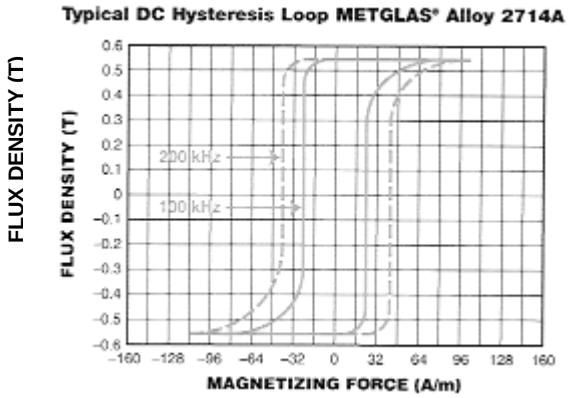
Square Loop Cores manufactured with cobalt-based METGLAS® amorphous alloy 2714A allow the design of mag amps that can operate at higher frequencies than previously possible. Their combination of magnetic properties enable magnetic amplifiers to provide unparalleled precision and efficiency in output regulation.

Mag amps are particularly well suited for outputs with currents of 1 amp to several tens of amps, although they are also used at lower currents where tight regulation and efficiency are extremely important.

Conventional regulated outputs are limited at higher frequencies and output currents. Linear regulators cannot handle output currents that exceed one or two amperes efficiently, and thus require heat sinking
schemes, which increase the size of the power supply. Independent switched-mode sub-regulators avoid this inefficiency, but usually require circuitry which is more complex, expensive and less reliable than a mag amp.

Standard sizes are available from 9.6 mm to 34.1 mm OD and the possibility of manufacturing custom sizes also exists. Core coatings meeting UL94V-0 and temperature class F are available upon request.

Typical DC Hysteresis Loop METGLAS Alloy 2714A



METGLAS® Square Loop magnetic cores are specifically designed to exhibit an extremely square dc Hysteresis loop and high BSAT resulting in the following important benefits:

- Low saturated permeability
- Low coercive field – *indicating a small reset current*
- Low profile – *enabling weight and volume reduction of up to 50%*
- Low loss – *resulting from micro-thin METGLAS® ribbon (18μm)*

Physical Properties METGLAS® Alloy 2714A

Ribbon Thickness (μm)	18
Density (g/cm^3)	7.59
Thermal Expansion (ppm/°C)	12.7
Crystallization Temperature (°C)	560
Curie Temperature (°C)	225
Continuous Service Temperature (°C)	<120
Tensile Strength (MN/m^2)	1k-1.7k
Elastic Modulus (GN/m^2)	100-110
Vicker's Hardness (50g load)	960

Magnetic Properties METGLAS® Square Loop Cores

Saturation Flux Density (Tesla)	0.57
Saturation Magnetostriction (ppm)	<<1
Electrical Resistivity (μ-Ω-cm)	142
Squareness Ratio (%)	>95

