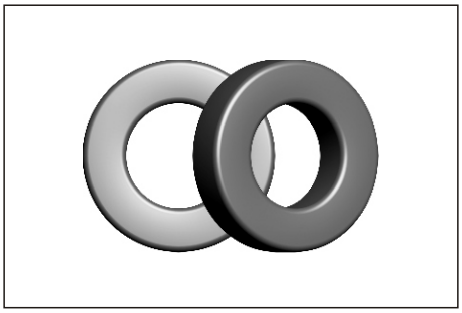
AMORPHOUS POWDER CORE SERIES PRODUCTS

INTRODUCTION

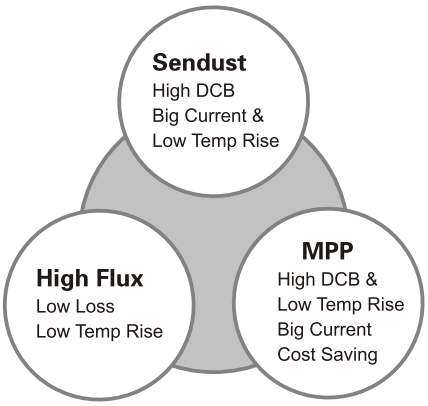


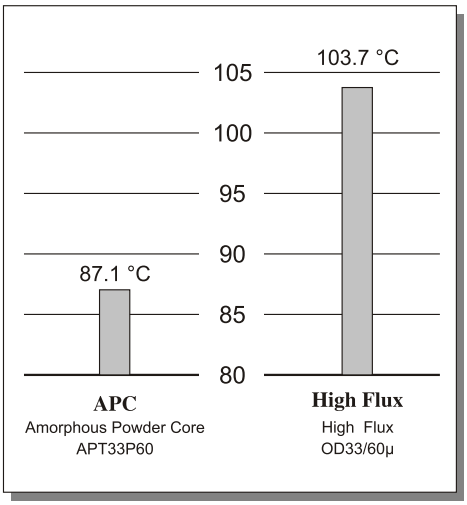
Amorphous Powder Core come into world with its utmost superior qualities SHINHOM proudly introduce Amorphous Powder Cores to customers.

Example of Field Test

Power	Application	Model	Comparison	Condition
350W	PFC	APT33P60	High Flux OS33/60μ	No Fan 100V Input

Benefit of Advanced Powder Core

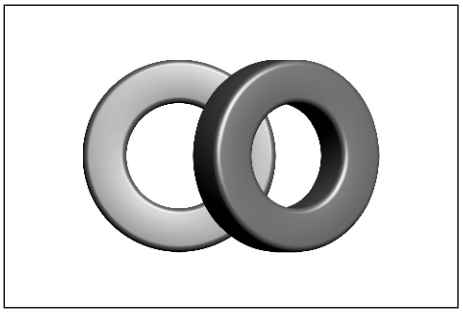




Material Property Comparison

Property	Amorphous powder Core	High Flux	MPP	Sendust KoolMμ	Iron	Ferrite
Bs(Gauss) saturation Flux Density	15,000	15,000	7,500	10,000	10,000~12,000	3,000~4,500
Core Loss Pc(mW/cm³) @100kHz,0.1T	600	13,000~18,000	500~1,500	850~1,200	1,300~1,800	Dep.Gap
% Ldc @100Oe(60μ)	70%	70%	50%	45%	40%	Dep.Gap
Composition	Fe-Si-B	Fe-Ni	Fe-Ni-Mo	Fe-Al-Si	Fe	Mn-Zn-Fe

Note: The properties are typical value measured.



AMORPHOUS POWDER CORE SERIES PRODUCTS

PROPERTIES OF APT

According to the market demand of severe competition, we put the state of are technology for the developing "Cost Effective" and "Attractive Performance" at the same time.

Power supply can be slim and smart with help of APT series it also enables cost effective.

Toroid core properties of APT series are ready to serve our customers.

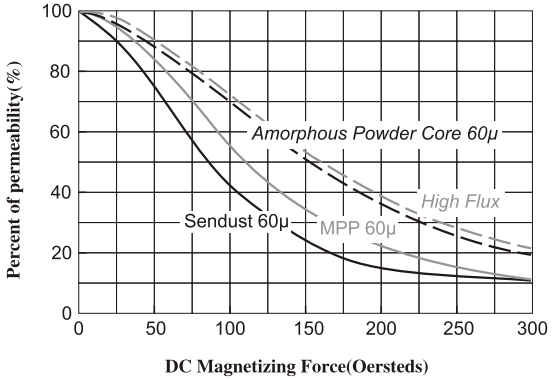
Innovative Benefit

- Remarkable Size Reduction
- Higher Efficient Solution
- More Cost Effective with Same Performance

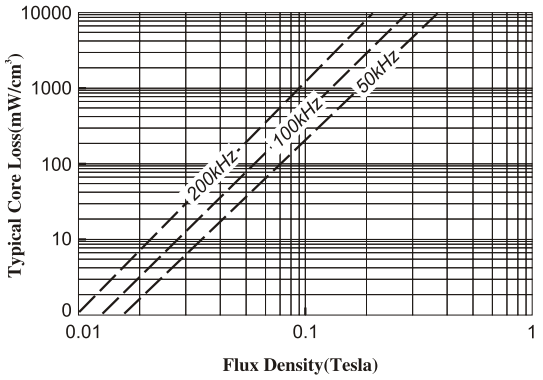
Application

- PFC Chokes for PC Power Supplies
- PFC Chokes for Server/Workstation power Supplies
- PFC Chokes for Industrial PC
- PFC Chokes for LCD/PDP TV Power Supplies
- PFC Output Choke for General Industrial Power Supplies

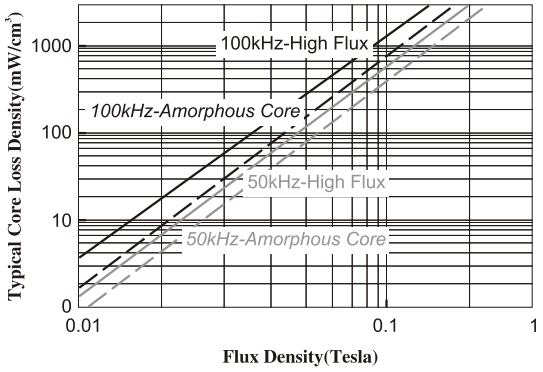
Comparison with HF, MPP and Sendust Material on DCB



