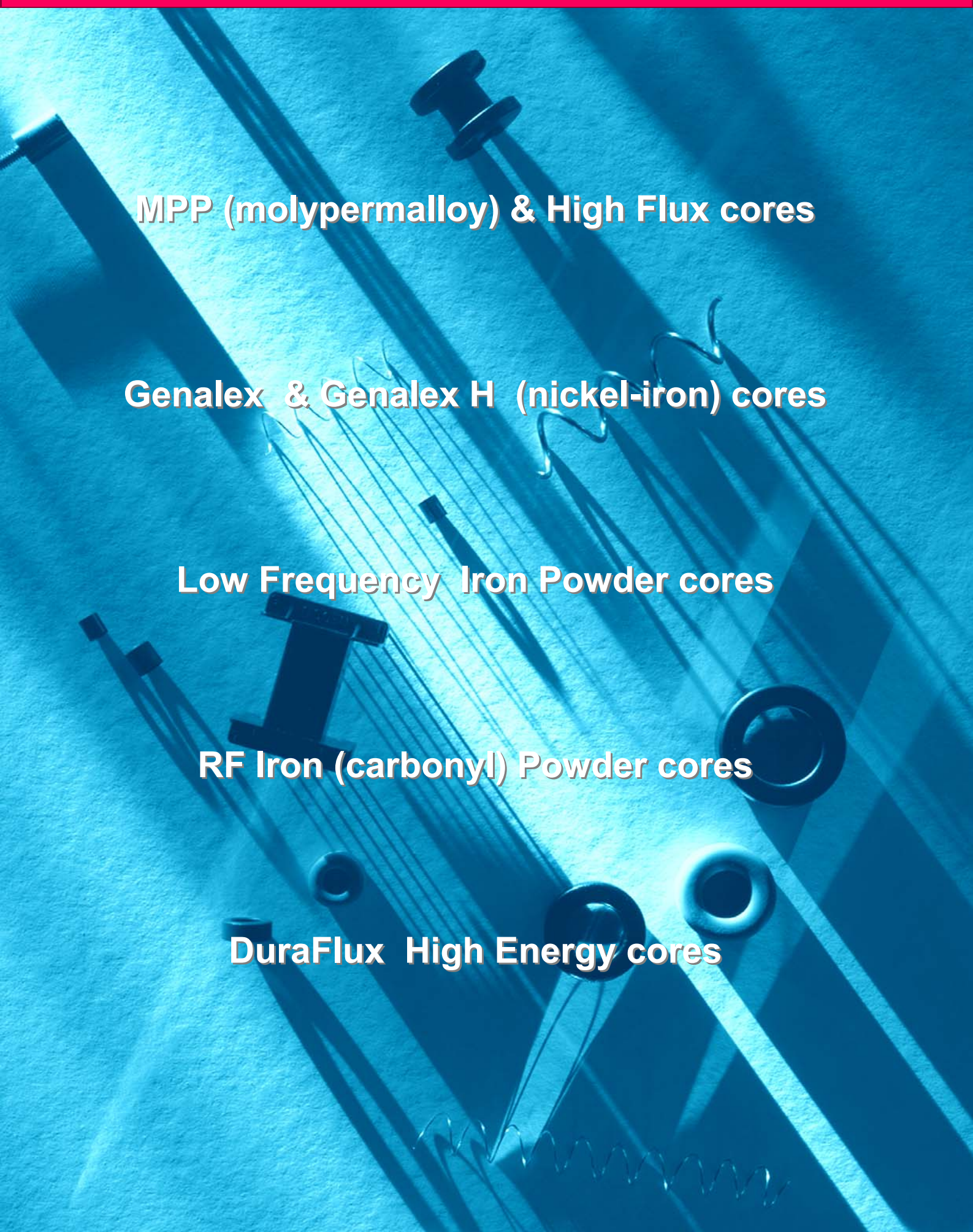
Powdered Metal Cores



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Company Profile

Toroidal cores

MMG is committed to manufacturing high quality soft magnetic cores in powdered metals.

Company History

MMG continues to produce an extensive range of toroid cores, rods, pots, cups, caps and sleeves in high frequency carbonyl irons, low frequency pure irons, nickel-iron molypermalloy (MPP) and High Flux materials and now silicon-iron DuraFlux.

Quality Assurance

The manufacturing techniques used ensures the highest quality product is produced at the most competitive pricing. Quality inspection is done at all stages of production with samples being tested in our laboratory during powder preparation and core production. At the end of production the cores are individually tested and graded thereby guaranteeing Quality Assurance.
Specifications listed are in accordance with BS 6454 (1983) standards for calculating effective parameters of magnetic piece parts. Dimensional data is expressed in scientific notation to three significant figures (i.e. 1.29E+05). Magnetic properties for C1 are expressed to five significant figures. Sampling procedures are indexed by acceptable quality levels (AQL) for lot-by-lot inspection in accordance with BS 6001 (1991) ISO 2859-1 (1998).

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MPP (molypermalloy) & High Flux cores

Part Number	O.D. (mm)	I.D. (mm)	HT. (mm)	Volume Ve (mm³)	Area Ae (mm²)	Length Le (mm)	O.D. (inches)	I.D. (inches)	HT. (inches)	Winding Area (cm²)
G22K-	6.35	2.79	1.00	1.87E+01	1.45E+00	1.29E+01	0.250	0.110	0.039	0.0412
G22H-	6.35	2.79	1.50	2.95E+01	2.30E+00	1.29E+01	0.250	0.110	0.059	0.0412
G22-	6.35	2.79	2.79	5.74E+01	4.47E+00	1.29E+01	0.250	0.110	0.110	0.0412
G64B-	6.60	2.67	2.54	5.55E+01	4.36E+00	1.27E+01	0.260	0.105	0.100	0.0370
G64-	6.60	2.67	4.78	1.08E+02	8.47E+00	1.27E+01	0.260	0.105	0.188	0.0370
G63C-	7.87	3.96	1.90	5.72E+01	3.33E+00	1.72E+01	0.310	0.156	0.075	0.0940
G63-	7.87	3.96	3.18	9.86E+01	5.73E+00	1.72E+01	0.310	0.156	0.125	0.0940
G51-	9.65	4.78	3.18	1.45E+02	6.95E+00	2.09E+01	0.380	0.188	0.125	0.1439
G51A-	9.65	4.78	3.96	1.83E+02	8.78E+00	2.09E+01	0.380	0.188	0.156	0.1439
G50D-	10.16	5.08	2.00	9.80E+01	4.43E+00	2.21E+01	0.400	0.200	0.079	0.1647
G50-	10.16	5.08	3.96	2.04E+02	9.22E+00	2.21E+01	0.400	0.200	0.156	0.1647
G65D-	11.18	6.35	2.00	1.10E+02	4.23E+00	2.61E+01	0.440	0.250	0.079	0.2688
G65-	11.18	6.35	3.96	2.31E+02	8.84E+00	2.61E+01	0.440	0.250	0.156	0.2688
G54-	12.70	4.50	4.75	3.87E+02	1.70E+01	2.27E+01	0.500	0.177	0.187	0.1257
G54D-	12.70	4.50	2.00	1.53E+02	6.72E+00	2.27E+01	0.500	0.177	0.079	0.1257
G60D-	12.70	7.62	2.00	1.38E+02	4.51E+00	3.06E+01	0.500	0.300	0.079	0.3982
G60-	12.70	7.62	4.75	3.47E+02	1.13E+01	3.06E+01	0.500	0.300	0.187	0.3982
G62-	16.64	10.16	6.35	7.86E+02	1.94E+01	4.04E+01	0.655	0.400	0.250	0.7329
G23-	17.27	9.65	6.35	8.94E+02	2.24E+01	4.00E+01	0.680	0.380	0.250	0.6576
G29-	20.32	12.70	6.35	1.13E+03	2.26E+01	5.00E+01	0.800	0.500	0.250	1.1690
G58-	22.86	13.97	7.62	1.76E+03	3.17E+01	5.56E+01	0.900	0.550	0.300	1.4250
G57-	26.92	14.73	11.18	3.83E+03	6.22E+01	6.16E+01	1.060	0.580	0.440	1.5904
G27-	27.10	15.00	14.60	5.12E+03	8.20E+01	6.24E+01	1.067	0.591	0.575	1.6513
G56A-	33.02	19.94	10.67	5.16E+03	6.47E+01	7.98E+01	1.300	0.785	0.420	2.9681
G55-	34.29	23.37	8.89	4.01E+03	4.54E+01	8.84E+01	1.350	0.920	0.350	4.1079
G49-	35.81	22.35	10.46	5.79E+03	6.57E+01	8.81E+01	1.410	0.880	0.412	3.7497
G48-	39.88	24.13	14.48	1.03E+04	1.06E+02	9.64E+01	1.570	0.950	0.570	4.3855
G47-	46.74	24.13	18.03	1.98E+04	1.91E+02	1.04E+02	1.840	0.950	0.710	4.3855
G1A-	50.50	30.00	13.50	1.54E+04	1.28E+02	1.21E+02	1.988	1.181	0.531	6.8349
G2B-	58.00	35.00	13.97	2.01E+04	1.44E+02	1.40E+02	2.283	1.378	0.550	9.3482

Note: *dimensions are for uncoated cores, tolerance +/- 0.25mm (0.01inch)*
See page nn for AL values.

Ordering Part No. example (Dimensions + Material) G50-95.

Low Frequency Iron Powder cores

Part Number	O.D. (mm)	I.D. (mm)	HT. (mm)	Volume Ve (mm³)	Area Ae (mm²)	Length Le (mm)	O.D. (inches)	I.D. (inches)	HT. (inches)	Winding Area (cm²)
G63-	7.87	3.96	3.18	9.86E+01	5.73E+00	1.72E+01	0.310	0.156	0.125	0.0940
G60-	12.70	7.62	4.75	3.47E+02	1.13E+01	3.06E+01	0.500	0.300	0.187	0.3982
G62-	16.64	10.16	6.35	7.86E+02	1.94E+01	4.04E+01	0.655	0.400	0.250	0.7329
G23-	17.27	9.65	6.35	8.94E+02	2.24E+01	4.00E+01	0.680	0.380	0.250	0.6576
G23A-	17.27	9.65	9.03	1.37E+03	3.41E+01	4.00E+01	0.680	0.380	0.356	0.6576
G29-	20.32	12.70	6.35	1.13E+03	2.26E+01	5.00E+01	0.800	0.500	0.250	1.1690
G25-	24.70	12.70	9.70	2.91E+03	5.33E+01	5.46E+01	0.972	0.500	0.382	1.1690
G57-	26.92	14.73	11.18	3.83E+03	6.22E+01	6.16E+01	1.060	0.580	0.440	1.5904
G57B-	26.92	14.73	7.92	2.65E+03	4.29E+01	6.16E+01	1.060	0.580	0.312	1.5904
G27-	27.10	15.00	14.60	5.12E+03	8.20E+01	6.24E+01	1.067	0.591	0.575	1.6513
G27A-	27.10	15.00	11.00	3.80E+03	6.08E+01	6.24E+01	1.067	0.591	0.433	1.6513
G27B-	27.10	15.00	6.70	2.22E+03	3.56E+01	6.24E+01	1.067	0.591	0.264	1.6513
G27C-	27.10	15.00	10.00	3.43E+03	5.50E+01	6.24E+01	1.067	0.591	0.394	1.6513
G56-	33.02	19.94	11.18	5.42E+03	6.79E+01	7.98E+01	1.300	0.785	0.440	2.9681
G48-	39.88	24.13	14.48	1.03E+04	1.06E+02	9.64E+01	1.570	0.950	0.570	4.3855
G1-	50.50	30.00	17.00	1.97E+04	1.63E+02	1.21E+02	1.988	1.181	0.669	6.8349
G1D-	50.50	30.00	25.40	2.99E+04	2.47E+02	1.21E+02	1.988	1.181	1.000	6.8349
G6-	70.00	46.00	20.00	3.81E+04	2.15E+02	1.77E+02	2.756	1.811	0.787	16.2597
G9-	80.00	48.00	29.00	8.16E+04	4.24E+02	1.93E+02	3.150	1.890	1.142	17.7205
G37-	100.00	60.00	28.00	1.28E+05	5.31E+02	2.41E+02	3.937	2.362	1.102	27.8051

Note: *dimensions are for uncoated cores, tolerance +/- 0.25mm (0.01inch)*
See page nn for AL values.

