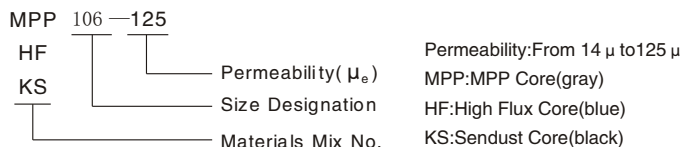


ALLOY POWDER CORE SERIES PRODUCTS

Toroidal Cores

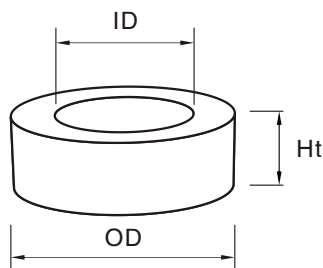
TYPICAL PART No.



STANDARD SPECIFICATIONS

Part No. MPP-XXX-XX HF-XXX-XX KS-XXX-XX	A_L nH/N ²	Dimensions (Bare)			Dimensions (Coated)			L cm	A cm ²	V cm ³
		OD mm	ID mm	HT mm	OD mm(Max)	ID mm(Min)	HT mm(Max)			
FA-141-26	24	35.80	22.40	10.50	36.63	21.54	11.28	0.678	6.088	3.640
141-35	33	35.80	22.40	10.50	36.63	21.54	11.28	0.678	6.088	3.640
141-60	56	35.80	22.40	10.50	36.63	21.54	11.28	0.678	6.088	3.640
141-75	70	35.80	22.40	10.50	36.63	21.54	11.28	0.678	6.088	3.640
141-90	84	35.80	22.40	10.50	36.63	21.54	11.28	0.678	6.088	3.640
141-125	117	35.80	22.40	10.50	36.63	21.54	11.28	0.678	6.088	3.640
157-26	35	39.90	24.10	14.50	40.72	23.30	15.37	9.840	1.072	10.500
157-35	48	39.90	24.10	14.50	40.72	23.30	15.37	9.840	1.072	10.500
157-60	81	39.90	24.10	14.50	40.72	23.30	15.37	9.840	1.072	10.500
157-75	101	39.90	24.10	14.50	40.72	23.30	15.37	9.840	1.072	10.500
157-90	121	39.90	24.10	14.50	40.72	23.30	15.37	9.840	1.072	10.500
157-125	168	39.90	24.10	14.50	40.72	23.30	15.37	9.840	1.072	10.500
168-26	47	42.90	24.20	16.26	44.00	23.30	17.16	10.261	1.475	15.741
168-35	63	42.90	24.20	16.26	44.00	23.30	17.16	10.261	1.475	15.741
168-60	108	42.90	24.20	16.26	44.00	23.30	17.16	10.261	1.475	15.741
168-75	135	42.90	24.20	16.26	44.00	23.30	17.16	10.261	1.475	15.741
168-90	161	42.90	24.20	16.26	44.00	23.30	17.16	10.261	1.475	15.741
168-125	224	42.90	24.20	16.26	44.00	23.30	17.16	10.261	1.475	15.741
184-26	59	46.70	24.10	18.00	47.63	23.32	18.92	10.740	1.990	21.300
184-35	80	46.70	24.10	18.00	47.63	23.32	18.92	10.740	1.990	21.300
184-60	135	46.70	24.10	18.00	47.63	23.32	18.92	10.740	1.990	21.300
184-75	169	46.70	24.10	18.00	47.63	23.32	18.92	10.740	1.990	21.300
184-90	202	46.70	24.10	18.00	47.63	23.32	18.92	10.740	1.990	21.300
184-125	281	46.70	24.10	18.00	47.63	23.32	18.92	10.740	1.990	21.300

