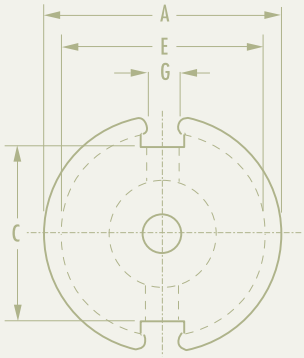
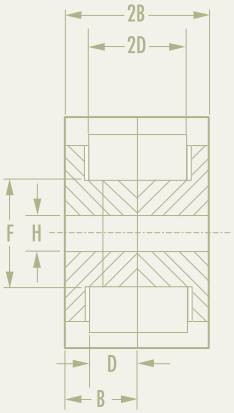
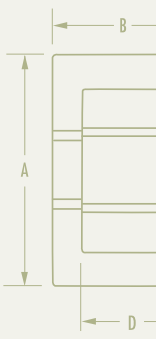
MAGNETICS®

FERRITE CORES

2013 CATALOG







Part Number Index

TOROIDS

E CORES

SHAPES

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Applications & Materials

Ferrites are dense, homogenous ceramic structures made by mixing iron oxide with oxides or carbonates of one or more metals such as zinc, manganese, nickel or magnesium. They are pressed, then fired in a kiln at 1,000 - 1,500°C, and machined as needed to meet various operational requirements. Ferrite parts can be easily and economically molded into many different geometries. Many diverse materials are available, providing a choice of desirable electrical and mechanical properties.

Magnetics' ferrite cores are manufactured for a wide variety of applications. Magnetics has the leading MnZn ferrite materials for power transformers, power inductors, wideband transformers, common mode chokes and many other applications.

ADVANTAGES OF MAGNETICS' FERRITES

- The widest range of toroid sizes in power and high permeability materials
- Superior toroid coatings available in several options: epoxy, nylon and Parylene C
- Standard gapping to precise inductance or mechanical dimension: wide range of coil former and assembly hardware available
- The full range of standard planar E and I cores
- Rapid prototyping capability for new development

FERRITE APPLICATIONS

APPLICATIONS	DESIRED PROPERTIES	PREFERRED MATERIALS	AVAILABLE SHAPES
Broadband Transformers	Low loss, high μ. Good frequency response.	J, W	Pot cores, Toroids, E, U & I cores, RM cores, EP cores
Common Mode Chokes	Very high μ (permeability).	J, W	Toroids, E Cores
Converter and Inverter Transformers	Low losses, high saturation.	F, L, P, R, T	Toroids, E, U, & I cores, Pot cores, RS cores, Planar cores
Differential Mode Inductors	Low losses, high temperature stability, good stability across load conditions.	F, P, R, T	Gapped Pot cores, EP cores, E cores, RM cores, Planar cores, PQ cores
Linear Filters and Sensors	Good loss factor, linearity and temperature linearity at low drive level.	C, E, V	Pot cores, Toroids
Narrow Band Transformers	Moderate Q, high μ, high stability.	F, J	Pot cores, Toroids, RM cores, EP cores
Noise Filters	High μ, good frequency response.	J, W	Toroids
Power Inductors	Low losses at high flux densities and temperatures. High saturation. Good stability across load conditions.	F, L, P, R, T	Pot cores, E cores, PQ cores, RM cores, Planar cores
Power Transformers	High μ and low losses at high flux densities and temperatures. High saturation. Low exciting currents.	F, L, P, R, T	Ungapped pot cores, E, U & I cores, Toroids, EP cores, RS cores, DS cores, PQ cores, Planar cores
Pulse Transformers	High μ, low loss, high B saturation.	J, W	Toroids
Telecom Inductors	Low losses, high temperature stability, good stability across load conditions.	F, P, R, T	Pot cores, EP cores, E cores, RM cores, Planar cores

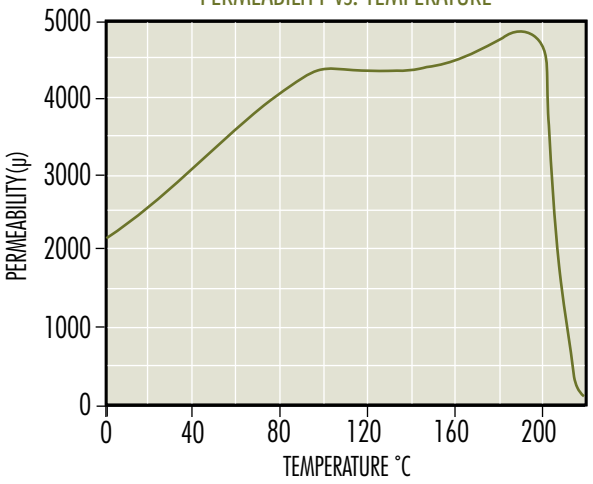
			INDUCTORS & POWER TRANSFORMERS					EMI/RFI FILTERS & BROADBAND TRANSFORMERS		LINEAR FILTERS & SENSORS		
MATERIAL			**L**	**R**	**P**	**F**	**T**	**J**	**W**	**C**	**E**	**V**
Initial Permeability	μ_i		900 ± 25%	2,300 ± 25%	2,500 ± 25%	3,000 ± 20%	3,000 ± 25%	5,000 ± 20%	10,000 ± 30%	900 ± 25%	2,000 ± 25%	2,300 ± 25%
Maximum Usable Frequency (50% roll-off)	f	MHz	≤6	≤1.8	≤1.8	≤1.5	≤1.5	≤ 0.7	≤0.5	≤8	≤3	≤1.5
Relative Loss Factor X 10^{-6} 25°C		tan δ/μ_{iac}						≤15 100 kHz	≤7 10 kHz	≤10 300 kHz	≤3 100 kHz	≤5 100 kHz
Curie Temperature	T_c	°C	> 300	> 210	> 210	> 210	> 220	> 145	> 135	> 200	> 160	> 170
Flux Density @ 1,194 A/m (15 Oe) 25°C	B_m 10 kHz	G mT	4,200 420	4,700 470	4,700 470	4,700 470	5,300 530	4,300 430	3,900 390	3,800 380	3,600 360	4,400 440
Remanence 25°C	B_r	G mT	1,500 150	1,600 160	1,600 160	1,500 150	1,500 150	1,000 100	800 80	1,500 150	700 70	1,500 150
Power Loss (PL) Sine Wave, in mW/cm³ (typical)	25 kHz 200 mT (2,000 G)	@25°C		90	180	60	80					
		@60°C		65	110	55	75					
		@100°C		60	65	90	70					
		@120°C		65	110	125	75					
	100 kHz 100 mT (1,000 G)	@25°C		87	70	70	65					
		@60°C		64	50	65	57					
		@100°C		58	65	110	55					
		@120°C		64	45	150	58					
	500 kHz 50 mT (500 G)	@25°C	290									
		@60°C	150									
		@100°C	115	175	300		150					
		@120°C	130									
Resistivity	ρ	Ω-m	10	5	5	5	5	0.5	0.1	2	2	1
Density	δ	g/cm³	4.8	4.8	4.8	4.8	4.8	4.8	4.9	4.7	4.7	4.8

R Material

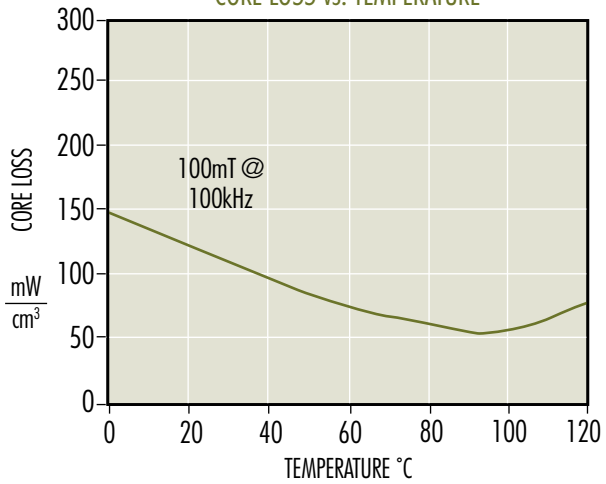
A medium frequency multi-purpose power transformer, inductor and filter material. Widely available in shapes and toroids. Engineered for lowest losses between 90 - 100°C.

Initial Perm (25°C; ≤ 10 kHz) ..... **2,300 ± 25%**
Saturation Flux Density (4,700 G at 15 Oe, 25°C) .....470 mT, 11.9 A·T/cm
Curie Temperature .....210°C

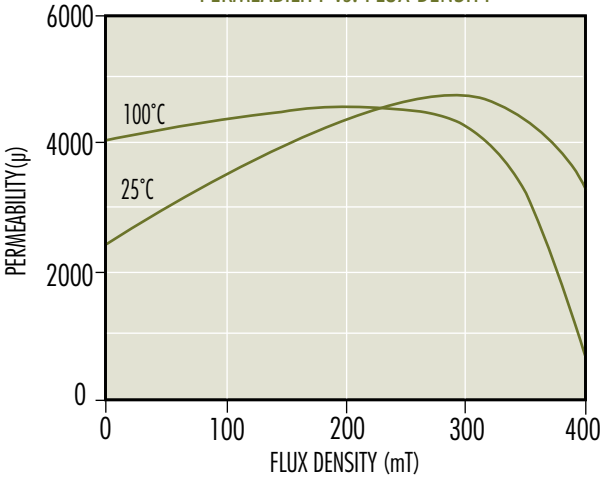
PERMEABILITY vs. TEMPERATURE



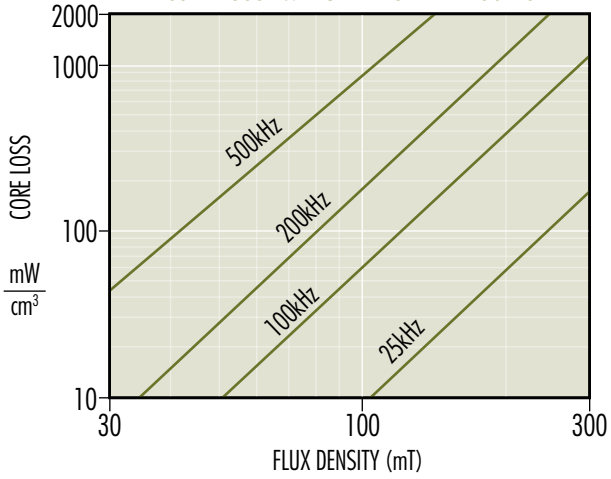
CORE LOSS vs. TEMPERATURE



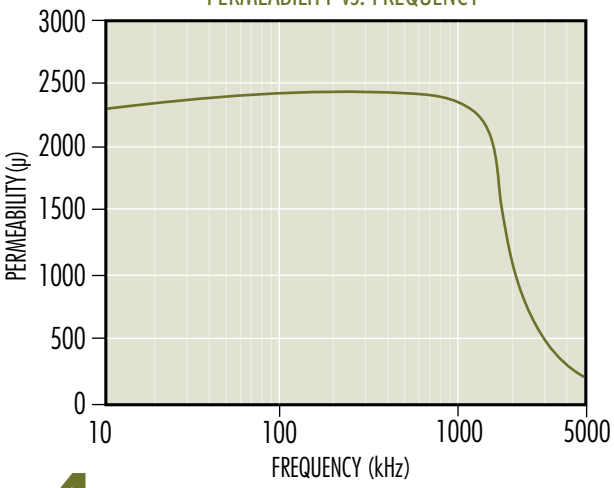
PERMEABILITY vs. FLUX DENSITY



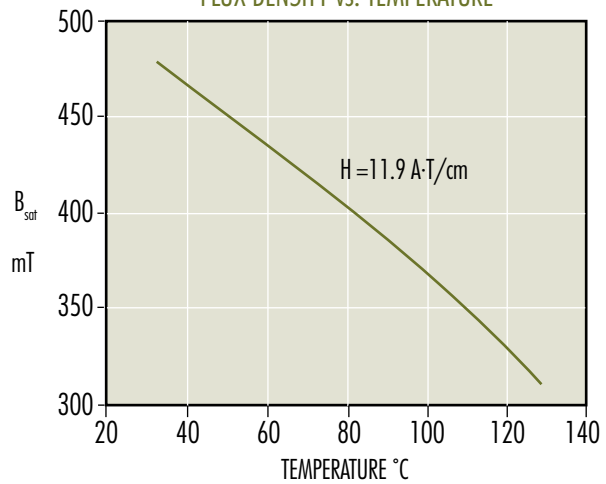
CORE LOSS vs. FLUX DENSITY AT 100° C



PERMEABILITY vs. FREQUENCY



FLUX DENSITY vs. TEMPERATURE

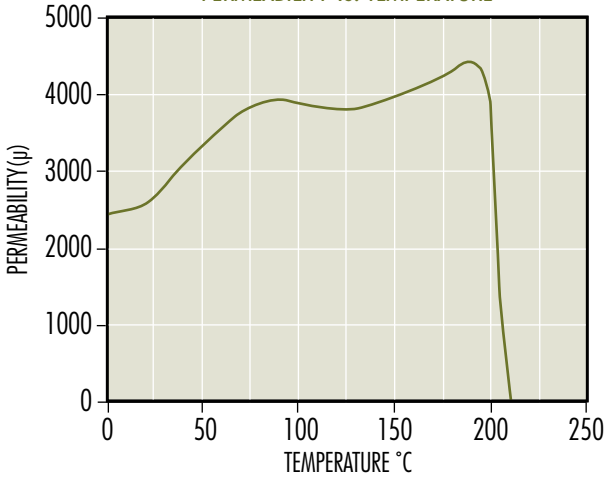


P Material

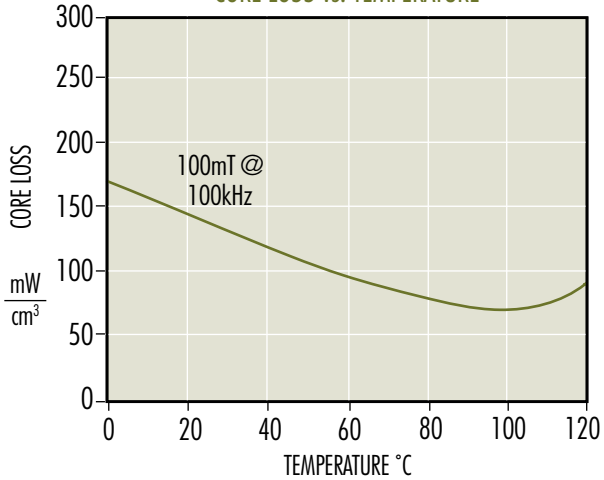
A low-medium frequency general-purpose power converter material. Engineered for lowest losses between 80 - 100°C. Available in almost all core sizes and shapes.

Initial Perm (25°C; ≤ 10 kHz) ..... **2,500 ± 25%**
Saturation Flux Density (4,700 G at 15 Oe, 25°C) .....470 mT, 11.9 A·T/cm
Curie Temperature .....210°C

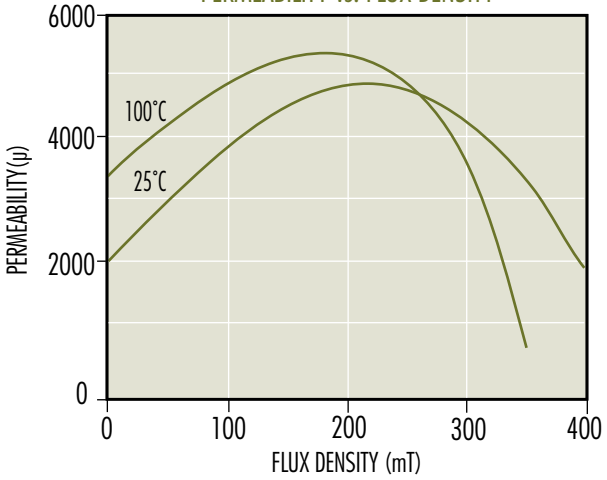
PERMEABILITY vs. TEMPERATURE



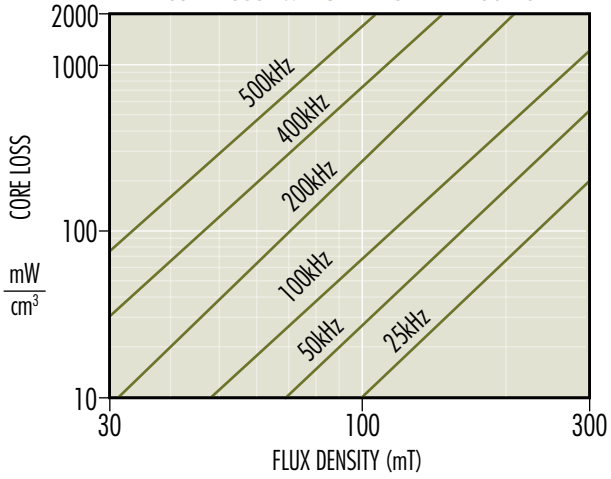
CORE LOSS vs. TEMPERATURE



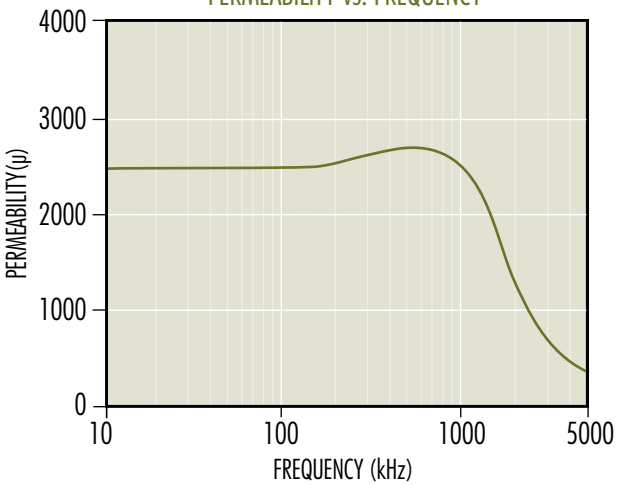
PERMEABILITY vs. FLUX DENSITY



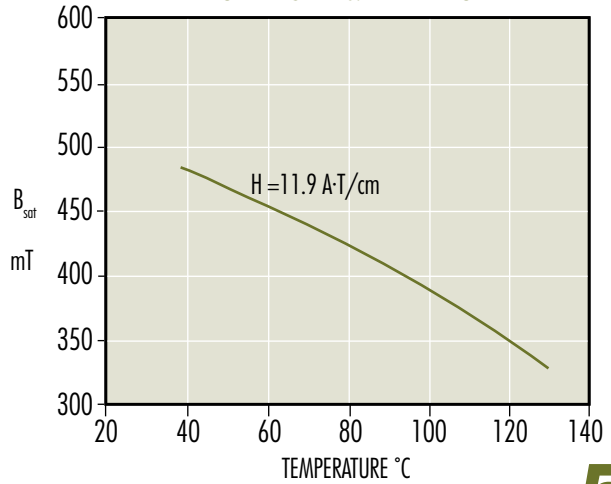
CORE LOSS vs. FLUX DENSITY AT 100° C



PERMEABILITY vs. FREQUENCY



FLUX DENSITY vs. TEMPERATURE

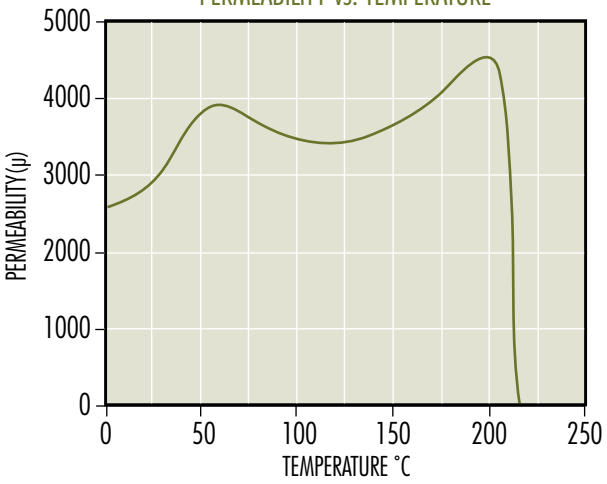


F Material

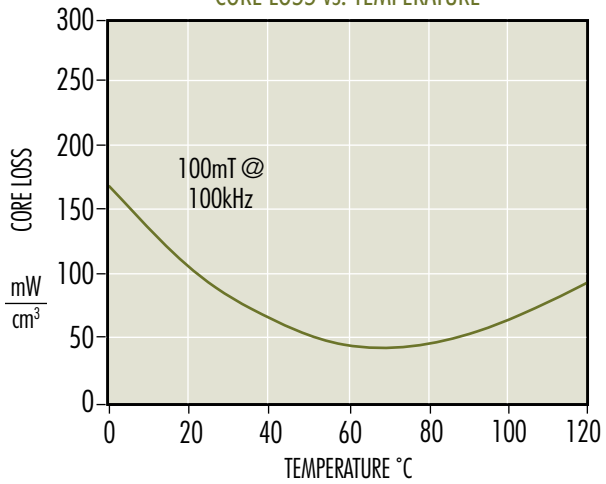
A medium frequency general-purpose power transformer, inductor and filter material. Slightly higher in perm than P or R Material. Engineered for lowest losses between 50 - 80°C.