Ordering Part No. example (Dimensions + Material) G29-32.

RF Iron (carbonyl) Powder cores

Part Number	O.D. (mm)	I.D. (mm)	HT. (mm)	Volume Ve (mm³)	Area Ae (mm²)	Length Le (mm)	O.D. (inches)	I.D. (inches)	HT. (inches)	Winding Area (cm²)
G64-	6.60	2.67	4.78	1.08E+02	8.47E+00	1.27E+01	0.260	0.105	0.188	0.0370
G64C-	6.60	2.67	2.63	5.77E+01	4.52E+00	1.27E+01	0.260	0.105	0.104	0.0370
G64D-	6.60	2.67	1.14	2.28E+01	1.79E+00	1.27E+01	0.260	0.105	0.045	0.0370
G63-	7.87	3.96	3.18	9.86E+01	5.73E+00	1.72E+01	0.310	0.156	0.125	0.0940
G63B-	7.87	3.96	2.54	7.79E+01	4.53E+00	1.72E+01	0.310	0.156	0.100	0.0940
G60-	12.70	7.62	4.75	3.47E+02	1.13E+01	3.06E+01	0.500	0.300	0.187	0.3982
G62-	16.64	10.16	6.35	7.86E+02	1.94E+01	4.04E+01	0.655	0.400	0.250	0.7329
G29-	20.32	12.70	6.35	1.13E+03	2.26E+01	5.00E+01	0.800	0.500	0.250	1.1690
G57-	26.92	14.73	11.18	3.83E+03	6.22E+01	6.16E+01	1.060	0.580	0.440	1.5904
G56-	33.02	19.94	11.18	5.42E+03	6.79E+01	7.98E+01	1.300	0.785	0.440	2.9681
G48-	39.88	24.13	14.48	1.03E+04	1.06E+02	9.64E+01	1.570	0.950	0.570	4.3855
G6-	70.00	46.00	20.00	3.81E+04	2.15E+02	1.77E+02	2.756	1.811	0.787	16.2597
G9-	80.00	48.00	29.00	8.16E+04	4.24E+02	1.93E+02	3.150	1.890	1.142	17.7205
G37-	100.00	60.00	28.00	1.28E+05	5.31E+02	2.41E+02	3.937	2.362	1.102	27.8051

Note: *dimensions are for uncoated cores, tolerance +/- 0.25mm (0.01inch)*
See page nn for AL values.

Ordering Part No. example (Dimensions + Material) G63-15.

DuraFlux High Energy cores

Part Number	O.D. (mm)	I.D. (mm)	HT. (mm)	Volume Ve (mm³)	Area Ae (mm²)	Length Le (mm)	O.D. (inches)	I.D. (inches)	HT. (inches)	Winding Area (cm²)
G22-	6.35	2.79	2.79	5.74E+01	4.47E+00	1.29E+01	0.250	0.110	0.110	0.0412
G64B-	6.60	2.67	2.54	5.55E+01	4.36E+00	1.27E+01	0.260	0.105	0.100	0.0370
G63-	7.87	3.96	3.18	9.86E+01	5.73E+00	1.72E+01	0.310	0.156	0.125	0.0940
G51-	9.65	4.78	3.18	1.45E+02	6.95E+00	2.09E+01	0.380	0.188	0.125	0.1439
G51A-	9.65	4.78	3.96	1.83E+02	8.78E+00	2.09E+01	0.380	0.188	0.156	0.1439
G50-	10.16	5.08	3.96	2.04E+02	9.22E+00	2.21E+01	0.400	0.200	0.156	0.1647
G65-	11.18	6.35	3.96	2.31E+02	8.84E+00	2.61E+01	0.440	0.250	0.156	0.2688
G60-	12.70	7.62	4.75	3.47E+02	1.13E+01	3.06E+01	0.500	0.300	0.187	0.3982
G60A-	12.70	7.62	6.35	4.68E+02	1.53E+01	3.06E+01	0.500	0.300	0.250	0.3982
G62-	16.64	10.16	6.35	7.86E+02	1.94E+01	4.04E+01	0.655	0.400	0.250	0.7329
G23-	17.27	9.65	6.35	8.94E+02	2.24E+01	4.00E+01	0.680	0.380	0.250	0.6576
G29-	20.32	12.70	6.35	1.13E+03	2.26E+01	5.00E+01	0.800	0.500	0.250	1.1690
G58-	22.86	13.97	7.62	1.76E+03	3.17E+01	5.56E+01	0.900	0.550	0.300	1.4250
G57-	26.92	14.73	11.18	3.83E+03	6.22E+01	6.16E+01	1.060	0.580	0.440	1.5904
G57E-	26.92	14.73	20.00	7.05E+03	1.14E+02	6.16E+01	1.060	0.580	0.787	1.5904
G56A-	33.02	19.94	10.67	5.16E+03	6.47E+01	7.98E+01	1.300	0.785	0.420	2.9681
G55-	34.29	23.37	8.89	4.01E+03	4.54E+01	8.84E+01	1.350	0.920	0.350	4.1079
G49-	35.81	22.35	10.46	5.79E+03	6.57E+01	8.81E+01	1.410	0.880	0.412	3.7497
G48-	39.88	24.13	14.48	1.03E+04	1.06E+02	9.64E+01	1.570	0.950	0.570	4.3855
G47-	46.74	24.13	18.03	1.98E+04	1.91E+02	1.04E+02	1.840	0.950	0.710	4.3855
G1A-	50.50	30.00	13.50	1.54E+04	1.28E+02	1.21E+02	1.988	1.181	0.531	6.8349
G2B-	58.00	35.00	13.97	2.01E+04	1.44E+02	1.40E+02	2.283	1.378	0.550	9.3482
G6-	70.00	46.00	20.00	3.81E+04	2.15E+02	1.77E+02	2.756	1.811	0.787	16.2597
G9A-	80.00	48.00	12.70	3.54E+04	1.84E+02	1.93E+02	3.150	1.890	0.500	17.7205
G9-	80.00	48.00	29.00	8.16E+04	4.24E+02	1.93E+02	3.150	1.890	1.142	17.7205

Note: *dimensions are for uncoated cores, tolerance +/- 0.25mm (0.01inch)*
See page nn for AL values.

Ordering Part No. example (Dimensions + Material) G2B-DF60.

MPP (molypermalloy) & High Flux cores

Part Number	Material grades (MPP cores: 91 to 98 ; High Flux cores: 81 to 87)						
	91 / 81	92 / 82	93 / 83	95 / 85	96 / 86	97 / 87	98
G22K-			8.52*	18.00*			22.46*
G22H-			13.46*	27.00*			35.46*
G22-	6	10	24	50	59	64	69
G64B-	6	11	26	54	64	69	75
G64-	12	21	50	103	122	132	144
G63C-				30.38		38.89	42.05
G63-	6	11	25	52	62	66	73
G51-	6	11	25	53	63	68	74
G51A-	7	14	32	66	78	84	92
G50D-				31.46	37.00	42.70	43.55
G50-	7	14	32	66	78	84	92
G65D-				25.43			35.19
G65-	6	11	26	53	63	68	74
G54-				117.80	138.50	150.80	163.00
G54D-				46.45	54.62	59.45	64.28
G60D-				23.19	27.27	29.68	32.09
G60-	6.4	12	27	56	67	72	79
G62-	8	15	35	72	88	92	104
G23-	10	19	43	89	105	114	123
G29-	7.8	14	32	68	81	87	96
G58-	9.9	19	43	90	106	115	124
G57-	18	32	75	157	185	201	217
G27-	23.11	42.91	99.02	206.30	242.60	264.10	285.50
G56A-	14	28	61	127	150	163	176
G55-	9	16	38	79	93	101	109
G49-	13	24	56	117	138	150	162
G48-	19	35	81	168	198	215	233
G47-	32	59	135	281	330		
G1A	17	32	73	152	179	195	210
G2B	18	33	75	156	185	200	218

Note: *AL values are expressed in nH per turn (N) squared. The cores are manufactured to the AL values listed, the permeability for each material is for reference only. The AL values are measured at a flux density < 10 gauss and frequency of 1kHz. The cores are graded into bands of +/- 8% Note * low profile cores are graded into bands of +/-10% of the nominal AL value.*

Ordering example (Dimension + Material) e.g. G50-95 for MPP or G60-85 for High Flux.

Low Frequency Iron Powder cores

Part Number	Material grade			
	37	32	36	35
G63-			28.90 - 33.93	34.77 - 40.63
G60-	17.60 - 22.10	24.30 - 28.30	30.40 - 35.70	36.60 - 42.80
G62-	23.50 - 29.40	32.30 - 38.20	40.60 - 47.60	48.80 - 57.10
G23-	28.10 - 35.13	38.64 - 45.67	48.48 - 56.91	58.32 - 68.15
G23A-	42.91 - 53.64	59.00 - 69.73	74.02 - 86.89	89.04 - 104.06
G29-	22.10 - 27.60	30.40 - 35.90	38.10 - 44.70	45.80 - 53.60
G25-	49.08 - 61.35	67.48 - 79.75	84.66 - 99.38	101.80 - 119.00
G57-	49.70 - 62.20	68.40 - 80.80	85.80 - 101.00	103.00 - 121.00
G57B-	35.03 - 43.78	48.16 - 56.92	60.42 - 70.93	72.68 - 84.94
G27-	66.02 - 82.52	90.77 - 107.30	113.90 - 133.70	137.00 - 160.10
G27A-	48.98 - 61.23	67.35 - 79.57	84.49 - 99.19	101.60 - 118.80
G27B-	28.63 - 35.79	39.37 - 46.53	49.39 - 57.98	59.41 - 69.44
G27C-	44.25 - 55.31	60.84 - 71.90	76.33 - 89.60	91.82 - 107.30
G56-	42.10 - 52.60	57.90 - 68.50	72.60 - 85.30	87.30 - 103.00
G48-	54.30 - 67.80	74.70 - 88.30	93.60 - 110.00	112.00 - 132.00
G1-	66.20 - 82.80	91.00 - 108.00	114.00 - 134.00	137.00 - 161.00
G1D-	102.00 - 127.50	140.30 - 165.80	176.00 - 206.60	211.70 - 247.40
G6-	60.30 - 75.40	82.90 - 98.00	104.00 - 122.00	125.00 - 147.00
G9-	108.00 - 135.00	149.00 - 176.00	187.00 - 219.00	224.00 - 263.00
G37-	110.00 - 138.00	152.00 - 179.00	190.00 - 224.00	229.00 - 268.00

Note: *AL values are expressed in nH per turn (N) squared. The cores are manufactured to the AL values listed, the permeability for each material is for reference only. The AL values are measured at a flux density < 10 gauss and frequency of 10kHz.*

RF Iron (carbonyl) Powder cores

Part Number	Material grade			
	21	11	15	SN35
G64-	3.29 - 4.94	6.18 - 8.65	7.00 - 9.47	
G64C-	1.74 - 2.61	3.26 - 4.56	3.69 - 4.99	
G64D-	0.66 - 0.99	1.23 - 1.73	1.40 - 1.89	
G63-	1.68 - 2.51	3.14 - 4.40	3.56 - 4.82	13.19 - 16.12
G63B-	1.32 - 1.99	2.48 - 3.48	2.81 - 3.81	10.42 - 12.73
G60-	1.77 - 2.65	3.32 - 4.64	3.76 - 5.08	14.68 - 17.95
G62-	2.35 - 3.53	4.41 - 6.17	5.00 - 6.67	19.03 - 23.26
G29-	2.21 - 3.31	4.14 - 5.80	4.69 - 6.35	17.87 - 21.84
G57-	4.98 - 7.46	9.33 - 13.10	10.60 - 14.30	39.96 - 48.84
G56-	4.21 - 6.31	7.89 - 11.10	8.94 - 12.10	33.70 - 41.19
G48-	5.42 - 8.14	10.20 - 14.20	11.50 - 15.60	43.70 - 53.41
G6-	6.03 - 9.05	11.30 - 15.80	12.80 - 17.30	
G9-	10.80 - 16.20	20.30 - 28.40	23.00 - 31.10	
G37-	11.00 - 16.60	20.70 - 29.00	23.50 - 31.70	

Note: *AL values are expressed in nH per turn (N) squared. The cores are manufactured to the AL values listed, the permeability for each material is for reference only. The AL values are measured at a flux density < 10 gauss and frequency of 1MHz.*