Core Loss Density of APT

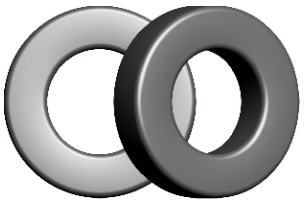


Typical Core Loss Density Comparyson with High Flux

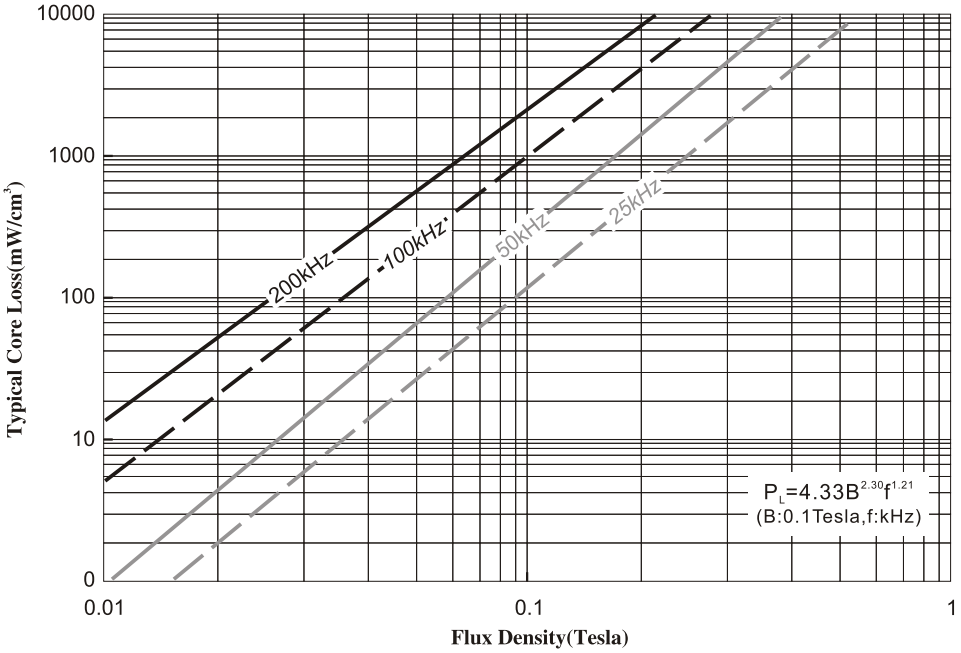


AMORPHOUS POWDER CORE SERIES PRODUCTS

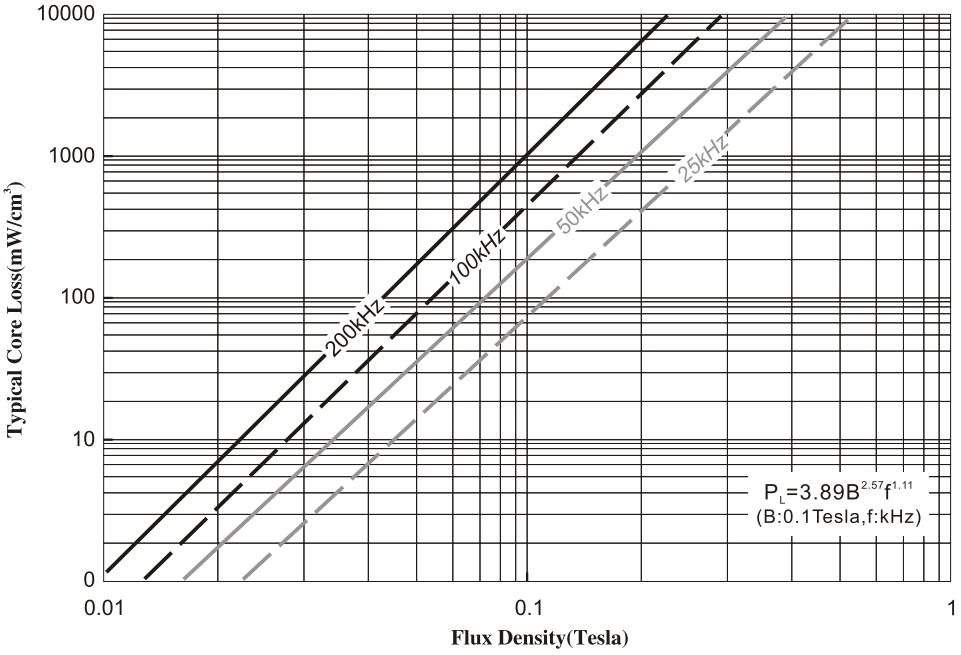
PROPERTIES OF APT

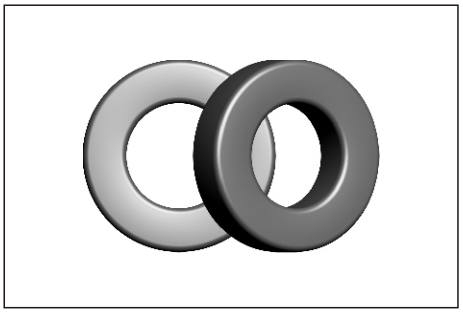


Core Loss Density Curves, 26 μ



Core Loss Density Curves, 60~90 μ

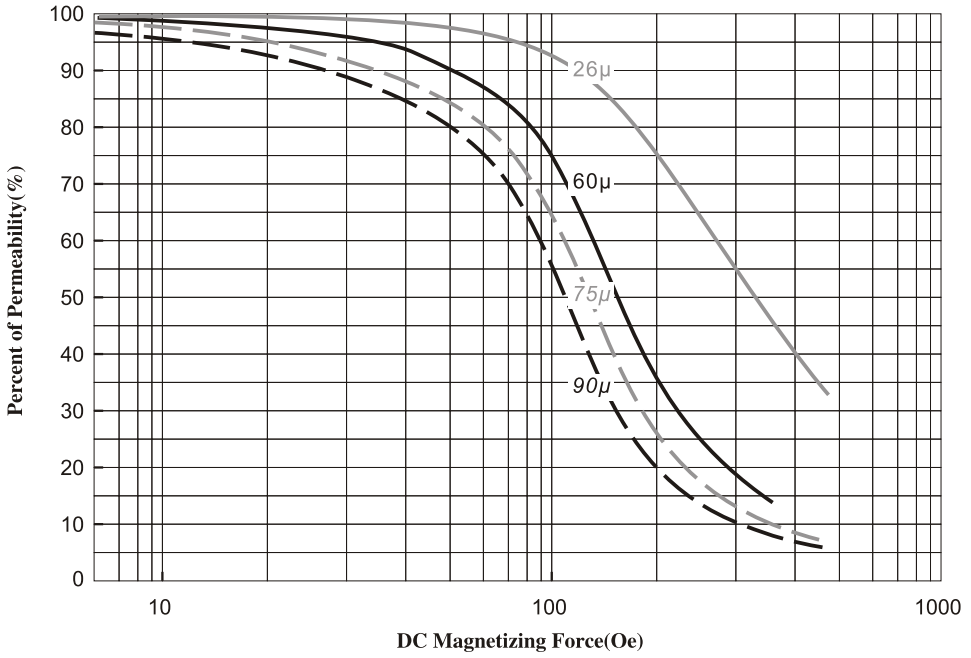




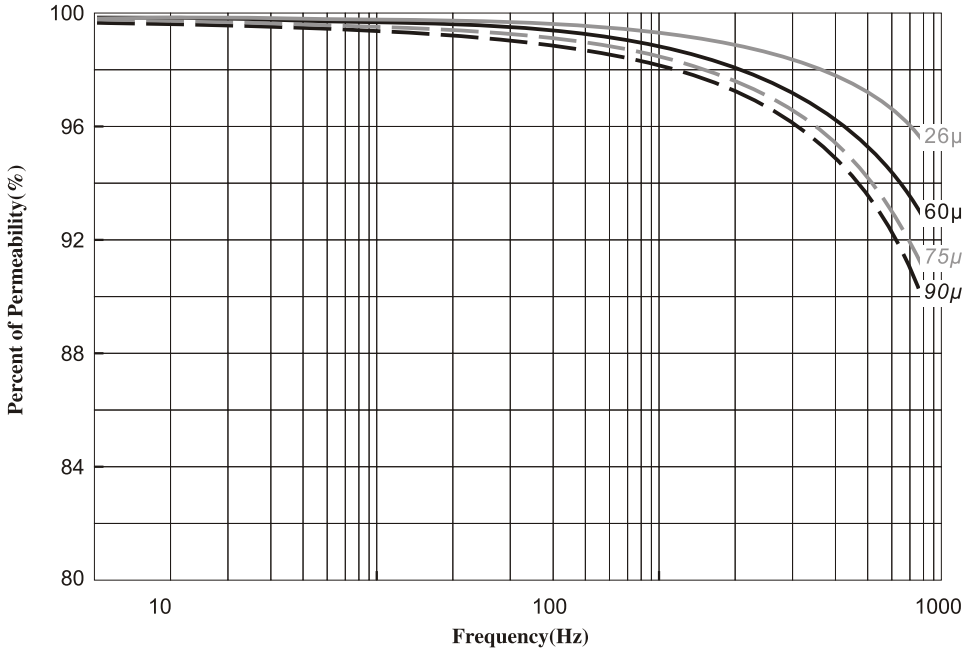
AMORPHOUS POWDER CORE SERIES PRODUCTS

PROPERTIES OF APT

Core Loss Density Curves, 26 μ

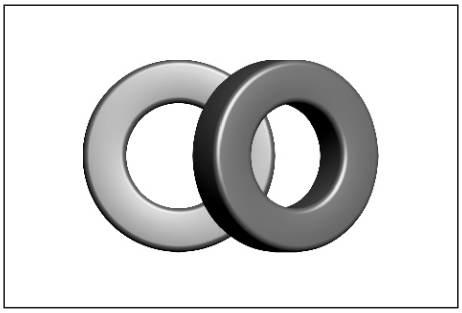


Core Loss Density Curves, 60~90 μ



AMORPHOUS POWDER CORE SERIES PRODUCTS

PROPERTIES OF APT



Permeability versus DC Bias Curve Fit Formula

Effective Permeability(μ_{eff})

For a magnetic circuit constructed with an air gap, or gaps, the permeability of a hypothetical homogeneous material that would provide the same reluctance, or net permeability.

$$\mu_{eff} = \sqrt{\frac{\mu_i^2 + a\mu_i^3 H + b\mu_i^4 H^2}{1 + c\mu_i H + d\mu_i^2 H^2}}$$

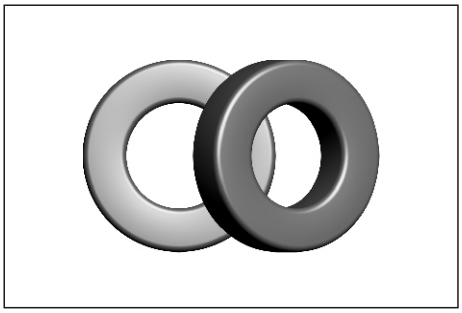
Value	a	b	c	d
26μ	-7.24×10^{-5}	-2.31×10^{-9}	-5.21×10^{-5}	-1.50×10^{-8}
60μ	-3.30×10^{-5}	-2.22×10^{-10}	-1.20×10^{-5}	-1.22×10^{-8}
75μ	-3.46×10^{-5}	-4.28×10^{-11}	-1.70×10^{-5}	-2.40×10^{-8}
90μ	-3.18×10^{-5}	-7.58×10^{-11}	-1.35×10^{-5}	-1.50×10^{-8}

Replacement Concept

High Flux 60μ ⟷ APTxxP60

MPP 60μ ⟷ APTxxP60

Note:
1. Number of winding is same.
2. Size of core is same for HF and MPP replacement.
3. Temperature rise of APC is smaller than High Flux, MPP.