TECHNICAL INFORMATION & PHYSICAL CHARACTERISTICS



L_e : Mean Magnetic Path length

A_e : Cross Section Area

V_e : Core Volume

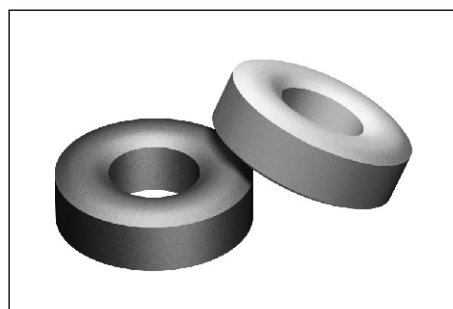
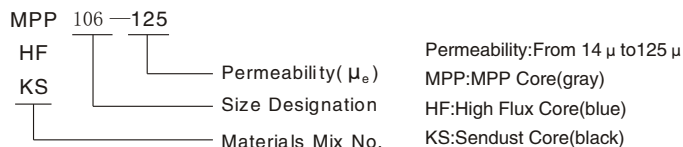
Operating temperature range: $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$

A_L Test condition: 10kHz, 1mT

ALLOY POWDER CORE SERIES PRODUCTS

Toroidal Cores

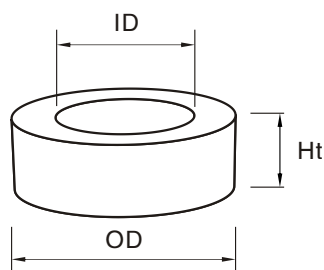
TYPICAL PART No.



STANDARD SPECIFICATIONS

Part No. MPP-XXX-XX HF-XXX-XX KS-XXX-XX	A_L nH/N ²	Dimensions (Bare)			Dimensions (Coated)			L cm	A cm ²	V cm ³
		OD mm	ID mm	HT mm	OD mm(Max)	ID mm(Min)	HT mm(Max)			
185-26	37	46.70	28.70	15.20	47.63	27.89	16.13	11.630	1.340	15.580
185-35	50	46.70	28.70	15.20	47.63	27.89	16.13	11.630	1.340	15.580
185-60	86	46.70	28.70	15.20	47.63	27.89	16.13	11.630	1.340	15.580
185-75	107	46.70	28.70	15.20	47.63	27.89	16.13	11.630	1.340	15.580
185-90	128	46.70	28.70	15.20	47.63	27.89	16.13	11.630	1.340	15.580
185-125	178	46.70	28.70	15.20	47.63	27.89	16.13	11.630	1.340	15.580
200-26	32	50.80	31.80	13.50	51.69	30.94	14.35	12.730	1.251	15.930
200-35	43	50.80	31.80	13.50	51.69	30.94	14.35	12.730	1.251	15.930
200-60	73	50.80	31.80	13.50	51.69	30.94	14.35	12.730	1.251	15.930
200-75	91	50.80	31.80	13.50	51.69	30.94	14.35	12.730	1.251	15.930
200-90	109	50.80	31.80	13.50	51.69	30.94	14.35	12.730	1.251	15.930
200-125	152	50.80	31.80	13.50	51.69	30.94	14.35	12.730	1.251	15.930
225-26	33	57.20	35.60	14.00	58.00	34.70	14.86	14.300	1.444	20.650
225-35	44	57.20	35.60	14.00	58.00	34.70	14.86	14.300	1.444	20.650
225-60	75	57.20	35.60	14.00	58.00	34.70	14.86	14.300	1.444	20.650
225-75	94	57.20	35.60	14.00	58.00	34.70	14.86	14.300	1.444	20.650
225-90	112	57.20	35.60	14.00	58.00	34.70	14.86	14.300	1.444	20.650
225-125	156	57.20	35.60	14.00	58.00	34.70	14.86	14.300	1.444	20.650
226-26	60	57.20	26.40	15.20	58.00	25.60	16.10	12.500	2.290	28.600
226-35	81	57.20	26.40	15.20	58.00	25.60	16.10	12.500	2.290	28.600
226-60	138	57.20	26.40	15.20	58.00	25.60	16.10	12.500	2.290	28.600
226-75	172	57.20	26.40	15.20	58.00	25.60	16.10	12.500	2.290	28.600
226-90	207	57.20	26.40	15.20	58.00	25.60	16.10	12.500	2.290	28.600
226-125	287	57.20	26.40	15.20	58.00	25.60	16.10	12.500	2.290	28.600