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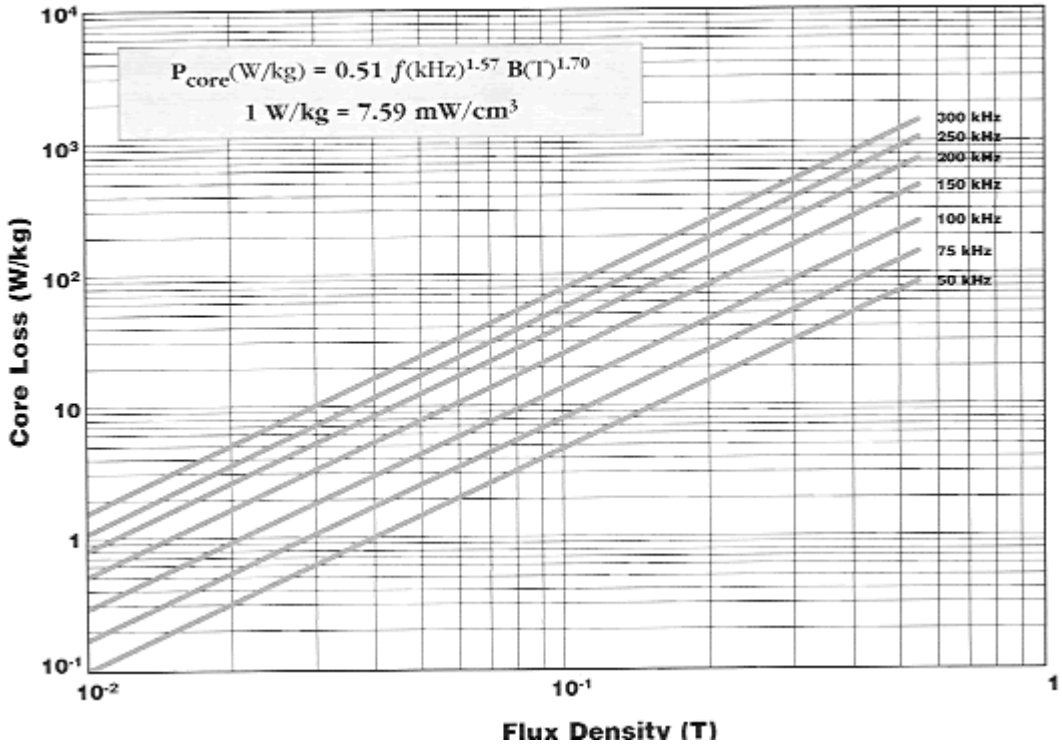
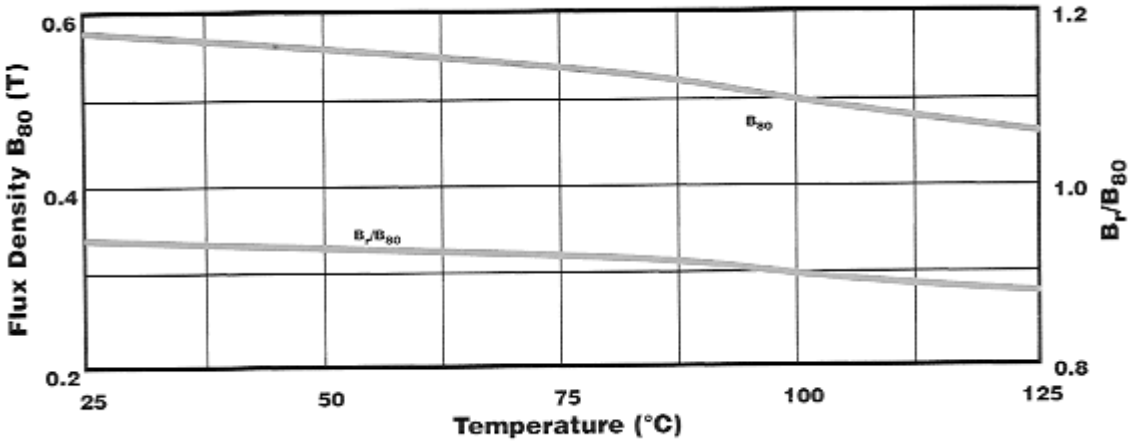
Core Loss vs. Flux Density† @ 25°C