AMORPHOUS POWDER CORE SERIES PRODUCTS

PRODUCT CHARACTERISTICS

Features

- Reduce Overall Component Cost than Other Solution
- Low Ripple Current
- High Effciency
- Smaller in Size (Save PCB Size)
- Smallest Temperature Rise among Powdered Core

Material Information

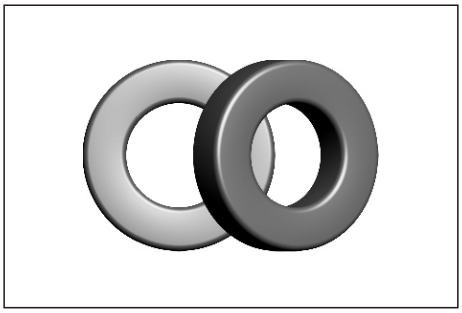
Properties	APT	MPP	High Flux	Sendust	Ferrite
Saturation Flux Density Bs(G)	15,000	7,500	15,000	10,000	3,000
DC Bias Property @ 100Oe	70%	50%	70%	45%	Gap dep
Core Loss @ 100kHz, 0.1T	600	500	1,300	850	Gap dep

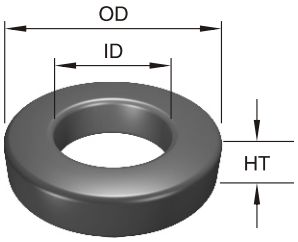
Specification of APT Series

APT	Size(Bare) (OD × ID × HT)	Size(Coated) (OD × ID × HT)	A_L (nH/N^2)	Ac (cm^2)	Le (cm)	SA (cm^2)	Wa (cm^2)	WaAc (cm^4)	Vol (cm^3)
APT13PXX	12.7 × 7.6 × 4.8	13.5 × 7.0 × 5.5	27	0.11	3.12	5.6	0.38	0.04	0.36
APT17PXX	16.5 × 10.2 × 6.4	17.4 × 9.5 × 7.1	35	0.19	4.11	9.2	0.71	0.14	0.79
APT18PXX	17.3 × 9.7 × 6.4	18.0 × 9.0 × 7.1	43	0.23	4.14	9.9	0.64	0.13	0.96
APT20PXX	20.3 × 12.7 × 6.4	21.1 × 12.1 × 7.1	32	0.23	5.09	12.1	1.14	0.26	1.15
APT23PXX	22.9 × 14.0 × 7.6	23.6 × 13.4 × 8.4	43	0.33	5.67	15.7	1.41	0.47	1.88
APT24PXX	23.6 × 14.4 × 8.9	24.3 × 13.8 × 9.7	51	0.39	5.88	17.9	1.49	0.58	2.28
APT27PXX	26.9 × 14.7 × 11.2	27.7 × 14.1 × 12.0	75	0.65	6.35	24.7	1.56	1.02	4.15
APT33PXX	33.0 × 19.9 × 10.7	33.8 × 19.3 × 11.6	61	0.67	8.15	31.5	2.93	1.97	5.48
APT36PXX	35.8 × 22.4 × 10.5	36.7 × 21.5 × 11.3	56	0.68	8.98	34.5	3.64	2.47	6.09
APT40PXX	39.9 × 23.1 × 14.5	40.7 × 23.3 × 15.4	81	1.07	9.84	48.4	4.27	4.58	10.55
APT46PXX	46.7 × 24.1 × 18.0	47.6 × 23.3 × 18.9	135	1.99	10.74	69.3	4.27	8.50	21.37
APT47PXX	46.7 × 28.7 × 15.2	47.6 × 27.9 × 16.1	86	1.34	11.63	61.7	6.11	8.19	15.58
APT50PXX	50.8 × 31.8 × 13.5	51.7 × 30.9 × 14.4	73	1.25	12.73	64.2	7.50	9.38	15.93
APT57PXX	57.2 × 26.4 × 15.2	58.0 × 25.6 × 16.1	138	2.29	12.51	91.0	5.14	11.77	28.60

AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 13PXX





Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	12.70	7.62	4.75
Coating Core(epoxy)	13.46	6.99	5.51

Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT13P26	12	26
APT13P60	27	60
APT13P75	34	75
APT13P90	40	90

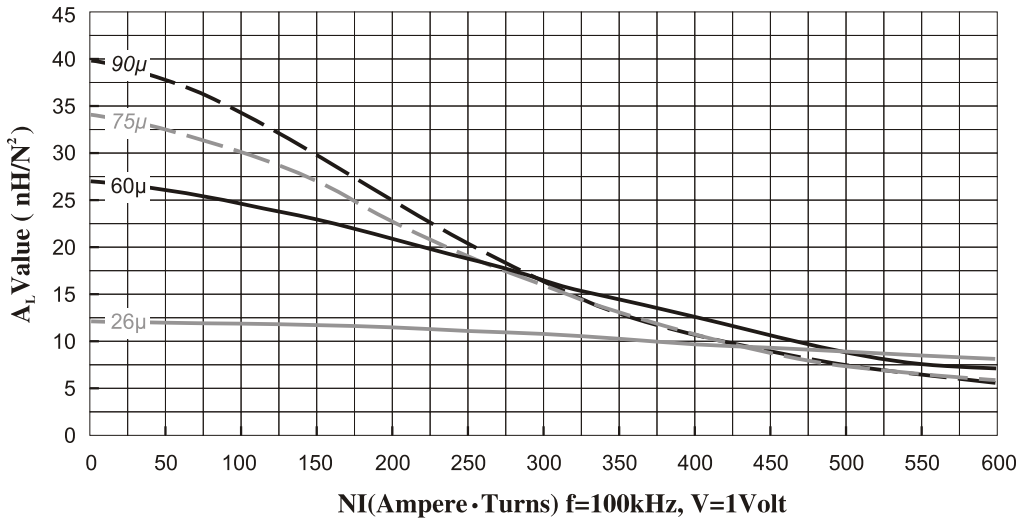
Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.114cm^2	3.12cm	0.383cm^2	0.356cm^3

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω	AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
15	0.1530	10	0.00271	24	0.0566	31	0.0518
16	0.1370	11	0.00376	25	0.0505	35	0.0723
17	0.1220	13	0.00520	26	0.0452	40	0.1010
18	0.1090	15	0.00722	27	0.0409	45	0.1400
19	0.0980	17	0.01000	28	0.0366	50	0.1970
20	0.0879	19	0.01390	29	0.0330	56	0.2690
21	0.0785	22	0.01930	30	0.0294	63	0.3810
22	0.0701	25	0.02700	31	0.0267	69	0.5270
23	0.0632	28	0.03710	32	0.0241	77	0.7160

A_L vs NI Curve



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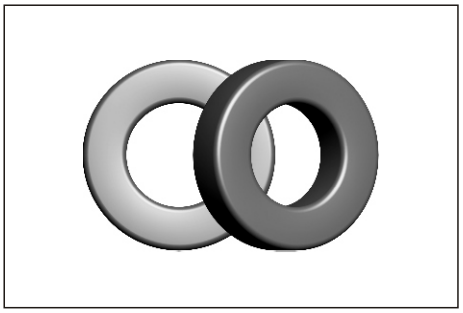
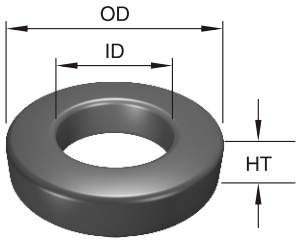


AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 17PXX



Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	16.51	10.16	6.35
Coating Core(epoxy)	17.40	9.53	7.11

Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.192cm^2	4.11cm	0.713cm^2	0.7891cm^3

Available Cores

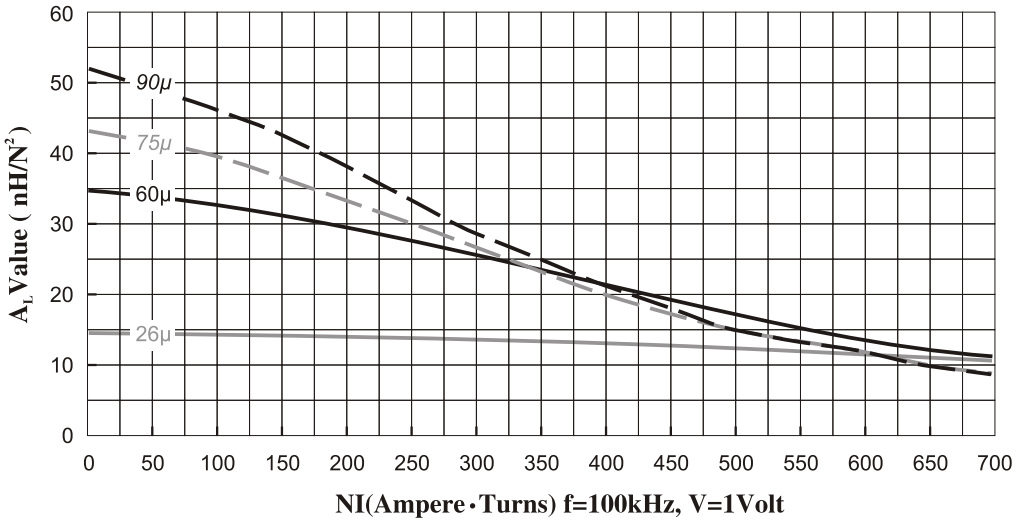
Part No.	A_L (nH/N^2)	Perm. (μ)
APT17P26	15	26
APT17P60	35	60
APT17P75	43	75
APT17P90	52	90

