

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 <sup>3</sup> ) . . . . .	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 <sup>2</sup> ) . . . . .	1k-1.7k
Elastic Modulus (GN/m <sup>2</sup> ) . . . . .	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

**Core Loss vs. Flux Density†  
@ 25°C**



**B<sub>80</sub>, B<sub>r</sub>/B<sub>80</sub> vs. Temperature§**



† B<sub>80</sub> - Flux Density @ 80 A/m

**Coercive Force vs. Frequency  
@ 25°C**



**Coercive Force vs. Temperature††**



†† 1 Oe = 79.6 A/m

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 <sup>2</sup> (cm)	Ac <sup>2</sup> (cm <sup>2</sup> )	Wa <sup>2</sup> (cm <sup>2</sup> )	WaAc <sup>4</sup> (cm <sup>4</sup> )	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%	

\*  $\alpha$  = Mean magnetic path length,  $\beta$  = Net Cross-sectional area,  $\gamma$  = 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

MAGAMP BOXED CORES	BOXED CORE DIMENSIONS			CALCULATED SPECIFICATIONS				BARE CORE	MAGNETIC SPECIFICATIONS	TEST SPECIFICATIONS				
	Core Type (X)	OD (mm)	ID (mm)	Ht (mm)	$Lm^\alpha$ (cm)	$Ac^\beta$ (cm <sup>2</sup> )	$Wa^\gamma$ (cm <sup>2</sup> )			$WaAc^x$ (cm <sup>4</sup> )	Mass (g)	Bsat (T)	Squareness Ratio @ 5kHz / 0.5Oe, 4 Turns (Br/Bm)	
		(max)	(min)	(max)	(nom)	(nom)	(nom)			(nom)			(nom)	(nom)
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%			

\*  $\alpha$  = Mean magnetic path length,  $\beta$  = Net Cross-sectional area,  $\gamma$  = 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 MATERIAL	BOX DESIGNATION (X)	MATERIAL DuPont	MANUFACTURER UL FILE #	MANUFACTURER FLAMMABILITY RATING
	P	ZYTEL 70G33L	E41938	HB
	L	ZYTEL FR50	E41938	94 V0
	V	RYNITE FR530L	E69578	94 V0



**Contact Information:**

---

**AMERICAS**

**Hitachi Metals America LLC.**

85 W. Algonquin Rd., Ste. 400  
Arlington Heights, IL  
60005-4142

**Tel:** (847) 364-7200 ext. 8219

**Fax:** (847) 364-7279 Fax



Компания «ЭлектроПласт» предлагает заключение долгосрочных отношений при поставках импортных электронных компонентов на взаимовыгодных условиях!

Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

Помимо этого, одним из направлений компании «ЭлектроПласт» является направление «Источники питания». Мы предлагаем Вам помощь Конструкторского отдела:

- Подбор оптимального решения, техническое обоснование при выборе компонента;
- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



#### Как с нами связаться

**Телефон:** 8 (812) 309 58 32 (многоканальный)

**Факс:** 8 (812) 320-02-42

**Электронная почта:** [org@eplast1.ru](mailto:org@eplast1.ru)

**Адрес:** 198099, г. Санкт-Петербург, ул. Калинина, дом 2, корпус 4, литера А.