B_{80}, B_r/B_{80} vs. Temperature§



§ B_{80} – Flux Density @ 80 A/m

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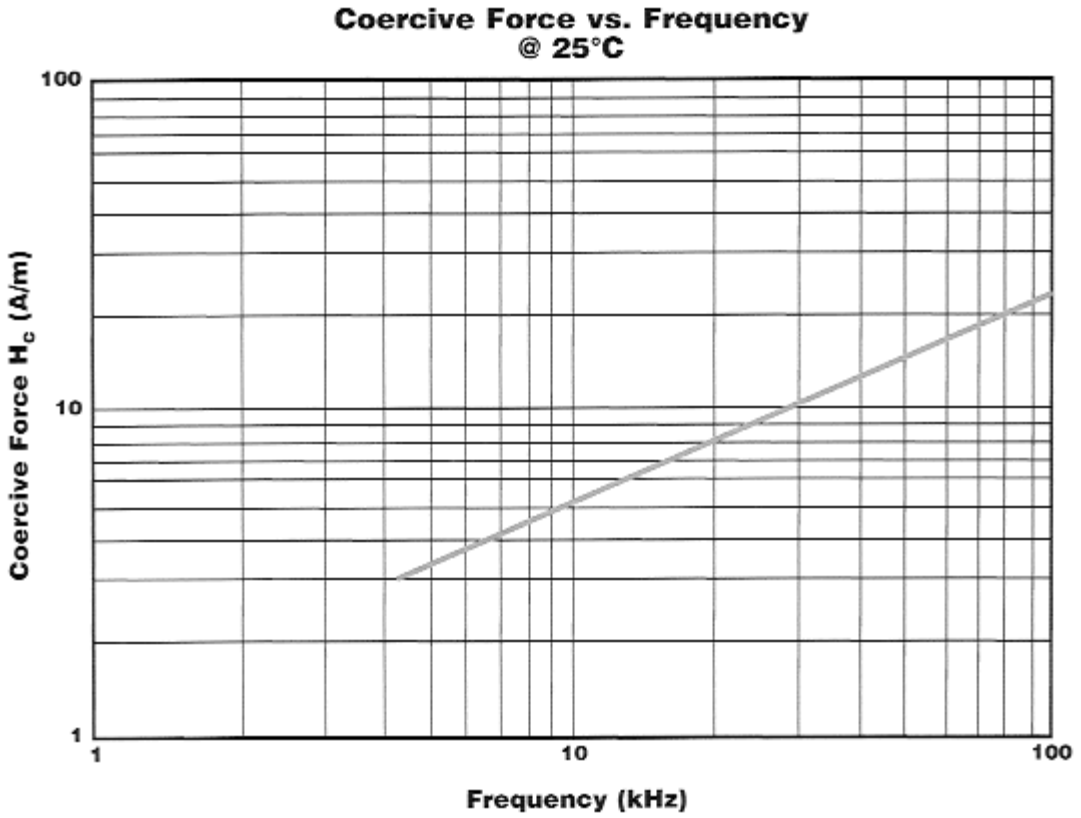