Typical Q values

Number of Turns Wire size SWG42 (AWG 38)	Material grade		
	21	11	15
3	55 @ L = 0.05µH	47 @ L = 0.07µH	
6	58 @ L = 0.10µH	59 @ L = 0.20µH	48 @ L = 0.23µH
12	62 @ L = 0.41µH	72 @ L = 0.53µH	62 @ L = 0.66µH
25	62 @ L = 0.73µH	82 @ L = 1.40µH	83 @ L = 1.79µH
50	58 @ L = 2.66µH	87 @ L = 5.70µH	92 @ L = 6.80µH
100	35 @ L = 10.9µH	70 @ L = 23.0µH	90 @ L = 26.9µH
160	20 @ L = 27.5µH	63 @ L = 55.5µH	83 @ L = 67.9µH

Note: *Q values are measured at the cores optimum frequency and are for reference only.*

DuraFlux High Energy cores

Part Number	Material grade			
		DF48		DF60
G22-		13.97		24
G64B-		13.74		26
G63-		13.40		25
G51-		13.37		25
G51A-		16.88		32
G50-		16.75		32
G65-		13.61		26
G60-		14.93		27
G60A-		20.16		37.8
G62-		19.34		35
G23-		22.48		43
G29-		18.16		32
G58-		22.95		43
G57-		40.60		75
G57E-		74.64		150
G56A-		32.60		61
G55-		20.85		38
G49-		29.73		56
G48-		44.40		81
G47-		71.54		135
G1A-		41.95		73
G2B-		42.08		75
G6-		50.94		95.52
G9A-		37.75		70.77
G9-		91.04		170.7

Note: *AL values are expressed in nH per turn (N) squared. The cores are manufactured to the AL values listed, the permeability for each material is for reference only. The AL values are measured at a flux density < 10 gauss and frequency of 10 kHz. The AL tolerance is +/-10% from the nominal AL value.*

Core Materials

MPP (molypermalloy)

Nickel-iron alloy particles insulated and separated by clay are pressed into shape before being bonded with epoxy resin. The particles are spherical in shape with 70 - 80% nickel, 2 - 4% molybdenum and the balance being iron. This material exhibits excellent magnetic characteristics with low hysteresis and eddy current losses, high resistivity, good inductance stability after high DC biasing, high Q values and good temperature stability. Initial permeability's range from 14μi to 173μi. MPP cores are colour coded in Gentian Blue with an epoxy polyester powder coating which provides a minimum breakdown of 1kV (ac @ 50Hz) with a maximum coating thickness of 0.25mm per surface.

Material grade	**91**	**92**	**93**	**95**	**96**	**97**	**98**
Permeability (μi)	14	26	60	125	147	160	173
Max. Power Loss (mW/cm³)	750	600	500	400	400	400	400
at Frequency (kHz)	50	50	50	50	50	50	50
at Flux Density (gauss)	1000	1000	1000	1000	1000	1000	1000
Max. Total Loss (Ω/H/μ)	60.0	70.0	1.5	0.2	0.2	0.2	0.2
at Frequency (kHz)	75	75	8	1.8	1.8	1.8	1.8
at Flux Density (gauss)	4	4	10	20	20	20	20
Flux density at 200 Oersteds (gauss)	2700	3600	5200	6100	6250	6400	6500
DC Bias @ 80% permeability (Oersteds)	200	110	50	28	24	22	19

Note: *Losses and dc bias levels are only typical and may vary with larger sized cores.*

High Flux (nickel-iron)

The material is similar in make-up to the MPP material with a 50/50 nickel to iron ratio. The particles are spherical in shape allowing for higher flux density levels to be reached with greater energy storage capacity. The greater content of iron in High Flux materials results in the losses being slightly higher than MPP. Peak flux density saturation levels greater than 12000 Gauss with DC Bias levels significantly higher than MPP materials. Initial permeability's range from 14μi to 160μi. High Flux cores are colour coded in Gentian Blue with an epoxy polyester powder coating which provides a minimum breakdown of 1kV (ac @ 50Hz) with a maximum coating thickness of 0.25mm per surface.

Material grade	**81**	**82**	**83**	**85**	**86**	**87**
Permeability (μi)	14	26	60	125	147	160
Max. Power Loss (mW/cm³)	2672	1402	645	600	600	600
at Frequency (kHz)	50	50	50	50	50	50
at Flux Density (gauss)	1000	1000	1000	1000	1000	1000
Flux density at 200 Oersteds (gauss)	3000	4800	8000	12200	12800	13000
DC Bias @ 80% permeability (Oersteds)	480	130	78	35	24	20

Note: *Losses and dc bias levels are only typical and may vary with larger sized cores.*

Core Materials

Low Frequency Iron Powder

Often referred to as sponge iron is available in permeability's from 45μi to 90μi. The material offers high saturation flux density levels but with relatively high losses. The material provides a cost effective solution in applications such as light dimmers or RFI suppressers. Low Frequency Iron powder cores are colour coded in Traffic Purple with an epoxy polyester powder coating which provides a minimum breakdown of 1kV (ac @ 50Hz) with a maximum coating thickness of 0.25mm per surface.

Material grade	**37**	**32**	**36**	**35**
Permeability (μi)	45	60	75	90
Max. Power Loss (mW/cm³) at Frequency (kHz) at Flux Density (gauss)	3300 50 1000	2640 50 1000	2430 50 1000	2420 50 1000
Flux density at 75 Oersteds (gauss)	7400	8200	8500	8600

Note: *Losses are only typical and may vary with larger sized cores.*

RF Iron (carbonyl) Powder

Carbonyl iron powders available in permeability's from 5μi to 35μi. Lower permeability's are also available as Carbonyl blends with Phenolic material (i.e. plastics). These materials offer a wide frequency range to 250MHz with very high Q values. High Frequency Iron powder cores are colour coded in Deep Black with an epoxy polyester powder coating which provides a minimum breakdown of 1kV (ac @ 50Hz) with a maximum coating thickness of 0.25mm per surface. Cores made from SN35 grade material are colour coded yellow.

Material grade	**PH**	**HF / PH**	**21**	**11**	**15**	**SN35**
Powder Type	Phenolic	Blend	Carbonyl SF	Carbonyl TH	Carbonyl E	Carbonyl GQ4
Permeability (μi)	1	4~5	5	9	10	35
Frequency range (MHz) for high Q	50 -250	20 - 200	20 -150	10 - 50	0.1 - 10	0.1 - 1.0

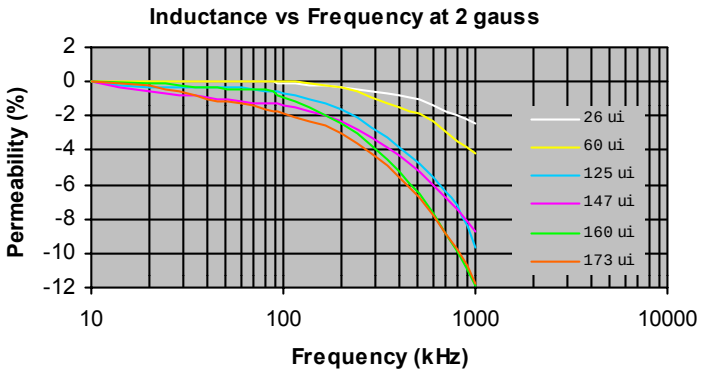
DuraFlux High Energy Powder

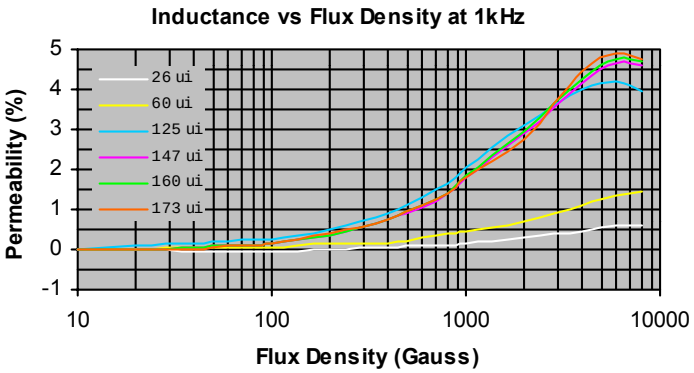
DuraFlux cores are manufactured from a complex composition of Silicon Iron powdered particles which are compacted into various core shapes. The unique combination of high saturation flux density and high dc bias capability makes DuraFlux cores an ideal choice for demanding high energy storage applications. With a 200 ºC maximum operating temperature, DuraFlux cores can operate in extreme temperature environments such as automotive engine compartments. DuraFlux cores are colour coded in light green.

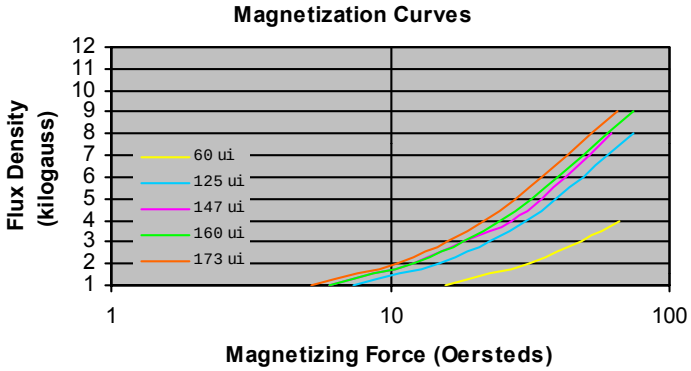
Material grade	**DF48**	**DF60**
Permeability (μi)	32	60
Max. Power Loss (mW/cm³) at Frequency (kHz) at Flux Density (gauss)	1400 50 1000	800 50 1000
Saturation Flux Density Bsat (gauss)	n/a	15000
DC Bias @ 80% permeability (Oersteds)	140	80

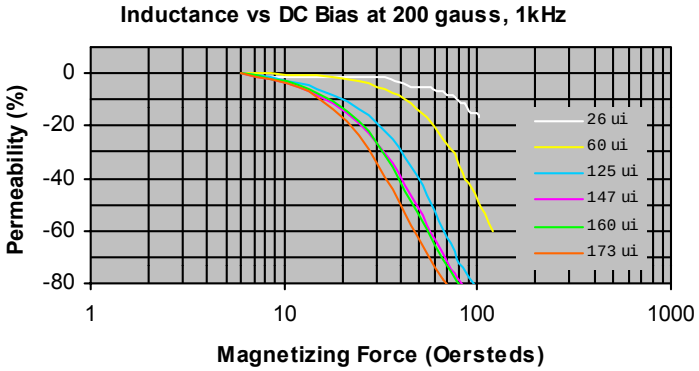
Note: *Losses and dc bias levels are only typical and may vary with larger sized cores.*