Initial Perm (25°C; ≤ 10 kHz) ..... **3,000 ± 20%**
Saturation Flux Density (4,700 G at 15 Oe, 25°C) .....470 mT, 11.9 A·T/cm
Curie Temperature .....210°C

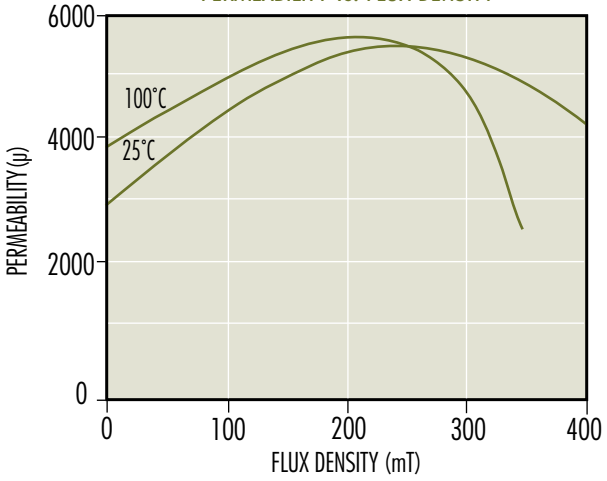
PERMEABILITY vs. TEMPERATURE



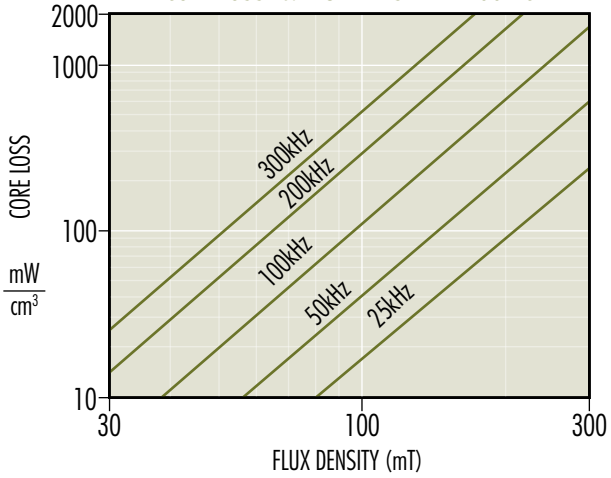
CORE LOSS vs. TEMPERATURE



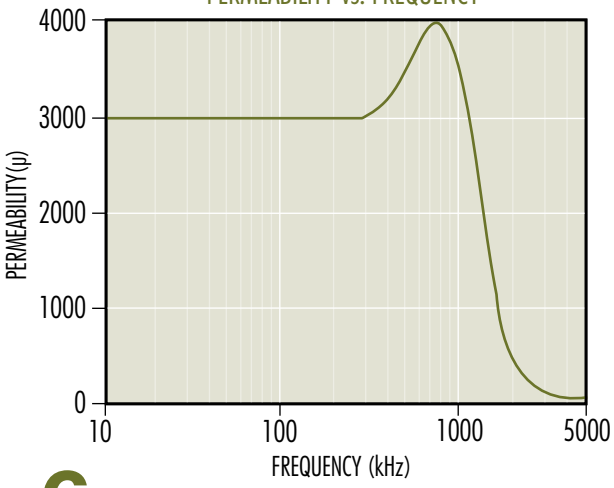
PERMEABILITY vs. FLUX DENSITY



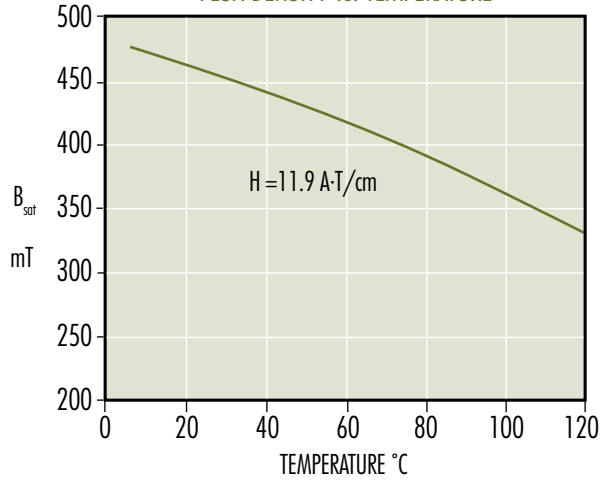
CORE LOSS vs. FLUX DENSITY AT 100° C



PERMEABILITY vs. FREQUENCY



FLUX DENSITY vs. TEMPERATURE

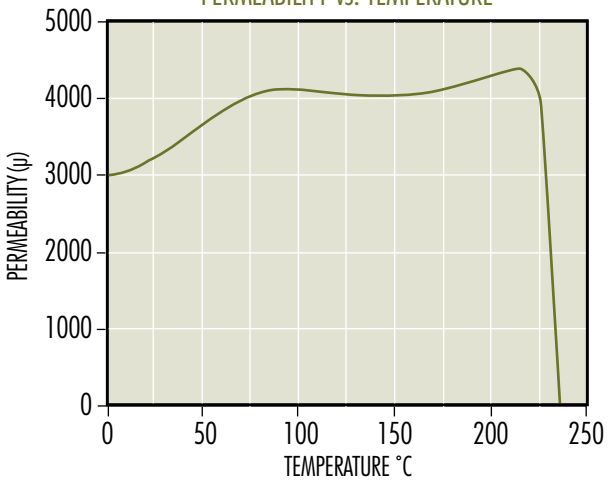


T Material

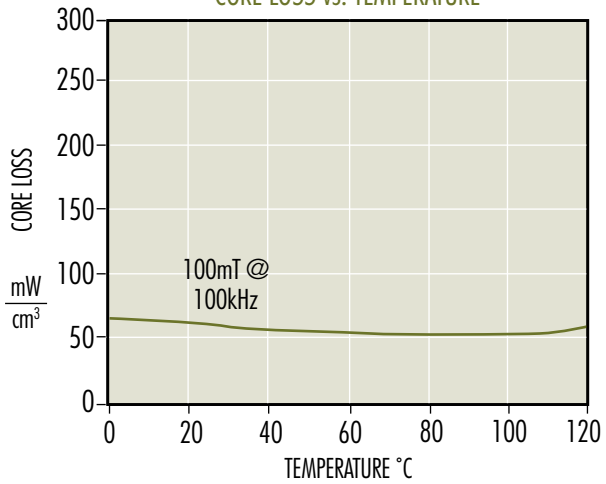
A power material for transformers and inductors operating from 20 kHz to 750 kHz. T material offers stability in both perm and losses over a wide temperature range.

Initial Perm (25°C; ≤ 10 kHz) ..... **3,000 ± 25%**
Saturation Flux Density (5,300 G at 15 Oe, 25°C) .....530 mT, 11.9 A·T/cm
Curie Temperature .....220°C

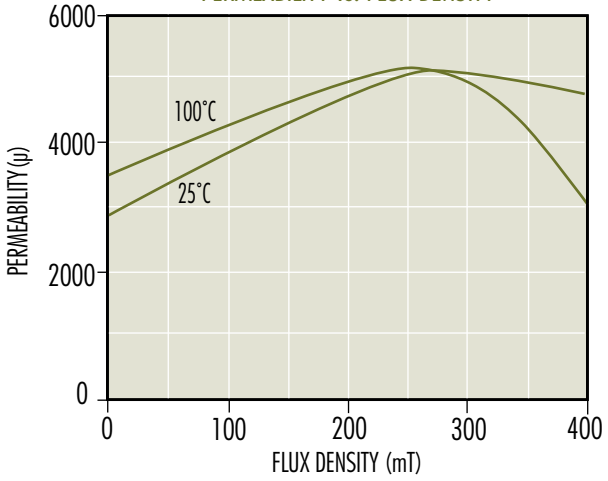
PERMEABILITY vs. TEMPERATURE



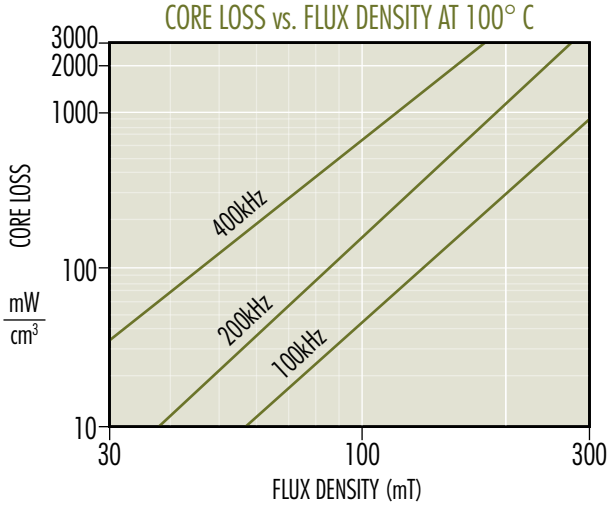
CORE LOSS vs. TEMPERATURE



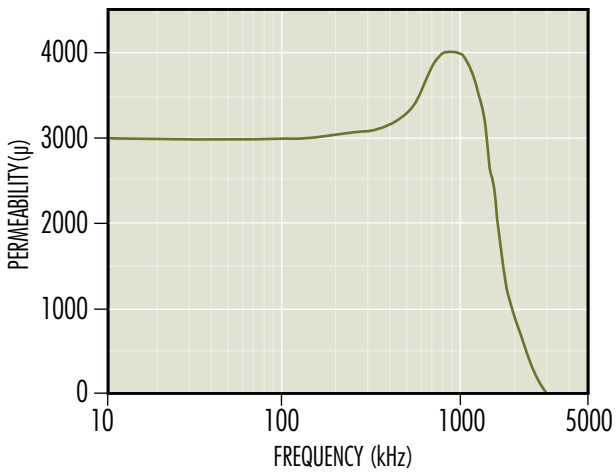
PERMEABILITY vs. FLUX DENSITY



CORE LOSS vs. FLUX DENSITY AT 100° C



PERMEABILITY vs. FREQUENCY

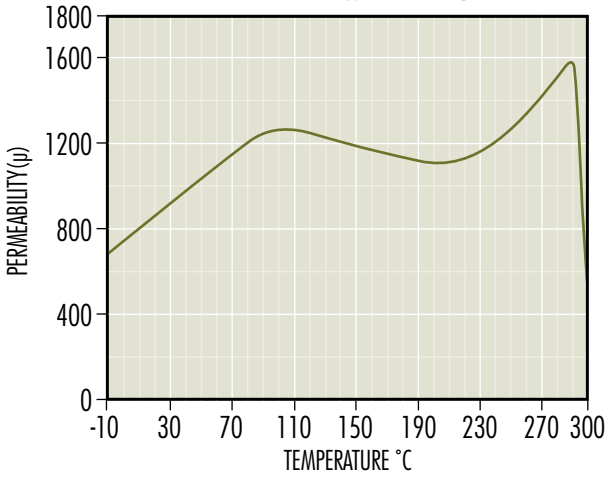


L Material

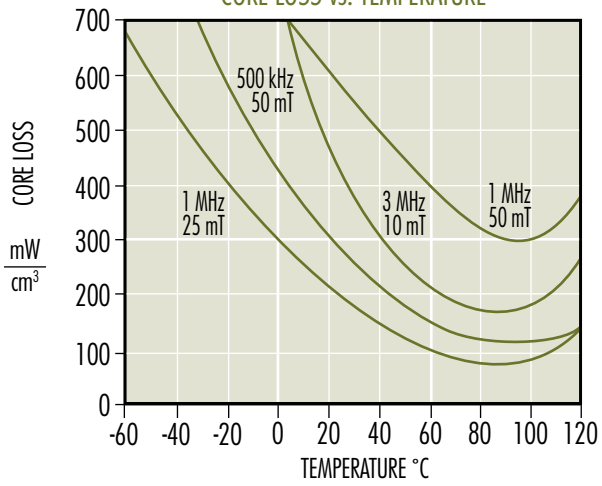
A high-frequency high-temperature power material. L material is optimized for transformers and inductors from 500 kHz – 3 MHz. Core losses are minimized between 70 – 100°C.

Initial Perm (25°C; ≤ 10 kHz), Uncoated ..... 900 ± 25%
Initial Perm (25°C; ≤ 10 kHz), Coated ..... 750 ± 25%
Saturation Flux Density (4,200 G at 15 Oe, 25°C) .....420 mT, 11.9 A·T/cm
Curie Temperature ..... 300°C

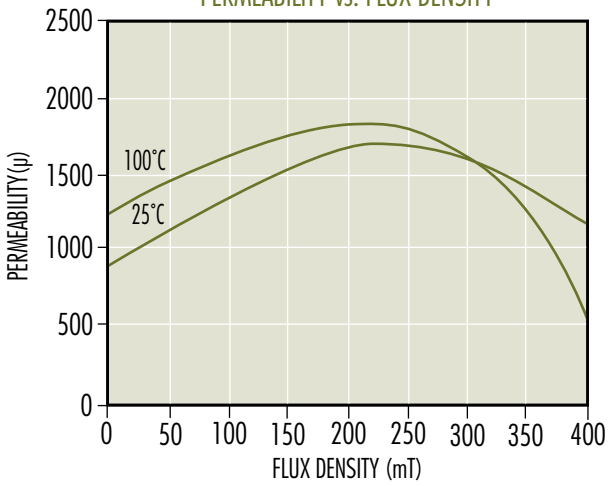
PERMEABILITY vs. TEMPERATURE



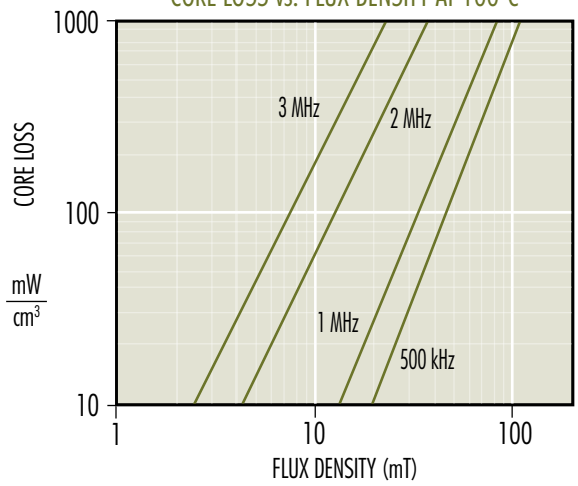
CORE LOSS vs. TEMPERATURE



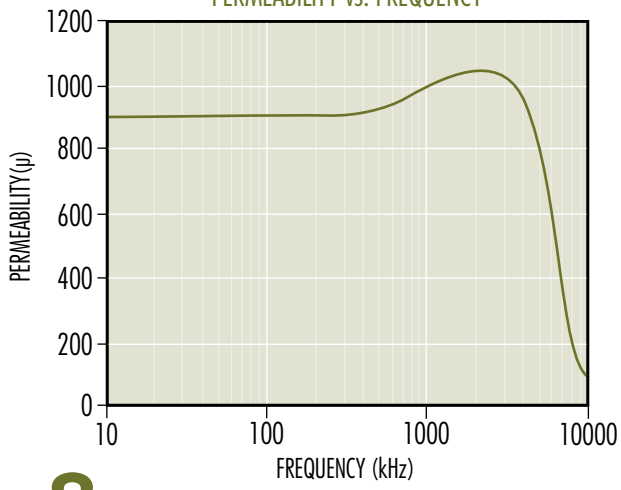
PERMEABILITY vs. FLUX DENSITY



CORE LOSS vs. FLUX DENSITY AT 100°C



PERMEABILITY vs. FREQUENCY

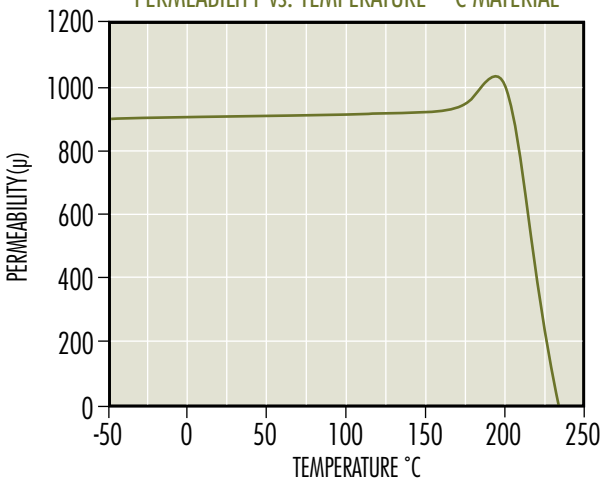


Materials

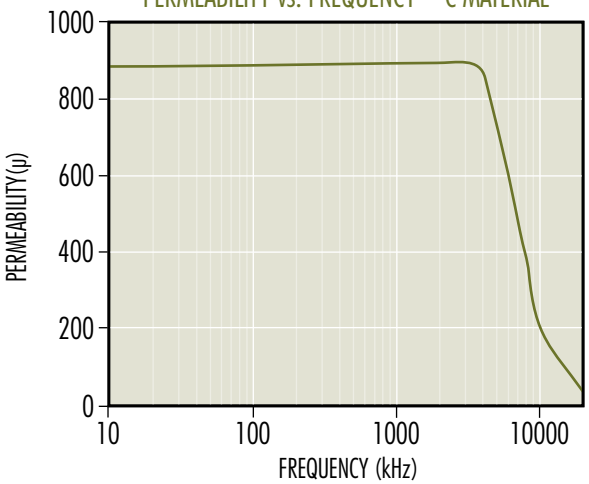
C, E and V materials work well for Telecom Filters, Wideband, Matching and Pulse transformer applications, and High Q inductors.

	C	E	V
Initial Perm	900 ± 25%	2,000 ± 25%	2,300 ± 25%
Saturation Flux Density	380 mT, 11.9 A·T/cm (3,800 G at 25°C, 15 Oe)	360 mT, 11.9 A·T/cm (3,600 G at 25°C, 15 Oe)	440 mT, 11.9 A·T/cm (4,400 G at 25°C, 15 Oe)
Curie Temperature	200°C	160°C	170°C

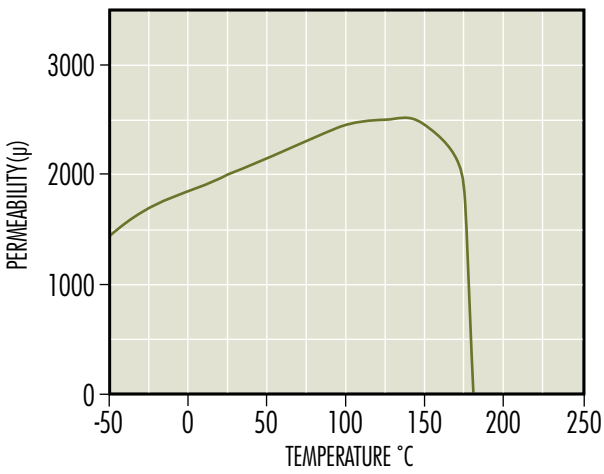
PERMEABILITY vs. TEMPERATURE – C MATERIAL



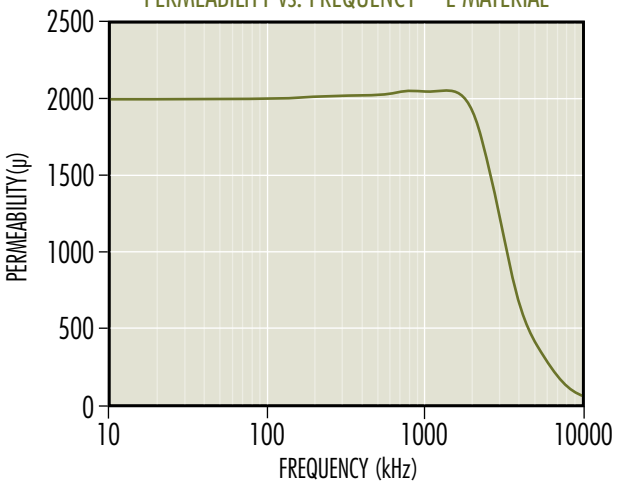
PERMEABILITY vs. FREQUENCY – C MATERIAL



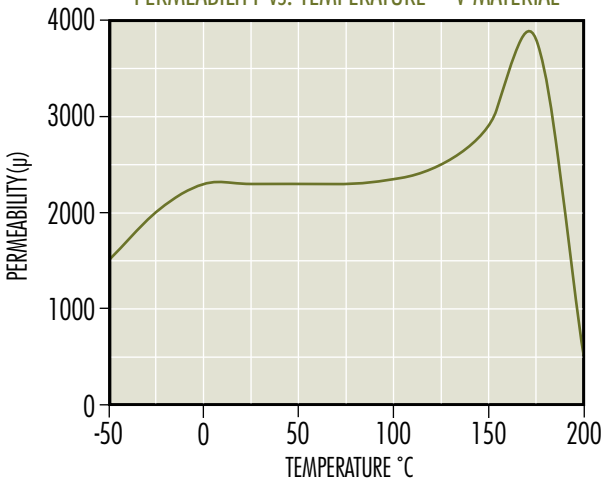
PERMEABILITY vs. TEMPERATURE – E MATERIAL



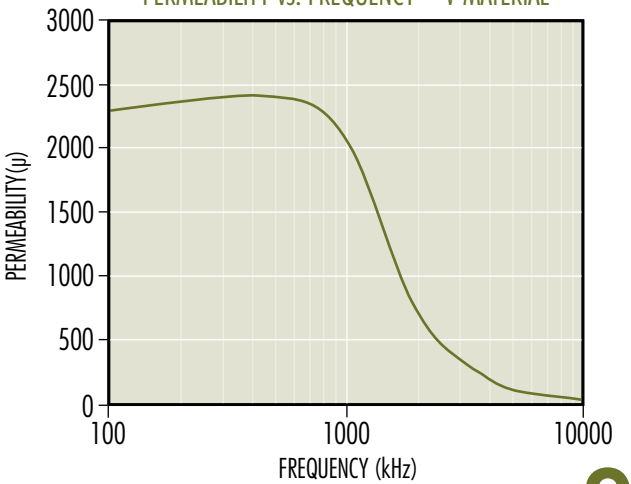
PERMEABILITY vs. FREQUENCY – E MATERIAL



PERMEABILITY vs. TEMPERATURE – V MATERIAL



PERMEABILITY vs. FREQUENCY – V MATERIAL

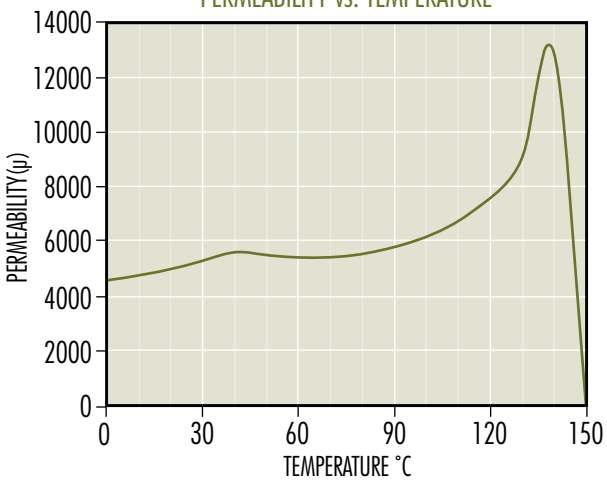


J Material

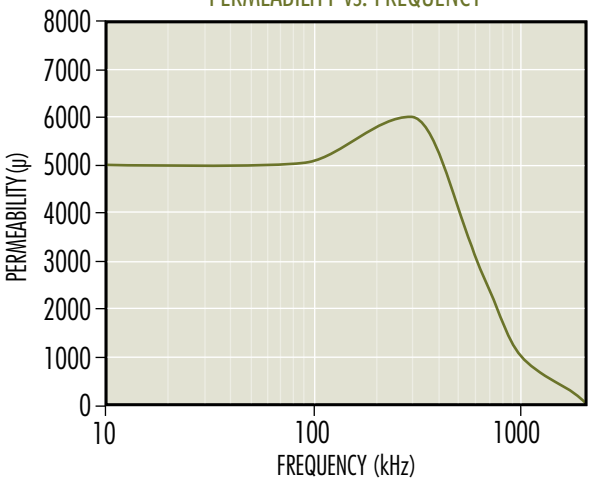
A medium perm general-purpose material. Well suited both for EMI/RFI filtering and broadband transformers.