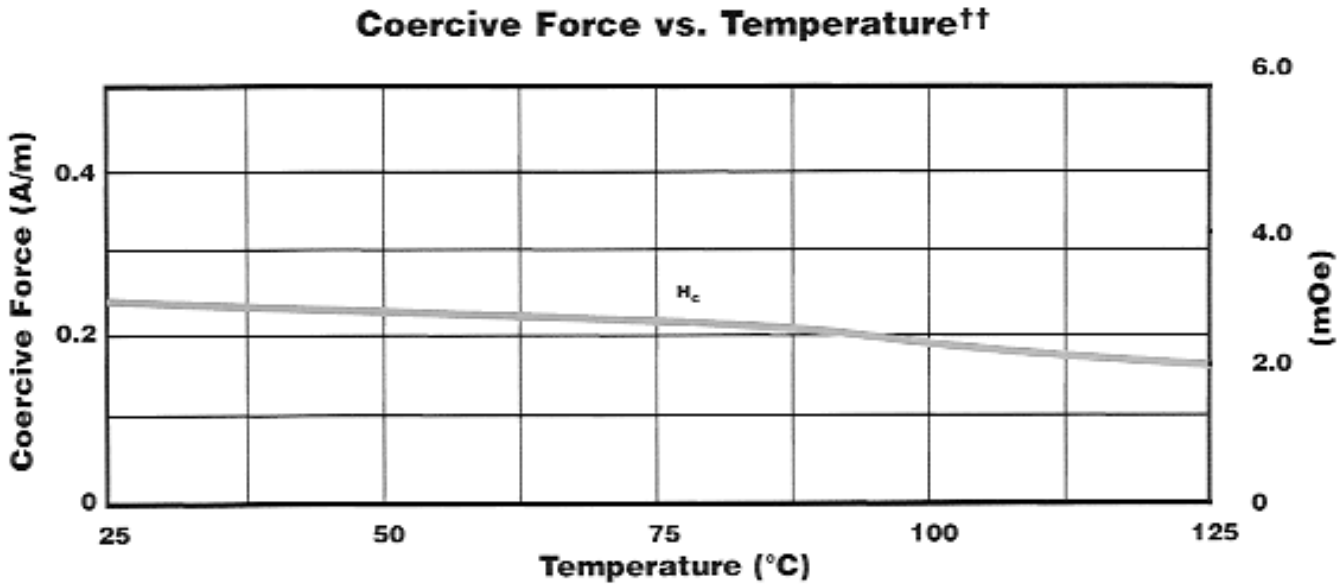

†† 1 Oe = 79.6 A/m

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MAGAMP COATED CORES	COATED CORE DIMENSIONS WITH OVALITY			CALCULATED SPECIFICATIONS				BARE CORE	MAGNETIC SPECIFICATIONS	TEST SPECIFICATIONS
Core Type	OD (mm)	ID (mm)	Ht (mm)	Lm^{α} (cm)	Ac^{β} (cm^2)	Wa^{γ} (cm^2)	$WaAc^{x}$ (cm^4)	Mass (g)	Bsat (T)	Squareness Ratio @ 5kHz / 0.5Oe, 4 Turns (Br/Bm)
	(max)	(min)	(max)	(nom)	(nom)	(nom)	(nom)	(nom)	(nom)	(min)
MP1005M4AS	11.37	5.91	6.12	2.59	0.06	0.27	0.02	1.20	0.57	84%
MP1105M4AS	12.50	8.76	6.29	3.24	0.03	0.60	0.02	0.77	0.57	84%
MP1205M4AS	13.30	7.77	6.29	3.14	0.06	0.47	0.03	1.39	0.57	84%
MP1303M4AS	14.32	8.76	4.70	3.50	0.04	0.60	0.02	1.12	0.57	84%
MP1305M4AS	14.07	8.76	6.29	3.46	0.06	0.60	0.03	1.53	0.57	84%
MP1405M4AS	15.54	8.76	6.29	3.67	0.08	0.60	0.05	2.35	0.57	84%
MP1505M4AS	16.87	8.76	6.29	3.87	0.11	0.60	0.06	3.17	0.57	84%
MP1506M4AS	16.80	8.76	7.87	3.86	0.14	0.60	0.08	4.18	0.57	84%
MP1603M4AS	17.58	11.86	4.70	4.50	0.04	1.10	0.05	1.43	0.57	84%
MP1705M4AS	18.75	11.86	6.29	4.66	0.08	1.10	0.09	2.95	0.57	84%
MP1706M4AS	18.73	11.86	7.87	4.68	0.11	1.10	0.12	4.07	0.57	84%
MP1805M4AS	20.25	11.86	6.29	4.88	0.11	1.10	0.12	4.10	0.57	84%
MP1903M4AS	21.24	11.86	4.70	5.00	0.08	1.10	0.09	3.17	0.57	84%
MP1905M4AS	20.29	11.86	6.29	4.92	0.11	1.10	0.12	4.29	0.57	84%
MP1906M4AS	20.97	11.86	7.87	4.99	0.16	1.10	0.18	6.23	0.57	84%
MP2006M4AS	21.81	14.33	7.87	5.54	0.12	1.61	0.20	5.20	0.57	84%
MP2008M4AS	21.86	11.86	9.91	5.15	0.25	1.10	0.27	9.88	0.57	84%
MP2208M4AS	23.69	15.57	9.91	6.01	0.18	1.90	0.33	8.16	0.57	84%
MP2303M4AS	24.91	15.57	4.70	6.19	0.08	1.90	0.15	3.88	0.57	84%
MP2306M4AS	25.13	15.57	7.87	6.23	0.17	1.90	0.32	8.16	0.57	84%
MP2410M4AS	26.30	18.05	11.05	6.83	0.21	2.56	0.53	10.91	0.57	84%
MP2505M4AS	27.43	18.05	6.29	7.01	0.12	2.56	0.32	6.75	0.57	84%
MP2510M4AS	27.47	18.05	11.05	7.01	0.25	2.56	0.64	13.50	0.57	84%
MP2705M4AS	29.10	15.57	6.29	6.89	0.21	1.90	0.39	11.03	0.57	84%
MP3005M4AS	32.01	18.05	6.29	7.69	0.21	2.56	0.53	12.30	0.57	84%
MP3210M4AS	34.72	21.14	11.05	8.58	0.39	3.51	1.36	25.78	0.57	84%
MP3506M4AS	37.43	24.24	7.87	9.52	0.25	4.61	1.15	18.35	0.57	84%