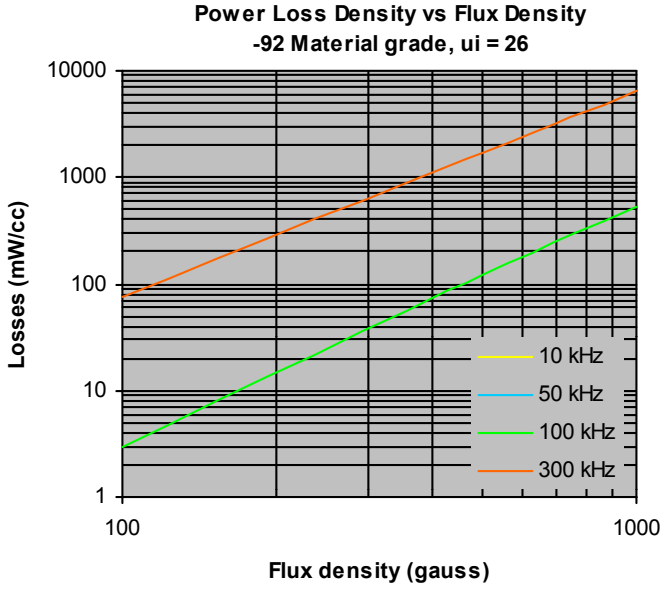
MPP performance graphs

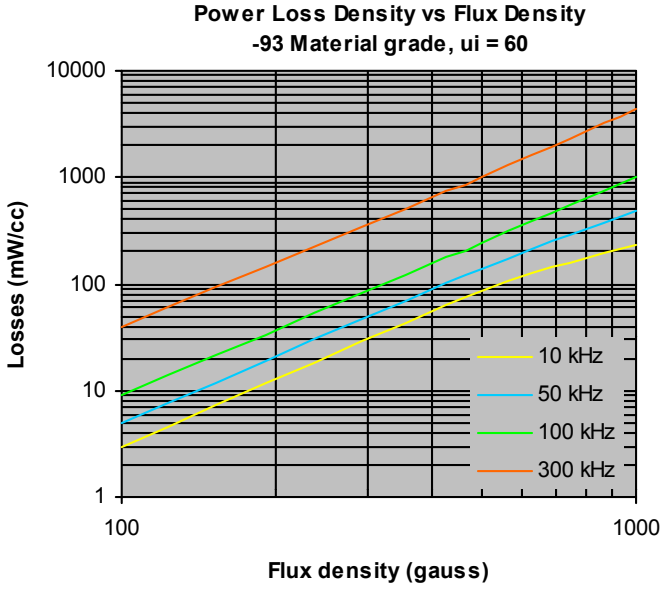












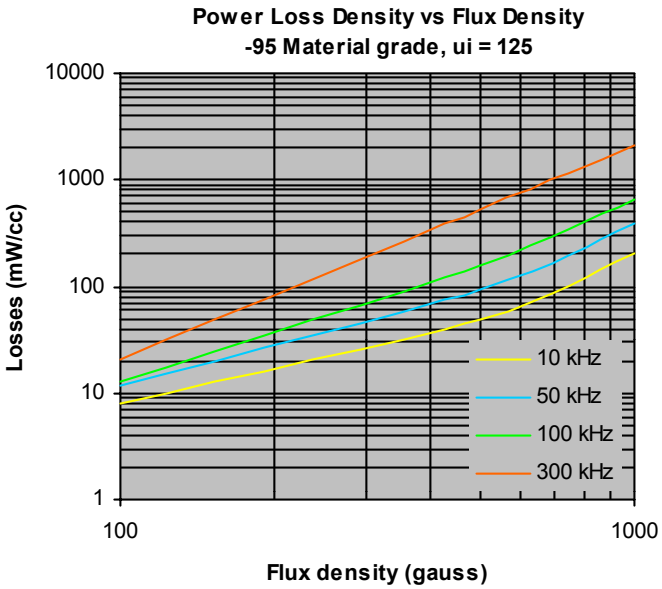
Coefficients **k = 2.55e-16** **m = 2.3188** **n = 2.2380**

Coefficients **k = 7.06e-09** **m = 1.0382** **n = 1.9859**

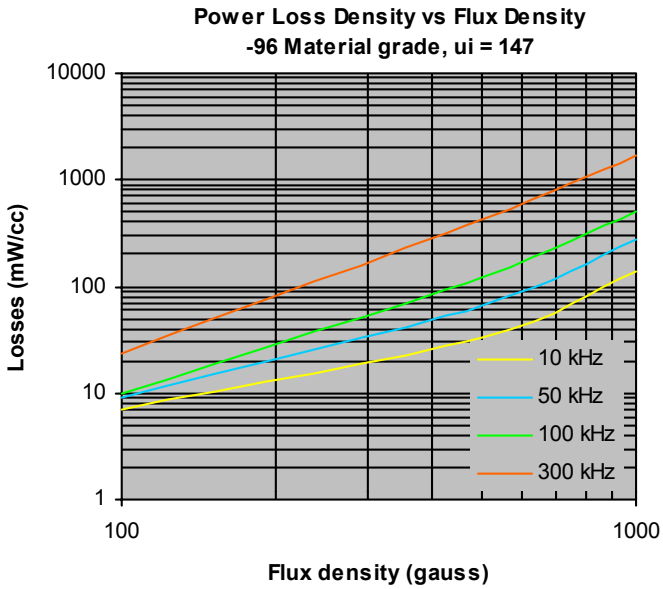
$$PLD = k \times F^{m} \times B^{n}$$

where PLD = power loss density (mW/cm³), F = frequency (Hertz), B = flux density (gauss)

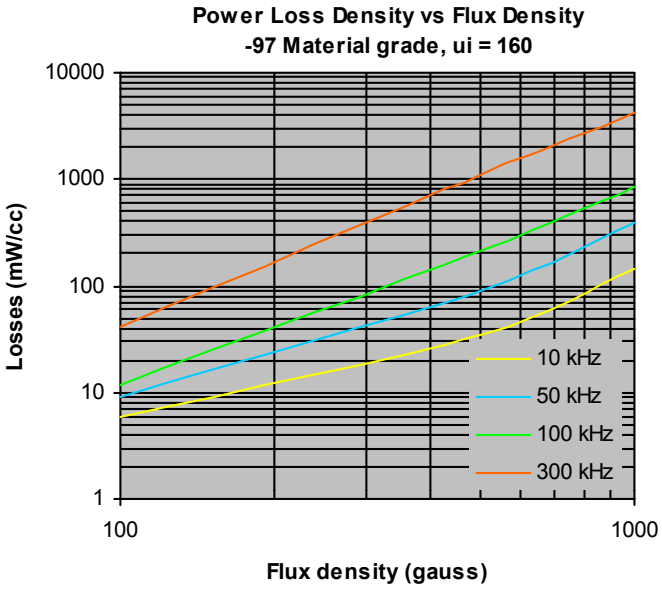
MPP performance graphs



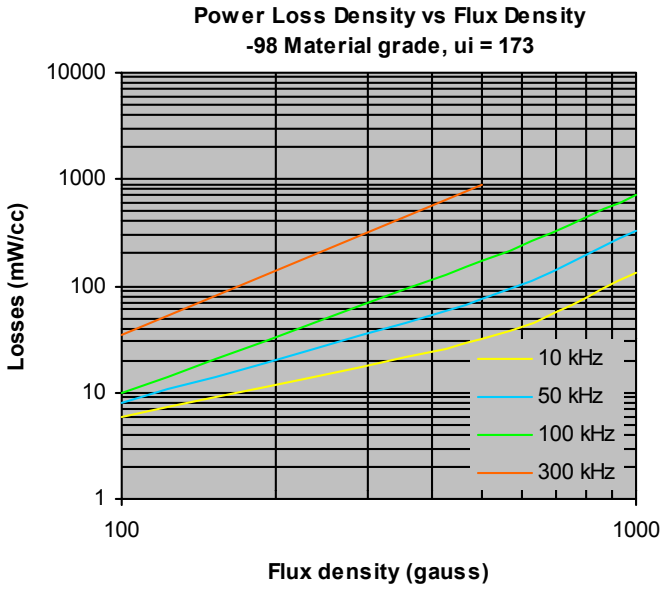
Coefficients **k = 2.78e-06** **m = 0.7701** **n = 1.5085**



Coefficients **k = 7.58e-07** **m = 0.8721** **n = 1.4882**



Coefficients **k = 1.57e-08** **m = 1.1699** **n = 1.6301**



Coefficients **k = 2.45e-08** **m = 1.1221** **n = 1.6207**

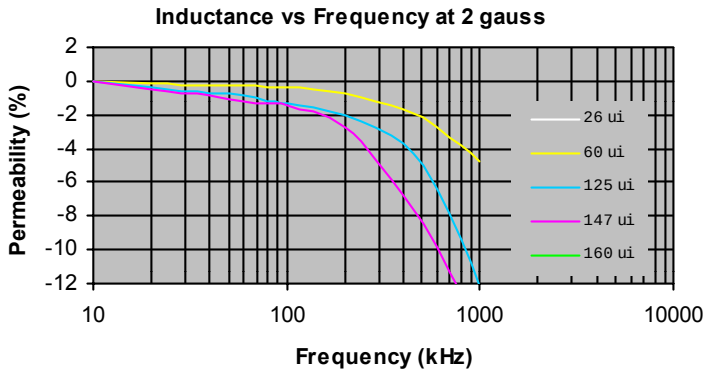
Total loss coefficients

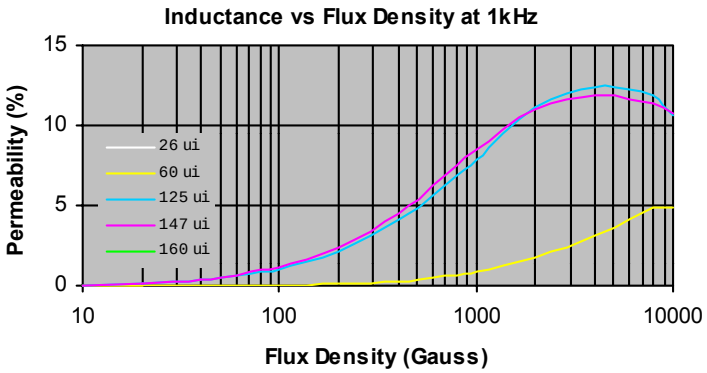
Legg's equation: $Rac/\mu i\ L = a\ B\ f + c\ f + e\ f^2$ $(\Omega/H/\mu i)$

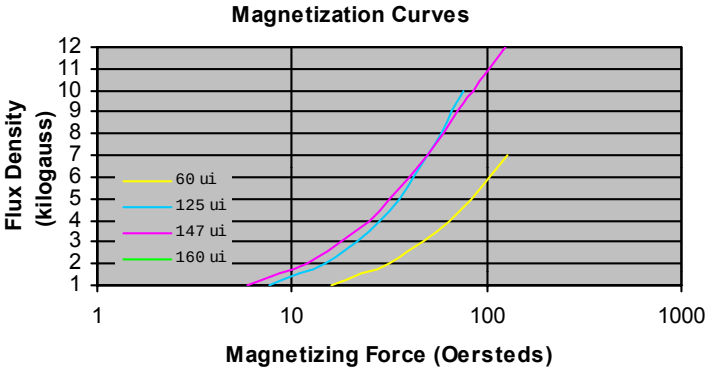
Material grade	Permeability (μi)	hysteresis (a)	eddy currents (e)	residual (c)
93	60	7.11e-06	14.50e-09	2.00e-06
95	125	0.74e-06	18.21e-09	14.44e-06
96	147	1.67e-06	15.59e-09	8.61e-06
97	160	0.30e-06	16.05e-09	37.78e-06
98	173	0.51e-06	12.04e-09	18.33e-06

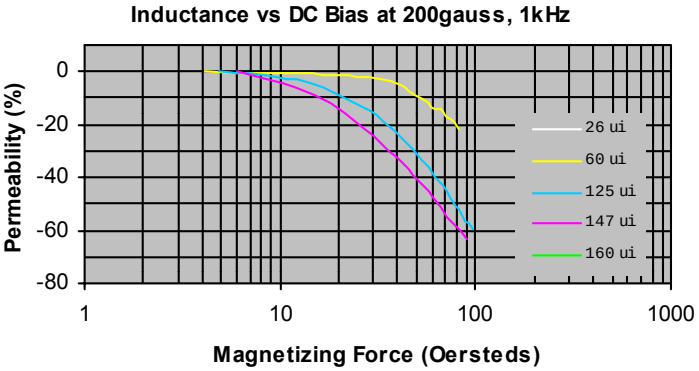
Note: coefficients are only typical and may vary with core size.