TECHNICAL INFORMATION & PHYSICAL CHARACTERISTICS



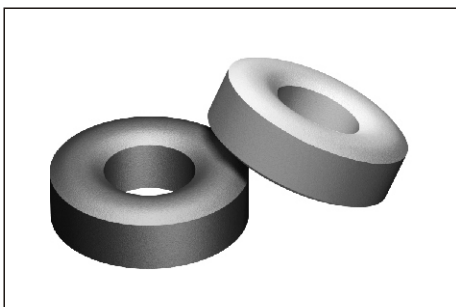
L_e : Mean Magnetic Path length

A_e : Cross Section Area

V_e : Core Volume

Operating temperature range: $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$

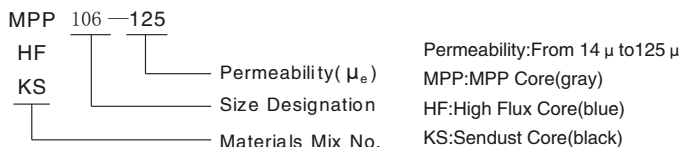
A_L Test condition: 10kHz, 1mT



ALLOY POWDER CORE SERIES PRODUCTS

Toroidal Cores

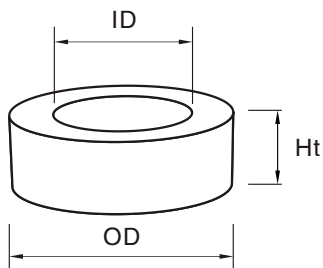
TYPICAL PART No.



STANDARD SPECIFICATIONS

Part No. MPP-XXX-XX HF-XXX-XX KS-XXX-XX	A_L nH/N ²	Dimensions (Bare)			Dimensions (Coated)			L cm	A cm ²	V cm ³
		OD mm	ID mm	HT mm	OD mm(Max)	ID mm(Min)	HT mm(Max)			
300-26	30	77.80	49.20	12.70	78.90	48.20	13.84	20.00	1.770	34.700
300-60	68	77.80	49.20	12.70	78.90	48.20	13.84	20.00	1.770	34.700
300-75	85	77.80	49.20	12.70	78.90	48.20	13.84	20.00	1.770	34.700
300-90	102	77.80	49.20	12.70	78.90	48.20	13.84	20.00	1.770	34.700
300-125	142	77.80	49.20	12.70	78.90	48.20	13.84	20.00	1.770	34.700
301-26	37	77.80	49.20	15.90	78.90	48.20	17.02	19.950	2.270	45.300
301-60	85	77.80	49.20	15.90	78.90	48.20	17.02	19.950	2.270	45.300
301-75	107	77.80	49.20	15.90	78.90	48.20	17.02	19.950	2.270	45.300
301-90	128	77.80	49.20	15.90	78.90	48.20	17.02	19.950	2.270	45.300
301-125	178	77.80	49.20	15.90	78.90	48.20	17.02	19.950	2.270	45.300

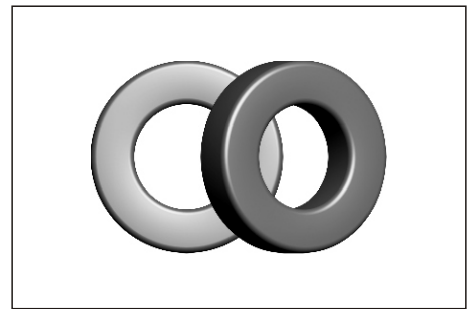
TECHNICAL INFORMATION & PHYSICAL CHARACTERISTICS



L_e : Mean Magnetic Path length
 A_e : Cross Section Area
 V_e : Core Volume
 Operating temperature range: $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$
 A_L Test condition: 10kHz, 1mT