Initial Perm (25°C; ≤ 10 kHz) ..... **5,000 ± 20%**
Saturation Flux Density (4,300 G at 15 Oe, 25°C) ..... 430 mT, 11.9 A·T/cm
Curie Temperature ..... 145°C

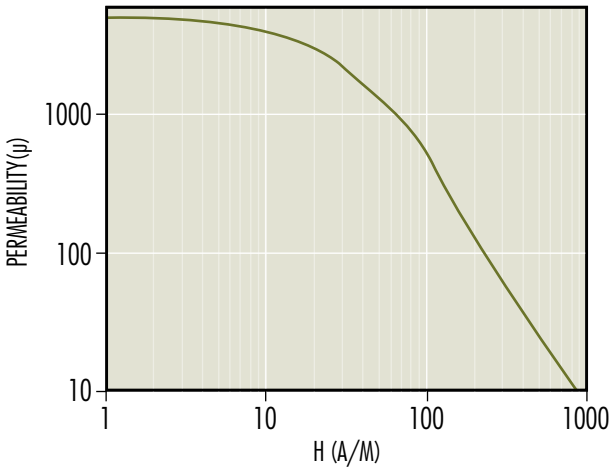
PERMEABILITY vs. TEMPERATURE



PERMEABILITY vs. FREQUENCY



PERMEABILITY vs. DC BIAS



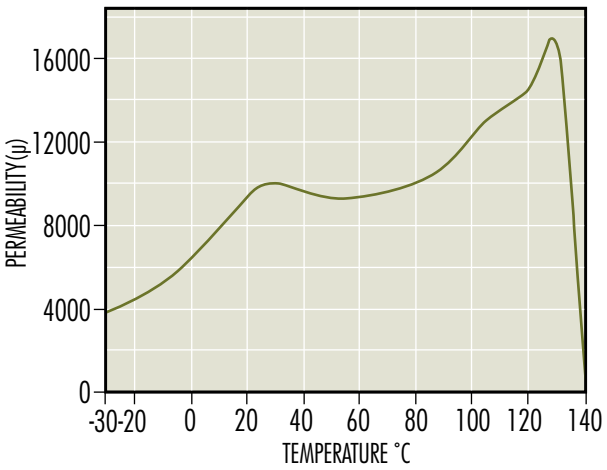
W Material

A high permeability material used for EMI/RFI suppression, common mode chokes, pulse and broadband transformers.

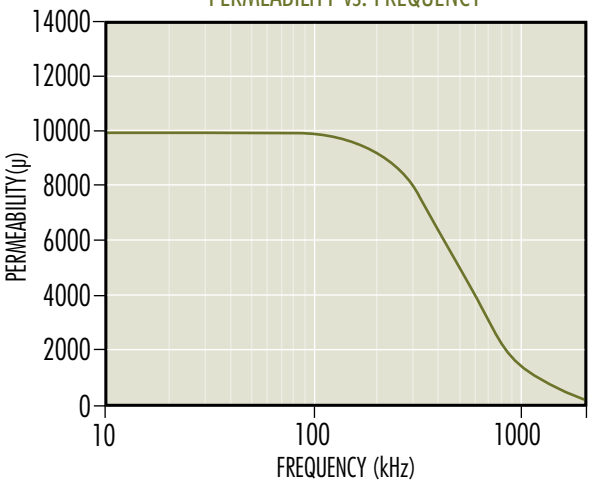
Available in shapes and toroids.

Initial Perm (25°C; ≤ 10 kHz) ..... **10,000 ± 30%**
Saturation Flux Density (3,900 G at 15 Oe, 25°C) .....390 mT, 11.9 A·T/cm
Curie Temperature .....135°C

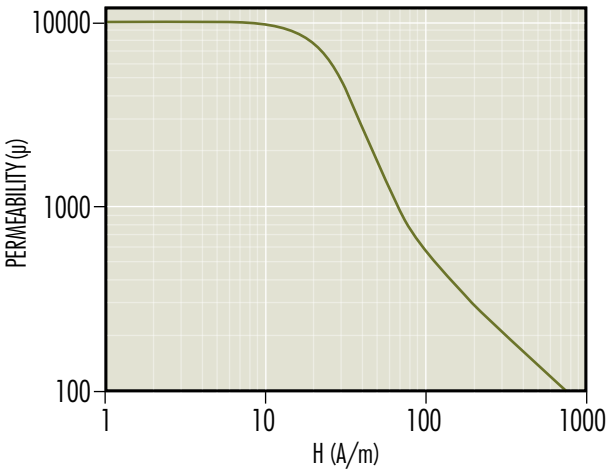
PERMEABILITY vs. TEMPERATURE



PERMEABILITY vs. FREQUENCY



PERMEABILITY vs. DC BIAS



Gapped Cores
How To Order

Part Number

Gap Code

The letter indicates the type of gap and a three-digit number defines the value.

CODE	MEANING	EXAMPLE
A_ _ _	**A_L** (if <1000)	DF42311**A275** (A_L=275)
X_ _ _	**A_L** if 1000 or greater (add 1000 to code)	0P44721**X250** (A_L=1250)
F_ _ _	**A_L** if <100, non-integer (divide code by 10)	0R42510**F807** (A_L=80.7)
G_ _ _	**Depth of Grind** in mils (1000^{ths} of an inch)	0F44317**G079** (Gap=0.079")
M_ _ _	**Depth of Grind**, mm (divide code by 10)	0F43019**M015** (Gap=1.5 mm)

A_L is inductance factor, mH/1000 Turns, or nH/T^2.
Either the A_L or the depth of grind (not both) is controlled during production of gapped cores.
See the chart on pages 14-15 for tolerances.

Gap-to-Gap vs Ungapped-to-Gap Core Sets

"Gap-to-gap combination" means the gap is symmetrical. Half of the total gap is removed from each piece.

"Ungapped-to-gap combination" means an asymmetrical gap; the entire gap is taken from one piece, and the other piece is ungapped.

Gapping for A_L

In most applications, defining the gap with the A_L results in inductors with the least variation. Electrical measurement is inherently more precise, and compensation is made for variability in material permeability and core geometry.

When specifying and ordering E cores (including EC, EFD, EER, ETD, and Planar E cores) gapped to an A_L, it is important to note which cores are produced in gap-to-gap combination, because two gapped pieces are assembled to achieve the A_L. Alternatively, for E cores provided ungapped-to-gap, an ungapped piece must be used with a gapped piece to achieve the A_L. Pot, RS, DS, RM, PQ, and EP cores are sold as sets whether the combination is gap-to-gap or ungapped-to-gap.

A_L testing and limits are calculated to three significant digits, based on the normal value. For example, A_L=99±3% is interpreted as 96.0 Minimum, 99.0 Nominal, and 102.0 Maximum.

Magnetics tests gapped A_L values with full bobbins, usually 100 turns, or 250 turns for deep gaps. The drive level is low (5 Gauss) and the frequency is set low enough to avoid resonance effects. Measured inductance in an application may vary significantly from the theoretical value due to low turns, low bobbin fill, leakage effects, resonance effects, or elevated drive levels.

It is important for the users to verify the correlation between the test of the core and the specific test being applied to the inductor or transformer. Planar E cores, Planar RM, and Planar PQ cores are especially susceptible to correlation discrepancies.

Gapping for Depth of Grind

For parts ordered in pieces (E and I cores). The depth of grind is given for each piece.

For parts ordered in sets, the depth of grind is given as a total for the set, and may be ungapped-to-gap core pieces, or gap-to-gap. To make an ungapped-to-gap set, use one piece of each. For example, use 0R41808G050 with 0R41808EC for an asymmetrical gap of 0.050"± 0.001". For the same gap, but symmetric, use two pieces of 0R41808G025.

For deep gaps, however, better consistency often results when the depth of grind is specified. In such cases, variation in the finished inductor is dominated by the variation in the windings, especially if the number of turns is low.

Gapped Cores
Depth of Grind Tolerances

Tolerance Ranges for Pot, RS, DS, RM, PQ, and EP cores

INCHES		MILLIMETERS		
GAP	TOLERANCE	GAP	TOLERANCE	GAP CONDITION
0.001"– 0.038"	±0.0005"	0.1 mm– 0.9 mm	±0.03 mm	Ungapped to gap combination
0.039"– 0.076"	±0.001"	1.0 mm– 1.9 mm	±0.04 mm	Ungapped to gap combination (Except if the gap is more than 10% of the minimum bobbin depth for the set*, then gap-to-gap combination.)
0.077"– 0.114"	±0.002"	2.0 mm– 2.9 mm	±0.07 mm	Gap to gap combination (Except if the gap is less than 10% of the minimum bobbin depth for the set*, then ungapped-to-gap combination.)
0.115"– 0.152"	±0.002"	3.0 mm– 3.8 mm	±0.07 mm	Gap to gap combination
0.153"– 0.228"	±0.004"	3.9 mm– 5.0 mm	±0.12 mm	Gap to gap combination

*The bobbin depth for the set is the 2D dimension or 2 times the D dimension

Tolerance Ranges for E, EC, ER, EER, EFD, ETD and Planar E cores

INCHES		MILLIMETERS	
GAP	TOLERANCE	GAP	TOLERANCE
0.001"– 0.038"	±0.0005"	0.1 mm– 0.9 mm	±0.03 mm
0.039"– 0.076"	±0.001"	1.0 mm– 1.9 mm	±0.04 mm
0.077"– 0.152"	±0.002"	2.0 mm– 3.8 mm	±0.07 mm
0.153"– 0.228"	±0.004"	3.9 mm– 5.0 mm	±0.12 mm

Gapped Cores

A_L Value Tolerances

SIZE	GAP TO GAP ±3%	UNGAPPED TO GAP COMBINATION			
		±3%	±5%	±7%	±10%
E CORES					PAGE 24 - 27
41203	16-27	28-55	≤86	≤117	≤160
41205	28-47	48-107	≤170	≤229	≤316
41707	22-37	38-89	≤140	≤190	≤259
41808	27-42	43-121	≤192	≤258	≤355
41810	44-74	75-235	≤376	≤512	≤704
42510	37-61	62-200	≤318	≤432	≤595
42515	28-43	44-210	≤333	≤452	≤616
42520	107-190	191-397	≤643	≤874	≤1202
42530	45-72	73-409	≤655	≤891	≤1225
43007	42-67	68-307	≤491	≤668	≤919
43009	55-91	92-222	≤353	≤475	≤653
43515	54-87	88-429	≤687	≤934	≤1284
43520	65-111	112-461	≤738	≤1003	≤-1380
44011	59-95	96-642	≤1029	≤1400	≤1940
44016	52-83	84-545	≤872	≤1185	≤1629
44020	78-126	127-916	≤1480	≤1999	
44022	94-156	157-1187	≤1903	≤1999	
44317	81-136	137-762	≤1222	≤1676	≤1999
44721	107-180	181-1188	≤1920	≤1999	
45528	113-186	187-500	≤1999		
45530	150-360	361-600	≤1999		
45724	129-218	219-450	≤1999		
46016	102-129	130-1231	≤1999		
46527	142-235	236-650	≤ 1999		
47133	150-285	286-950	≤1999		
47228	120-199	200-1823	≤1999		
48020	99-158	159-1922	≤1999		
49928	150-285	286-975	≤1999		
EC CORES					PAGE 38 - 39
43517	49-79	80-438	≤702	≤954	≤1312
44119	61-98	99-627	≤1004	≤1365	≤1891
45224	76-123	124-911	≤1471	≤1999	
47035	83-135	136-1403	≤1999		

*These tolerances also apply to Planar E-I combination.

SIZE	GAP TO GAP ±3%	UNGAPPED TO GAP COMBINATION			
		±3%	±5%	±7%	±10%
PLANAR E CORES*					PAGE 28 - 31
41425	19-35	36-76	≤122	≤166	≤228
41434	17-31	32-77	≤123	≤167	≤230
41805	18-32	33-205	≤329	≤448	≤617
42107	35-66	67-188	≤304	≤414	≤569
42216	78-141	142-405	≤656	≤892	≤1239
43208	118-216	217-643	≤1040	≤1427	≤1964
43618	119-222	223-673	≤1088	≤1491	≤1999
43808	173-315	316-956	≤1547	≤1999	
44008	106-189	190-507	≤821	≤1116	≤1548
44308	201-367	368-1130	≤1828	≤1999	
44310	169-305	306-1130	≤1828	≤1999	
45810	266-481	482-1496	≤1999		
46410	379-701	702-1999			
49938	336-594	595-1999			
ER CORES					PAGE 32 - 33
40906	15-65	66-70	≤110	≤150	≤200
41126	40-74	75-100	≤140	≤190	≤275
41426	45-84	85-130	≤190	≤250	≤380
41826	50-84	85-200	≤325	≤445	≤650
42313	55-90	91-200	≤525	≤710	≤900
43021	80-169	170-710	≤1050	≤1460	≤1975
EER/ETD CORES					PAGE 40 - 41/44 - 45
43434	55-88	89-500	≤806	≤1095	≤1507
43521	54-86	87-566	≤913	≤1241	≤1707
43939	95-156	157-641	≤1028	≤1398	≤1935
44216	71-117	118-876	≤1415	≤1925	≤1999
44444	73-117	118-881	≤1423	≤1935	≤1999
44949	81-130	131-1075	≤1736	≤1999	
45959	51-118	119-1822	≤1999		
EFD CORES					PAGE 42 - 43
41212	18-29	30-90	≤130	≤170	≤230
41515	19-30	31-81	≤127	≤172	≤236
42019	29-45	46-220	≤350	≤430	≤575
42523	41-66	67-296	≤475	≤646	≤888
43030	50-90	91-450	≤790	≤975	≤1125

Gapped Cores

A_L Value Tolerances

SIZE	GAP TO GAP ±3%	UNGAPPED TO GAP COMBINATION			
		±3%	±5%	±7%	±10%
EP CORES					PAGE 48 - 49
40707	25-50	51-75	≤125		≤160
41010	25-55	56-75	≤125		≤160
41313	25-75	76-110	≤175	≤275	≤315
41717	25-100	101-175	≤275	≤400	≤630
42120	25-180	181-450	≤630	≤850	≤1250
POT CORES					PAGE 50 - 51
40704	25-35	36-62	≤95	≤125	≤175
40905	25-48	49-87	≤135	≤180	≤240
41107	25-75	76-135	≤220	≤285	≤399
41408	71-113	114-210	≤307	≤417	≤574
41811	96-174	175-326	≤523	≤712	≤988
41814	65-135	136-340	≤510	≤700	≤980
42213	113-204	205-482	≤779	≤1060	≤1459
42616	139-249	250-695	≤1125	≤1543	≤1999
43019	170-304	305-1015	≤1642	≤1999	
43622	222-399	400-1494	≤1999		
44229	169-389	390-1965	≤1999		
RS (ROUND-SLAB) CORES					PAGE 52 - 53
41408		25-177	≤283	≤385	≤530
41811	25-39	40-270	≤400	≤525	≤800
42311	25-39	40-347	≤708	≤963	≤1325
42318	25-39	40-452	≤731	≤994	≤1378
42616	25-39	40-622	≤998	≤1369	≤1884
43019	25-62	63-918	≤1485	≤1999	
43622	40-62	63-1286	≤1999		
44229	40-62	63-1732	≤1999		

SIZE	GAP TO GAP ±3%	UNGAPPED TO GAP COMBINATION			
		±3%	±5%	±7%	±10%
DS (DOUBLE SLAB) CORES					PAGE 52 - 53
42311	109-195	196-386	≤625	≤850	≤1170
42318	78-135	136-441	≤706	≤961	≤1332
42616	117-205	206-580	≤930	≤1276	≤1756
43019	149-264	265-873	≤1412	≤1922	≤1999
43622	170-300	301-1111	≤1797	≤1999	
44229	179-315	316-1543	≤1999		
PQ CORES					PAGE 54 - 55
42016	60-184	185-467	≤755	≤1027	≤1425
42020	50-139	140-467	≤754	≤1026	≤1422
42610	200-396	397-777	≤1258	≤1728	≤1999
42614	110-334	335-645	≤1044	≤1421	≤1972
42620	95-296	297-888	≤1436	≤1955	≤1999
42625	77-234	235-880	≤1423	≤1936	≤1999
43214	127-416	417-548	≤885	≤1207	≤1661
43220	128-409	410-486	≤1369	≤1878	≤1999
43230	84-241	242-808	≤1305	≤1775	≤1999
43535	89-255	256-980	≤1575	≤1999	
44040	83-230	231-1006	≤1625	≤1999	
45050	128-210	210-1999			
RM CORES					PAGE 56 - 57
41110	25-50	51-55	≤75	≤170	≤250
41510	56-98	99-162	≤258	≤352	≤484
41812	69-120	121-238	≤381	≤519	≤714
41912	69-120	121-238	≤381	≤519	≤714
42316	84-150	151-395	≤633	≤862	≤1195
42819	126-200	201-625	≤1002	≤1374	≤1892
43723	145-250	251-977	≤1580	≤1999	

Chart shows type of combination and the guaranteed tolerance for corresponding A_L ranges. Ranges indicated are the tolerances for standard gapped. For ± 5%, ± 7%, and ± 10%, the maximum A_L for each is shown. Standard cores are manufactured to the smallest allowed tolerances.

Toroids

2.54 mm – 12.7 mm

Ferrite toroids offer high magnetic efficiency as there is no air gap, and the cross sectional area is uniform. Available in many sizes (O.D. from 2.54 mm to 140 mm) and materials (permeabilities ranging from 900 to 10,000), this section lists common sizes.

Typical applications for high permeability toroids (J and W materials) include common mode chokes, broadband transformers, pulse transformers and current transformers. L, R, P, F and T material toroids are excellent choices for high frequency transformers.

		COATING			NOMINAL A_L (MH/1000T)						
SIZE (mm)	ORDERING CODE	V	Y	Z	L ± 25%	R ± 25%	P ± 25%	F ± 20%	J ± 20%	W ± 30%	C ± 25%
2.54 x 1.27 x 1.27	**0_40200TC**		✓			400	454	525	875	1,750	158
3.46 x 1.78 x 1.27	**0_40301TC**		✓			380	410	495	825	1,650	149
3.94 x 2.24 x 1.27	**0_40502TC**		✓			340	368	440	735	1,470	129
3.94 x 2.24 x 2.54	**0_40503TC**		✓			670	716	885	1,475	2,950	258
4.83 x 2.29 x 1.27	**0_40401TC**		✓			440	474	570	950	1,900	170
4.83 x 2.29 x 2.54	**0_40402TC**		✓			870	948	1,140	1,900	3,800	341
5.84 x 3.05 x 1.52	**0_40601TC**		✓		178	450	488	585	980	1,960	177
5.84 x 3.05 x 3.18	**0_40603TC**		✓		372	940	1,020	1,225	2,040	4,080	372
7.62 x 3.18 x 4.78	**0_40705TC**		✓		751	1,920	2,088	2,505	4,175	8,350	751
9.53 x 5.59 x 7.11	**0_40907TC**		✓	✓	683	1,730	1,884	2,260	3,765	7,530	683
9.53 x 4.75 x 3.18	**0_41003TC**		✓	✓	399	1,000	1,095	1,314	2,196	4,392	399
9.53 x 4.75 x 4.78	**0_41005TC**		✓	✓	599	1,510	1,650	1,980	3,308	6,616	599
12.7 x 5.16 x 6.35	**0_41206TC**	✓	✓	✓	1,029	2,600	2,820	3,384	5,640	11,280	1,029
12.7 x 8.14 x 3.18	**0_41303TC**	✓	✓	✓	255	680	745	894	1,488	2,976	254
12.7 x 8.14 x 3.89	**0_41304TC**	✓	✓	✓	311	850	931	1,116	1,860	3,720	311
12.7 x 8.14 x 5.08	**0_41305TC**	✓	✓	✓	407	1,090	1,190	1,430	2,380	4,760	406
12.7 x 8.14 x 6.35	**0_41306TC**	✓	✓	✓	508	1,360	1,485	1,782	2,968	5,936	508

Nominal A_L values for L perm are based on uncoated toroids. For specific values of any core, see the datasheet.