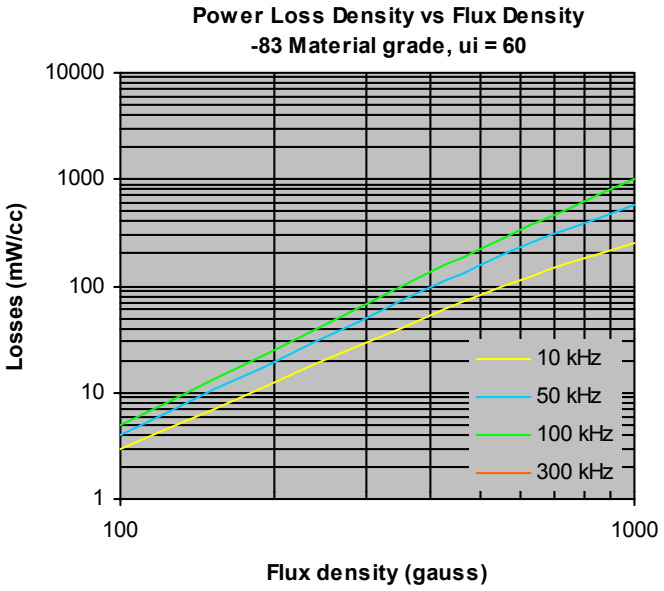
High Flux performance graphs

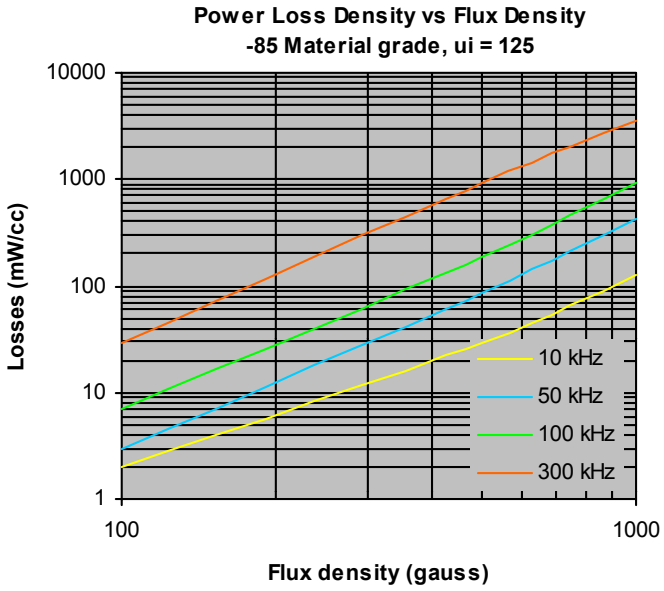












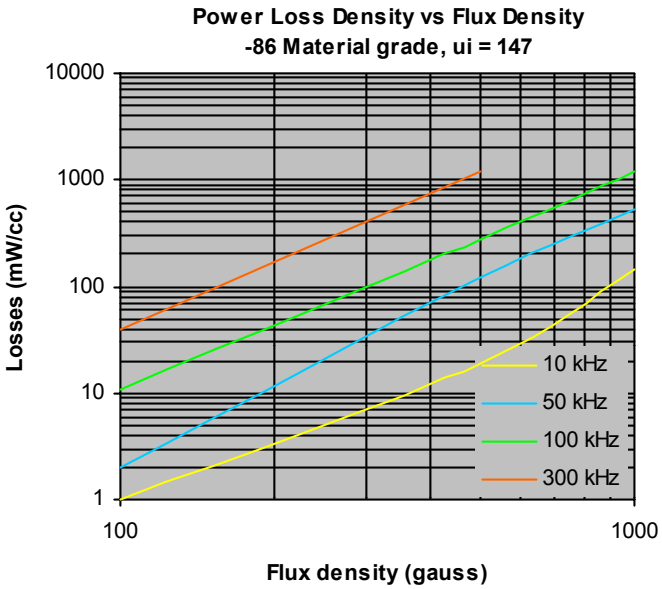
Coefficients **k = 3.04e-08** **m = 0.8063** **n = 2.1651**

Coefficients **k = 9.48e-10** **m = 1.1031** **n = 2.1584**

$$PLD = k \times F^{m} \times B^{n}$$

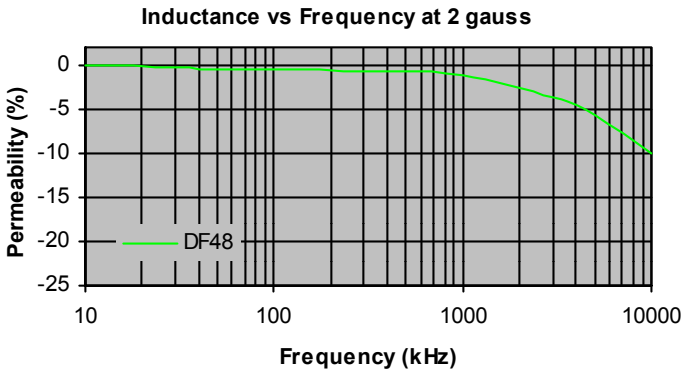
where PLD = power loss density (mW/cm³), F = frequency (Hertz), B = flux density (gauss)

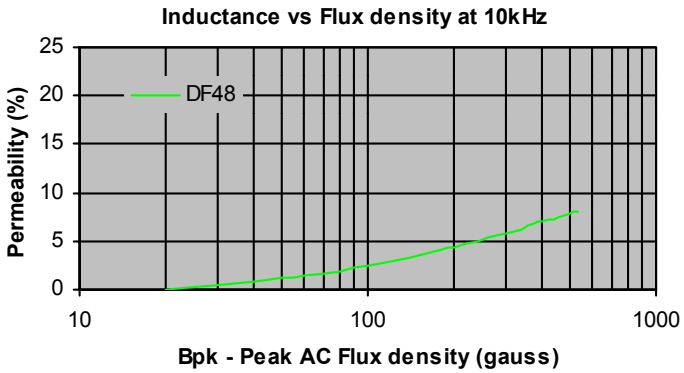
High Flux performance graphs

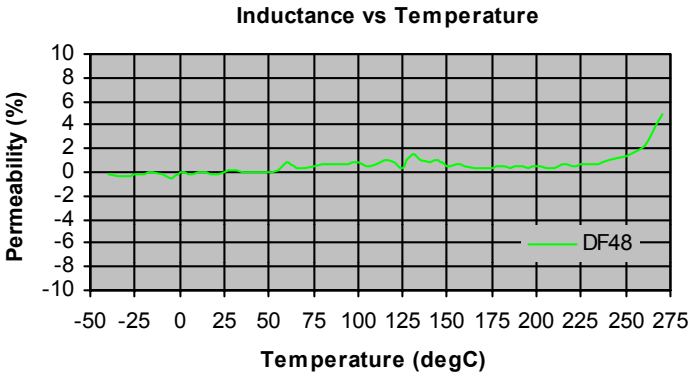


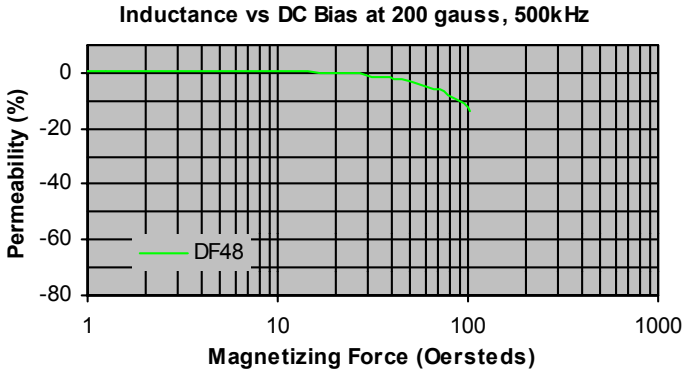
Coefficients **k = 1.26e-10** **m = 1.1375** **n = 2.4273**

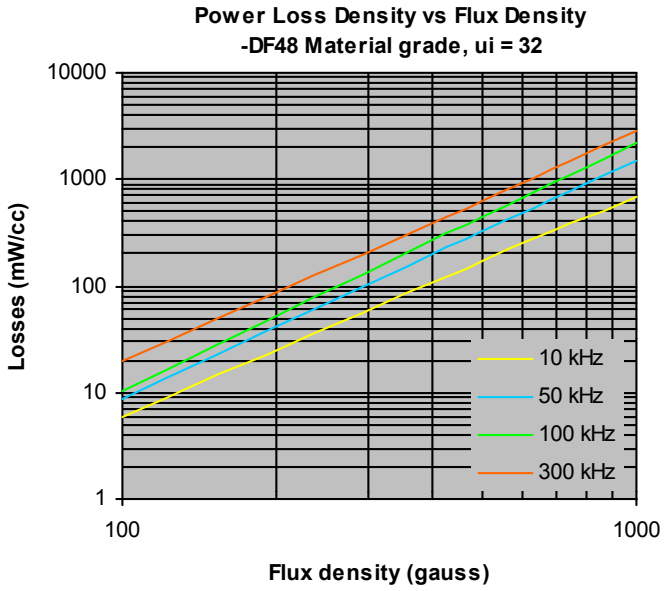
DuraFlux DF48 performance graphs

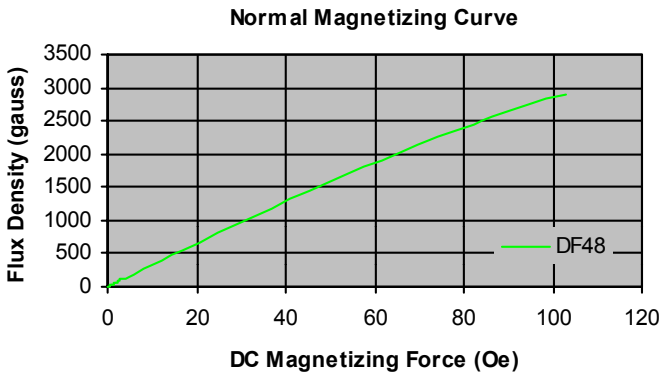










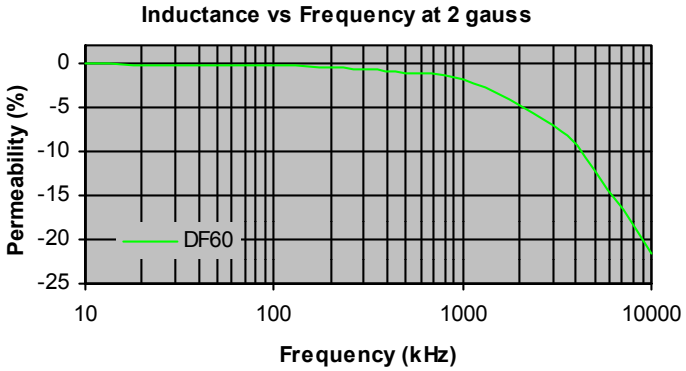


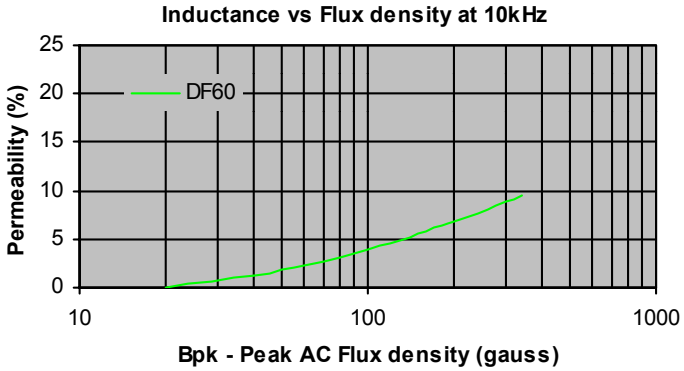
Coefficients **k = 7.21e-07** **m = 0.5539** **n = 2.2355**

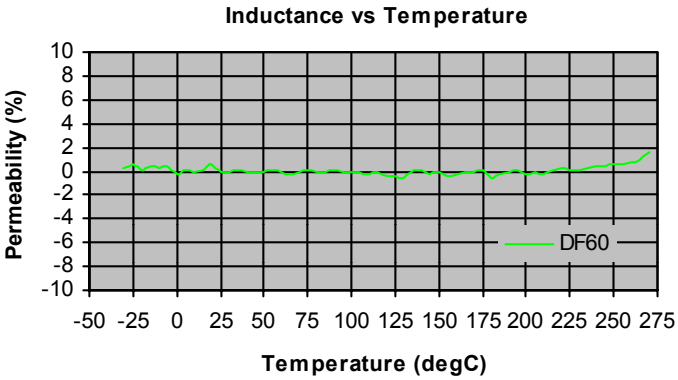
$$PLD = k \times F^{m} \times B^{n}$$

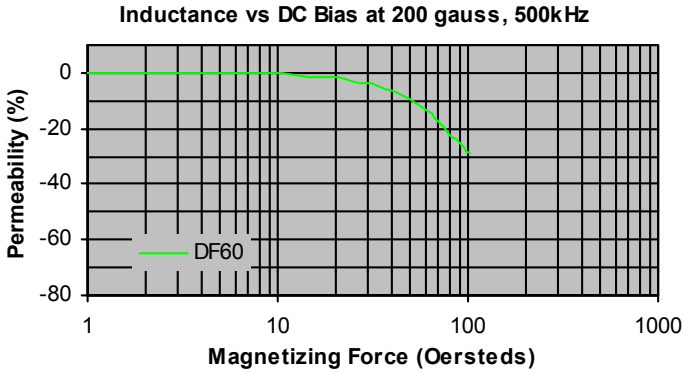
where PLD = power loss density (mW/cm³), F = frequency (Hertz), B = flux density (gauss)