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	10	0.00165
13	0.1900	11	0.00230
14	0.1710	13	0.00318
15	0.1530	15	0.00443
16	0.1370	17	0.00617
17	0.1220	19	0.00856
18	0.1090	21	0.01190
19	0.0980	24	0.01660
20	0.0879	27	0.02310

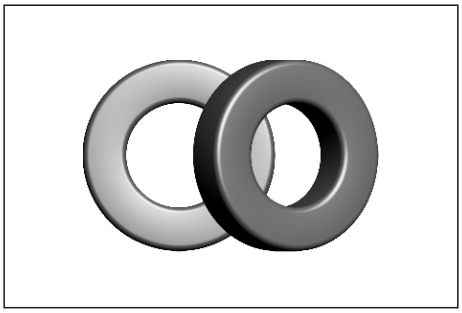
AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	31	0.0323
22	0.0701	35	0.0453
23	0.0632	39	0.0626
24	0.0566	44	0.0876
25	0.0505	49	0.1230
26	0.0452	55	0.1720
27	0.0409	62	0.2390
28	0.0366	69	0.3360
29	0.0330	77	0.4600

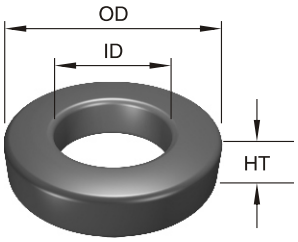
A_L vs NI Curve



AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 18PXX





Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	17.27	9.65	6.35
Coating Core(epoxy)	18.03	9.02	7.11

Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT18P26	19	26
APT18P60	43	60
APT18P75	53	75
APT18P90	64	90

Magnetic Dimensions

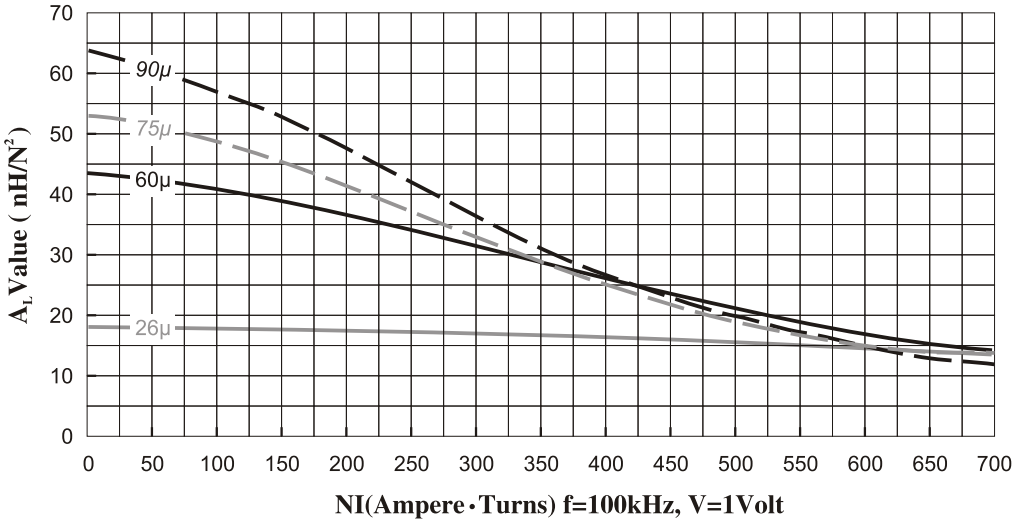
Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.232cm^2	4.14cm	0.638cm^2	0.9605cm^3

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	9	0.00161
13	0.1900	10	0.00225
14	0.1710	12	0.00311
15	0.1530	14	0.00434
16	0.1370	16	0.00606
17	0.1220	18	0.00843
18	0.1090	20	0.01180
19	0.0980	23	0.01640
20	0.0879	26	0.02280

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	29	0.0319
22	0.0701	33	0.0449
23	0.0632	37	0.0621
24	0.0566	41	0.0869
25	0.0505	47	0.1220
26	0.0452	52	0.1710
27	0.0409	58	0.2370
28	0.0366	65	0.3340
29	0.0330	73	0.4580

A_L vs NI Curve



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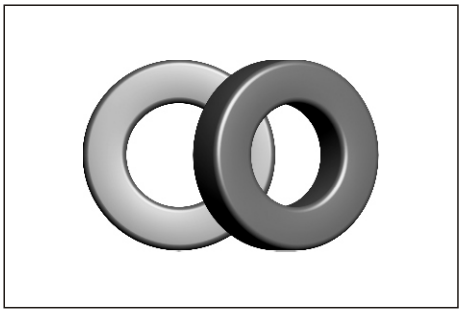
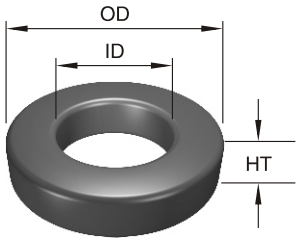


AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 20PXX



Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	20.32	12.70	6.35
Coating Core(epoxy)	21.1	12.07	7.11

Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.226cm^2	5.09cm	1.14cm^2	1.151cm^3

Available Cores

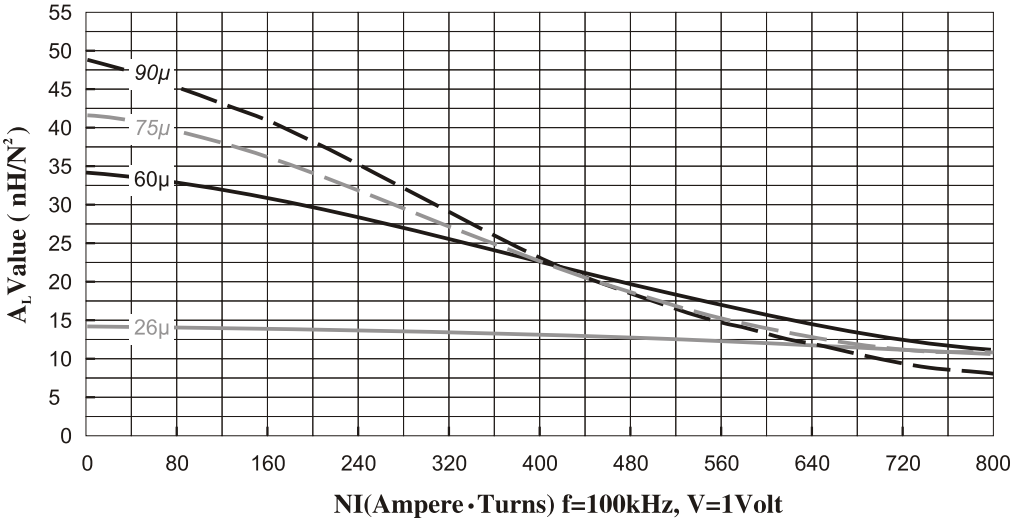
Part No.	A_L (nH/N^2)	Perm. (μ)
APT20P26	14	26
APT20P60	32	60
APT20P75	41	75
APT20P90	49	90

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	13	0.00221
13	0.1900	15	0.00307
14	0.1710	17	0.00424
15	0.1530	19	0.00590
16	0.1370	22	0.00822
17	0.1220	25	0.01140
18	0.1090	28	0.01590
19	0.0980	32	0.02220
20	0.0879	35	0.03080

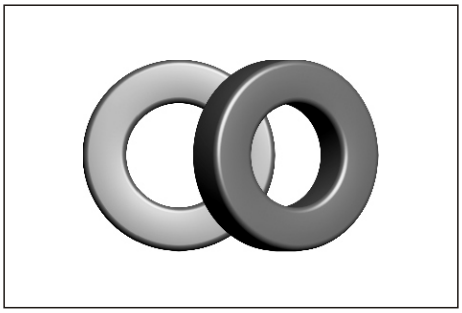
AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	40	0.0430
22	0.0701	45	0.0604
23	0.0632	50	0.0834
24	0.0566	56	0.1170
25	0.0505	63	0.1640
26	0.0452	71	0.2300
27	0.0409	79	0.3180
28	0.0366	89	0.4480
29	0.0330	98	0.6140

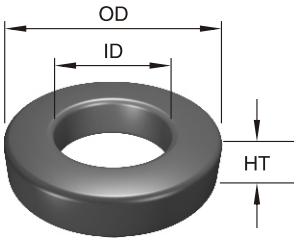
A_L vs NI Curve



AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 23PXX





Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	22.86	13.97	7.62
Coating Core(epoxy)	23.62	13.39	8.38

Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT23P26	19	26
APT23P60	43	60
APT23P75	54	75
APT23P90	65	90

Magnetic Dimensions

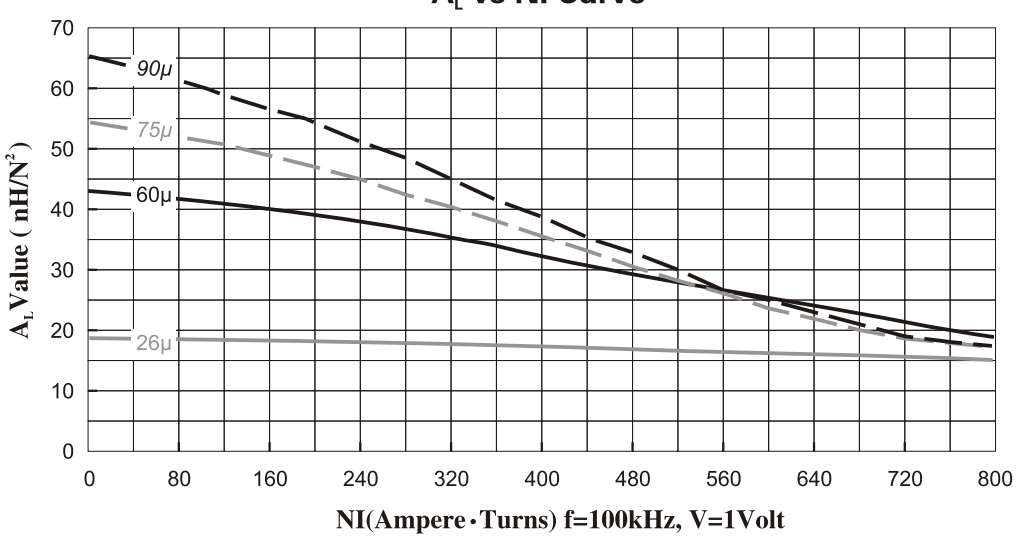
Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.331cm^2	5.67cm	1.41cm^2	1.8771cm^3

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	15	0.00276
13	0.1900	17	0.00384
14	0.1710	19	0.00532
15	0.1530	22	0.00742
16	0.1370	25	0.01040
17	0.1220	28	0.01440
18	0.1090	31	0.02020
19	0.0980	35	0.02810
20	0.0879	40	0.03920

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	45	0.0548
22	0.0701	50	0.0771
23	0.0632	56	0.1070
24	0.0566	63	0.1500
25	0.0505	71	0.2100
26	0.0452	79	0.2950
27	0.0409	88	0.4090
28	0.0366	99	0.5770
29	0.0330	109	0.7910

A_L vs NI Curve



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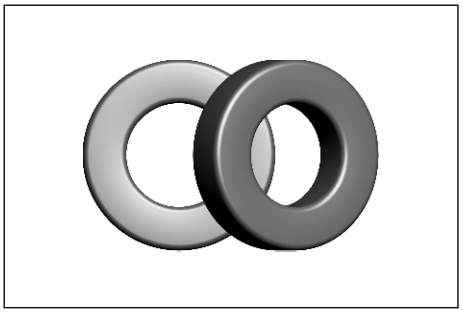
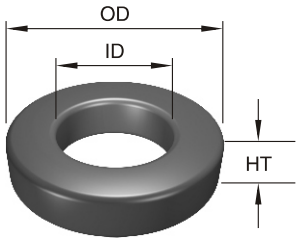


AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 24PXX



Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	23.57	14.40	8.89
Coating Core(epoxy)	24.30	13.77	9.70

Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.388cm^2	5.88cm	1.49cm^2	2.2814cm^3

Available Cores

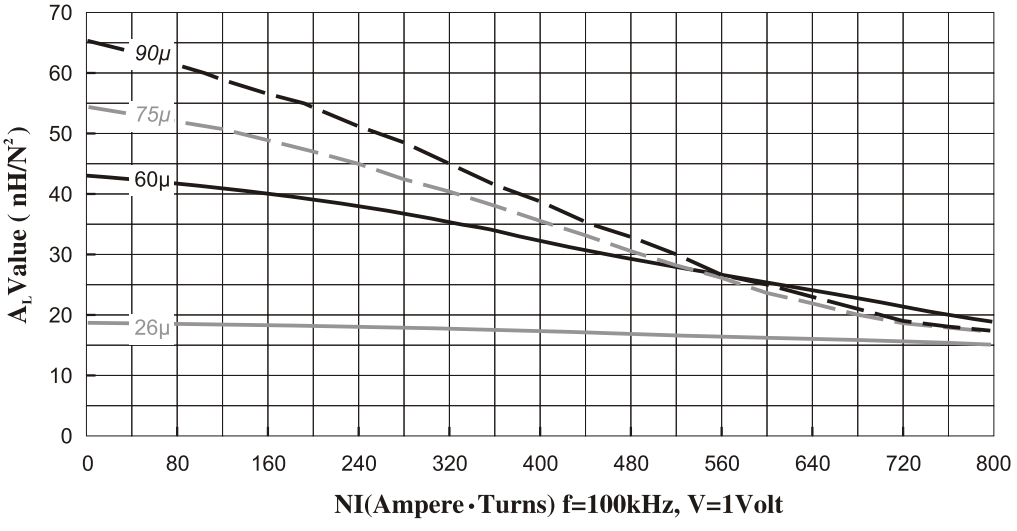
Part No.	A_L (nH/N^2)	Perm. (μ)
APT22P26	22	26
APT51P60	51	60
APT63P75	63	75
APT76P90	76	90

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	15	0.00307
13	0.1900	17	0.00429
14	0.1710	20	0.00595
15	0.1530	22	0.00832
16	0.1370	25	0.01160
17	0.1220	29	0.01620
18	0.1090	32	0.02270
19	0.0980	36	0.03180
20	0.0879	41	0.04430

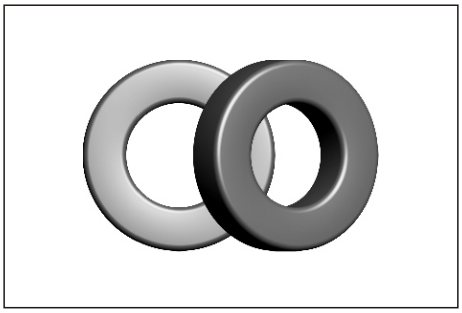
AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	46	0.0620
22	0.0701	52	0.0874
23	0.0632	58	0.1210
24	0.0566	65	0.1700
25	0.0505	73	0.2380
26	0.0452	81	0.3360
27	0.0409	91	0.4650
28	0.0366	101	0.6570
29	0.0330	112	0.9010

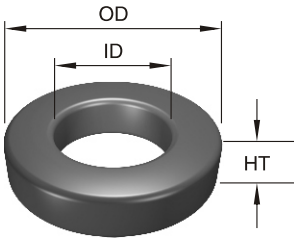
A_L vs NI Curve



AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 27PXX





Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	26.92	14.73	11.18
Coating Core(epoxy)	27.70	14.10	11.99

Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT27P26	32	26
APT27P60	75	60
APT27P75	94	75
APT27P90	113	90

Magnetic Dimensions

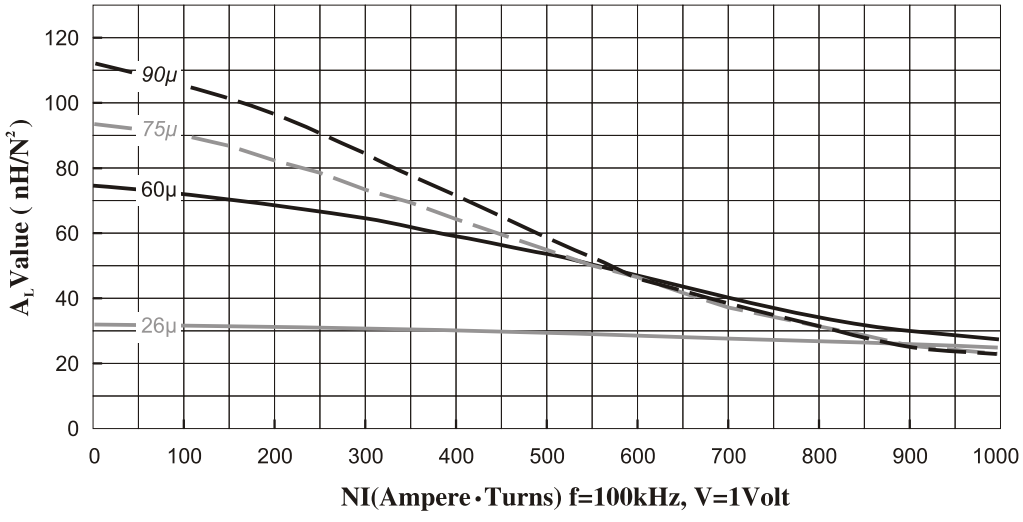
Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.654cm^2	6.35cm	1.56cm^2	4.150cm^3