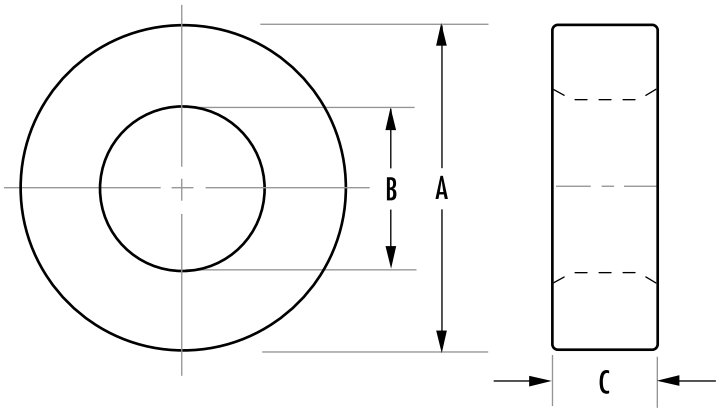
HOW TO ORDER

0 J 4 14 06 TC

- Coating code
- Ferrite core material
- Used for all ferrite types
- Approximate diameter in mm
- Approximate height in mm
- Geometry code

COATING CODE

0 – Bare core
V – Nylon coating
Y – Parylene coating
Z – Epoxy coating



		MAGNETIC DATA						HARDWARE	
SIZE (mm)	ORDERING CODE	l_e (mm)	A_e (mm^2)	V_e (mm^3)	Window Area (cm^2)	WaAc (cm^4)	Weight (grams per piece)	Headers & Mounts	Cups
2.54 x 1.27 x 1.27	**0_40200TC**	5.5	0.77	4.3	0.01	0.0001	0.03		
3.46 x 1.78 x 1.27	**0_40301TC**	7.65	1.03	7.87	0.02	0.0003	0.04		
3.94 x 2.24 x 1.27	**0_40502TC**	9.2	1.05	9.7	0.03	0.0004	0.05		
3.94 x 2.24 x 2.54	**0_40503TC**	9.2	2.1	19.4	0.03	0.0008	0.10		
4.83 x 2.29 x 1.27	**0_40401TC**	10.2	1.5	15.7	0.04	0.0006	0.09		
4.83 x 2.29 x 2.54	**0_40402TC**	10.2	3.1	31.5	0.04	0.001	0.17		
5.84 x 3.05 x 1.52	**0_40601TC**	13.0	2.0	26.7	0.07	0.001	0.14		
5.84 x 3.05 x 3.18	**0_40603TC**	13.0	4.3	56.0	0.07	0.003	0.30		
7.62 x 3.18 x 4.78	**0_40705TC**	15.0	9.9	149	0.07	0.008	0.90		
9.53 x 5.59 x 7.11	**0_40907TC**	22.7	13.7	310	0.24	0.03	1.60		
9.53 x 4.75 x 3.18	**0_41003TC**	20.7	7.3	151	0.17	0.01	0.82		
9.53 x 4.75 x 4.78	**0_41005TC**	20.7	10.9	227	0.17	0.02	1.20		
12.7 x 5.16 x 6.35	**0_41206TC**	25.0	22.0	550	0.20	0.05	3.30		
12.7 x 8.14 x 3.18	**0_41303TC**	31.7	7.1	226	0.49	0.04	1.20		
12.7 x 8.14 x 3.89	**0_41304TC**	31.7	8.7	276	0.49	0.05	1.44		
12.7 x 8.14 x 5.08	**0_41305TC**	31.7	11.4	361	0.49	0.06	1.90		
12.7 x 8.14 x 6.35	**0_41306TC**	31.7	14.2	451	0.49	0.07	2.40		

Refer to page 58 for hardware information.

		BARE NOMINAL DIMENSIONS (mm)			BARE LIMITING DIMENSIONS (mm)		
SIZE (mm)	ORDERING CODE	OD (A)	ID (B)	HT (C)	OD (A) max	ID (B) min	HT (C) max
2.54 x 1.27 x 1.27	**0_40200TC**	2.54	1.27	1.27	2.75	1.06	1.45
3.46 x 1.78 x 1.27	**0_40301TC**	3.46	1.78	1.27	3.71	1.62	1.45
3.94 x 2.24 x 1.27	**0_40502TC**	3.94	2.24	1.27	4.14	2.03	1.45
3.94 x 2.24 x 2.54	**0_40503TC**	3.94	2.24	2.54	4.14	2.03	2.80
4.83 x 2.29 x 1.27	**0_40401TC**	4.83	2.29	1.27	5.03	2.08	1.45
4.83 x 2.29 x 2.54	**0_40402TC**	4.83	2.29	2.54	5.03	2.08	2.80
5.84 x 3.05 x 1.52	**0_40601TC**	5.84	3.05	1.52	6.13	2.76	1.71
5.84 x 3.05 x 3.18	**0_40603TC**	5.84	3.05	3.18	6.13	2.76	3.43
7.62 x 3.18 x 4.78	**0_40705TC**	7.62	3.18	4.78	7.88	2.92	4.91
9.53 x 5.59 x 7.11	**0_40907TC**	9.53	5.59	7.11	9.78	5.33	7.29
9.53 x 4.75 x 3.18	**0_41003TC**	9.53	4.75	3.18	9.78	4.49	3.31
9.53 x 4.75 x 4.78	**0_41005TC**	9.53	4.75	4.78	9.78	4.49	4.91
12.7 x 5.16 x 6.35	**0_41206TC**	12.7	5.16	6.35	12.96	4.90	6.53
12.7 x 8.14 x 3.18	**0_41303TC**	12.7	8.14	3.18	12.96	7.67	3.31
12.7 x 8.14 x 3.89	**0_41304TC**	12.7	8.14	3.89	12.96	7.67	4.09
12.7 x 8.14 x 5.08	**0_41305TC**	12.7	8.14	5.08	12.96	7.67	5.26
12.7 x 8.14 x 6.35	**0_41306TC**	12.7	8.14	6.35	12.96	7.67	6.53

Toroids

12.7 mm – 25.34 mm

		COATING			NOMINAL A_L (MH/1000T)							
SIZE (mm)	ORDERING CODE	V	Y	Z	L ± 25%	R ± 25%	P ± 25%	F ± 20%	T ± 25%	J ± 20%	W ± 30%	C ± 25%
12.7 x 7.14 x 5.08	**0_41405TC**	✓	✓	✓	526	1,320	1,440	1,730		2,890	5,780	500
12.7 x 7.14 x 6.35	**0_41406TC**	✓	✓	✓	658	1,660	1,805	2,166		3,612	7,224	625
12.7 x 7.14 x 4.78	**0_41407TC**	✓	✓	✓	495	1,240	1,356	1,630		2,715	5,430	470
12.7 x 7.14 x 7.62	**0_41410TC**	✓		✓	790	1,990	2,162	2,595		4,335	8,675	790
13.2 x 7.37 x 3.96	**0_41506TC**	✓		✓	415	1,020	1,111	1,334		2,295	4,590	315
13.6 x 7.01 x 3.51	**0_41435TC**	✓		✓	419	1,040	1,130	1,350		2,260	4,520	418
14.0 x 8.99 x 5.0	**0_41450TC**	✓		✓	399	990	1,080	1,290		2,160	4,320	397
15.9 x 9.07 x 4.7	**0_41605TC**	✓		✓	475	1,260	1,375	1,650	1,650	2,760	5,520	475
15.9 x 9.07 x 9.4	**0_41610TC**	✓		✓	950	2,450	2,660	3,200		5,410	10,600	950
18.4 x 9.75 x 10.3	**0_41809TC**	✓		✓	1,177	2,810	3,050	3,660		6,115	12,200	1,177
20.6 x 12.7 x 6.35	**0_42106TC**	✓		✓	553	1,380	1,500	1,680		2,800	5,600	553
20.6 x 12.7 x 8.89	**0_42109TC**	✓		✓	774	1,930	2,100	2,520		4,200	8,400	774
22.1 x 13.7 x 6.35	**0_42206TC**	✓		✓	547	1,380	1,510	1,812	1,821	3,020	6,040	538
22.1 x 13.7 x 7.9	**0_42207TC**	✓		✓	680	1,720	1,875	2,250		3,700	7,400	671
22.1 x 13.7 x 12.7	**0_42212TC**	✓		✓	1,093	2,770	3,020	3,624		6,040	12,080	1,084
25.34 x 15.45 x 7.66	**0_42507TC**	✓		✓	705	1,800	1,958	2,348		3,913	7,825	690
25.34 x 15.45 x 10.0	**0_42508TC**	✓		✓	891	2,220	2,420	2,900		4,830	9,660	

Nominal A_L values for L perm are based on uncoated toroids. For specific values of any core, see the datasheet.

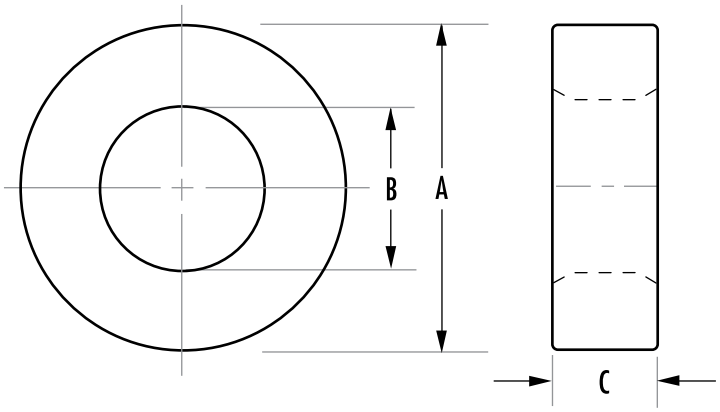
HOW TO ORDER

0 J 4 14 06 TC

- 0 — Coating code
- J — Ferrite core material
- 4 — Used for all ferrite types
- 14 — Approximate diameter in mm
- 06 — Approximate height in mm
- TC — Geometry code

COATING CODE

0 – Bare core
V – Nylon coating
Y – Parylene coating
Z – Epoxy coating



		MAGNETIC DATA						HARDWARE	
SIZE (mm)	ORDERING CODE	l_e (mm)	A_e (mm^2)	V_e (mm^3)	Window Area (cm^2)	WaAc (cm^4)	Weight (grams per piece)	Headers & Mounts	Cups
12.7 x 7.14 x 5.08	**0_41405TC**	29.5	13.7	405	0.40	0.05	2.03		
12.7 x 7.14 x 6.35	**0_41406TC**	29.5	17.1	507	0.40	0.07	2.70	✓	
12.7 x 7.14 x 4.78	**0_41407TC**	29.5	12.9	381	0.40	0.05	1.90	✓	
12.7 x 7.14 x 7.62	**0_41410TC**	29.5	20.6	608	0.40	0.17	3.04		
13.2 x 7.37 x 3.96	**0_41506TC**	30.6	11.2	343	0.42	0.05	1.9	✓	
13.6 x 7.01 x 3.51	**0_41435TC**	30.1	11.1	335	0.36	0.04	1.7		
14.0 x 8.99 x 5.0	**0_41450TC**	35.0	12.3	430	0.63	0.08	2.2	✓	
15.9 x 9.07 x 4.7	**0_41605TC**	37.2	15.6	580	0.62	0.10	2.8	✓	
15.9 x 9.07 x 9.4	**0_41610TC**	37.2	31.2	1,164	0.62	0.20	5.8		
18.4 x 9.75 x 10.3	**0_41809TC**	41.4	43.1	1,783	0.74	0.32	9.9	✓	
20.6 x 12.7 x 6.35	**0_42106TC**	50.3	24.6	1,238	1.27	0.31	5.4	✓	
20.6 x 12.7 x 8.89	**0_42109TC**	50.3	34.4	1,733	1.27	0.43	8.1	✓	
22.1 x 13.7 x 6.35	**0_42206TC**	54.1	26.2	1,417	1.48	0.39	6.4	✓	
22.1 x 13.7 x 7.9	**0_42207TC**	54.2	32.5	1,763	1.48	0.48	8.5	✓	
22.1 x 13.7 x 12.7	**0_42212TC**	51.9	52.3	2,834	1.48	0.77	13.5	✓	
25.34 x 15.45 x 7.66	**0_42507TC**	61.5	37.1	2,284	1.89	0.69	11.6	✓	
25.34 x 15.45 x 10.0	**0_42508TC**	61.5	48.0	2,981	1.89	0.89	14.9	✓	

Refer to page 58 for hardware information.

		BARE NOMINAL DIMENSIONS (mm)			BARE LIMITING DIMENSIONS (mm)		
SIZE (mm)	ORDERING CODE	OD (A)	ID (B)	HT (C)	OD (A) max	ID (B) min	HT (C) max
12.7 x 7.14 x 5.08	**0_41405TC**	12.7	7.14	5.08	12.96	6.88	5.26
12.7 x 7.14 x 6.35	**0_41406TC**	12.7	7.14	6.35	12.96	6.88	6.53
12.7 x 7.14 x 4.78	**0_41407TC**	12.7	7.14	4.78	12.96	6.88	4.91
12.7 x 7.14 x 7.62	**0_41410TC**	12.7	7.14	7.62	12.96	6.88	7.88
13.2 x 7.37 x 3.96	**0_41506TC**	13.2	7.37	3.96	13.47	7.11	4.09
13.6 x 7.01 x 3.51	**0_41435TC**	13.6	7.01	3.51	13.85	6.75	3.64
14.0 x 8.99 x 5.0	**0_41450TC**	14.0	8.99	5.0	14.25	8.73	5.14
15.9 x 9.07 x 4.7	**0_41605TC**	15.9	9.07	4.7	16.26	8.5	4.83
15.9 x 9.07 x 9.4	**0_41610TC**	15.9	9.07	9.4	16.26	8.5	9.66
18.4 x 9.75 x 10.3	**0_41809TC**	18.4	9.75	10.3	18.83	9.37	10.52
20.6 x 12.7 x 6.35	**0_42106TC**	20.6	12.7	6.35	20.96	12.31	6.53
20.6 x 12.7 x 8.89	**0_42109TC**	20.6	12.7	8.89	20.96	12.31	9.15
22.1 x 13.7 x 6.35	**0_42206TC**	22.1	13.7	6.35	22.48	13.33	6.53
22.1 x 13.7 x 7.9	**0_42207TC**	22.1	13.7	7.9	22.48	13.33	8.18
22.1 x 13.7 x 12.7	**0_42212TC**	22.1	13.7	12.7	22.48	13.33	12.96
25.34 x 15.45 x 7.66	**0_42507TC**	25.34	15.45	7.66	25.91	14.98	8.18
25.34 x 15.45 x 10.0	**0_42508TC**	25.34	15.45	10.0	25.91	14.98	10.27

Toroids

26.9 mm – 46.9 mm

		COATING			NOMINAL A_L (MH/1000T)					
SIZE (mm)	ORDERING CODE	V	Y	Z	R ± 25%	P ± 25%	F ± 20%	T ± 25%	J ± 20%	W ± 30%
26.9 x 14.2 x 12.2	**0_42712TC**	✓		✓	3,610	3,920	4,710		7,650	15,300
29 x 19 x 7.43	**0_42908TC**	✓		✓	1,450	1,585	1,902		3,170	6,340
29 x 19 x 15.2	**0_42915TC**			✓	2,960	3,222	3,868		6,447	12,894
30.8 x 19.1 x 12.7	**0_43113TC**			✓	2,850	3,100	3,720		6,200	12,400
32 x 15 x 4.5	**0_43205TC**			✓	1,480	1,610	1,930		3,220	6,440
36 x 23 x 10	**0_43610TC**			✓	2,030	2,210	2,726		4,543	9,085
36 x 23 x 15	**0_43615TC**			✓	3,100	3,366	4,040		6,736	13,400
36 x 23 x 20	**0_43620TC**			✓					9,086	
38.1 x 19 x 6.35	**0_43806TC**			✓	2,020	2,200	2,640		4,400	8,800
38.1 x 19 x 12.7	**0_43813TC**			✓	3,850	4,185	5,020		8,365	16,700
38.1 x 19 x 25.4	**0_43825TC**			✓	8,060	8,762	10,040		16,730	33,400
41.8 x 26.2 x 18	**0_44015TC**			✓	3,860	4,200	5,040	5,040	8,408	16,816
44.3 x 19 x 15.9	**0_44416TC**			✓	5,360	5,830	7,000		11,600	23,200
44.3 x 19 x 19.1	**0_44419TC**			✓		7,970	9,550			
46.9 x 27 x 15	**0_44715TC**			✓	3,700	4,030	4,840		8,075	16,100

Nominal A_L values for L perm are based on uncoated toroids. For specific values of any core, see the datasheet.

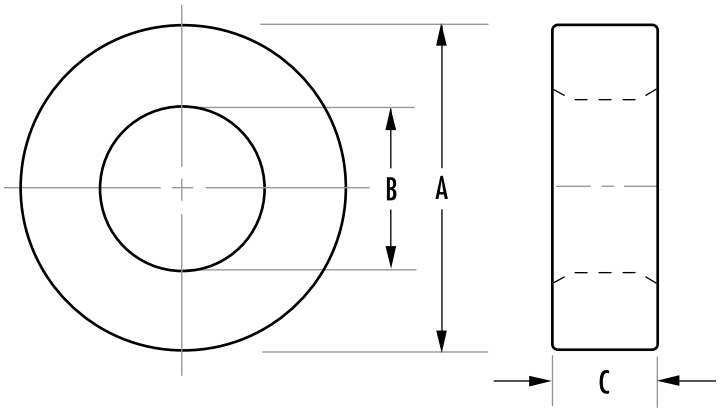
HOW TO ORDER

0 J 4 14 06 TC

- Coating code
- Ferrite core material
- Used for all ferrite types
- Approximate diameter in mm
- Approximate height in mm
- Geometry code

COATING CODE

0 – Bare core
V – Nylon coating
Y – Parylene coating
Z – Epoxy coating



		MAGNETIC DATA						HARDWARE	
SIZE (mm)	ORDERING CODE	l_e (mm)	A_e (mm^2)	V_e (mm^3)	Window Area (cm^2)	WaAc (cm^4)	Weight (grams per piece)	Headers & Mounts	Cups
26.9 x 14.2 x 12.2	**0_42712TC**	60.2	73.2	4,410	1.57	1.16	22.5		
29 x 19 x 7.43	**0_42908TC**	73.2	37.0	2,679	2.84	1.05	12.9	✓	
29 x 19 x 15.2	**0_42915TC**	73.2	74.9	5,481	2.84	2.13	27.6	✓	
30.8 x 19.1 x 12.7	**0_43113TC**	75.4	73.6	5,547	2.83	2.11	29.3	✓	
32 x 15 x 4.5	**0_43205TC**	67.2	36.4	2,451	0.34	0.61	12.9	✓	
36 x 23 x 10	**0_43610TC**	89.7	63.9	5,731	4.15	2.65	29.4	✓	
36 x 23 x 15	**0_43615TC**	89.6	95.9	8,596	2.85	3.98	44	✓	
36 x 23 x 20	**0_43620TC**	89.6	128	11,461	4.15	5.31	54		
38.1 x 19 x 6.35	**0_43806TC**	82.9	58.3	4,826	2.85	1.66	26.4	✓	
38.1 x 19 x 12.7	**0_43813TC**	82.9	115.6	9,652	2.85	3.28	51.7	✓	
38.1 x 19 x 25.4	**0_43825TC**	82.8	233	19,304	2.85	6.56	103.4	✓	
41.8 x 26.2 x 18	**0_44015TC**	103	138	14,205	5.39	7.44	68.9	✓	
44.3 x 19 x 15.9	**0_44416TC**	88.0	187	16,559	2.85	5.33	80.8	✓	
44.3 x 19 x 19.1	**0_44419TC**	88.0	228	20,146	2.85	6.50	107.9	✓	
46.9 x 27 x 15	**0_44715TC**	110.4	145.5	16,063	5.72	8.34	84.0	✓	

Refer to page 58 for hardware information.