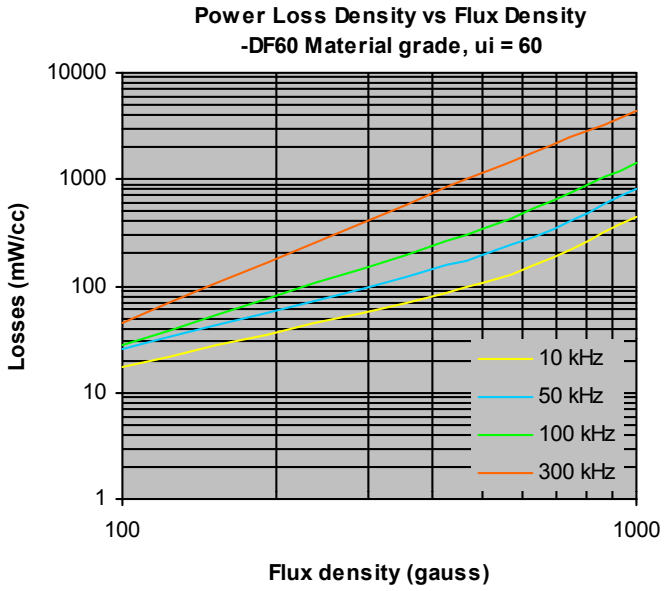
DuraFlux DF60 performance graphs

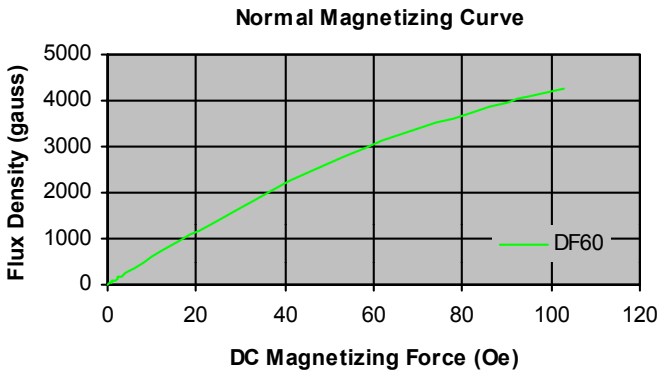












Coefficients **k = 5.92e-06** **m = 0.7701** **n = 1.5085**

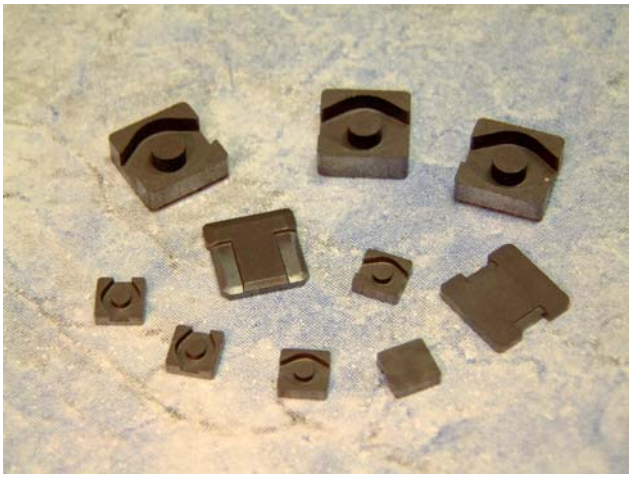
$$PLD = k \times F^{m} \times B^{n}$$

where PLD = power loss density (mW/cm³), F = frequency (Hertz), B = flux density (gauss)

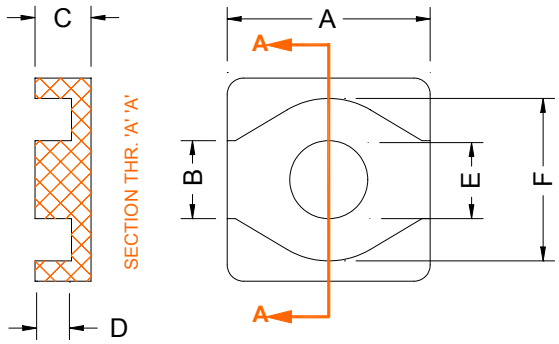
SMD (surface mount device) inductors

SMD inductors manufactured in DuraFlux materials offer low profile, small sized, high energy core solutions for today's power hungry application. Using flat wound coils allows for extreme currents typically found in today's modern notebook processors and similar small sized electronic devices. The high dc biasing ability of DuraFlux allows for a minimum drop off in inductance while still maintaining a high level of efficiency.

SMD Inductor cores are assembled with an ER core and I core. The I core forms the base of the inductor where the coil winding is terminated. The unique design of the core reduces any flux leakage to a minimum while still maintaining maximum heat dissipation from the core surface.



ER CORES



ER Core - Part Numbers

Dimensions which are fixed are dependant on available tooling. Dimensions which are variable can be adjusted during set-up. The ER core part number defines the outside dimensions, core height, coil window, centre post dimension and material grade. ER cores are also available with a chamfered edge for part orientation during assembly.

PCM A - C - D - E - G

A - outside dimension (mm)
C - core height dimension (mm)
D - coil height dimension (mm)
E - centre post dimension (mm)
G - DuraFlux material grade

Size: 6.6 x 6.6mm - 180° series

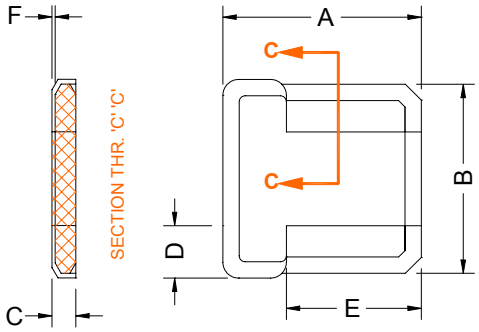
Part Number	A (fixed)	B (fixed)	C (variable)	D (variable)	E (fixed)	F (fixed)	G (material)
PCM 6.4-3.7-2.6-2.4-60	6.4	2.4	3.70	2.60	2.4	5.1	DF60
PCM 6.4-2.0-1.0-2.1-48	6.4	2.4	2.00	1.00	2.1	5.1	DF48
PCM 6.4-1.9-0.9-2.4-48	6.4	2.4	1.90	0.90	2.4	5.1	DF48
PCM 6.4-1.7-0.9-2.4-48	6.4	2.4	1.70	0.90	2.4	5.1	DF48
PCM 6.4-1.3-0.5-2.4-48	6.4	2.4	1.30	0.50	2.4	5.1	DF48

Size: 12.7 x 12.7mm - 180° series

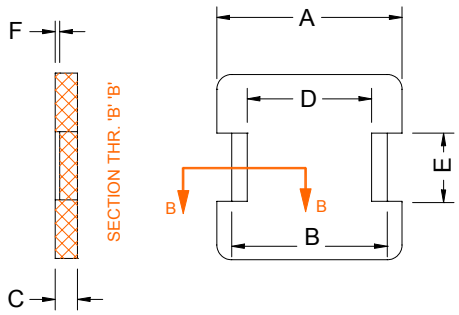
Part Number	A (fixed)	B (fixed)	C (variable)	D (variable)	E (fixed)	F (fixed)	G (material)
PCM 12.5-4.5-3.0-4.8-48	12.5	4.8	4.50	3.00	4.8	10.4	DF48
PCM 12.5-4.15-3.05-4.8-60	12.5	4.8	4.15	3.05	4.8	10.4	DF60
PCM 12.5-4.0-2.9-4.8-60	12.5	4.8	4.00	2.90	4.8	10.4	DF60
PCM 12.5-3.95-2.45-4.8-60	12.5	4.8	3.95	2.45	4.8	10.4	DF60
PCM 12.5-3.9-1.8-4.8-60	12.5	4.8	3.90	1.80	4.8	10.4	DF60
PCM 12.5-3.7-2.55-4.8-48	12.5	4.8	3.70	2.55	4.8	10.4	DF48
PCM 12.5-3.55-2.25-4.8-60	12.5	4.8	3.55	2.25	4.8	10.4	DF60
PCM 12.5-3.35-2.05-4.8-60	12.5	4.8	3.35	2.05	4.8	10.4	DF60
PCM 12.5-2.5-1.4-4.8-48	12.5	4.8	2.50	1.40	4.8	10.4	DF48

Typical part numbers

I CORES



T Shape



H Shape

I Core - Part Numbers

The I core part number defines the outside dimensions, core height, step type and material grade. I cores are available in two standard shapes as indicated with a 'T' or 'H' symbol within the part number. Custom step sizes are available with minimum tooling changes required. Core heights are adjustable during set-up. Cores made from DF48 grade material do not require coating. Maximum breakdown as measured from the I core step to step is > 120Vac. Cores made from DF60 grade material require an epoxy coating layer of less than 0.1mm in thickness on the outside surface of the I core so as to ensure a breakdown voltage of > 120Vac. All cores are treated for oxidation when exposed to normal environments.

PCB A - C - F - G

A - outside dimension (mm)
C - core height dimension (mm)
D - step type & dimension (mm)
G - DuraFlux material grade

Size: 6.6 x 6.6mm - 180° series

Shape	Part Number	A (fixed)	B (fixed)	C (variable)	D (fixed)	E (fixed)	F (fixed)	G (material)
T	PCB 6.4-0.95-0.15T-48	6.4	6.2	0.95	1.9	4.3	0.2	DF48

Size: 12.7 x 12.7mm - 180° series

Shape	Part Number	A (fixed)	B (fixed)	C (variable)	D (fixed)	E (fixed)	F (fixed)	G (material)
H	PCB 12.5-1.5-0.3H1-48	12.5	10.5	1.50	8.4	4.6	0.3	DF48
T	PCB 12.5-1.7-0.3T-60	12.5	11.9	1.70	3.3	8.5	0.3	DF60
T	PCB 12.5-1.2-0.3T-60	12.5	11.9	1.20	3.3	8.5	0.3	DF60
T	PCB 12.5-1.95-0.3T-60	12.5	11.9	1.95	3.3	8.5	0.3	DF60
T	PCB 12.5-2.1-0.5T-60	12.5	11.9	2.10	3.3	8.5	0.5	DF60
T	PCB 12.5-1.9-0.5T-48	12.5	11.9	1.90	3.3	8.5	0.5	DF48
T	PCB 12.5-1.6-0.3T-60	12.5	11.9	1.60	3.3	8.5	0.3	DF60
T	PCB 12.5-1.8-0.3T-60	12.5	11.9	1.80	3.3	8.5	0.3	DF60
H	PCB 12.5-1.0-0.3H1-48	12.5	10.5	1.00	8.4	4.6	0.3	DF48

Typical part numbers

SMD (surface mount device) inductors

Electrical Specification

Size: 6.6 x 6.6mm - 180° series

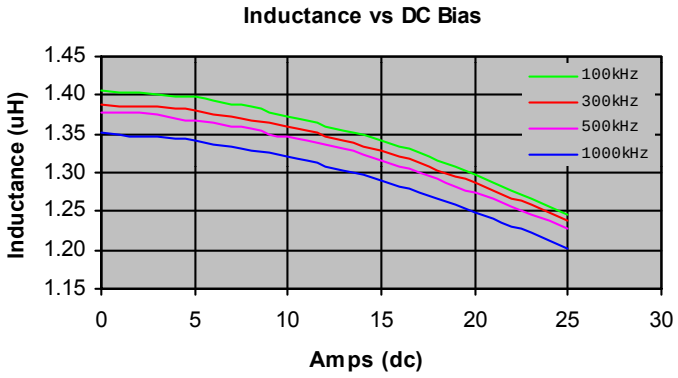
	ER core Part Number	I core Part Number	Max. Height (mm)	Turns	Inductance (µH)			Max. Amps (Adc)
	PCM 6.4-3.7-2.6-2.4-60	PCM 6.4-3.7-2.6-2.4-60	7.40	4½	0.40	0.35	µH Typ. @	20
	PCM 6.4-2.0-1.0-2.1-48	PCB 6.4-0.95-0.15T-48	2.95	2½	0.22	0.19	µH Typ. @	17

