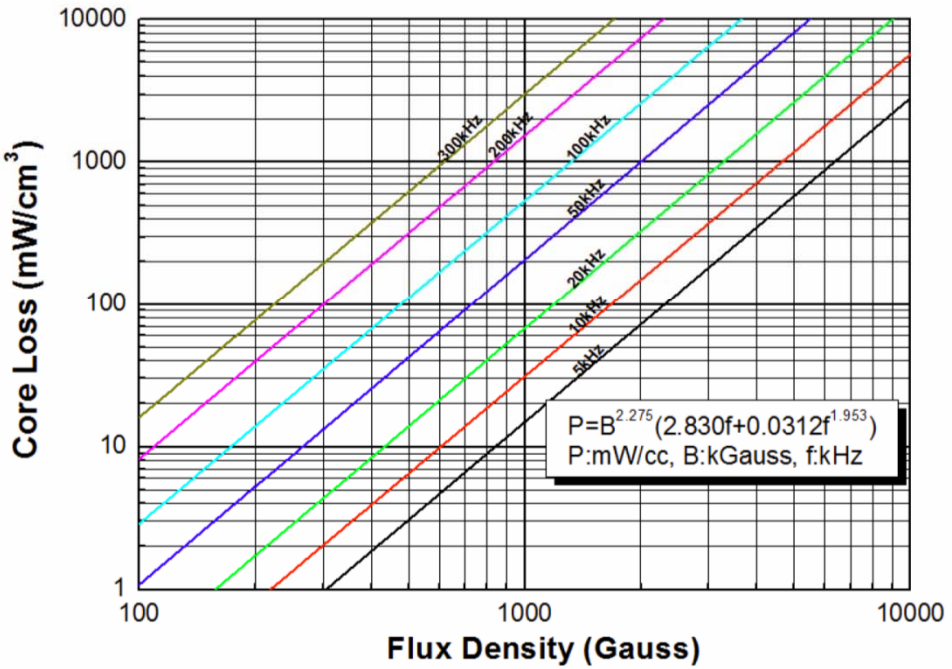


Core Loss - 60μ

Unit : [mW/cc]

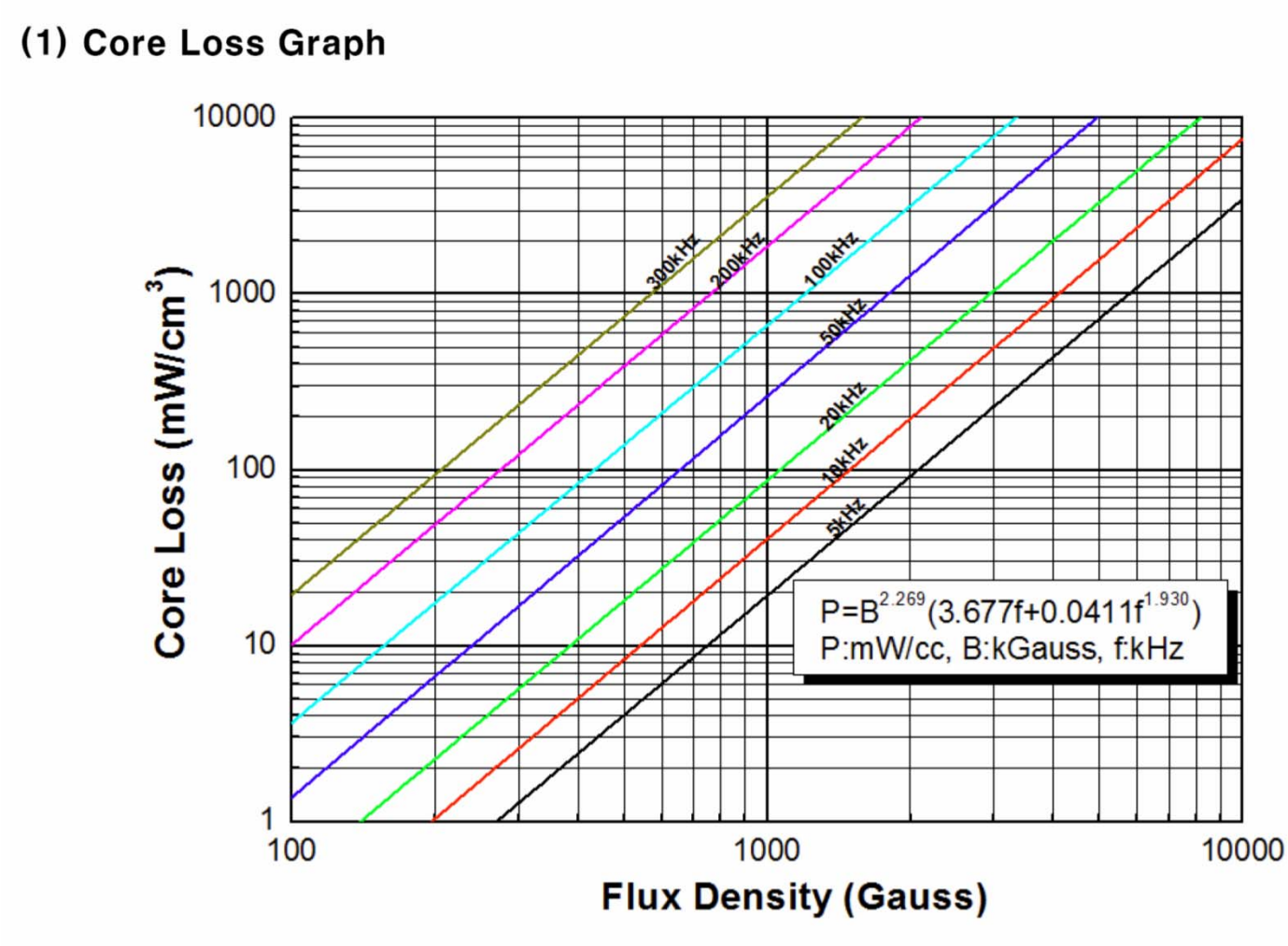
Material	60 μ Core Loss		
	Core Loss Equation (P:mW/cc, B:kGauss, f:kHz)	@50kHz,500G	@50kHz,1,000G
HS Core	$P=B^{2.275}(2.830f+0.0312f^{1.953})$	43	206
MPP	$P=B^{2.183}(2.485f+0.0125f^{2.099})$	38	170
High Flux	$P=B^{2.284}(3.050f+0.0023f^{2.397})$	37	180
SENDUST	$P=B^{2.207}(4.518f+0.0244f^{1.967})$	61	279