		BARE NOMINAL DIMENSIONS (mm)			BARE LIMITING DIMENSIONS (mm)		
SIZE (mm)	ORDERING CODE	OD (A)	ID (B)	HT (C)	OD (A) max	ID (B) min	HT (C) max
26.9 x 14.2 x 12.2	**0_42712TC**	26.9	14.2	12.2	27.63	13.39	12.62
29 x 19 x 7.43	**0_42908TC**	29.0	19.0	7.43	29.52	18.49	7.68
29 x 19 x 15.2	**0_42915TC**	29.0	19.0	15.2	29.52	18.49	15.63
30.8 x 19.1 x 12.7	**0_43113TC**	30.8	19.1	12.7	31.5	18.49	13.26
32 x 15 x 4.5	**0_43205TC**	32.0	15.0	4.5	33.28	14.4	4.68
36 x 23 x 10	**0_43610TC**	36.0	23.0	10.0	36.7	22.5	10.27
36 x 23 x 15	**0_43615TC**	36.0	23.0	15.0	36.7	22.5	15.24
36 x 23 x 20	**0_43620TC**	36.0	23.0	20.0	36.7	22.5	20.56
38.1 x 19 x 6.35	**0_43806TC**	38.1	19.0	6.35	38.87	18.28	6.53
38.1 x 19 x 12.7	**0_43813TC**	38.1	19.0	12.7	38.87	18.28	12.96
38.1 x 19 x 25.4	**0_43825TC**	38.1	19.0	25.4	38.87	18.28	25.91
41.8 x 26.2 x 18	**0_44015TC**	41.8	26.2	18.0	42.8	25.6	18.4
44.3 x 19 x 15.9	**0_44416TC**	44.3	19.0	15.7	45.22	18.28	16.26
44.3 x 19 x 19.1	**0_44419TC**	44.3	19.0	19.1	45.22	18.28	19.66
46.9 x 27 x 15	**0_44715TC**	46.9	27.0	15.0	47.65	26.23	15.27

Toroids

49.1 mm – 140 mm

		COATING			NOMINAL A_L (MH/1000T)				
SIZE (mm)	ORDERING CODE	V	Y	Z	R ± 25%	P ± 25%	F ± 20%	J ± 20%	W ± 30%
49.1 x 33.8 x 15.9	**0_44916TC**			✓	2,710	2,950	3,540	5,900	11,800
49.1 x 31.8 x 15.9	**0_44920TC**			✓	2,790	3,032	3,640	6,065	12,130
49.1 x 31.8 x 19.05	**0_44925TC**			✓	3,420	3,718	4,460	7,435	14,870
49.1 x 33.8 x 31.3	**0_44932TC**			✓	5,430	5,900	7,080	11,800	23,600
60.96 x 41.78 x 12.7	**0_46013TC**			✓				4,800	9,483
60.96 x 41.78 x 19.05	**0_46019TC**			✓				7,100	
61 x 35.6 x 12.7	**0_46113TC**			✓	3,140	3,491	4,107	6,845	13,690
63 x 38 x 24.5	**0_46325TC**			✓					21,056
63 x 38 x 24.5	**0_46326TC**			✓	5,770	6,270	7,530	12,500	
73.7 x 38.9 x 12.5	**0_47313TC**			✓	3,700	4,024	4,880	8,140	16,280
73.7 x 38.9 x 25.2	**0_47325TC**			✓	7,400	8,050	9,760	16,280	
85.7 x 55.5 x 12.7	**0_48613TC**			✓	2,510	2,726	3,310	5,520	11,040
85.7 x 55.5 x 25.4	**0_48625TC**			✓	5,040	5,480	6,570	10,960	
85.7 x 55.5 x 25.4	**0_48626TC**			✓					18,760
102 x 65.8 x 15	**0_49715TC**			✓	3,025	3,464	3,945	6,575	11,178
107 x 65 x 18	**0_49718TC**			✓	4,127	4,486	5,383	8,972	15,252
107 x 65 x 25	**0_49725TC**			✓	5,732	6,230	7,477	12,461	21,184
140 x 106 x 25	**0_49740TC**			✓	3,200	3,477	4,173	6,955	11,823

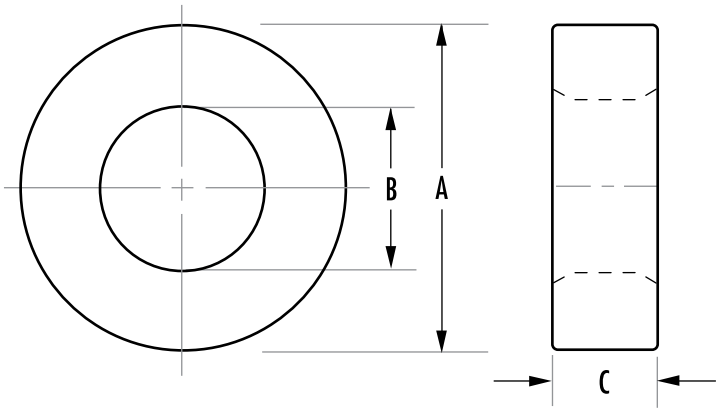
HOW TO ORDER

0 J 4 14 06 TC

- Coating code
- Ferrite core material
- Used for all ferrite types
- Approximate diameter in mm
- Approximate height in mm
- Geometry code

COATING CODE

0 – Bare core
V – Nylon coating
Y – Parylene coating
Z – Epoxy coating



		MAGNETIC DATA						HARDWARE	
SIZE (mm)	ORDERING CODE	l_e (mm)	A_e (mm^2)	V_e (mm^3)	Window Area (cm^2)	WaAc (cm^4)	Weight (grams per piece)	Headers & Mounts	Cups
49.1 x 33.8 x 15.9	**0_44916TC**	127	120	15,298	8.99	10.6	75.3	✓	
49.1 x 31.8 x 15.9	**0_44920TC**	123.2	135.4	16,676	7.94	9.45	83	✓	
49.1 x 31.8 x 19.05	**0_44925TC**	123	162	20,000	7.94	12.8	98	✓	
49.1 x 33.8 x 31.3	**0_44932TC**	127	237	30,100	8.99	21.2	150.6	✓	
60.96 x 41.78 x 12.7	**0_46013TC**	157.6	120.4	18,968	13.68	16.48	94		
60.96 x 41.78 x 19.05	**0_46019TC**	157.6	180.5	28,453	13.68	24.7	141		
61 x 35.6 x 12.7	**0_46113TC**	144.6	157.4	22,774	9.93	15.5	113	✓	
63 x 38 x 24.5	**0_46325TC**	152	300	45,598	11.1	33.2	225		
63 x 38 x 24.5	**0_46326TC**	152	300	45,600	11.3	33.9	225	✓	
73.7 x 38.9 x 12.5	**0_47313TC**	165	210	34,771	11.9	25	172		
73.7 x 38.9 x 25.2	**0_47325TC**	165	423	70,099	11.9	50.3	347		
85.7 x 55.5 x 12.7	**0_48613TC**	214.9	188.8	40,582	24.2	45.7	201		
85.7 x 55.5 x 25.4	**0_48625TC**	215	375	80,700	24.2	90.8	399		
85.7 x 55.5 x 25.4	**0_48626TC**	215	377	81,165	24.2	91.2	402		
102 x 65.8 x 15	**0_49715TC**	255.3	267.2	68,821	34	90.8	341		
107 x 65 x 18	**0_49718TC**	259.31	370.27	96,013	28.6	106	475		
107 x 65 x 25	**0_49725TC**	259.31	514.3	133,351	33.2	171	660		
140 x 106 x 25	**0_49740TC**	381.5	422.3	161,086	88.2	372	797		

Refer to page 58 for hardware information.

		BARE NOMINAL DIMENSIONS (mm)			BARE LIMITING DIMENSIONS (mm)		
SIZE (mm)	ORDERING CODE	OD (A)	ID (B)	HT (C)	OD (A) max	ID (B) min	HT (C) max
49.1 x 33.8 x 15.9	**0_44916TC**	49.1	33.8	15.9	49.84	33.07	16.26
49.1 x 31.8 x 15.9	**0_44920TC**	49.1	31.8	15.9	49.84	31.03	16.26
49.1 x 31.8 x 19.05	**0_44925TC**	49.1	31.8	19.05	49.84	31.03	19.44
49.1 x 33.8 x 31.3	**0_44932TC**	49.1	33.8	31.3	49.84	33.07	32.26
60.96 x 41.78 x 12.7	**0_46013TC**	60.96	41.78	12.7	61.86	40.88	12.96
60.96 x 41.78 x 19.05	**0_46019TC**	60.96	41.78	19.05	61.86	40.88	19.43
61 x 35.6 x 12.7	**0_46113TC**	61	35.6	12.7	61.85	34.67	12.96
63 x 38 x 24.5	**0_46325TC**	63	38	24.5	64.34	36.65	25.58
63 x 38 x 24.5	**0_46326TC**	63	38	24.5	63.89	37.1	25.38
73.7 x 38.9 x 12.5	**0_47313TC**	73.7	38.9	12.5	74.68	37.9	12.96
73.7 x 38.9 x 25.2	**0_47325TC**	73.7	38.9	25.2	74.7	37.9	25.91
85.7 x 55.5 x 12.7	**0_48613TC**	85.7	55.5	12.7	87	54.28	12.96
85.7 x 55.5 x 25.4	**0_48625TC**	85.7	55.5	25.4	87	54.28	25.91
85.7 x 55.5 x 25.4	**0_48626TC**	85.7	55.5	25.4	87.63	53.64	26.54
102 x 65.8 x 15	**0_49715TC**	102	65.8	15	104	64.5	15.5
107 x 65 x 18	**0_49718TC**	107	65	18	109	63.7	18.35
107 x 65 x 25	**0_49725TC**	107	65	25	109	63.7	25.75
140 x 106 x 25	**0_49740TC**	140	106	25	143	104	26

E, I Cores

9 mm – 35 mm

E cores are less expensive than pot cores, and have the advantage of simple bobbin winding plus easy assembly. E cores do not, however, offer self-shielding. Lamination size E cores are available to fit commercially offered bobbins previously designed to fit the strip stampings of standard lamination sizes. Metric and DIN sizes are also available. E cores can be pressed to different thicknesses, providing a selection of cross-sectional areas. E cores can be mounted in different directions and, if desired, provide a low profile.

Typical applications for E cores include differential mode, power and telecom inductors, as well as, broadband, power, converter and inverter transformers.

		NOMINAL A_L (MH/1000T)						
TYPE/SIZE	ORDERING CODE	L	R	P	F	T	J	W
E 9/4/2	**0_40904EC**	280	493	540	650		1,040	
E 13/7/3	**0_41203EC**	350	587	640	770		1,367	
E 13/7/6	**0_41205EC**	700	1,467	1,600	1,950		3,300	
E 17/7/4	**0_41707EC**	520	1,013	1,100	1,300		1,900	
E 19/8/5	**0_41808EC**	550	1,153	1,253	1,500	1,500	2,500	4,293
E 19/8/10	**0_41810EC**	1,000	2,300	2,500	3,000		5,000	8,600
E 25/10/7	**0_42510EC**	800	1,767	1,920	2,300		3,700	7,660
E 25/13/7	**0_42513EC**	900	1,900	2,314	2,460		4,000	
E 25/16/6	**0_42515EC**	540	1,153	1,253	1,500		2,400	
I 25/3/6	**0_42515IC**	820	1,760	1,913	2,290		3,667	
E 25/10/13	**0_42520EC**	1,600	3,533	3,840	4,600		7,400	13,813
E 25/13/11	**0_42526EC**		2,800	3,512	4,068	4,068	5,951	
E 25/16/13	**0_42530EC**	1,070	2,307	2,507	3,000		4,800	8,213
E 31/15/7	**0_43007EC**	920	2,060	2,240	2,700		3,800	8,200
E 31/13/9	**0_43009EC**	1,400	2,893	3,147	3,780		5,893	
E 34/14/9	**0_43515EC**		2,667	2,907	3,500		5,813	11,414
E 35/21/9	**0_43520EC**		1,947	2,120	2,555		4,240	

HOW TO ORDER

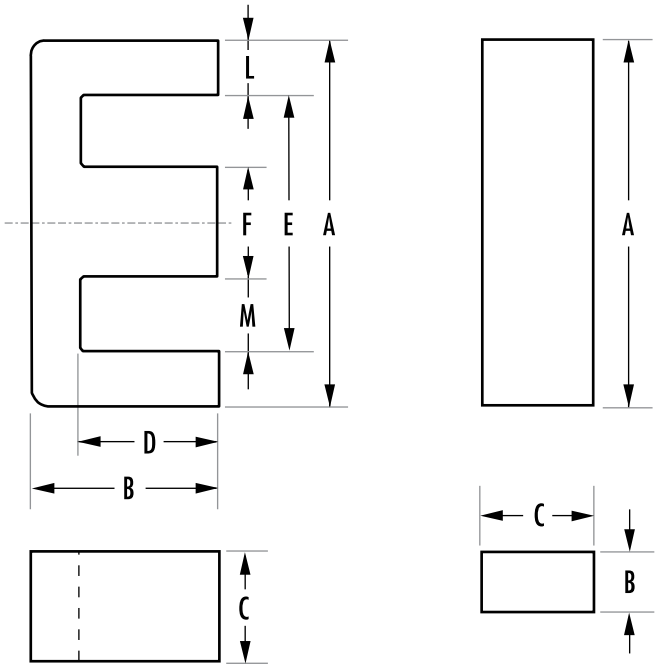
0 R 4 30 07 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height in mm
- Geometry code

GEOMETRY CODE

EC – E core
IC – I core

Cores are sold per piece (for sets multiply by 2).
Any practical gap available. See page 14.



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
E 9/4/2	**0_40904EC**	15.6	5.0	3.6	78	0.002	0.7		
E 13/7/3	**0_41203EC**	27.8	10.1	10.1	279	0.016	1.3		
E 13/7/6	**0_41205EC**	27.7	20.2	20.0	558	0.03	2.6		
E 17/7/4	**0_41707EC**	30.4	16.6	12.6	505	0.03	3.0		
E 19/8/5	**0_41808EC**	39.9	22.6	22.1	900	0.08	4.4	✓	
E 19/8/10	**0_41810EC**	40.1	45.5	45.4	1,820	0.14	8.5		
E 25/10/7	**0_42510EC**	49.0	39.5	37.0	1,930	0.16	9.5	✓	
E 25/13/7	**0_42513EC**	57.8	51.8	51.8	2,990	0.27	16		
E 25/16/6	**0_42515EC**	73.5	40.1	39.7	2,950	0.56	15	✓	
I 25/3/6	**0_42515IC**	48.3	39.8	38.7	1,920	0.18	10		
E 25/10/13	**0_42520EC**	48.0	78.4	76.8	3,760	0.48	19	✓	
E 25/13/11	**0_42526EC**	57.5	78.4	76.8	4,500	0.41	36		
E 25/16/13	**0_42530EC**	73.5	80.2	79.4	5,900	0.74	30		
E 31/15/7	**0_43007EC**	67.0	60.0	49.0	4,000	0.50	20	✓	
E 31/13/9	**0_43009EC**	61.9	83.2	83.2	5,150	0.59	26	✓	
E 34/14/9	**0_43515EC**	69.3	80.7	80.7	5,590	0.98	28	✓	
E 35/21/9	**0_43520EC**	94.3	90.6	90.5	8,540	1.68	42		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)							
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F	L	M
E 9/4/2	**0_40904EC**	9.0 ± 0.4	4.06 ± 0.25	1.91 ± 0.13	2.03 min	4.85 min	1.91 ± .013	1.91 ± 0.25	1.57 ± 0.25
E 13/7/3	**0_41203EC**	12.7 ± 0.25	5.69 ± 0.18	3.18 ± 0.13	3.96 min	9.19 min	3.18 ± 0.08	1.57 nom	3.05 min
E 13/7/6	**0_41205EC**	12.7 ± 0.25	5.69 ± 0.18	6.4 ± 0.15	3.96 min	9.2 min	3.2 ± 0.13	1.57 ref	3.05 min
E 17/7/4	**0_41707EC**	16.8 ± .38	7.11 ± 0.18	3.56 ± 0.12	3.94 min	10.4 min	3.56 ± 0.13	2.79 nom	3.63 min
E 19/8/5	**0_41808EC**	19.1 ± .4	8.1 ± 0.13	4.75 ± 0.2	5.7 ± 0.13	14.33 ± 0.33	4.75 ± 0.2	2.38 nom	4.79 nom
E 19/8/10	**0_41810EC**	19.1 ± .4	8.1 ± 0.18	9.53 ± 0.13	5.7 min	14.0 min	4.75 ± 0.2	2.38 ref	4.79 ref
E 25/10/7	**0_42510EC**	25.4 ± .6	9.65 ± 0.2	6.35 ± 0.25	6.4 min	18.8 min	6.35 ± 0.25	3.3 nom	6.1 min
E 25/13/7	**0_42513EC**	25.0 + 0.8/-0.7	12.8 + 0/-0.4	7.5 + 0/-0.6	8.7 + 0.6/-0	17.5 + 0.9/-0	7.5 + 0/-0.5	3.55 ref	5.35 ref
E 25/16/6	**0_42515EC**	25.4 ± 0.38	15.9 ± 0.25	6.35 ± 0.25	12.6 min	18.8 min	6.35 ± 0.13	3.12 ± 0.13	6.4 ± 0.25
I 25/3/6	**0_42515IC**	25.4 ± 0.38	3.18 ± 0.12	6.35 ± 0.25					
E 25/10/13	**0_42520EC**	25.4 ± 0.6	9.65 ± 0.2	12.7 ± 0.25	6.4 min	18.8 min	6.35 ± 0.25	3.6 max	6.1 min
E 25/13/11	**0_42526EC**	25.0 + 0.8/-0.7	12.8 + 0/-0.5	11 + 0/-0.5	8.7 + 0.5/-0	17.5 + 1/-0	7.5 + 0/-0.5	3.53 ref	5.37 ref
E 25/16/13	**0_42530EC**	25.4 ± 0.38	15.9 ± 0.25	12.7 ± 0.25	12.6 min	18.8 min	6.35 ± 0.13	3.12 ± 0.13	6.4 ± 0.25
E 31/15/7	**0_43007EC**	30.8 + 0/-1.4	15.0 ± 0.2	7.3 ± 0/-0.5	9.71 + 0.5/-0	19.5 + 1/-0	7.2 + 0/-0.5	5.65 nom	6.15 nom
E 31/13/9	**0_43009EC**	30.95 ± 0.5	13.1 ± 0.25	9.4 ± 0.3	8.5 min	21.4 min	9.4 ± 0.13	4.29 nom	6.0 min
E 34/14/9	**0_43515EC**	34.3 ± 0.6	14.1 ± 0.15	9.3 ± 0.25	9.8 ± 0.13	25.5 min	9.3 ± 0.2	4.7 max	8.0 min
E 35/21/9	**0_43520EC**	34.9 ± 0.38	20.6 ± 0.25	9.53 ± 0.18	15.6 min	25.1 min	9.53 ± 0.25	4.75 ± 0.25	7.95 nom

E, I Cores

40 mm – 100 mm

		NOMINAL A_L (MH/1000T)					
TYPE/SIZE	ORDERING CODE	R	P	F	T	J	W
E 40/17/11	**0_44011EC**	4,000	4,347	5,200		7,293	
E 42/21/9	**0_44016EC**	2,667	2,907	3,495		5,647	
E 43/21/15	**0_44020EC**	4,600	5,000	6,000	5,300	9,700	
I 43/6/15	**0_44020IC**	6,253	6,800				
E 43/21/20	**0_44022EC**	5,533	6,013	7,600	6,950	10,613	
E 42/33/20	**0_44033EC**	4,000	4,709	5,562		8,727	
E 41/17/12	**0_44317EC**	3,900	4,240	5,900		9,800	18,293
E 47/20/16	**0_44721EC**	5,360	5,827	8,300			
E 56/28/21	**0_45528EC**	6,293	6,840	8,220	8,625		
E 56/28/25	**0_45530EC**	7,520	8,173	9,800	9,860	14,920	
E 56/24/19	**0_45724EC**	8,093	8,800	10,400	10,440	14,580	24,000
E 60/22/16	**0_46016EC**	5,733	6,240	6,590			
E 65/32/27	**0_46527EC**	8,600	9,200		10,600		
E 70/33/32	**0_47133EC**	10,800	11,600	13,400			
E 72/28/19	**0_47228EC**	5,960	6,480	7,780		11,850	
E 80/38/20	**0_48020EC**	4,673	5,080	6,000			
E 100/59/27	**0_49928EC**	6,227	6,773				

HOW TO ORDER

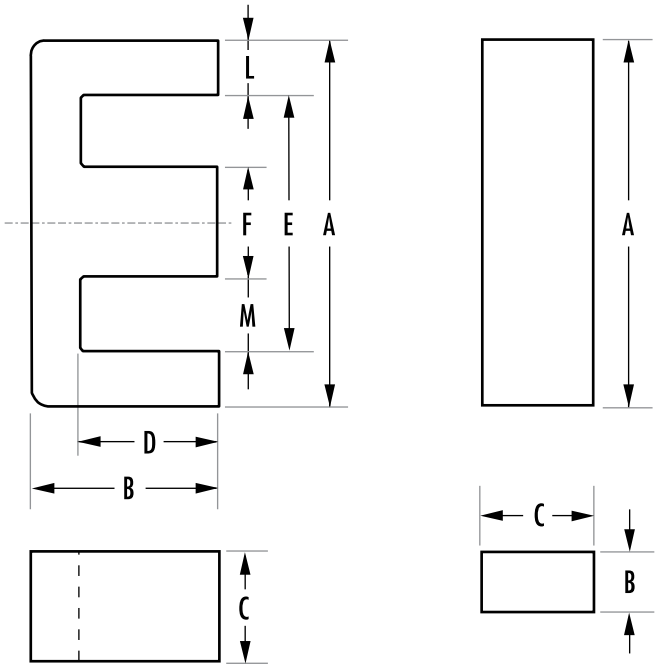
0 R 4 72 28 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height in mm
- Geometry code

GEOMETRY CODE

EC – E core
IC – I core

Cores are sold per piece (for sets multiply by 2).
Any practical gap available. See page 14.