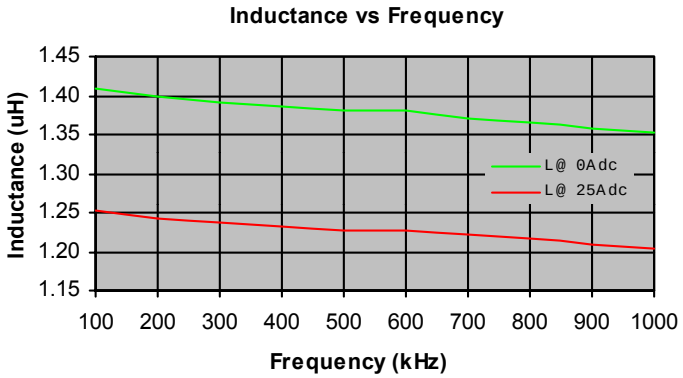
Size: 12.7 x 12.7mm - 180° series

	ER core Part Number	I core Part Number	Max. Height (mm)	Turns	Inductance (µH)			Max. Amps (Adc)
	PCM 12.5-4.5-3.0-4.8-48	PCB 12.5-1.5-0.3H1-48	6.00	1½	0.18	0.14	µH Typ. @	65
	PCM 12.5-4.5-3.0-4.8-48	PCB 12.5-1.5-0.3H1-48		2½	0.40	0.32	µH Typ. @	50
	PCM 12.5-4.5-3.0-4.8-48	PCB 12.5-1.5-0.3H1-48		3½	0.80	0.64	µH Typ. @	40
*	PCM 12.5-4.5-3.0-4.8-48	PCB 12.5-1.5-0.3H1-48		4½	1.40	1.12	µH Typ. @	30
	PCM 12.5-4.5-3.0-4.8-48	PCB 12.5-1.5-0.3H1-48		5½	2.00	1.60	µH Typ. @	26
	PCM 12.5-4.5-3.0-4.8-48	PCB 12.5-1.5-0.3H1-48		6½	2.80	2.20	µH Typ. @	23
	PCM 12.5-4.15-3.05-4.8-60	PCB 12.5-1.7-0.3T-60	5.85	3½	0.90	0.77	µH Typ. @	25
	PCM 12.5-4.0-2.9-4.8-60	PCB 12.5-1.2-0.3T-60	5.20	4½	1.50	1.28	µH Typ. @	18
	PCM 12.5-3.95-2.45-4.8-60	PCB 12.5-1.95-0.3T-60	5.90	2½	0.50	0.43	µH Typ. @	40
	PCM 12.5-3.9-1.8-4.8-60	PCB 12.5-2.1-0.5T-60	6.00	1½	0.30	0.26	µH Typ. @	40
	PCM 12.5-3.7-2.55-4.8-48	PCB 12.5-1.9-0.5T-48	5.60	1½	0.15	0.13	µH Typ. @	40
	PCM 12.5-3.55-2.25-4.8-60	PCB 12.5-1.6-0.3T-60	5.15	3½	1.00	0.85	µH Typ. @	23
	PCM 12.5-3.35-2.05-4.8-60	PCB 12.5-1.8-0.3T-60	5.15	2½	0.60	0.51	µH Typ. @	27

SMD performance graphs

ER core (PCM 12.5-4.5-3.0-4.8-48) and I core (PCB 12.5-1.5-0.3H1-48) were assembled with a 4½ turn flat coil as indicated (*) above. The inductance verses dc bias and frequency graphs were tested with 100kHz, 0.1Vrms at 25°C ambient.

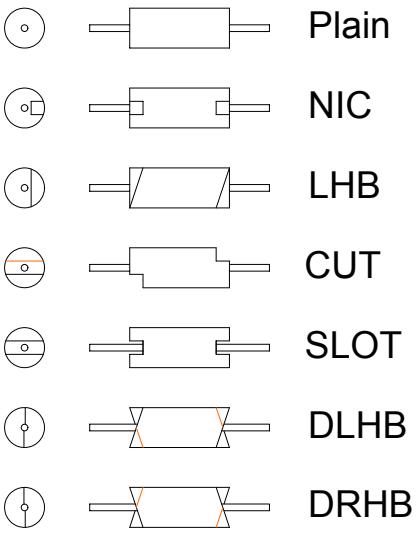




Axial leaded cores (coilforms)

A wide range of choke cores, with and without wire leads are available in a selected range of Carbonyl iron and Phenolic plastic materials. Choke cores are available with end forms as shown below (unless otherwise specified) and a range of wire leads which can also be moulded into the coilform ends. Wire lead ends are stamped into a range of end forms from pure tin coated oxygen free copper wires.

End Forms

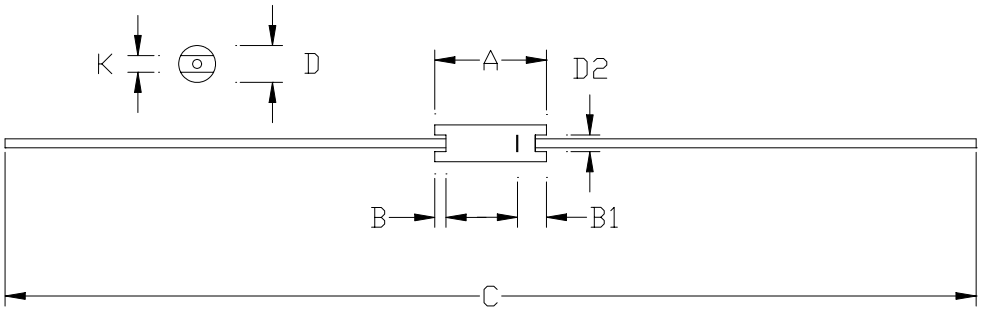


Carbonyl grades

BASE TYPE	μi	Freq. Range MHz	MMG grade
PHENOLIC	1	50 ~ 250	PH
CARBONYL	4	100 ~ 200	MDG-PH1
CARBONYL	4/5	100 ~ 200	HF-PH1
CARBONYL	5	50 ~ 200	21
CARBONYL	8	10 ~ 100	HF
CARBONYL	9	1.0 ~ 20	11
CARBONYL	10	0.5 ~ 10	15
CARBONYL	12	0.5 ~ 10	EN12
CARBONYL	14	0.1 ~ 5	EN/C14
CARBONYL	20	0.1 ~ 2.5	SB
CARBONYL	22	0.1 ~ 2.5	SL22
CARBONYL	25	0.1 ~ 2.5	SN33
CARBONYL	35	0.1 ~ 2.5	SN35
CARBONYL	35	0.1 ~ 2.5	SQ35

The permeability and 'Q' of these grades can be adjusted slightly to suit specific customer requirements. The frequency is for optimum 'Q' values but the material can be used outside this frequency range with minimum effect other than 'Q'

Core outline



A – core length
B – slot depth
B1 – hole depth
C – axial leaded core length
D – core diameter
D2 – hole diameter
K – slot width

AXIAL LEADED CORES

A wide range of axial leaded cores are available in standard grades of Carbonyl iron powders and in Phenolic (non-magnetic) materials. Other sizes are available on request.

Core body diameter		Max. core length		Max. leadwire dia.	
mm	inches	mm	inches	mm	inches
1.55	0.061	5.00	0.197	0.50	0.020
1.65	0.065	5.00	0.197	0.50	0.020
1.80	0.071	6.00	0.236	0.60	0.024
2.00	0.079	8.00	0.314	0.60	0.024
2.40	0.094	10.00	0.393	0.60	0.024
2.70	0.106	10.00	0.393	0.60	0.024
2.90	0.114	12.00	0.472	0.60	0.024
3.10	0.122	15.00	0.590	0.60	0.024
3.20	0.126	15.00	0.590	0.80	0.031
3.30	0.130	15.00	0.590	0.80	0.031
3.80	0.149	19.00	0.747	0.80	0.031
4.00	0.157	19.00	0.747	0.80	0.031
4.50	0.177	20.00	0.786	0.80	0.031
5.00	0.197	25.00	0.983	0.80	0.031
5.35	0.210	32.00	1.258	1.20	0.047
5.50	0.216	32.00	1.258	1.20	0.047
6.00	0.236	32.00	1.258	1.20	0.047
6.35	0.250	32.00	1.258	1.20	0.047
8.00	0.314	32.00	1.258	1.20	0.047

Standard leadwire lengths are from 12mm thr. 50mm
Lead material is pure tin coated OFHC copper

Types 6 thr. to 17 also available with blind holes and endforms for customer's own lead insertion.

Shields for choke cores

A wide range of shields (sleeves) are available, sizes not detailed below may be available on request. All cores can be made in lengths smaller that the maximum lengths shown.

Outside Diameter		Inside Diameter		Length	
mm	inches	mm	inches	mm	inches
2.20	0.086	1.60	0.063	5	0.197
3.25	0.128	2.45	0.096	9	0.354
3.78	0.149	2.45	0.096	10	0.394
3.90	0.153	3.00	0.118	10	0.394
5.00	0.197	2.45	0.096	10	0.394
5.35	0.210	2.75	0.108	10	0.394
6.35	0.250	3.30	0.130	10	0.394
9.40	0.369	6.75	0.265	16	0.630
12.30	0.483	9.53	0.375	32	1.260

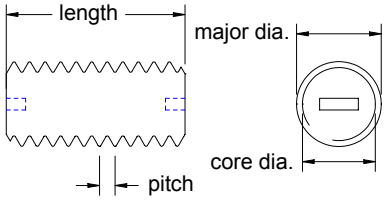
Cores can be pressed in all standard grades of Carbonyl iron, LF iron, DuraFlux and Phenolic (non-magnetic) materials.

Screw cores and Rod cores

SCREW CORES

A wide range of screw cores are available, sizes not detailed may be available on request. All cores can be made in lengths smaller than the maximum lengths shown.

Core outline



Core body diameter		Max. core length		Pitch
mm	inches	mm	inches	mm
1.75	0.069	5.00	0.197	0.350
3.00	0.118	10.00	0.393	0.500
3.50	0.138	12.00	0.472	0.500
4.00	0.157	15.00	0.590	0.500

Cores can be pressed from all standard grades of Carbonyl iron, LF iron and DuraFlux materials.

ROD CORES

A wide range of rods (blank) are available, sizes not detailed may be available on request. All cores can be made in lengths smaller that the maximum lengths shown.

Core body diameter		Max. core length	
mm	inches	mm	inches
1.55	0.061	5.00	0.197
1.65	0.065	5.00	0.197
1.80	0.071	6.00	0.236
2.00	0.079	8.00	0.314
2.40	0.094	10.00	0.393
2.70	0.106	10.00	0.393
2.90	0.114	12.00	0.472
3.10	0.122	15.00	0.590
3.20	0.126	15.00	0.590
3.30	0.130	15.00	0.590
3.80	0.149	19.00	0.747
4.00	0.157	19.00	0.747
4.50	0.177	20.00	0.786
5.00	0.197	25.00	0.983
5.35	0.210	32.00	1.258
5.50	0.216	32.00	1.258
6.00	0.236	32.00	1.258
6.35	0.250	32.00	1.258
8.00	0.314	32.00	1.258
10.00	0.393	32.00	1.258
12.70	0.499	35.00	1.376
19.00	0.747	35.00	1.376

Cores can be pressed in all standard grades of Carbonyl Iron, Low Frequency Iron powders, DuraFlux and in Phenolic (non-magnetic material)

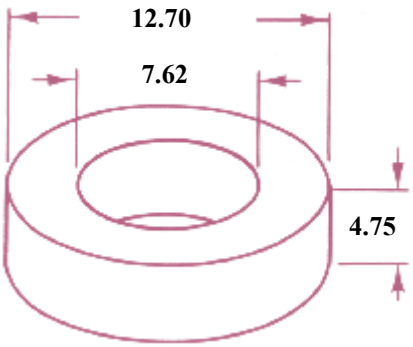
Core Data Sheet

Part Number: **G60 – 95** ***Material Grade:*** **95** ***Manufactured by:*** **Auto**

Description:

MPP – iron alloy particles insulated and separated by clay are pressed into shape before being bonded with epoxy resin. The particles are spherical in shape with 70 – 80% nickel, 2 – 4% molybdenum and the balance being iron. The material has low hysteresis and eddy current losses, good inductance stability after high DC biasing and good temperature stability.

Mechanical Drawing:



Note: dimensions are for uncoated cores.

Dimensional Data:	
OD (+/- 0.25)	12.70
ID (+/- 0.25)	7.62
HT (+/- 0.25)	4.75
Rad	3.00
Strength (Newtons) typ.	85.5

Note: dimensions in mm.