AMORPHOUS POWDER CORE SERIES PRODUCTS

INTRODUCTION

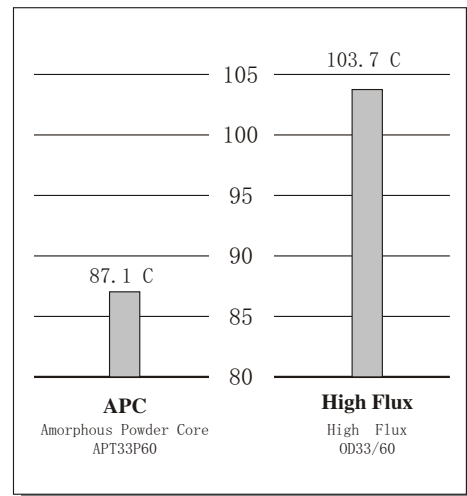
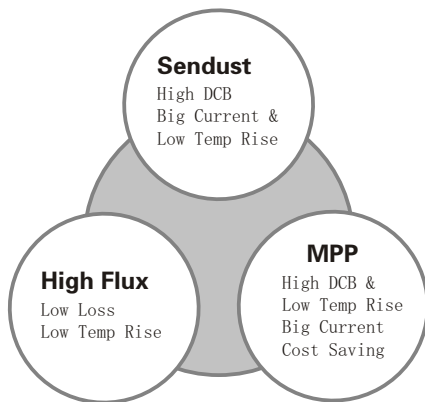


Amorphous Powder Core come into world with its utmost superior qualities
 SHINHOM proudly introduce Amorphous Powder Cores to customers.

Example of Field Test

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

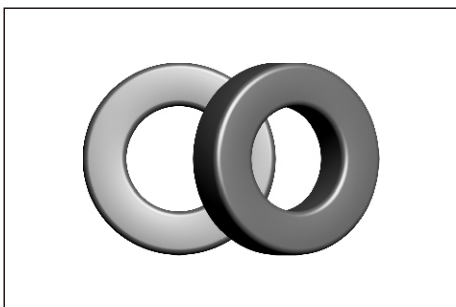
Benefit of Advanced Powder Core



Material Property Comparison

Property	Amorphous powder Core	High Flux	MPP	Sendust KoolM	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/cm) @100kHz, 0.1T	600	13,000~18,000	500~1,500	850~1,200	1,300~1,800	Dep. Gap
% Ldc @1000e (60)	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.

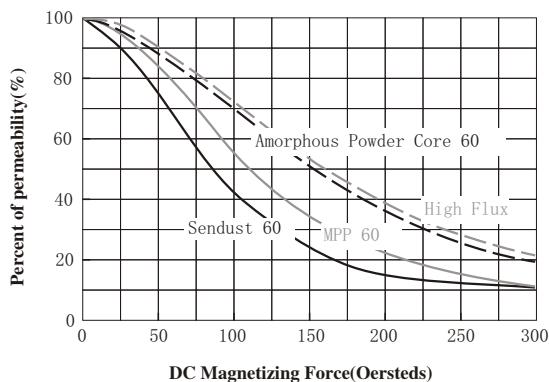
Innovative Benefit

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

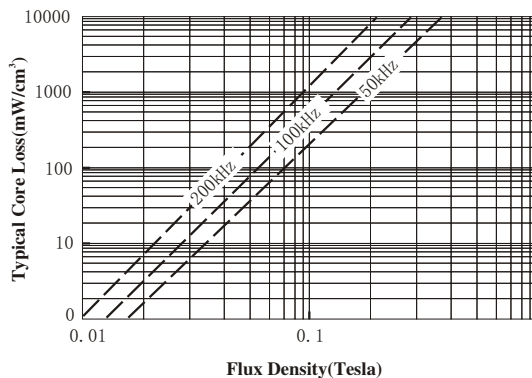
Application

- 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

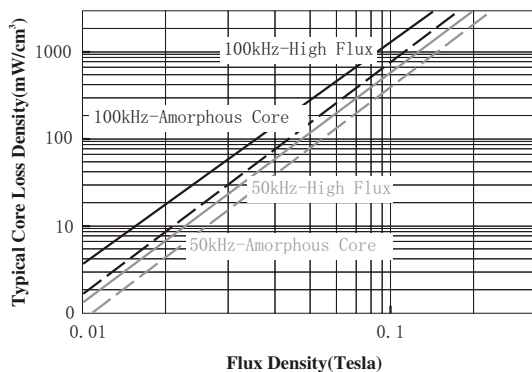
Comparison with HF, MPP and Sendust Material on DCB