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
E 40/17/11	**0_44011EC**	76.7	127	114	9,780	1.26	49		
E 42/21/9	**0_44016EC**	98.4	107	106	10,500	1.65	52		
E 43/21/15	**0_44020EC**	97.0	178	175	17,300	3.55	87	✓	
I 43/6/15	**0_44020IC**	67.1	177	176	11,900	1.36	60		
E 43/21/20	**0_44022EC**	97.0	233	233	22,700	4.22	114	✓	
E 42/33/20	**0_44033EC**	145	236	234	34,200	6.36	164		
E 41/17/12	**0_44317EC**	77.0	149	142	11,500	1.88	57	✓	
E 47/20/16	**0_44721EC**	88.9	234	226	20,800	3.3	103	✓	
E 56/28/21	**0_45528EC**	124	353	345	44,000	9.78	212	✓	
E 56/28/25	**0_45530EC**	123	420	411	52,000	12.1	255	✓	
E 56/24/19	**0_45724EC**	107	337	337	36,000	6.98	179	✓	
E 60/22/16	**0_46016EC**	110	248	240	27,200	5.74	135		
E 65/32/27	**0_46527EC**	147	540	530	79,000	23.5	410	✓	
E 70/33/32	**0_47133EC**	149	683	676	102,000	23.3	495		
E 72/28/19	**0_47228EC**	137	368	363	50,300	15.0	250	✓	
E 80/38/20	**0_48020EC**	184	392	392	72,300	31.6	357	✓	
E 100/59/27	**0_49928EC**	274	738	692	202,000	90.6	980		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)							
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F	L	M
E 40/17/11	**0_44011EC**	40.0 ± 0.51	17.0 ± 0.31	10.69 ± 0.31	10.0 min	27.6 min	10.7 ± 0.31	5.99 ± 0.25	8.86 nom
E 42/21/9	**0_44016EC**	42.15 ± 0.85	21.1 ± 0.2	9.0 ± 0.25	14.9 min	29.5 min	11.95 ± 0.25	5.94 ± 0.13	8.9 ± 0.25
E 43/21/15	**0_44020EC**	43.0 + 0/-1.7	21.0 ± 0.2	15.2 + 0/-0.6	14.8 + 0.6/-0	29.5 + 1.4/-0	12.2 + 0/-0.5	6.75 nom	8.65 nom
I 43/6/15	**0_44020IC**	43.0 + 0/-1.7	5.9 ± 0.2	15.2 + 0/-0.6					
E 43/21/20	**0_44022EC**	43.0 + 0/-1.7	21.0 ± 0.2	20.0 + 0/-0.8	14.8 + 0.6/-0	29.5 + 1.4/-0	12.2 + 0/-0.5	6.75 nom	8.65 nom
E 42/33/20	**0_44033EC**	42.0 + 1/-0.7	32.8 + 0/-0.4	20.0 + 1/-0.8	26.0 + 1/-0	29.5 + 1.4/-0	12.2 + 0/-0.5	5.98 ref	9.13 ref
E 41/17/12	**0_44317EC**	40.6 ± 0.65	16.6 ± 0.2	12.4 ± 0.3	10.4 min	28.6 min	12.45 ± 0.25	6.33 max	7.95 min
E 47/20/16	**0_44721EC**	46.9 ± 0.8	19.6 ± 0.2	15.6 ± 0.25	12.1 min	32.4 ± 0.65	15.6 ± 0.25	7.54 nom	7.87 min
E 56/28/21	**0_45528EC**	56.2 + 0/-2.1	27.5 ± 0.3	21.0 + 0/-0.8	18.5 + 0.8/-0	37.5 + 1.5/-0	17.2 + 0/-0.5	9.35 ref	10.15 ref
E 56/28/25	**0_45530EC**	56.2 + 0/-2.1	27.6 ± 0.38	24.61 ± 0.38	18.5 min	37.5 min	17.2 + 0/-0.5	9.35 ref	10.15 ref
E 56/24/19	**0_45724EC**	56.1 ± 1	23.6 ± 0.25	18.8 ± 0.25	14.6 ± 0.13	38.1 min	18.8 ± 0.25	9.5 nom	9.03 nom
E 60/22/16	**0_46016EC**	59.99 ± 0.78	22.3 ± 0.3	15.62 ± 0.38	13.8 min	44.0 min	15.62 ± 0.38	7.7 ± 0.25	14.49 ± 0.25
E 65/32/27	**0_46527EC**	65.0 + 1.5/-1.2	32.8 + 0/-0.6	27.4 + 0/-0.8	22.0 + 0.8/-0	44.2 + 1.8/-0	20.0 + 0/-0.7	9.95 ref	12.72 ref
E 70/33/32	**0_47133EC**	70.5 ± 1	33.2 + 0/-0.5	32.0 + 0/-0.8	21.9 + 0.7/-0	48.0 + 1.5/-0	22.0 + 0/-0.7	11.25 nom	13.0 nom
E 72/28/19	**0_47228EC**	72.4 ± 0.76	27.9 ± 0.33	19.0 ± 0.33	17.8 min	52.6 min	19.0 ± 0.38	9.53 ± 0.38	16.9 min
E 80/38/20	**0_48020EC**	80.0 ± 1.6	38.1 ± 0.3	19.8 ± 0.4	28.2 ± 0.3	59.1 min	19.8 ± 0.4	11.25 nom	19.45 min
E 100/59/27	**0_49928EC**	100.3 ± 2.0	59.4 ± 0.47	27.5 ± 0.5	46.85 ± 0.38	72.0 min	27.5 ± 0.5	13.75 ± 0.38	22.65 ± 0.5

Planar E, I Cores

14 mm – 36 mm

Planar E cores are offered in all of the IEC standard sizes, and a number of other sizes. The leg length and window height (B and D dimensions) are adjustable for specific applications without new tooling. This permits the designer to adjust the final core specification to exactly accommodate the planar conductor stack height, with no wasted space. Clips and clip slots are available in many cases, which is useful for prototyping. I cores are also offered standard, reducing path length and increasing inductance. Planar cores provide the lowest profile design. E-I planar combinations allow practical face bonding in high volume assembly. The flat back can accommodate a heat sink.

Differential mode inductors, DC/DC, and AC/DC converters are typical applications for planar cores.

		NOMINAL A_L (MH/1000T)			
TYPE/SIZE	ORDERING CODE	L	R	P	F
14/2.5/5	**0_41425EC**	780	1,519	1,595	1,765
E 14 C	**C_41434EC**	600	1,327	1,399	1,563
I 14 C	**C_41434IC**	780	1,504	1,580	1,749
E 18 C	**C_41805EC**	1,500	3,244	3,430	3,853
I 18 C	**C_41805IC**	1,800	3,606	3,801	4,241
E 18	**F_41805EC**	1,550	3,244	3,430	3,853
I 18	**F_41805IC**	1,800	3,641	3,837	4,278
E 22/4/7	**0_42107EC**	1,350	2,920	3,173	3,810
I 22/4/7	**0_42107IC**	1,480	3,320	3,600	4,330
E 22 C	**C_42216EC**	2,300	5,066	5,387	6,131
I 22 C	**C_42216IC**	2,900	6,147	6,506	7,327
E 22	**F_42216EC**	2,400	5,066	5,387	6,131
I 22	**F_42216IC**	2,900	6,207	6,568	7,932
E 32 C	**C_43208EC**	3,200	6,521	6,918	7,834
I 32 C	**C_43208IC**	3,700	7,321	7,745	8,711
E 32	**F_43208EC**	3,200	6,521	6,918	7,834
I 32	**F_43208IC**	3,700	7,321	7,745	8,711
E 36/6/18	**0_43618EC**		6,678	7,090	8,039
I 36/6/18	**0_43618IC**		7,303	7,736	8,729

HOW TO ORDER

C R 4 14 34 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate width in mm
- Geometry code

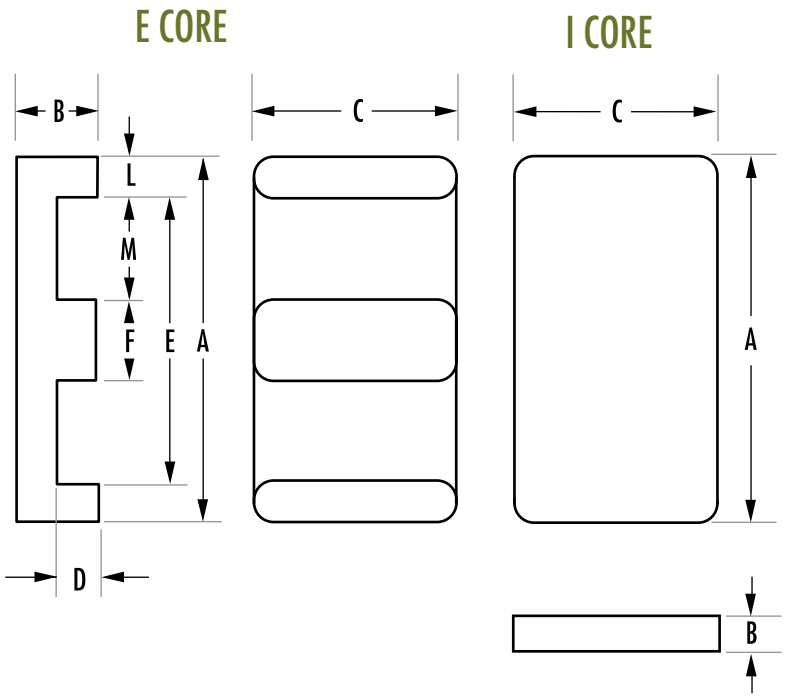
SHAPE CODE

C – Planar core with clip recesses
F or 0 – Planar core option: no clip recesses
For clip slot dimensions—see individual data sheets

GEOMETRY CODE

EC – Planar E core
IC – Planar I core

Cores are sold per piece (for sets multiply by 2).
Any practical gap available, see page 14.



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
14/2.5/5	**0_41425EC**	16.7	14.7	14.7	244	0.01	1.2		
E 14 C	**C_41434EC**	20.7	14.7	14.7	304	0.02	1.5		
I 14 C	**C_41434IC**	16.4	14.2	11.4	230	0.008	1.2		✓
E 18 C	**C_41805EC**	24.2	40.1	39.9	972	0.07	4.8		
I 18 C	**C_41805IC**	20.3	39.5	35.9	830	0.03	4.1		✓
E 18	**F_41805EC**	24.2	40.1	39.9	972	0.07	4.8		
I 18	**F_41805IC**	20.3	40.1	39.9	813	0.03	3.9		
E 22/4/7	**0_42107EC**	25.7	37.1	36.0	960	0.06	4.2		
I 22/4/7	**0_42107IC**	22.7	35.7	33.5	809	0.03	3.9		
E 22 C	**C_42216EC**	32.3	76.0	73.1	2,451	0.27	12.0		
I 22 C	**C_42216IC**	26.1	80.4	72.5	2,100	0.14	10.4		✓
E 22	**F_42216EC**	32.5	78.5	76.0	2,550	0.27	12.5		
I 22	**F_42216IC**	25.8	80.6	80.6	2,080	0.13	10.2		
E 32 C	**C_43208EC**	41.4	130	130	5,380	0.71	26		
I 32 C	**C_43208IC**	35.1	130	130	4,560	0.36	22		
E 32	**F_43208EC**	41.4	130	130	5,380	0.71	26		
I 32	**F_43208IC**	35.1	130	130	4,560	0.36	22		
E 36/6/18	**0_43618EC**	42.4	135	135	5,750	0.55	28		
I 36/6/18	**0_43618IC**	37.4	135	135	5,060	0.27	25		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)							
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F	L	M
14/2.5/5	**0_41425EC**	14.0 ±0.3	2.5 ±0.1	5.0 ±0.1	1.0 ±0.1	11.0 ±0.25	3.0 ±0.1	1.5 ref	4.0 ref
E 14 C	**C_41434EC**	14.0 ±0.3	3.5 ±0.1	5.0 ±0.15	1.91 min	10.5 min	3.0 ±0.1	1.5 ref	4.0 ref
I 14 C	**C_41434IC**	14.0 ±0.3	1.8 ±0.05	5.0 ±0.15	1.5 ±0.1	2.5 +0.2/-0			
E 18 C	**C_41805EC**	18.0 ±0.35	4.0 ±0.1	10.0 ±0.2	2.0 ±0.1	14 ±0.3	4.0 ±0.1	2.0 ref	5.0 ref
I 18 C	**C_41805IC**	18.0 ±0.35	2.4 ±0.5	10.0 ±0.2	2.0 ±0.1	2.5 +0.2/-0			
E 18	**F_41805EC**	18.0 ±0.35	4.0 ±0.1	10.0 ±0.2	2.0 ±0.1	13.7 min	4.0 ±0.1	2.0 ref	5.0 ref
I 18	**F_41805IC**	18.0 ±0.41	2.39 ±0.1	10.0 ±0.2					
E 22/4/7	**0_42107EC**	21.8 ±0.4	3.91 ±0.8	7.8 ±0.5	1.73 ±0.2	16.8 ±0.3	5.0 ±0.2	2.5 ±0.12	5.89 ±0.25
I 22/4/7	**0_42107IC**	21.8 ±0.4	2.3 ±0.2	7.8 ±0.3					
E 22 C	**C_42216EC**	21.8 ±0.4	5.7 ±0.1	15.8 ±0.3	3.05 min	16.1 min	5.0 ±0.1	2.5 ref	5.9 ref
I 22 C	**C_42216IC**	21.8 ±0.4	2.9 ±.0.05	15.8 ±0.3	2.5 ±0.1	2.9 +0.2/-0			
E 22	**F_42216EC**	21.8 ±0.4	5.72 ±0.1	15.8 ±0.3	3.05 min	16.1 min	5.0 ±0.1	2.5 ref	5.9 ref
I 22	**F_42216IC**	21.8 ±0.4	2.95 ±0.1	15.8 ±0.3					
E 32 C	**C_43208EC**	31.75 ±0.64	6.35 ±0.13	20.32 ±0.41	3.18 ±0.2	24.9 min	6.35 ±0.13	3.18 ref	9.27 ref
I 32 C	**C_43208IC**	31.75 ±0.64	3.18 ±0.13	20.32 ±0.41					
E 32	**F_43208EC**	31.75 ±0.64	6.35 ±0.13	20.32 ±0.41	3.18 ±0.2	24.9 min	6.35 ±0.13	3.18 ref	9.27 ref
I 32	**F_43208IC**	31.75 ±0.64	3.18 ±0.13	20.32 ±0.41					
E 36/6/18	**0_43618EC**	35.56 ±0.5	6.35 ±0.13	17.8 ±0.4	2.41 min	27.2 min	7.62 ±0.18	3.81 ±0.13	10.16 ±0.25
I 36/6/18	**0_43618IC**	35.56 ±0.5	3.68 ±0.3	17.8 ±0.4					

Planar E, I Cores

38 mm – 102 mm

		NOMINAL A_L (MH/1000T)				
TYPE/SIZE	ORDERING CODE	L	R	P	F	J
E 38	**F_43808EC**	3,880	7,618	8,354	9,490	
I 38	**F_43808IC**	4,600	9,028	9,566	10,801	
E 40/8/10	**0_44008EC**		4,233	4,504	5,134	7,130
I 40/4/10	**0_44008IC**		4,744	5,035	5,706	8,026
E 43/8/28	**0_44308EC**		8,598	9,150	10,432	
I 43/4/28	**0_44308IC**		9,541	10,130	11,849	
E 43	**F_44310EC**		8,266	8,803	10,057	
I 43	**F_44310IC**		9,541	10,130	11,489	
E 58 C	**C_45810EC**		8,498	9,073	10,427	
I 58 C	**C_45810IC**		9,821	10,457	11,941	
E 58	**F_45810EC**		8,498	9,073	10,427	
I 58	**F_45810IC**		9,821	10,457	11,941	
E 64 C	**C_46410EC**		14,618	15,599	17,901	
I 64 C	**C_46410IC**		16,139	17,189	19,639	
E 64	**F_46410EC**		14,618	15,599	17,901	
I 64	**F_46410IC**		16,192	17,245	19,699	
E 102	**0_49938EC**		9,292	9,997	11,697	

HOW TO ORDER

C R 4 64 10 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate width in mm
- Geometry code

SHAPE CODE

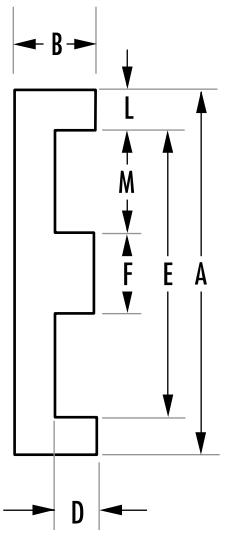
C – Planar core with clip recesses
F or 0 – Planar core option: no clip recesses
For clip slot dimensions—see individual data sheets

GEOMETRY CODE

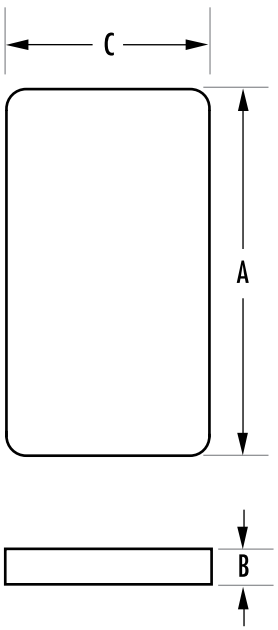
EC – Planar E core
IC – Planar I core

Cores are sold per piece (for sets multiply by 2).
Any practical gap available, see page 14.

E CORE



I CORE



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
E 38	**F_43808EC**	52.4	194	194	10,200	1.88	51		
I 38	**F_43808IC**	43.7	194	194	8,460	0.94	42		
E 40/8/10	**0_44008EC**	51.9	101	95.1	5,220	0.77	26		
I 40/4/10	**0_44008IC**	43.8	99.5	95.1	4,360	0.38	21		
E 43/8/28	**0_44308EC**	57.5	227	227	13,100	2.52	64		
I 43/4/28	**0_44308IC**	48.6	227	227	11,000	1.27	54		
E 43	**F_44310EC**	61.1	229	229	13,900	3.18	71		
I 43	**F_44310IC**	50.4	229	229	11,500	1.59	58		
E 58 C	**C_45810EC**	80.6	308	308	24,600	8.16	119		✓
I 58 C	**C_45810IC**	67.7	310	310	20,800	4.09	101		✓
E 58	**F_45810EC**	80.6	308	308	24,600	8.16	119		
I 58	**F_45810IC**	68.3	310	310	20,829	4.09	101		
E 64 C	**C_46410EC**	80.2	516	516	41,400	11.10	195		✓
I 64 C	**C_46410IC**	69.9	511	511	35,539	5.52	172		✓
E 64	**F_46410EC**	80.2	516	516	41,400	11.10	200		
I 64	**F_46410IC**	69.6	511	511	35,539	5.52	172		
E 102	**0_49938EC**	148	540	525	79,800	50.5	400		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)							
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F	L	M
E 38	**F_43808EC**	38.1 ±0.76	8.26 ±0.13	25.4 ±0.51	4.45 ±0.13	30.23 min	7.62 ±0.15	3.81	11.43
I 38	**F_43808IC**	38.1 ±0.76	3.81 ±0.13	25.4 ±0.51					
E 40/8/10	**0_44008EC**	40.65 ±0.5	8.51 ±0.25	10.7 ±0.25	4.06 ±0.25	30.45 ±0.3	10.15 ±0.15	5.1 ref	10.15 ref
I 40/4/10	**0_44008IC**	40.64 ±0.5	4.45 ±0.25	10.7 ±0.25					
E 43/8/28	**0_44308EC**	43.2 ±0.5	8.51 ±0.25	27.9 ±0.38	4.19 min	34.4 min	8.13 ±0.13	4.2 nom	13.46 nom
I 43/4/28	**0_44308IC**	43.2 ±0.9	4.1 ±0.13	27.9 ±0.6					
E 43	**F_44310EC**	43.2 ±0.9	9.50 ±0.13	27.9 ±0.6	5.4 ±0.13	34.7 min	8.1 ±0.2	4.7 max	13.2 min
I 43	**F_44310IC**	43.2 ±0.9	4.1 ±0.13	27.9 ±0.6					
E 58 C	**C_45810EC**	58.42 ±1.2	10.54 ±0.2	38.1 ±0.8	6.35 min	50.0 min	8.1 ±0.2	3.7 ref	21.4 ref
I 58 C	**C_45810IC**	58.42 ±1.2	4.06 ±0.13	38.1 ±0.8					
E 58	**F_45810EC**	58.42 ±1.2	10.54 ±0.2	38.1 ±0.8	6.35 min	50.0 min	8.1 ±0.2	3.7 ref	21.4 ref
I 58	**F_45810IC**	58.42 ±1.2	4.06 ±0.13	38.1 ±0.8					
E 64 C	**C_46410EC**	64.0 ±0.76	10.2 ±0.1	50.8 ±0.81	5.03 min	53.16 min	10.16 ±0.18	5.08 ±0.12	21.8 ±0.25
I 64 C	**C_46410IC**	64.0 ±1.27	5.08 ±0.13	50.8 ±1.02					
E 64	**F_46410EC**	64.0 ±0.76	10.2 ±0.1	50.8 ±0.81	5.03 min	53.16 min	10.16 ±0.18	5.08 ±0.12	21.8 ±0.25
I 64	**F_46410IC**	64.0 ±1.27	5.08 ±0.13	50.8 ±1.02					
E 102	**0_49938EC**	102.0 ±1.0	20.3 ±0.25	37.5 ±0.4	13.3 ±0.25	86.0 ±1.0	14.0 ±0.25	8.0 ref	36.0 ref

ER Cores

ER cores are a cross between E cores and pot cores. The round centerpost of the ER core offers minimal winding resistance. In addition, they offer better space utilization and shielding than with rectangular center leg planar cores. When compared with non-planar cores, ERs offer minimal height and better thermal performance.

E/I combinations facilitate economical assembly. Surface mount accessories are available.

Typical applications of ER cores include differential mode inductors and power transformers.