Magnetic Properties:	
C1 (mm-1)	2.6940
Le (mm)	3.06E+01
He (mm)	4.57E+00
Ae (mm2)	1.13E+01
Ve (mm3)	3.47E+02

Electrical Data:

AL norm	56.00	*Permeability (ui)*	125.0	*tol +/-* 10.000
AL max	60.48	*Breakdown voltage (rms)*		1000
AL min	51.52	*Test Voltage (AC)*		0.010
		Typical DC bias at 80% permeability (A/m)		2222

Note: AL values are expressed in nH per turn (N) squared. The cores are manufactured to the AL values listed, the permeability for each material is for reference only. The AL values are measured at a flux density of < 1mT (10 gauss) and at a frequency of 1kHz.

Packing Information:

Vacuum packed: 250 per bag; 2250 per carton

Coating Data:

Epoxy/Poly, Gentian Blue, 0.25 mm approx. per surface.

Test Conditions and Windings for measurements:

Total losses, typical 0.2 ohm/H/u measured at

Test set-up conditions required during testing.

Frequency (kHz) 1.8 Flux density (mT) 2.0

Turns 200 Wire 0.16 Volts (AC) 0.036

Special Comments

1.
2.
3.

Total losses combines hysteresis, residual and eddy current losses. Eddy current loss limits below 300 kHz.

Note: MMG IOM Limited reserves the right to change specification data as required without notice.

MPP Equivalents

MMG	Magnetics	Arnold
G22-93	55021-A2	A-529024-8
G22-95	55020-A2	A-520052-8
G22-96	55019-A2	A-528058-8
G22-97	55018-A2	A-527064-8
G22-98	55014-A2	A-526069-8
G64B-93	55241-A2	A-460026-8
G64B-95	55240-A2	A-331054-8
G64B-96	55239-A2	A-464064-8
G64B-97	55238-A2	A-461069-8
G64B-98	55234-A2	A-465075-8
G64-93	55271-A2	A-135050-8
G64-95	55270-A2	A-134103-8
G64-96	55269-A2	A-224122-8
G64-97	55268-A2	A-638132-8
G64-98	55264-A2	A-222144-8
G63-93	55031-A2	A-138025-8
G63-95	55030-A2	A-137052-8
G63-96	55029-A2	A-225062-8
G63-97	55028-A2	A-338066-8
G63-98	55024-A2	A-223073-8
G51-93	55281-A2	A-500025-8
G51-95	55280-A2	A-250053-8
G51-96	55279-A2	A-499063-8
G51-97	55278-A2	A-498068-8
G51-98	55274-A2	A-497074-8
G51A-93	55291-A2	A-247032-8
G51A-95	55290-A2	A-246066-8
G51A-96	55289-A2	A-245078-8
G51A-97	55288-A2	A240084-8
G51A-98	55284-A2	A-244092-8
G50-93	55041-A2	A-307032-8
G50-95	55040-A2	A-292066-8
G50-96	55039-A2	A-239078-8
G50-97	55038-A2	A-308084-8
G50-98	55034-A2	A-238092-8
G65-93	55131-A2	A-255026-8
G65-95	55130-A2	A-253053-8
G65-96	55129-A2	A-252063-8
G65-97	55128-A2	A-670068-8
G65-98	55124-A2	A-251074-8
G60-93	55051-A2	A-051027-2
G60-95	55050-A2	A-050056-2
G60-96	55049-A2	A-143067-2
G60-97	55048-A2	A-301072-2
G60-98	55044-A2	A-172079-2
G62-93	55121-A2	A-266036-2
G62-95	55120-A2	A-281072-2
G62-96	55119-A2	A-264088-2
G62-97	55118-A2	A-285092-2
G62-98	55114-A2	A-263104-2
G23-93	55381-A2	A-189043-2
G23-95	55380-A2	A-190089-2
G23-96	55379-A2	A-193105-2
G23-97	55378-A2	A-559114-2
G23-98	55374-A2	A-194123-2

MMG	Magnetics	Arnold
G29-93	55848-A2	A-848032-2
G29-95	55206-A2	A-206068-2
G29-96	55205-A2	A-144081-2
G29-97	55204-A2	A-271087-2
G29-98	55200-A2	A-173096-2
G58-93	55059-A2	A-059043-2
G58-95	55310-A2	A-310090-2
G58-96	55309-A2	A-147106-2
G58-97	55308-A2	A-300115-2
G58-98	55304-A2	A-174124-2
G57-93	55894-A2	A-894075-2
G57-95	55930-A2	A-930157-2
G57-96	55929-A2	A-145185-2
G57-97	55928-A2	A-302201-2
G57-98	55924-A2	A-175217-2
G56A-93	55071-A2	A-291061-2
G56A-95	55548-A2	A-548127-2
G56A-96	55547-A2	A-148150-2
G56A-97	55546-A2	A-303163-2
G56A-98	55542-A2	A-176176-2
G55-93	55586-A2	A-345038-2
G55-95	55585-A2	A-585079-2
G55-96	55584-A2	A-149093-2
G55-97	55583-A2	A-304101-2
G55-98	55579-A2	A-177109-2
G49-93	55076-A2	A-076056-2
G49-95	55324-A2	A-324117-2
G49-96	55323-A2	A-150138-2
G49-97	55322-A2	A-305150-2
G49-98	55318-A2	A-178162-2
G48-93	55083-A2	A-083081-2
G48-95	55254-A2	A-254168-2
G48-96	55253-A2	A-151198-2
G48-97	55252-A2	A-306215-2
G48-98	55248-A2	A-179233-2
G47-93	55439-A2	A-759135-2
G47-95	55438-A2	A-438281-2
G47-96	55437-A2	A-152330-2
G47-97	55436-A2	A-325360-2
G47-98	55432-A2	A-180390-2
G1A-93	55716-A2	A-106073-2
G1A-95	55715-A2	A-715152-2
G1A-96	55714-A2	A-154179-2
G1A-97	55713-A2	A-327195-2
G1A-98	55709-A2	A-181210-2
G2B-93	55110-A2	A-488075-2
G2B-95	55109-A2	A-109156-2
G2B-96	55108-A2	A-155185-2
G2B-97	55107-A2	A-328200-2
G2B-98	55103-A2	A-182218-2

High Flux Equivalents

MMG	Magnetics	Arnold
G22-83	58021-A2	HF-025060-8
G22-85	58020-A2	HF-025125-8
G22-86	58019-A2	HF-025147-8
G22-87	58018-A2	HF-025160-8
G64B-83	58241-A2	HF-027060-8
G64B-85	58240-A2	HF-027125-8
G64B-86	58239-A2	HF-027147-8
G64B-87	58238-A2	HF-027160-8
G64-83	58271-A2	HF-026060-8
G64-85	58270-A2	HF-026125-8
G64-86	58269-A2	HF-026147-8
G64-87	58268-A2	HF-026160-8
G63-83	58031-A2	HF-031060-8
G63-85	58030-A2	HF-031125-8
G63-86	58029-A2	HF-031147-8
G63-87	58028-A2	HF-031160-8
G51-83	58281-A2	HF-039060-8
G51-85	58280-A2	HF-039125-8
G51-86	58279-A2	HF-039147-8
G51-87	58278-A2	HF-039160-8
G51A-83	58291-A2	HF-038060-8
G51A-85	58290-A2	HF-038125-8
G51A-86	58289-A2	HF-038147-8
G51A-87	58288-A2	HF-038160-8
G50-83	58041-A2	HF-040060-8
G50-85	58040-A2	HF-040125-8
G50-86	58039-A2	HF-040147-8
G50-87	58038-A2	HF-040160-8
G65-83	58131-A2	HF-044060-8
G65-85	58130-A2	HF-044125-8
G65-86	58129-A2	HF-044147-8
G65-87	58128-A2	HF-044160-8
G60-83	58051-A2	HF-050060-2
G60-85	58050-A2	HF-050125-2
G60-86	58049-A2	HF-050147-2
G60-87	58048-A2	HF-050160-2
G62-83	58121-A2	HF-065060-2
G62-85	58120-A2	HF-065125-2
G62-86	58119-A2	HF-065147-2
G62-87	58118-A2	HF-065160-2
G23-83	58381-A2	HF-068060-2
G23-85	58380-A2	HF-068125-2
G23-86	58379-A2	HF-068147-2
G23-87	58378-A2	HF-068160-2

MMG	Magnetics	Arnold
G29-83	58848-A2	HF-080060-2
G29-85	58206-A2	HF-080125-2
G29-86	58205-A2	HF-080147-2
G29-87	58204-A2	HF-080160-2
G58-83	58059-A2	
G58-85	58310-A2	HF-090125-2
G58-86	58309-A2	HF-090147-2
G58-87	58308-A2	HF-090160-2
G57-83	58894-A2	
G57-85	58930-A2	HF-106125-2
G57-86	58929-A2	HF-106147-2
G57-87	58928-A2	HF-106160-2
G56A-83	58071-A2	
G56A-85	58548-A2	HF-130125-2
G56A-86	58547-A2	HF-130147-2
G56A-87	58546-A2	HF-130160-2
G55-83	58586-A2	HF-135060-2
G55-85	58585-A2	HF-135125-2
G55-86	58584-A2	HF-135060-2
G55-87	58583-A2	
G49-83	58076-A2	
G49-85	58324-A2	HF-141125-2
G49-86	58323-A2	HF-141147-2
G49-87	58322-A2	HF-141160-2
G48-83	58083-A2	HF-157060-2
G48-85	58254-A2	HF-157125-2
G48-86	58253-A2	HF-157147-2
G48-87	58252-A2	HF-157160-2
G47-83	58439-A2	HF-184060-2
G47-85	58438-A2	HF-184125-2
G47-86	58437-A2	HF-184147-2
G47-87	58436-A2	HF184160-2
G1A-83	58716-A2	HF-200060-2
G1A-85	58715-A2	HF-200125-2
G1A-86	58714-A2	HF-200147-2
G1A-87	58713-A2	HF-200160-2
G2B-83	58110-A2	HF-225060-2
G2B-85	58109-A2	HF-225125-2

DuraFlux Equivalents

MMG	AL (nH)	OD (mm)	ID (mm)	HT (mm)	OD (in)	ID (in)	HT (in)	Magnetics	Arnold
G22-DF60	24	6.35	2.79	2.79	0.250	0.110	0.110	77021-A7	MS-025060-8
G64B-DF60	26	6.60	2.67	2.54	0.260	0.105	0.100	77241-A7	MS-027060-8
G64-DF60	50	6.60	2.67	4.78	0.260	0.105	0.188	77271-A7	MS-026060-8
G63-DF60	25	7.87	3.96	3.18	0.310	0.156	0.125	77031-A7	MS-031060-8
G51-DF60	25	9.65	4.78	3.18	0.380	0.188	0.125	77281-A7	MS-039060-8
G51A-DF60	32	9.65	4.78	3.96	0.380	0.188	0.156	77291-A7	MS-038060-8
G50-DF60	32	10.16	5.08	3.96	0.400	0.200	0.156	77041-A7	MS-040060-8
G65-DF60	26	11.18	6.35	3.96	0.440	0.250	0.156	77131-A7	MS-044060-8
G60-DF60	27	12.70	7.62	4.75	0.500	0.300	0.187	77051-A7	MS-050060-2
G62-DF60	35	16.64	10.16	6.35	0.655	0.400	0.250	77121-A7 *	MS-065060-2
G23-DF60	43	17.27	9.65	6.35	0.680	0.380	0.250	77381-A7	MS-068060-2
G29-DF60	32	20.32	12.70	6.35	0.800	0.500	0.250	77848-A7	MS-080060-2
G58-DF60	43	22.86	13.97	7.62	0.900	0.550	0.300	77059-A7	MS-090060-2
G57-DF60	75	26.92	14.73	11.18	1.060	0.580	0.440	77894-A7	
G56A-DF60	61	33.02	19.94	10.67	1.300	0.785	0.420	77071-A7	MS-130060-2
G55-DF60	38	34.29	23.37	8.89	1.350	0.920	0.350	77586-A7	MS-135060-2
G49-DF60	56	35.81	22.35	10.46	1.410	0.880	0.412	77076-A7	MS-141060-2
G48-DF60	81	39.88	24.13	14.48	1.570	0.950	0.570	77083-A7	MS-157060-2
G47-DF60	135	46.74	24.13	18.03	1.840	0.950	0.710	77439-A7	MS-184060-2
G1A-DF60	73	50.50	30.00	13.50	1.988	1.181	0.531	77716-A7 *	MS-200060-2 *
G2B-DF60	75	58.00	35.00	13.97	2.284	1.377	0.550	77110-A7 *	MS-225060-2 *

** similar size cores*