Core Loss Density of APT

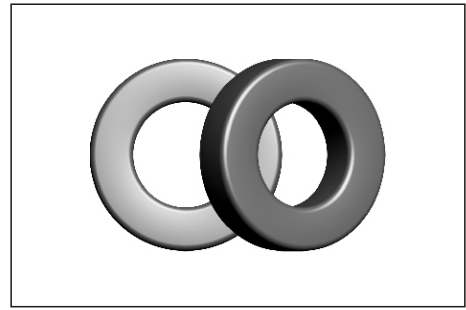


Typical Core Loss Density Comparysion with High Flux

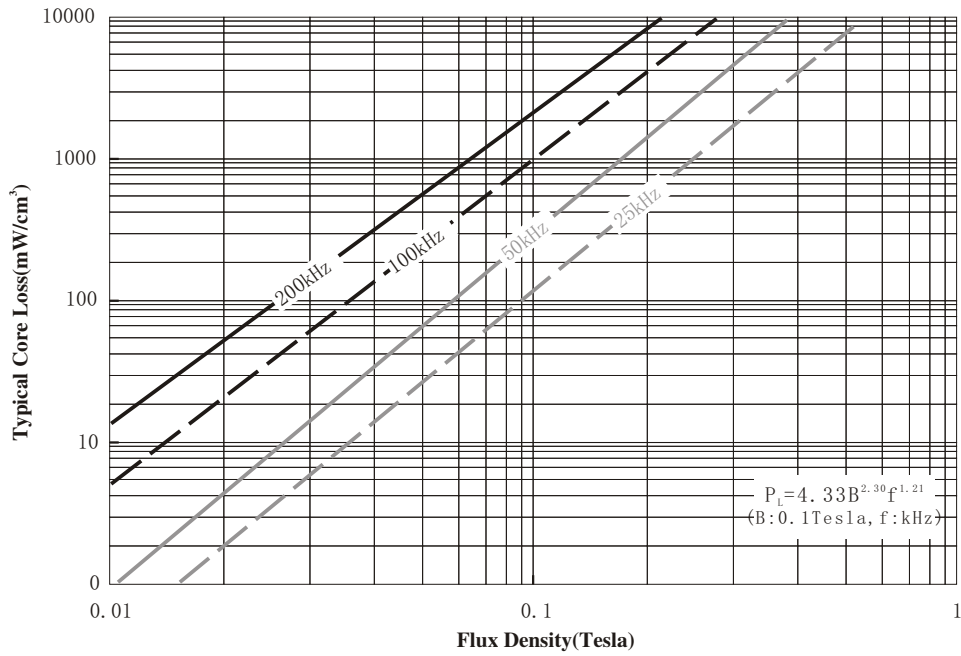


AMORPHOUS POWDER CORE SERIES PRODUCTS

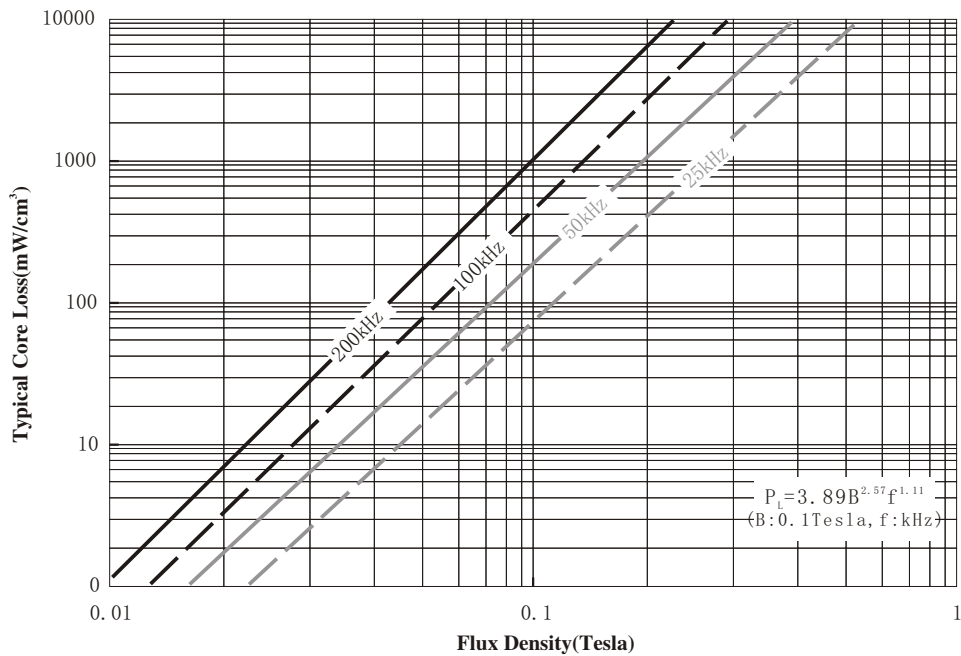
PROPERTIES OF APT

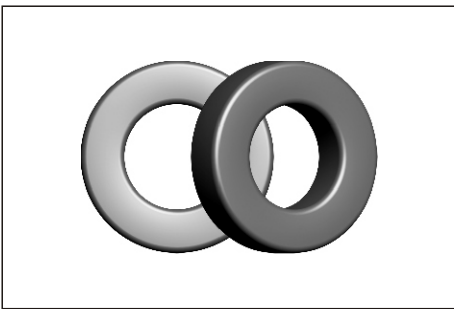


Core Loss Density Curves, 26 μ



Core Loss Density Curves, 60~90 μ

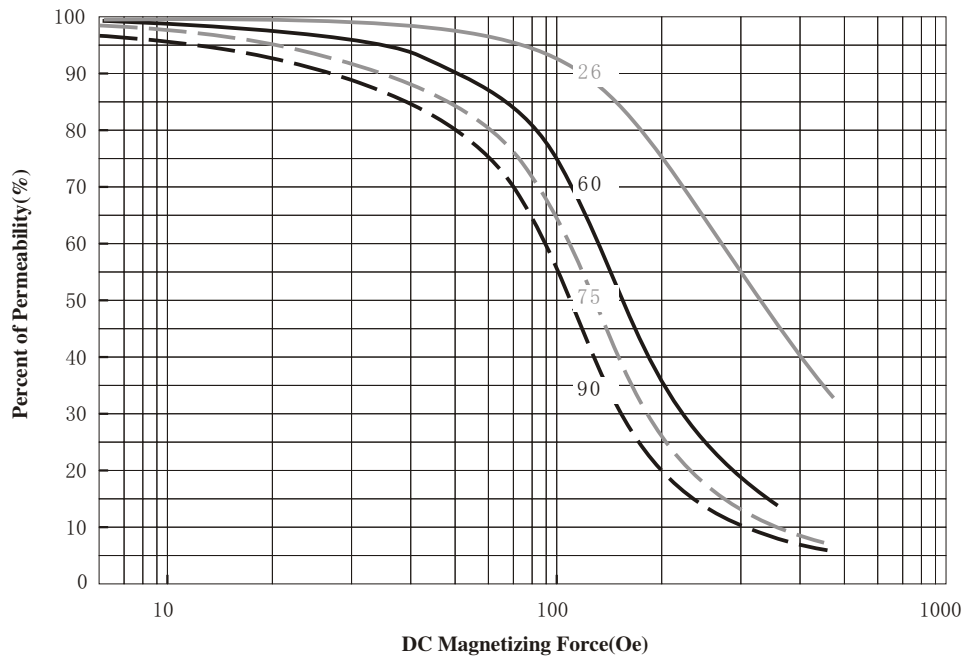




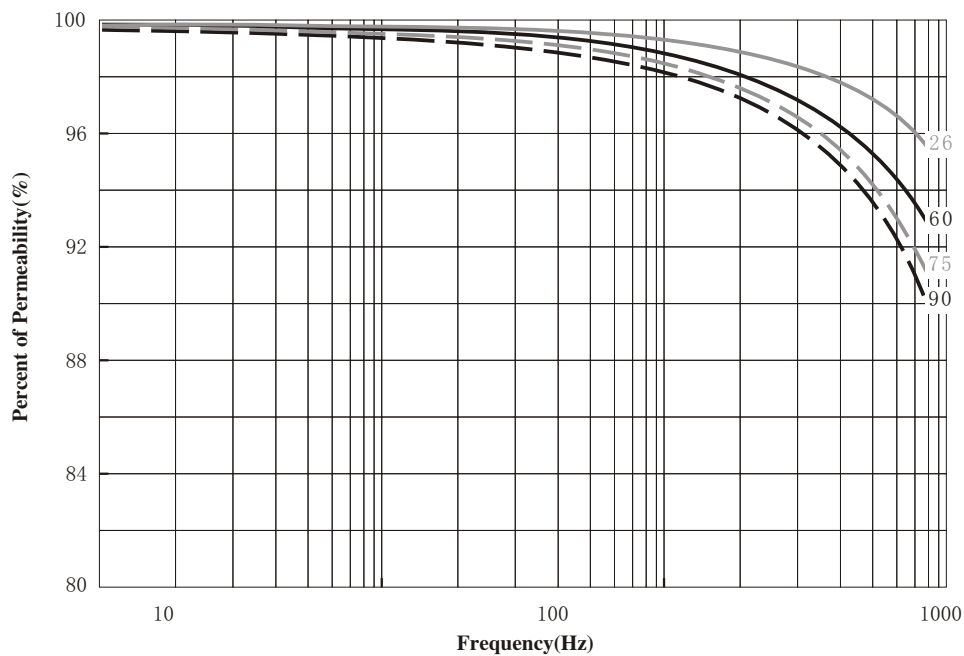
AMORPHOUS POWDER CORE SERIES PRODUCTS

PROPERTIES OF APT

Core Loss Density Curves, 26 μ