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	16	0.00367
13	0.1900	18	0.00514
14	0.1710	20	0.00715
15	0.1530	23	0.01000
16	0.1370	26	0.01410
17	0.1220	29	0.01970
18	0.1090	33	0.02760
19	0.0980	37	0.03870
20	0.0879	42	0.05410

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	47	0.0759
22	0.0701	53	0.1070
23	0.0632	59	0.1490
24	0.0566	66	0.2090
25	0.0505	74	0.2940
26	0.0452	83	0.4140
27	0.0409	93	0.5750
28	0.0366	104	0.8120
29	0.0330	115	1.1100

A_L vs NI Curve



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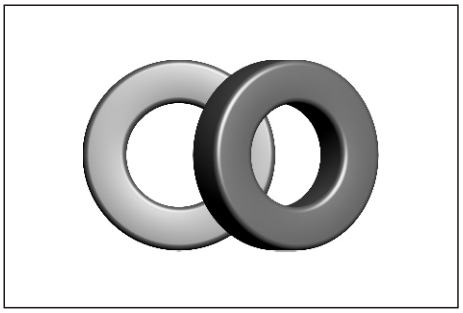
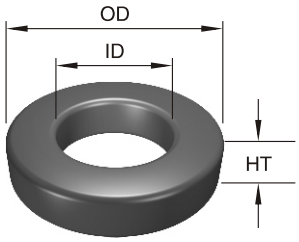


AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 33PXX



Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	33.02	19.94	10.67
Coating Core(epoxy)	33.83	19.30	11.61

Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.672cm^2	8.15cm	2.93cm^2	5.4768cm^3

Available Cores

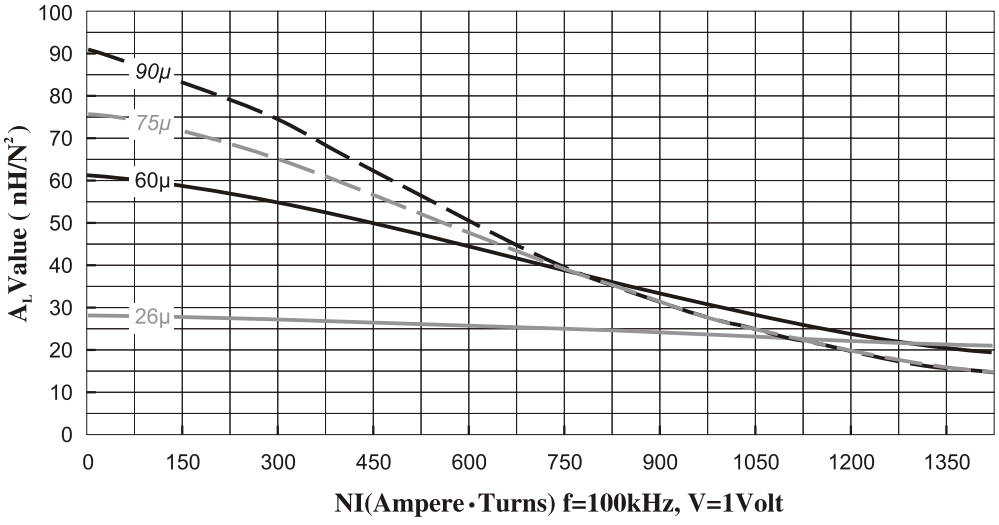
Part No.	A_L (nH/N^2)	Perm. (μ)
APT17P26	28	26
APT17P60	61	60
APT17P75	76	75
APT13P90	91	90

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	23	0.00517
13	0.1900	26	0.00722
14	0.1710	29	0.01000
15	0.1530	32	0.01400
16	0.1370	37	0.01970
17	0.1220	41	0.02740
18	0.1090	46	0.03840
19	0.0980	52	0.05380
20	0.0879	58	0.07500

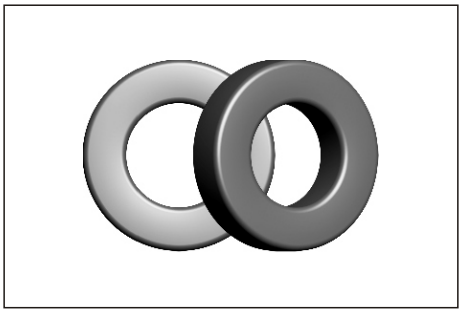
AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	66	0.1050
22	0.0701	74	0.1480
23	0.0632	82	0.2060
24	0.0566	92	0.2890
25	0.0505	103	0.4060
26	0.0452	115	0.5720
27	0.0409	128	0.7940
28	0.0366	143	1.1200
29	0.0330	159	1.5400

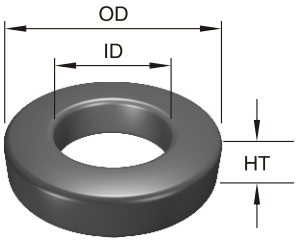
A_L vs NI Curve



AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 36PXX





Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	35.81	22.35	10.46
Coating Core(epoxy)	36.70	21.50	11.28

Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT36P26	24	26
APT36P60	56	60
APT36P75	70	75
APT36P90	84	90

Magnetic Dimensions

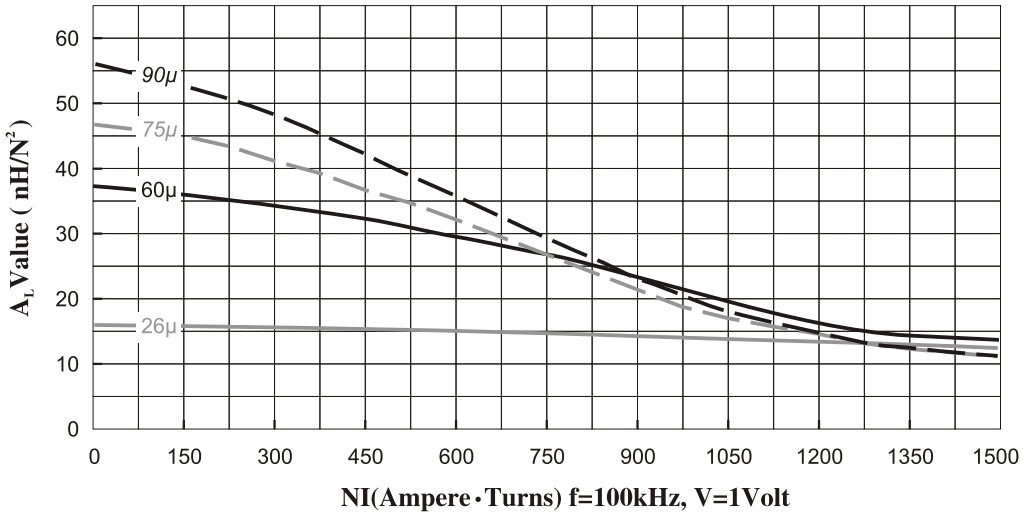
Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
0.678cm^2	8.98cm	3064cm^2	6.0884cm^3

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
12	0.2130	25	0.00579
13	0.1900	29	0.00809
14	0.1710	32	0.01120
15	0.1530	37	0.01570
16	0.1370	41	0.02200
17	0.1220	46	0.03060
18	0.1090	52	0.04290
19	0.0980	58	0.06000
20	0.0879	65	0.08370

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
21	0.0785	74	0.1170
22	0.0701	82	0.1660
23	0.0632	92	0.2290
24	0.0566	103	0.3220
25	0.0505	115	0.4520
26	0.0452	129	0.6370
27	0.0409	143	0.8850
28	0.0366	160	1.2500
29	0.0330	177	1.7100

A_L vs NI Curve



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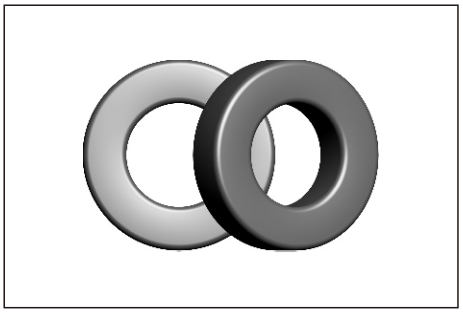
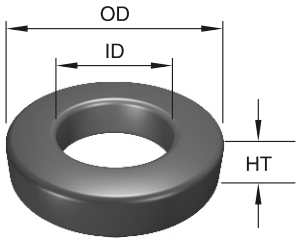


AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 40PXX



Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	39.88	24.13	14.48
Coating Core(epoxy)	40.70	23.30	15.37

Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
1.072cm^2	9.84cm	4.27cm^2	10.5485cm^3