* α = Mean magnetic path length, β = Net Cross-sectional area, γ = Core Window area and x = Area product.
* All measurements are done at Room Temperature (22°C to 28°C)
* Continuous Operating Temperature : 90°C (max.).
* Ovality of 5% on outer and inner diameter is permissible.
* Powder coated core, minimum coating thickness of 0.076 mm (3 mils) is maintained on core surface.
* Powder Coating Material:-DuPont (EFB534S0) / Manufacturer UL File # E206123.

FM No. EG/FM/0023 Rev. No.: 0 Date: 12/May/15

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MAGAMP BOXED CORES	BOXED CORE DIMENSIONS			CALCULATED SPECIFICATIONS				BARE CORE	MAGNETIC SPECIFICATIONS	TEST SPECIFICATIONS	
Core Type (X)	OD (mm)	ID (mm)	Ht (mm)	Lm^{α} (cm)	Ac^{β} (cm^2)	Wa^{γ} (cm^2)	$WaAc^{x}$ (cm^4)	Mass (g)	Bsat (T)	Squareness Ratio @ 5kHz / 0.5Oe, 4 Turns (Br/Bm)	
	(max)	(min)	(max)	(nom)	(nom)	(nom)	(nom)	(nom)	(nom)	(min) AS	(min) AH
MP1005X4AS	11.20	5.30	6.00	2.59	0.06	0.25	0.01	1.20	0.57	86%	-
MP1205X4AS	14.10	6.50	6.90	3.14	0.06	0.36	0.02	1.39	0.57	86%	-
MP1303X4AS	15.00	7.60	5.40	3.50	0.04	0.49	0.02	1.12	0.57	86%	-
MP1305X4AS	14.70	7.60	7.00	3.46	0.06	0.49	0.03	1.53	0.57	86%	-
MP1405X4AS	16.10	7.60	7.00	3.67	0.08	0.49	0.04	2.35	0.57	86%	-
MP1506X4AS / AH	17.40	7.50	8.60	3.86	0.14	0.48	0.07	4.18	0.57	86%	92%
MP1603X4AS	18.10	10.70	5.40	4.50	0.04	0.95	0.04	1.43	0.57	86%	-
MP1805X4AS	21.10	10.50	7.10	4.88	0.11	0.92	0.10	4.10	0.57	86%	-
MP1903X4AS	21.50	10.70	5.40	5.00	0.08	0.95	0.08	3.17	0.57	86%	-
MP1906X4AS / AH	21.50	10.70	8.60	4.99	0.16	0.95	0.15	6.23	0.57	86%	92%
MP2008X4AS / AH	22.50	10.70	10.70	5.15	0.25	0.95	0.24	9.88	0.57	86%	92%
MP2303X4AS	25.20	14.60	5.40	6.19	0.08	1.74	0.14	3.88	0.57	86%	-
MP2410X4AS / AH	28.10	17.00	11.80	6.83	0.21	2.35	0.48	10.91	0.57	86%	92%
MP2510X4AS / AH	28.10	17.00	11.80	7.01	0.25	2.35	0.58	13.50	0.57	86%	92%
MP2705X4AS / AH	29.80	14.50	7.00	6.89	0.21	1.72	0.36	11.03	0.57	86%	92%
MP3210X4AS / AH	35.30	19.60	11.80	8.58	0.39	3.11	1.21	25.78	0.57	86%	92%

* α = Mean magnetic path length, β = Net Cross-sectional area, γ = Core Window area and x = Area product.

* All measurements are done at Room Temperature (22°C to 28°C)

* Continuous Operating Temperature :90°C max. (Irrespective of type of box used).

	BOX DESIGNATION (X)	MATERIAL DuPont	MANUFACTURER UL FILE #	MANUFACTURER FLAMMABILITY RATING
BOX MATERIAL	P	ZYTEL 70G33L	E41938	HB
	L	ZYTEL FR50	E41938	94 V0
	V	RYNITE FR530L	E69578	94 V0

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