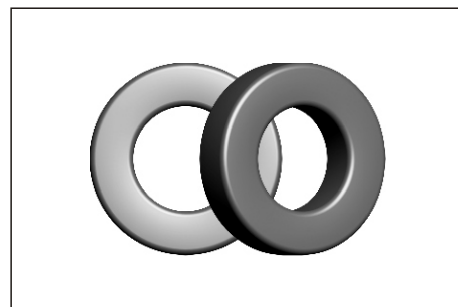


Core Loss Density Curves, 60~90 μ



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.

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

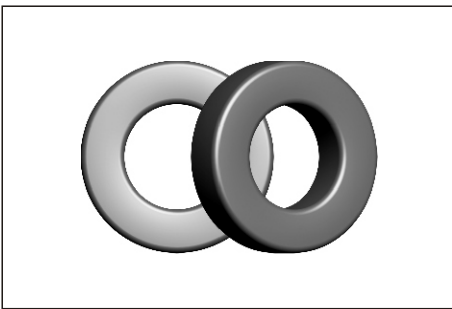
Value	a	b	c	d
26	-7.24×10^{-5}	-2.31×10^{-9}	-5.21×10^{-5}	-1.50×10^{-8}
60	-3.30×10^{-5}	-2.22×10^{-10}	-1.20×10^{-5}	-1.22×10^{-8}
75	-3.46×10^{-5}	-4.28×10^{-11}	-1.70×10^{-5}	-2.40×10^{-8}
90	-3.18×10^{-5}	-7.58×10^{-11}	-1.35×10^{-5}	-1.50×10^{-8}

Replacement Concept



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 Efficiency