Available Cores

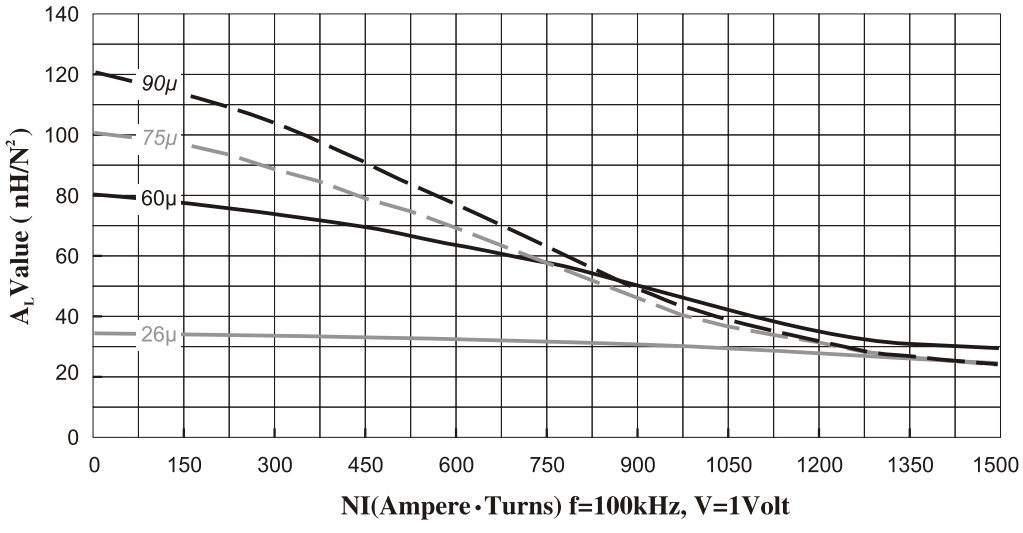
Part No.	A_L (nH/N^2)	Perm. (μ)
APT40P26	35	26
APT40P60	81	60
APT40P75	101	75
APT40P90	121	90

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
10	0.2670	22	0.00389
11	0.2380	25	0.00545
12	0.2130	28	0.00762
13	0.1900	31	0.01070
14	0.1710	35	0.01480
15	0.1530	40	0.02080
16	0.1370	45	0.02920
17	0.1220	50	0.04080
18	0.1090	57	0.05740

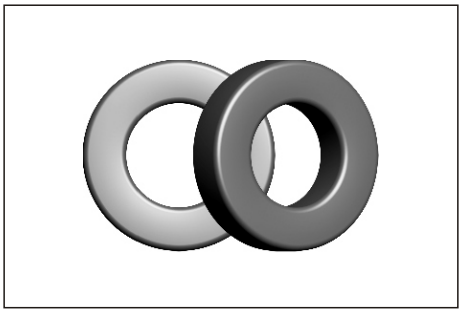
AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
19	0.0785	64	0.0804
20	0.0701	71	0.1120
21	0.0632	80	0.1580
22	0.0566	90	0.2230
23	0.0505	100	0.3090
24	0.0452	122	0.4350
25	0.0409	125	0.6110
26	0.0366	140	0.8620
27	0.0330	155	1.2000

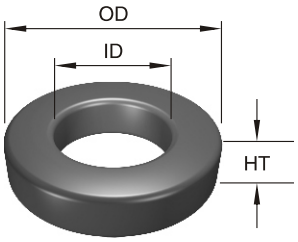
A_L vs NI Curve



AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 46PXX





Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	46.74	24.13	18.03
Coating Core(epoxy)	47.60	23.30	18.92

Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT46P26	59	26
APT46P60	135	60
APT46P75	169	75
APT46P90	202	90

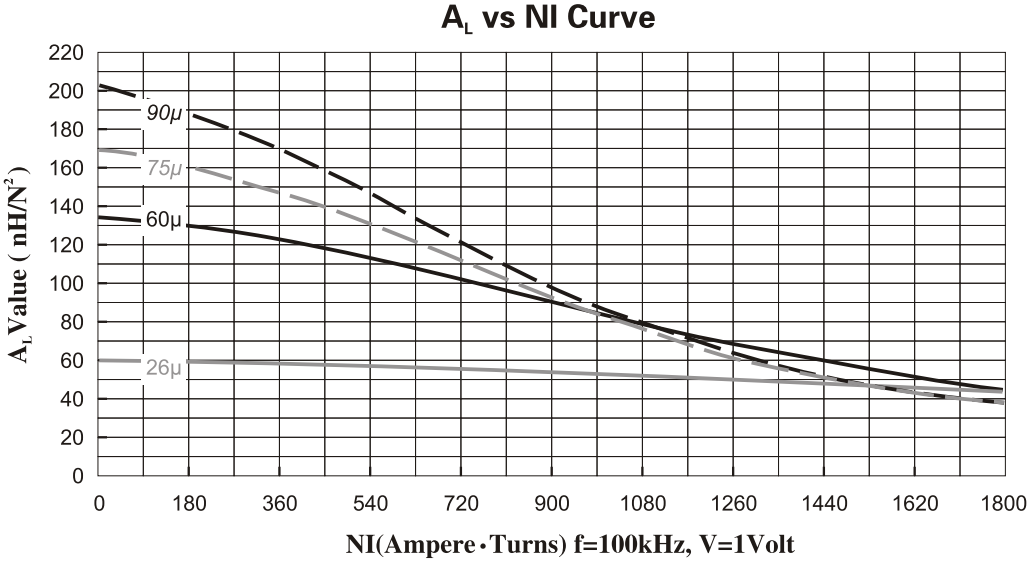
Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
1.990cm^2	10.74cm	4.27cm^2	21.373cm^3

Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
10	0.2670	22	0.0488
11	0.2380	25	0.0688
12	0.2130	28	0.0966
13	0.1900	31	0.0136
14	0.1710	35	0.0189
15	0.1530	40	0.0267
16	0.1370	45	0.0375
17	0.1220	50	0.0526
18	0.1090	57	0.0740

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
19	0.0785	64	0.1040
20	0.0701	71	0.1460
21	0.0632	80	0.2050
22	0.0566	90	0.2900
23	0.0505	100	0.1030
24	0.0452	112	0.5670
25	0.0409	125	0.7980
26	0.0366	140	1.1300
27	0.0330	155	1.5700



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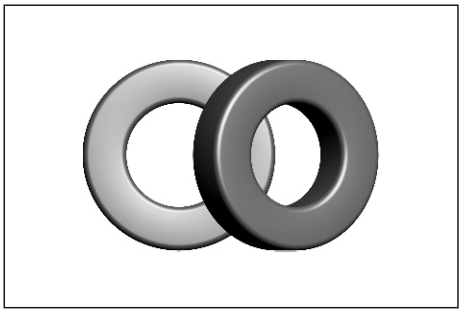
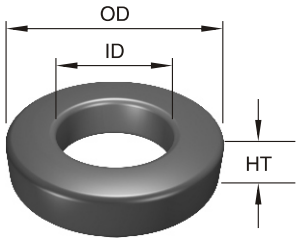


AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 47PXX



Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	46.74	28.70	15.24
Coating Core(epoxy)	47.60	27.90	16.13

Magnetic Dimensions

Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
1.34cm^2	11.63cm	6.11cm^2	15.584cm^3

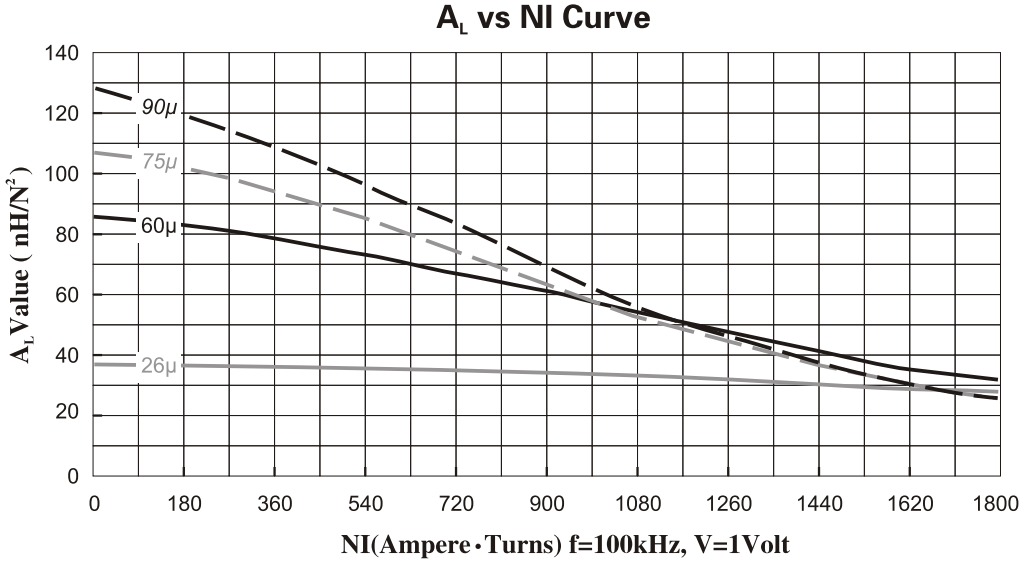
Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT47P26	37	26
APT47P60	86	60
APT47P75	107	75
APT47P90	128	90