		NOMINAL A_L (MH/1000T)			
TYPE/SIZE	ORDERING CODE	L	R	P	F
ER 9/5	**0_40906EC**	525	973	1,053	1,270
ER 11/6	**0_41126EC**	725	1,400	1,690	1,780
ER 12.5/8.5	**0_41308EC**	950	1,700	1,800	1,950
I 12.5/8.5	**0_41308IC**	1,000	1,800	1,900	2,000
ER 14.5/6	**0_41426EC**	850	1,600	1,700	1,850
ER 18/3/10	**0_41826EC**	1,300	2,623	2,770	3,104
ER 20/7/14	**C_42014EC**	1,600	3,788	4,026	4,575
I 20/7/14	**C_42014IC**	2,150	4,500	4,900	5,500
ER 20/7/14	**F_42014EC**	1,600	3,788	4,026	4,575
I 20/7/14	**F_42014IC**	2,150	4,479	4,740	5,338
ER 23/3/12	**0_42313EC**	1,850	3,800	4,030	4,540
ER 25/5.5/18	**0_42517EC**	3,300	7,021	7,447	8,427
I 25/2/18	**0_42517IC**				
ER 25/8/18	**0_42521EC**	2,300	5,440	5,801	6,649
ER 30/8/20	**0_43021EC**	2,400	5,465	5,841	6,729
I 30/2.5/20	**0_43021IC**	3,200	6,550	7,784	8,850
ER 32/6/25	**0_43225EC**		6,950	7,350	8,200

HOW TO ORDER

0 R 4 09 06 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate depth in mm
- Geometry code

SHAPE CODE

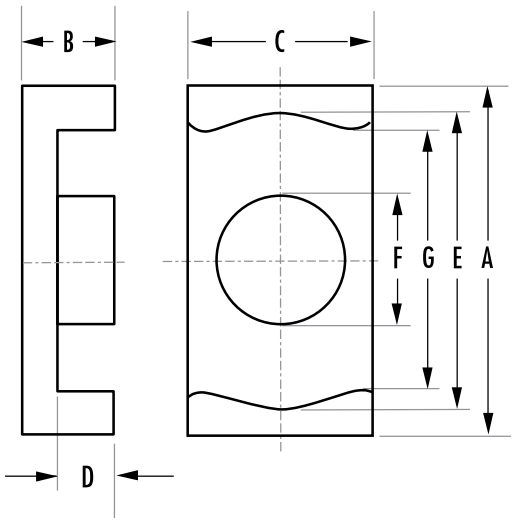
C – ER core with clip recesses
F or 0 – ER core option: no clip recesses

GEOMETRY CODE

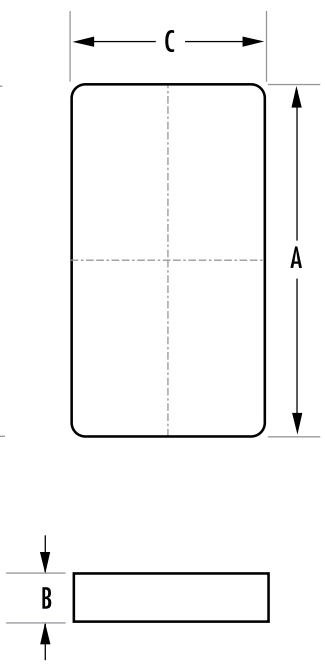
EC – ER core
IC – I core
For clip slot dimensions see individual data sheets.

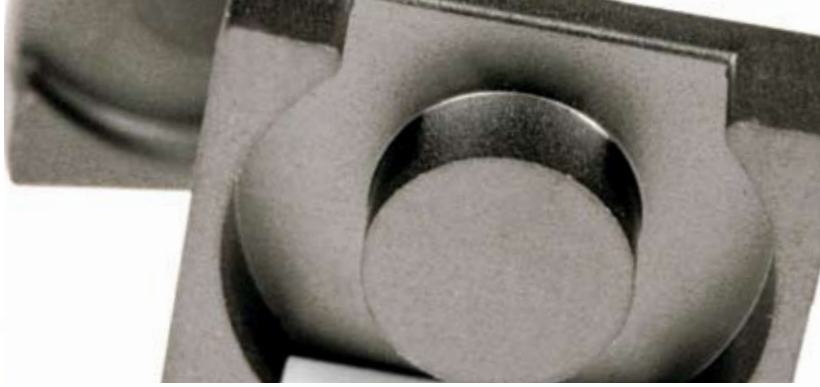
ER cores are sold per piece (for sets multiply by 2).
Any practical gap available. See page 14.

ER CORE



I CORE





		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
ER 9/5	**0_40906EC**	14.2	8.47	7.6	120	0.003	1	✓	✓
ER 11/6	**0_41126EC**	14.7	11.9	10.3	174	0.004	1		
ER 12.5/8.5	**0_41308EC**	17.5	19.9	19.2	348	0.011	2		
I 12.5/8.5	**0_41308IC**	15.9	19.8	19.2	315	0.006	1		
ER 14.5/6	**0_41426EC**	19.0	17.6	17.3	333	0.011	2		
ER 18/3/10	**0_41826EC**	22.1	30.2	30.1	667	0.025	3		
ER 20/7/14	**C_42014EC**	33.2	59.0	55.0	1,960	0.142	10.2		
I 20/7/14	**C_42014IC**	25.1	59.8	55.0	1,500	0.072	8.0		
ER 20/7/14	**F_42014EC**	33.2	59.0	55.0	1,960	0.142	10.1		
I 20/7/14	**F_42014IC**	25.5	57.3	52.5	1,460	0.069	8.0		
ER 23/3/12	**0_42313EC**	26.6	50.2	50.0	1,340	0.055	6.4		
ER 25/5.5/18	**0_42517EC**	26.4	89.7	82.8	2,370	0.151	16.4		
I 25/2/18	**0_42517IC**					0.076	13.1		
ER 25/8/18	**0_42521EC**	41.4	100	95.0	4,145	0.324	22.0		
ER 30/8/20	**0_43021EC**	46.0	108	95.0	4,970	0.488	26.4		
I 30/2.5/20	**0_43021IC**	36.2	108	95.0	3,910	0.244	20.8		
ER 32/6/25	**0_43225EC**	38.2	141	121	5,400	0.328	27.5		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)						
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F	G
ER 9/5	**0_40906EC**	9.5 + 0/-0.3	2.45 ± 0.05	5.0 + 0/-0.2	1.6 + 0.15/-0	7.5 + 0.4/-0	3.5 + 0/-0.2	7.1 + 0.35/-0
ER 11/6	**0_41126EC**	11.0 + 0/-0.35	2.45 ± 0.05	6.0 + 0/-0.2	1.5 + 0.15/-0	8.7 + 0.3/-0	4.25 + 0/-0.25	8.0 + 0/-0.25
ER 12.5/8.5	**0_41308EC**	12.8 ± 0.3	2.85 ± 0.8	8.7 ± 0.25	1.75 ± 0.13	11.2 ± 0.3	5.0 ± 0.15	9.05 ± 0.3
I 12.5/8.5	**0_41308IC**	12.8 ± 0.3	1.1 ± 0.1	8.7 ± 0.25				
ER 14.5/6	**0_41426EC**	14.7 + 0/-0.4	2.95 ± 0.5	6.8 + 0/-0.2	1.55 + 0.2/-0	11.6 + 0.4/-0	4.8 + 0/-0.2	
ER 18/3/10	**0_41826EC**	18.0 ± 0.35	3.15 ± 0.1	9.7 ± 0.2	1.6 ± 0.1	15.6 ± 0.3	6.2 ± 0.15	13.5 min
ER 20/7/14	**C_42014EC**	20.0 ± 0.35	6.8 ± 0.1	14.0 ± 0.3	4.6 ± 0.15	18 ± 0.35	8.8 ± 0.15	12.86 ± 0.35
I 20/7/14	**C_42014IC**	20.0 ± 0.35	2.3 ± 0.05	14.0 ± 0.3	1.9 ± 0.1	3.0 ± 0.1		
ER 20/7/14	**F_42014EC**	20 .0 ± 0.35	6.8 ± 0.1	14.0 ± 0.3	4.6 ± 0.15	18.0 ± 0.35	8.8 ± 0.15	12.86 ± 0.35
I 20/7/14	**F_42014IC**	20.0 ± 0.35	1.9 ± 0.05	14.0 ± 0.3				
ER 23/3/12	**0_42313EC**	23.2 ± 0.45	3.6 ± 0.1	12.5 ± 0.25	1.6 ± 0.1	20.2 ± 0.4	8.0 ± 0.2	17.5 min
ER 25/5.5/18	**0_42517EC**	25.0 ± 0.4	5.6 ± 0.1	18.0 ± 0.3	2.75 ± 0.15	22.0 ± 0.4	11.0 ± 0.2	15.2 ± 0.7
I 25/2/18	**0_42517IC**	25.0 ± 0.4	2.3 ± 0.05	18.0 ± 0.3				
ER 25/8/18	**0_42521EC**	25.0 ± 0.4	8.0 ± 0.1	18.0 ± 0.3	5.15 ± 0.15	22.0 ± 0.4	11.0 ± 0.2	15.2 ± 0.7
ER 30/8/20	**0_43021EC**	30.0 ± 0.4	8.0 ± 0.15	20.0 ± 0.3	5.3 ± 0.2	26.0 ± 0.4	11.0 ± 0.2	19.45 ± 0.4
I 30/2.5/20	**0_43021IC**	30.0 ± 0.4	2.7 ± 0.1	20.0 ± 0.3				
ER 32/6/25	**0_43225EC**	32.1+ 0.55/-0.45	6.0 ± 0.13	25.4 ± 0.4	2.9+0/-0.25	27.2 ± 0.4	12.4 ± 0.15	27.2 ± 0.4

U, I Cores

U cores are ideal for power transformer applications. The long legs of U core support low leakage inductance designs and facilitate superior voltage isolation. U/I combinations provide for economical assembly.

		NOMINAL A_L (MH/1000T)					
TYPE/SIZE	ORDERING CODE	L	R	P	F	J	W
U 11/4/6	**0_41106UC**		860	914	1,010	1,662	
I 11/2/6	**0_41106IC**		960	1,020	1,150	1,687	
U 22/21/6	**0_42220UC**		893	973	1,360	2,107	3,429
U 25/13/13	**0_42512UC**		1,907	2,067	2,480	4,400	
U 25/16/6	**0_42515UC**		1,107	1,333	1,600	2,507	
I 25/6/6	**0_42516IC**	660	1,480	1,650	1,770	2,907	
U 25/16/12	**0_42530UC**		2,093	2,280	2,740	4,860	
U 93/76/16	**0_49316UC**		3,450	3,730	4,110	8,100	
I 93/28/16	**0_49316IC**		4,600	4,960	5,840	10,500	
U 93/76/30	**0_49330UC**			7,219			
U 93/76/32	**0_49332UC**			7,700			
U 126/91/20	**0_49920UC**		3,000	3,572	4,265	6,967	
U 102/57/25	**0_49925UC**		4,533	5,500	6,500		
I 102/25/25	**0_49925IC**		5,707	6,200	7,440		

HOW TO ORDER

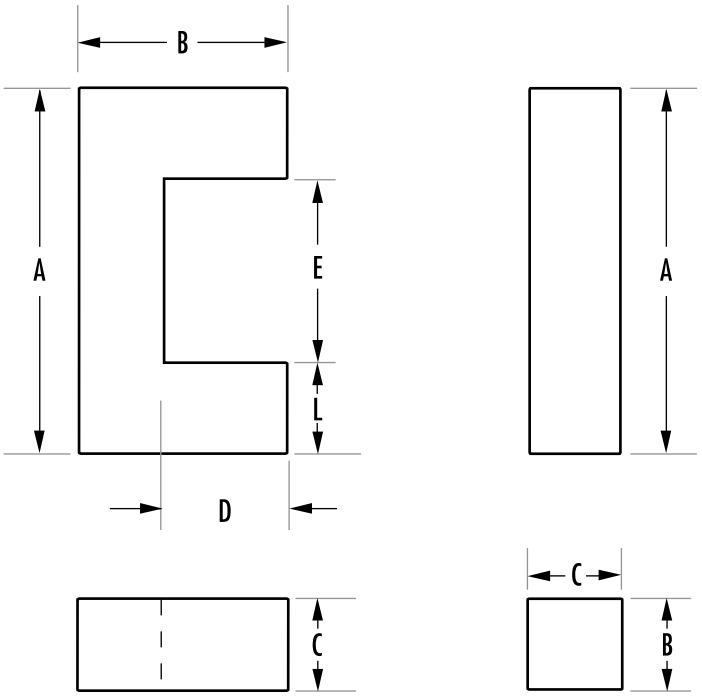
0 F 4 22 20 UC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate width in mm
- Geometry code

GEOMETRY CODE

UC – U core
IC – I core

U and I cores are sold per piece (for sets multiply by 2).



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
U 11/4/6	**0_41106UC**	29.2	12	11.5	350	0.02	1.8		
I 11/2/6	**0_41106IC**	24.6	11.5	11.5	283	0.01	1.5		
U 22/21/6	**0_42220UC**	95.8	39.7	39.7	4,130	0.63	19		
U 25/13/13	**0_42512UC**	68.9	80.0	80.0	4,170	0.78	29		
U 25/16/6	**0_42515UC**	83.4	40.4	40.4	3,370	0.57	17		
I 25/6/6	**0_42516IC**	64.3	40.3	40.3	2,590	0.32	13		
U 25/16/12	**0_42530UC**	83.4	80.8	80.8	6,740	1.13	34		
U 93/76/16	**0_49316UC**	353	452	452	160,000	91.4	800		
I 93/28/16	**0_49316IC**	257	450	450	115,000	45.8	600		
U 93/76/30	**0_49330UC**	354	840	840	297,000	173	1,490		
U 93/76/32	**0_49332UC**	353	905	896	319,000	185	1,600		
U 126/91/20	**0_49920UC**	480	560	560	268,800	286	1,360		
U 102/57/25	**0_49925UC**	308	645	645	199,000	121	988		
I 102/25/25	**0_49925IC**	245	645	645	158,000	60.7	784		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)					
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	L
U 11/4/6	**0_41106UC**	10.85 ± 0.2	4.19 ± 0.13	6.3 ± 0.13	2.24 ± 0.13	7.19 ± 0.2	1.83 ± 0.13
I 11/2/6	**0_41106IC**	10.8 ± 0.2	1.83 ± 0.12	6.3 ± 0.13			
U 22/21/6	**0_42220UC**	22.1 ± 0.38	20.6 ± 0.38	6.27 ± 0.18	13.98 min	9.5 ± 0.38	6.27 ± 0.18
U 25/13/13	**0_42512UC**	25.4 ± 0.5	12.9 ± 0.4	12.7 ± 0.4	6.35 min	12.8 ref	6.3 ± 0.13
U 25/16/6	**0_42515UC**	25.4 ± 0.51	15.9 ref	6.35 ± 0.12	9.27 min	12.7 ref	6.45 ± 0.15
I 25/6/6	**0_42516IC**	25.4 + 0.64/-0.51	6.35 ± 0.13	6.35 ± 0.13			
U 25/16/12	**0_42530UC**	25.4 ± 0.51	15.9 ref	12.7 ± 0.25	9.27 min	12.7 ref	6.45 ± 0.15
U 93/76/16	**0_49316UC**	93.0 ± 1.8	76.0 ± 0.5	16.0 ± 0.6	48.0 ± 0.9	36.2 ± 1.2	28.4 ref
I 93/28/16	**0_49316IC**	93.0 ± 1.8	27.5 ± 0.5	16.0 ± 0.6			
U 93/76/30	**0_49330UC**	93.0 ± 1.8	76.0 ± 0.5	30.0 ± 0.6	48.0 ± 0.9	36.2 ± 1.2	28.4 ref
U 93/76/32	**0_49332UC**	93.0 ± 1.8	76.0 ± 0.5	32.0 ± 0.6	48.0 ± 0.9	36.2 ± 1.2	28.4 ref
U 126/91/20	**0_49920UC**	126.0 ± 4.0	91.0 ± 1.0	20.0 ± 0.6	63.0 ± 2.0	70.0 ± 2.0	28.0 ref
U 102/57/25	**0_49925UC**	101.6 ± 1.5	57.1 ± 0.4	25.4 ± 0.6	31.7 ± 0.75	50.8 ± 1	25.4 ± 0.8
I 102/25/25	**0_49925IC**	101.6 ± 1.5	25.4 ± 0.4	25.4 ± 0.6			

UR Cores

UR cores are an excellent choice for high current designs and conditions where vibration occurs. The open window area accommodates large conductors. Holes through the center, or grooves on the outer legs of the core provide a method to secure the core to the PCB with mounting hardware.

Typical applications include: the output transformer application in welding, audio amplifiers, traction and other high-power designs.

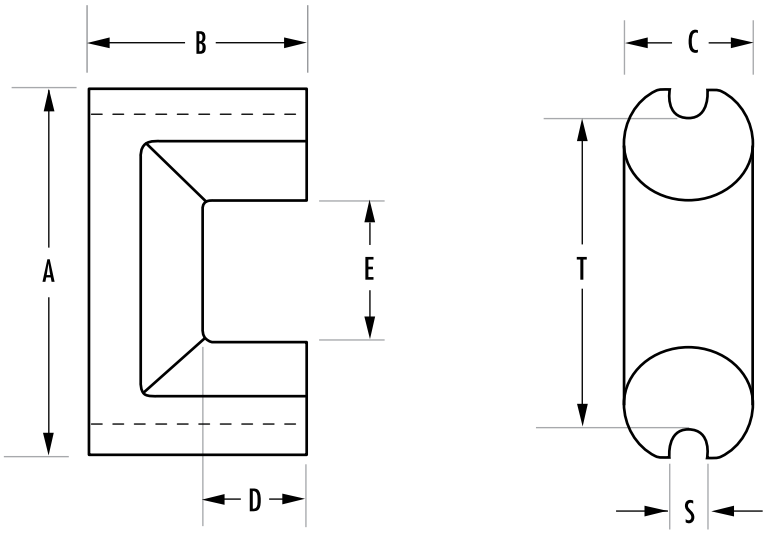
		NOMINAL A_L (MH/1000T)		
TYPE/SIZE	ORDERING CODE	R	P	F
UR 41/21/11	**0_44119UC**	1,627	1,773	2,130
UR 41/21	**0_44121UC**	1,880	2,047	2,465
UR 41/25	**0_44125UC**	1,600	1,747	2,105
UR 41/30	**0_44130UC**	1,400	1,520	1,830
UR 57	**0_45716UC**	2,600	3,061	3,622
UR 59	**0_45917UC**	3,027	3,274	3,881
UR 64	**0_46420UC**	3,787	4,098	4,864

HOW TO ORDER

0 P 4 41 25 UC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate depth in mm
- Geometry code

UR cores are sold per piece (for sets multiply by 2).
For UR 64 size, refer to datasheets for drawings.



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
UR 41/21/11	**0_44119UC**	121.2	91.1	80.5	11,000	2.75	54	✓	✓
UR 41/21	**0_44121UC**	113	104	84.0	11,800	2.81	55		
UR 41/25	**0_44125UC**	134.4	113.1	105.4	15,196	4.0	64		
UR 41/30	**0_44130UC**	154.8	112.1	105.4	17,346	5.25	75		
UR 57	**0_45716UC**	163	171	171	27,900	8.84	140		
UR 59	**0_45917UC**	189	210	210	39,700	13.8	198		
UR 64	**0_46420UC**	210	290	290	61,000	21.9	320		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)						
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	S	T
UR 41/21/11	**0_44119UC**	41.78 ± 0.81	20.9 ± 0.12	11.94 ± 0.25	13.4 min	18.8 ± 0.56	3.18 nom	34.66 ref
UR 41/21	**0_44121UC**	41.78 ± 0.81	20.62 ± 0.13	11.94 ± 0.25	11.1 ± 0.2	18.8 ± 0.56	3.18 ± 0.13	34.66 nom
UR 41/25	**0_44125UC**	41.78 ± 0.81	25.4 ± 0.13	11.94 ± 0.25	15.9 ± 0.2	18.8 ± 0.56	3.18 ± 0.13	34.66 nom
UR 41/30	**0_44130UC**	41.78 ± 0.81	30.5 ± 0.3	11.94 ± 0.25	20.8 min	18.8 ± 0.56	3.18 ± 0.13	34.66 ref
UR 57	**0_45716UC**	57.65 ± 1.7	28.6 + 0/-0.4	15.9 ± 0.4	15.5 + 1/-0	27.8 ± 0.9	4.8 ± 0.2	49.8 ± 0.8
UR 59	**0_45917UC**	59.34 ± 1.75	35.8 ± 0.4	17.0 ± 0.4	21.5 ± 0.8	26.5 ± 0.1	4.5 ± 0.2	50.5 ± 0.1
UR 64	**0_46420UC**	64.0 ± 1.95	40.5 ± 0.2	24.0 ± 0.3	26.5 ± 0.4	24.1 ± 0.9	4.0 min	44.0 ± 0.6

EC Cores

A cross between a pot core and an E core, EC cores have a round center post that provides a wide opening on each side, and therefore, minimum winding resistance. The long legs support low leakage inductance designs.

EC cores have standard channels for clamping assemblies. Plain bobbins, printed circuit bobbins and clamps are available for most sizes.

Magnetics EC cores are typically used in differential mode inductor and power transformer applications.