- Smaller in Size (Save PCB Size)
- Smallest Temperature Rise among Powdered Core

Material Information

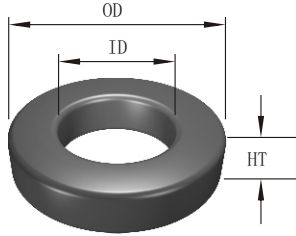
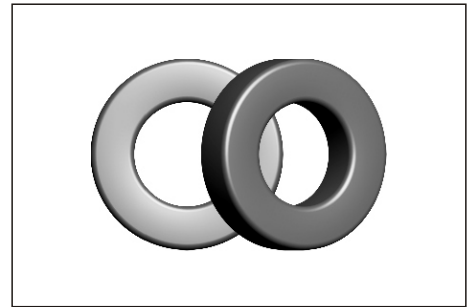
Properties	APT	MPP	High Flux	Sendust	Ferrite
Saturation Flux Density Bs(G)	15,000	7,500	15,000	10,000	3,000
DC Bias Property @ 100Oe	70%	50%	70%	45%	Gap dep
Core Loss @ 100kHz, 0.1T	600	500	1,300	850	Gap dep

Specification of APT Series

APT	Size(Bare) (OD × ID × HT)	Size(Coated) (OD × ID × HT)	A_L (nH/N ²)	A_c (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