Winding Information

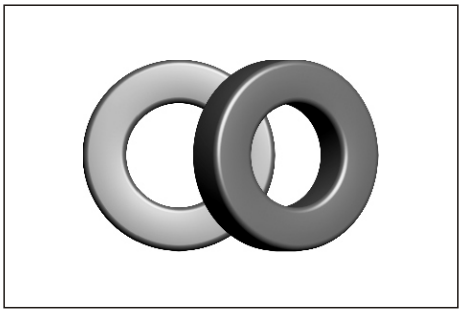
AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
10	0.2670	26	0.00505
11	0.2380	30	0.0708
12	0.2130	34	0.00990
13	0.1900	38	0.01390
15	0.1710	43	0.01930
15	0.1530	48	0.02700
16	0.1370	54	0.03800
17	0.1220	61	0.05300
18	0.1090	68	0.07450

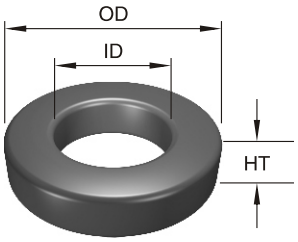
AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
19	0.0980	77	0.1040
20	0.0879	86	0.1460
21	0.0785	96	0.2050
22	0.0701	108	0.2900
23	0.0632	120	0.4020
24	0.0566	134	0.5650
25	0.0505	150	0.7950
26	0.0452	168	1.1200
27	0.0409	186	1.5600



AMORPHOUS POWDER CORE SERIES PRODUCTS

APT 50PXX





Core Dimensions

Cross Section	OD (max)	ID (min)	HT (max)
Bare Core(mm)	50.80	31.75	13.46
Coating Core(epoxy)	51.70	30.90	14.35

Available Cores

Part No.	A_L (nH/N^2)	Perm. (μ)
APT50P26	32	26
APT50P60	73	60
APT50P75	91	75
APT50P90	109	90

Magnetic Dimensions

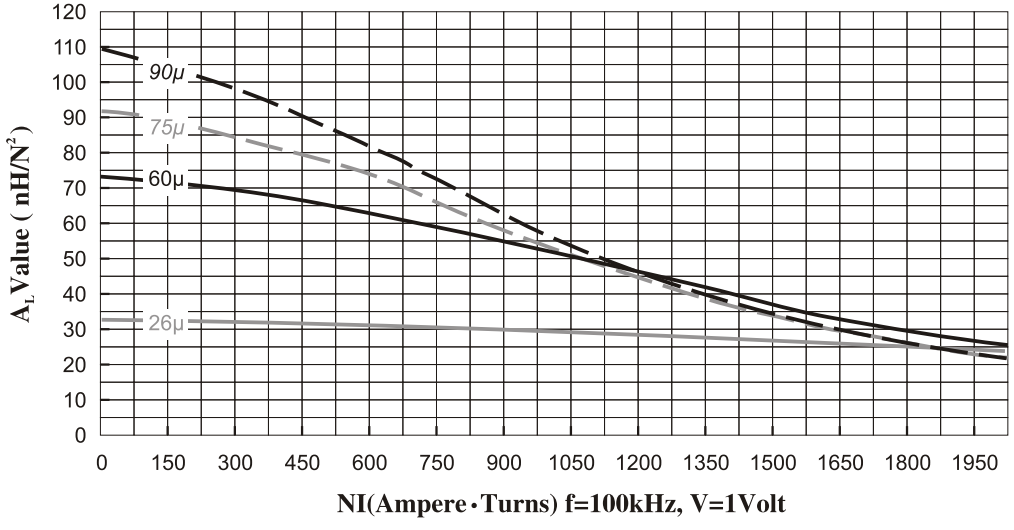
Cross Section (A)	Path Length (L)	Window Area (Wa)	Volume (V)
1.251cm^2	12.73cm	7.50cm^2	15.929cm^3

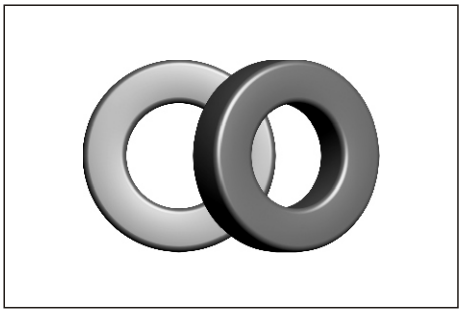
Winding Information

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
10	0.2670	30	0.00539
11	0.2380	33	0.00754
12	0.2130	38	0.01050
13	0.1900	43	0.01470
15	0.1710	48	0.02050
15	0.1530	54	0.02870
16	0.1370	60	0.04020
17	0.1220	68	0.05620
18	0.1090	76	0.07880

AWG No.	Wire Dia(cm)	Single Turns	Larger Rdc, Ω
19	0.0980	19	0.0980
20	0.0879	20	0.0879
21	0.0785	21	0.0785
22	0.0701	22	0.0701
23	0.0632	23	0.0632
24	0.0566	24	0.0566
25	0.0505	25	0.0505
26	0.0452	26	0.0452
27	0.0409	27	0.0409

A_L vs NI Curve





AMORPHOUS POWDER CORE SERIES PRODUCTS

APPENDIX

Unit and Conversions

cgs units	cgs units
$B=H+4\pi M$ B in gauss H in oersteds M in emu/cm³ μ_0(vacuum)=1	**$B=\mu_0 H+M$** B in webers/meter²(tesla) H in amperes/meter M in webers/meter² μ_0(vacuum)=$4\pi \times 10^{-7}$(weber/ampere meter)

cgs to mks	mks to cgs
B: 1 gauss=10^{-4} weber/meter² H: 1 oersted=79.58 amperes/meter M: 1 emu/cm³=12.57×10^{-4} weber/meter² Φ: 1 maxwell=10^{-8} weber	1 weber/meter²=10^{4} gauss 1 ampere/meter=12.57×10^{-3} Oe 1 weber/meter²=796 emu/cm³ 1 weber=10^{8}maxwells

Permeability(μ)

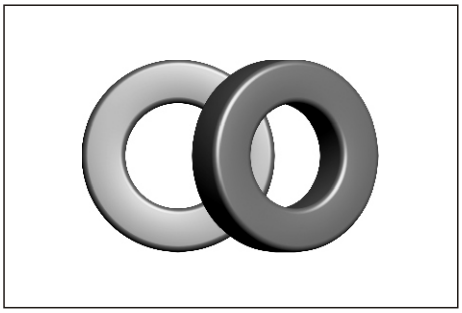
In magnetics, permeability is the ability of a material to conduct flux.
The magnetitude of the permeability at a given induction is a measure
of the ease with which a core material can be magnetized to that induction.
It is defined as the ratio of the flux density B to the magnetizing force H.

$$\mu = \frac{B}{H}$$

μ=permeability
B=flux density(gauss)
H=magnetizing force(oersteds)

AMORPHOUS POWDER CORE SERIES PRODUCTS

APPENDIX



Flux Density, B(Gauss; Tesla)

The corresponding parameter for the induced magnetic field in an area perpendicular to the flux path. Flux density is determined by the field strength permeability of the medium in which it is measured.
1T=10^4 Gauss

$$B_{\max} = \frac{E_{rms} \times 10^8}{4.44 f A N} \quad \textbf{: Faraday's Law}$$

B_{max}=maximum flux density(gauss)
E_{rms}=voltage across coil(volts)
f=frequency(hertz)
A=effective cross section area(cm^2)
N=number of turns

Magnetizing Force, H(Oe; A/m)

The magnetic field strength which produces magnetic flux. The mmf per unit length. H can be considered to be a measure of the strength or effort that the magnetomotive force applies to magnetic circuit to establish a magnetic field. H may be expressed as H=NI/l, where l is the mean length of the magnetic circuit in meters. 1 Oersted=79.58A/m

$$H = \frac{0.4\pi NI}{l} \quad \textbf{: Ampere's Law}$$

H= magnetizing force(oersteds)
N= number of turns
I = peak magnetizing current(amperes)
l *= mean magnetic path lenth(cm)*

Inductance of Wound core

The inductance of a wound core at a given number of turns is calculated using the following formula

$$L = \frac{0.4\pi\mu N^2 A \times 10^{-2}}{l}$$

$$L_N = A_L N^2 10^{-3}$$

L=inductance(μH)
μ=permeability
N=number of turns
A=effective cross section area(cm^2)
l *=mean magnetic path length(cm)*
L_N=Inductance at n turns(μH)
A_L=nominal Inductance(nH/N^2)

Core Loss

Power cores have low hysteresis loss, minimizing signal distortion, and low residual loss. The total core loss at low flux densities is the sum of hysteresis loss, residual loss, and eddy current loss. The core loss is calculated from the following Legg's equation.

$$\frac{R_{ac}}{\mu L} = aB_{max} f + cf + ef^2$$

R_{ac}/μL: Total loss factor
$aB_{max}f$: Hysteresis loss
cf: Residual loss
ef^2: Eddy current loss
R_{ac}= core loss resistance(ohms)
a= hysteresis loss coefficient
c= residual loss coffefficient
e= eddy current loss cofficient
μ= permeability
L= inductance(μH)
B_{max}= maximum flux density(gauss)
f= frequency(hertz)

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