(2) Core Loss Graph



Core Loss - 75µ & 90µ

(1) Core Loss Graph



HS Core Part List Toroids

P/N	Before Finish Dimensions			After Finish Dimensions			Path length (㎝)	Cross Section Area (㎠)	AL value (nH/n²)±8%			
	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX			026u	060u	075u	090u
HS096	9.65	4.78	3.18	10.29	4.27	3.81	2.18	0.0752	11	25	32	38
HS097	9.65	4.78	3.96	10.29	4.27	4.57	2.18	0.0945	14	32	40	48
HS102	10.16	5.08	3.96	10.80	4.57	4.57	2.38	0.1000	14	32	40	48
HS112	11.18	6.35	3.96	11.90	5.89	4.72	2.69	0.0906	11	26	32	38
HS127	12.70	7.62	4.75	13.46	6.99	5.51	3.12	0.114	12	27	34	40
HS166	16.51	10.16	6.35	17.4	9.53	7.11	4.11	0.192	15	35	43	52
HS172	17.27	9.65	6.35	18.03	9.02	7.11	4.14	0.232	19	43	53	64
HS203	20.32	12.7	6.35	21.1	12.07	7.11	5.09	0.226	14	32	41	49
HS229	22.86	13.97	7.62	23.62	13.39	8.38	5.67	0.331	19	43	54	65
HS234	23.57	14.4	8.89	24.3	13.77	9.7	5.88	0.388	22	51	63	76
HS270	26.92	14.73	11.18	27.7	14.1	11.99	6.35	0.654	32	75	94	113
HS330	33.02	19.94	10.67	33.83	19.3	11.61	8.15	0.672	28	61	76	91
HS343	34.29	23.37	8.89	35.2	22.6	9.83	8.95	0.454	16	38	47	57
HS358	35.81	22.35	10.46	36.7	21.5	11.28	8.98	0.678	24	56	70	84
HS400	39.88	24.13	14.48	40.7	23.3	15.37	9.84	1.072	35	81	101	121
HS467	46.74	24.13	18.03	47.6	23.3	18.92	10.74	1.99	59	135	169	202
HS468	46.74	28.7	15.24	47.6	27.9	16.13	11.63	1.34	37	86	107	128
HS508	50.8	31.75	13.46	51.7	30.9	14.35	12.73	1.25	32	73	91	109
HS571	57.15	26.39	15.24	58	25.6	16.1	12.5	2.29	60	138	172	206
HS572	57.15	35.56	13.97	58	34.7	14.86	14.3	1.444	33	75	94	112
HS610	62	32.6	25	63.1	31.37	26.27	14.37	3.675	83	192	240	288
HS740	74.1	45.3	35	75.2	44.07	36.27	18.38	5.04	89	206	257	309
HS777	77.8	49.23	12.7	78.9	48	13.97	20	1.77	30	68	85	102
HS778	77.8	49.23	15.9	78.9	48	17.02	20	2.27	37	85	107	128

HS Part List: Big toroidal Core

P/N	Before Finish Dimensions			After Finish Dimensions			Path length (㎝)	Cross Section Area (㎠)	AL value (nH/n²)±8%		
	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX	OD(mm) MAX	ID(mm) MIN	HT(mm) MAX			019u	026u	060u
HS1013	101.6	57.2	13.6	103.1	55.7	14.9	24.27	2.972	29	40	92
HS1016	101.6	57.2	16.5	103.1	55.7	17.8	24.27	3.522	35	48	112
HS1027	101.6	57.2	27.2	103.1	55.7	28.5	24.27	5.944	58	80	184
HS1033	101.6	57.2	33.0	103.1	55.7	34.3	24.27	7.044	70	96	224
HS1320	132.5	78.6	20.3	134.2	77.0	21.7	32.42	5.347	39	54	124
HS1325	132.5	78.6	25.4	134.2	77.0	26.8	32.42	6.710	49	68	156
HS1333	132.5	78.6	33.0	134.2	77.0	34.4	32.42	8.717	64	88	202
HS1340	132.5	78.6	40.6	134.2	77.0	42.0	32.42	10.694	79	108	248
HS1625	165.0	88.9	25.4	167.2	86.9	27.3	38.65	9.460	58	80	184

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Chang Sung Corp is the global leader in the manufacture of powder cores. Their offering includes:

-MPP
-High Flux (HF)
-Sendust
-Megaflux
-KH Series
-KS Series
-HS Series

Chang Sung Corp is Distributed in North America by:

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