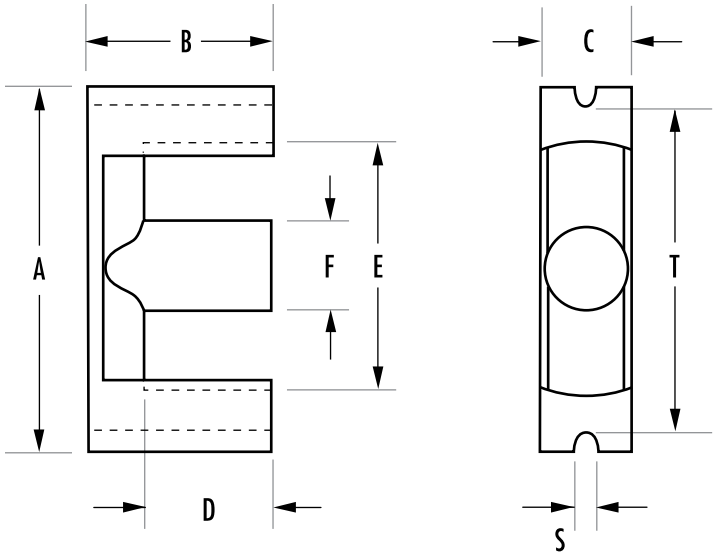
		NOMINAL A_L (MH/1000T)		
TYPE/SIZE	ORDERING CODE	R	P	F
EC 35	**0_43517EC**	2,213	2,400	3,000
EC 41	**0_44119EC**	2,947	3,200	3,700
EC 52	**0_45224EC**	3,867	4,200	5,040
EC 70	**0_47035EC**	4,413	4,800	5,760

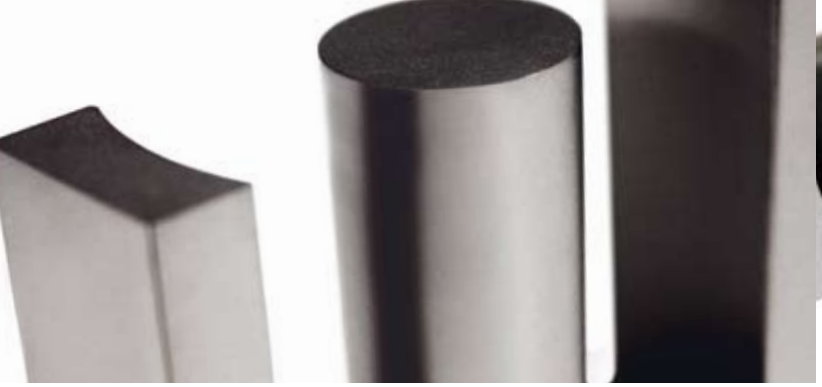
HOW TO ORDER

0 R 4 70 35 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate width in mm
- Geometry code

EC cores are sold per piece (for sets multiply by 2).
Any practical gap available. See page 14.





		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
EC 35	**0_43517EC**	77.4	84.3	71	6,530	0.83	36	✓	✓
EC 41	**0_44119EC**	89.3	121	106	10,800	1.67	60	✓	✓
EC 52	**0_45224EC**	105	180	141	18,800	3.87	111	✓	✓
EC 70	**0_47035EC**	144	279	211	40,100	13.4	253	✓	✓

Refer to page 58 for hardware information.

		DIMENSIONS (mm)							
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F	S	T
EC 35	**0_43517EC**	34.5 ± 0.8	17.3 ± 0.15	9.5 ± 0.3	12.3 ± 0.4	22.75 ± 0.55	9.5 ± 0.3	2.75 ± 0.25	28.5 ± 0.8
EC 41	**0_44119EC**	40.6 ± 1.0	19.5 ± 0.15	11.6 ± 0.3	13.9 ± 0.4	27.7 ± 0.7	11.6 ± 0.3	3.25 ± 0.25	33.6 ± 1
EC 52	**0_45224EC**	52.2 ± 1.3	24.2 ± 0.15	13.4 ± 0.35	15.9 ± 0.4	33.0 ± 0.9	13.4 ± 0.35	3.75 ± 0.25	44.0 ± 1.3
EC 70	**0_47035EC**	70.0 ± 1.7	34.5 ± 0.15	16.4 ± 0.4	22.75 ± 0.45	44.5 ± 1.2	16.4 ± 0.4	4.75 ± 0.25	59.6 ± 1.7

EER Cores

EER cores are an economical choice for transformers and inductors. The round centerpost offers the advantage of a shorter winding path length than winding around a square centerpost of equal area.

Differential mode inductors and power transformers are typical applications for Magnetics EER cores.

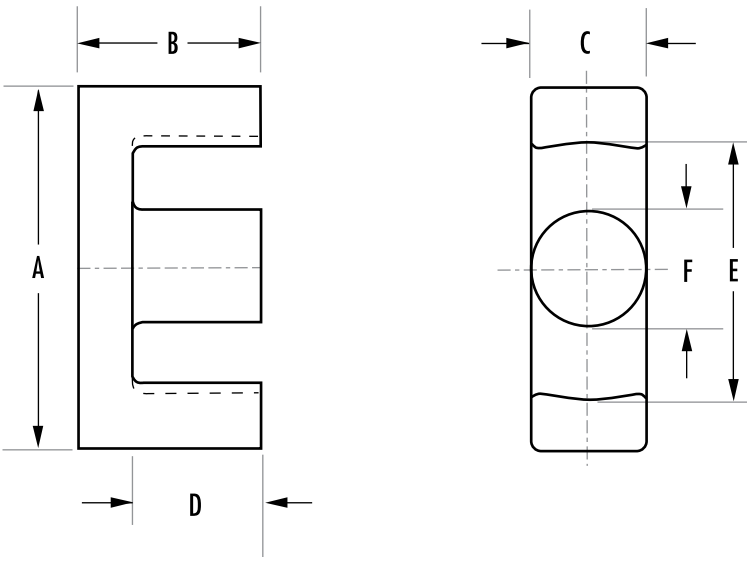
		NOMINAL A_L (MH/1000T)			
TYPE/SIZE	ORDERING CODE	L	R	P	F
EER 28/14/11	**0_42814EC**	1,340	2,700	3,352	3,896
EER 28/16/11	**0_42817EC**	1,150	2,500	2,913	3,400
EER 35L	**0_43521EC**		2,693	2,960	3,550
EER 40/22/13	**0_44013EC**		3,300	3,520	4,000
EER 42	**0_44216EC**		3,840	4,173	5,000
EER 48/18/17	**0_44818EC**		6,400	6,850	7,950
EER 48/21/21	**0_44821EC**		5,700	7,059	8,274
EER 53/18/18	**0_45418EC**		6,100	6,500	7,440

HOW TO ORDER

0 R 4 42 16 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height or width in mm
- Geometry code

EER cores are sold per piece (for sets multiply by 2).
Any practical gap available, see page 14.



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
EER 28/14/11	**0_42814EC**	64.0	81.4	77.0	5,260	0.532	28		
EER 28/16/11	**0_42817EC**	75.5	81.4	77.0	6,142	0.693	32		
EER 35L	**0_43521EC**	90.8	107	100	9,710	1.58	49	✓	
EER 40/22/13	**0_44013EC**	98.0	149	139	14,600	2.16	74		
EER 42	**0_44216EC**	98.7	175	166	17,300	2.98	106	✓	
EER 48/18/17	**0_44818EC**	86.0	232	223	19,900	2.93	102		
EER 48/21/21	**0_44821EC**	100	255	248	25,500	4.43	128		
EER 53/18/18	**0_45418EC**	91.8	250	240	23,000	3.61	122		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)					
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F
EER 28/14/11	**0_42814EC**	28.55 ± 0.55	14 ± 0.2	11.4 ± 0.35	9.75 ± 0.4	21.75 ± 0.5	9.9 ± 0.25
EER 28/16/11	**0_42817EC**	28.55 ± 0.55	16.7 ± 0.25	11.4 ± 0.35	12.65 ± 0.4	21.75 ± 0.5	9.9 ± 0.25
EER 35L	**0_43521EC**	35.0 ± 0.65	20.7 ± 0.2	11.4 ± 0.35	14.75 ± 0.35	26.15 ± 0.55	11.3 ± 0.25
EER 40/22/13	**0_44013EC**	40.0 ± 0.7	22.4 ± 0.2	13.4 ± 0.35	15.45 ± 0.35	29.6 ± 0.6	13.3 ± 0.25
EER 42	**0_44216EC**	42.15 ± 0.85	21.0 ± 0.2	14.7 ± 0.3	15.6 min	31.0 ± 0.6	14.7 ± 0.3
EER 48/18/17	**0_44818EC**	48.0 ± 1.0	18.0 ± 0.2	17.6 ± 0.4	11.45 ± 0.25	36.8 ± 0.8	17.6 ± 0.4
EER 48/21/21	**0_44821EC**	48.0 ± 1.0	21.2 +0/-0.4	21 + 0.3/-0.5	14.7 + 0.7/-0	38 + 0.5/-0.8	18.0 ± 0.3
EER 53/18/18	**0_45418EC**	53.5 ± 1.0	18.3 ± 0.2	17.95 ± 0.35	11.1 ± 0.3	40.65 ± 0.85	17.9 ± 0.4

EFD Cores

The industry standard flat design of EFD cores offers excellent space utilization for transformers or inductors. The optimized cross-sectional area is ideal for very flat compact transformer applications.

EFD cores are designed for compact transformers and inductor applications.

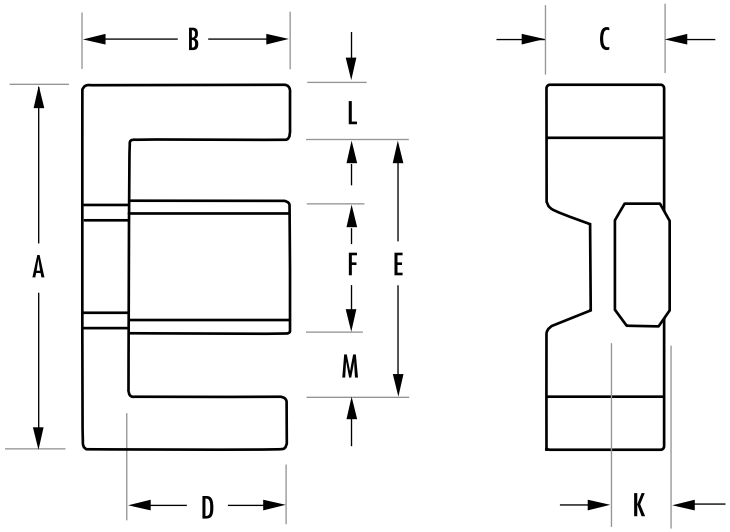
		NOMINAL A_L (MH/1000T)					
TYPE/SIZE	ORDERING CODE	L	R	P	F	T	J
EFD 10	**0_41009EC**	280	585	622	698		923
EFD 12	**0_41212EC**	380	760	800	844		2,600
EFD 15	**0_41515EC**	400	893	973	1,170	1,140	1,933
EFD 20	**0_42019EC**	650	1,300	1,633	1,881	1,540	2,696
EFD 25	**0_42523EC**	1,000	2,093	2,280	2,730	2,660	4,507
EFD 30	**0_43030EC**	1,000	2,200	2,695	3,137	2,520	4,668

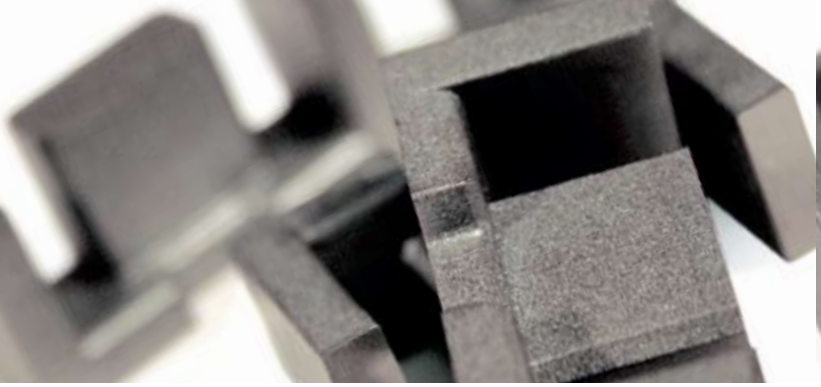
HOW TO ORDER

0 R 4 15 15 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate width (per set) in mm
- Geometry code

EFD cores are sold per piece (for sets multiply by 2).
Any practical gap available. See page 14.





		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
EFD 10	**0_41009EC**	23.7	7.2	6.5	171	0.004	0.9	✓	✓
EFD 12	**0_41212EC**	28.5	11.4	10.7	325	0.01	1.8	✓	✓
EFD 15	**0_41515EC**	34.0	15.0	12.2	510	0.02	2.8	✓	✓
EFD 20	**0_42019EC**	47.0	31.0	29.0	1,460	0.09	7.0	✓	✓
EFD 25	**0_42523EC**	57.0	58.0	55.0	3,300	0.24	16.2	✓	✓
EFD 30	**0_43030EC**	68.0	69.0	66.0	4,700	0.34	24.0	✓	✓

Refer to page 58 for hardware information.

	DIMENSIONS (mm)									
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F	K	L	M
EFD 10	**0_41009EC**	10.5 ± 0.3	5.2 ± 0.1	2.7 ± 0.1	3.75 ± 0.15	7.65 ± 0.25	4.55 ± 0.15	4.45 ± 0.05	1.43 ref	1.55 ref
EFD 12	**0_41212EC**	12.5 ± 0.3	6.2 ± 0.1	3.5 ± 0.1	4.55 ± 0.15	9.0 ± 0.25	5.4 ± 0.15	2.0 ± 0.1	1.75 ref	1.8 ref
EFD 15	**0_41515EC**	15.0 ± 0.4	7.5 ± 0.15	4.65 ± 0.15	5.5 ± 0.25	11.0 ± 0.35	5.3 ± 0.15	2.4 ± 0.1	2.0 nom	2.85 nom
EFD 20	**0_42019EC**	20.0 ± 0.55	10.0 ± 0.15	6.65 ± 0.15	7.7 ± 0.25	15.4 ± 0.5	8.9 ± 0.2	3.6 ± 0.15	2.3 ref	3.25 ref
EFD 25	**0_42523EC**	25.0 ± 0.66	12.5 ± 0.15	9.1 ± 0.2	9.05 min	18.1 min	11.4 ± 0.2	5.2 ± 0.15	3.15 ± 0.2	3.65 ± 0.2
EFD 30	**0_43030EC**	30.0 ± 0.8	15.0 ± 0.15	9.1 ± 0.2	11.2 ± 0.3	22.4 ± 0.75	14.6 ± 0.25	4.9 ± 0.15	3.8 ref	3.9 ref

ETD Cores

ETD cores are an economical choice for transformers or inductors. ETDs offer a round centerpost for minimum winding resistance. Dimensions are optimized for power transformer efficiency.

Hardware accessories are available.

Typical applications of Magnetics ETD cores include differential mode inductors and power transformers.

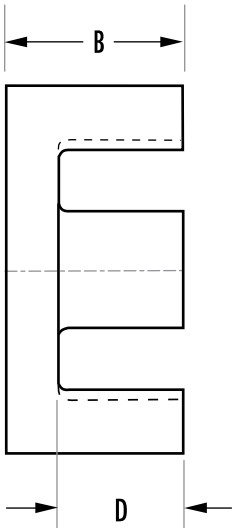
		NOMINAL A_L (MH/1000T)			
TYPE/SIZE	ORDERING CODE	L	R	P	F
ETD 29	**0_42929EC**	1,100	2,250	2,843	3,316
ETD 34	**0_43434EC**		2,707	2,933	3,600
ETD 39	**0_43939EC**		2,973	3,227	4,050
ETD 44	**0_44444EC**		3,667	4,000	4,950
ETD 49	**0_44949EC**		4,093	4,440	5,400
ETD 54	**0_45454EC**		5,200	6,281	7,400
ETD 59	**0_45959EC**		5,747	6,240	7,500

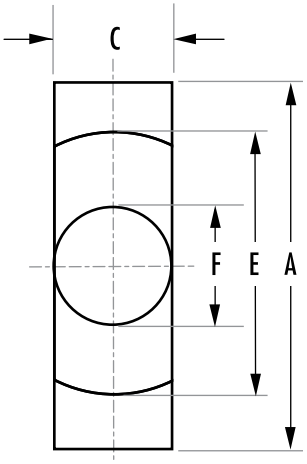
HOW TO ORDER

0 R 4 39 39 EC

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height (per set) in mm
- Geometry code

ETD cores are sold per piece (for sets multiply by 2.)
Any practical gap available. See page 14.





		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
ETD 29	**0_42929EC**	72.0	76.0	71.0	5,470	0.71	28	✓	✓
ETD 34	**0_43434EC**	78.6	97.1	91.6	7,640	1.19	40	✓	✓
ETD 39	**0_43939EC**	92.2	125	123	11,500	2.18	60	✓	✓
ETD 44	**0_44444EC**	103	173	172	17,800	3.68	94	✓	✓
ETD 49	**0_44949EC**	114	211	209	24,000	5.72	124	✓	✓
ETD 54	**0_45454EC**	127	280	280	35,500	8.88	180	✓	✓
ETD 59	**0_45959EC**	139	368	360	51,500	13.7	248	✓	✓

Refer to page 58 for hardware information.

		DIMENSIONS (mm)					
TYPE/SIZE	ORDERING CODE	A	B	C	D	E	F
ETD 29	**0_42929EC**	30.6 + 0/-1.6	15.8 ± 0.2	9.8 + 0/-0.6	11.0 ± 0.3	22.0 + 1.4/-0	9.8 + 0/-0.6
ETD 34	**0_43434EC**	35.0 + 0/-1.6	17.3 ± 0.2	11.1 + 0/-0.6	11.8 + 0.6/-0	25.6 + 1.4/-0	11.1 + 0/-0.6
ETD 39	**0_43939EC**	40.0 + 0/-1.8	19.8 ± 0.2	12.8 + 0/-0.6	14.2 + 0.8/-0	29.3 + 1.6/-0	12.8 + 0/-0.6
ETD 44	**0_44444EC**	45.0 + 0/-2.0	22.3 ± 0.2	15.2 + 0/-0.6	16.1 + 0.8/-0	32.5 + 1.6/-0	15.2 + 0/-0.6
ETD 49	**0_44949EC**	49.8 + 0/-2.2	24.7 ± 0.2	16.7 + 0/-0.6	17.7 + 0.8/-0	36.1 + 1.8/-0	16.7 + 0/-0.6
ETD 54	**0_45454EC**	54.5 ± 1.3	27.6 ± 0.2	18.9 ± 0.4	20.2 ± 0.4	41.2 ± 1.1	18.9 ± 0.4
ETD 59	**0_45959EC**	59.8 ± 1.3	31.0 ± 0.2	21.65 ± 0.45	22.1 min	44.7 ± 1.09	21.65 ± 0.45

Block Cores

Ferrites can be pressed in block form and then machined into intricate shapes. Where large sizes are required, it is possible to assemble them from two or more smaller machined or pressed sections; the variety of sizes and shapes becomes limitless.

Features of Magnetics ferrite blocks include, low porosity, extreme hardness, uniform physical properties, high density and ease of machining. J material offers high permeability; R material is suitable for power applications.

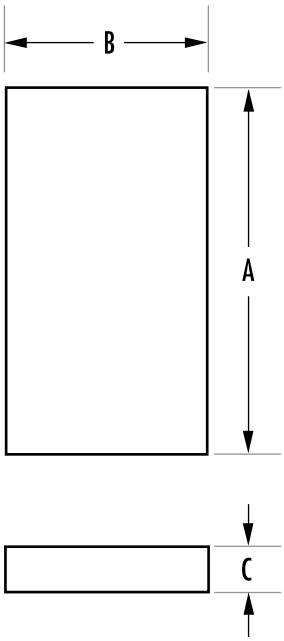
		AVAILABLE MATERIALS				
TYPE/SIZE	ORDERING CODE	L	R	P	F	J
I 11/4/6	**0_41106IC**		✓	✓	✓	✓
I 25/3/6	**0_42515IC**	✓	✓	✓	✓	✓
I 25/6/6	**0_42516IC**	✓	✓	✓	✓	✓
I 38	**F_43808IC**	✓	✓	✓	✓	
I 43/6/15	**0_44020IC**		✓	✓		
I 43/4/28	**0_44308IC**		✓	✓	✓	
I 58	**F_45810IC**		✓	✓	✓	
I 64	**F_46410IC**		✓	✓	✓	
I 93/28/16	**0_49316IC**		✓	✓	✓	✓
I 102/25/25	**0_49925IC**		✓	✓	✓	
FB 104/66/18	**0_49966FB**		✓	✓		✓
FB 100/85/25	**0_49985FB**		✓			

HOW TO ORDER

0 R 4 99 66 FB

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height in mm
- Geometry code

Block cores and I cores are sold per piece.



		MAGNETIC DATA		HARDWARE	
TYPE/SIZE	ORDERING CODE	V_e (mm^3)	Weight (grams each)	Bobbins	Clips
I 11/4/6	**0_41106IC**	108	0.6		
I 25/3/6	**0_42515IC**	445	2.5		
I 25/6/6	**0_42516IC**	905	4.5		
I 38	**F_43808IC**	3,360	17.0		
I 43/6/15	**0_44020IC**	3,250	16.5		
I 43/4/28	**0_44308IC**	4,450	22.0		
I 58	**F_45810IC**	8,529	41.5		
I 64	**F_46410IC**	14,839	72.0		
I 93/28/16	**0_49316IC**	35,500	200		
I 102/25/25	**0_49925IC**	59,500	290		
FB 104/66/18	**0_49966FB**	114,235	600		
FB 100/85/25	**0_49985FB**	194,310	1020		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)		
TYPE/SIZE	ORDERING CODE	A	B	C
I 11/4/6	**0_41106IC**	10.8 ± 0.2	1.83 ± 0.12	6.3 ± 0.13
I 25/3/6	**0_42515IC**	25.4 ± 0.38	3.18 ± 0.12	6.35 ± 0.25
I 25/6/6	**0_42516IC**	25.4 + 0.64/-0.51	6.35 ± 0.13	6.35 ± 0.13
I 38	**F_43808IC**	38.1 ± 0.76	3.81 ± 0.13	25.4 ± 0.51
I 43/6/15	**0_44020IC**	43.0 + 0/-1.7	5.9 ± 0.2	15.2+0/-0.6
I 43/4/28	**0_44308IC**	43.2 ± 0.9	4.1 ± 0.13	27.9 ± 0.6
I 58	**F_45810IC**	58.42 ± 1.2	4.06 ± 0.12	38.1 ± 0.8
I 64	**F_46410IC**	64.0 ± 1.27	5.08 ± 0.13	50.8 ± 1.02
I 93/28/16	**0_49316IC**	93.0 ± 1.8	27.5 ± 0.5	16.0 ± 0.6
I 102/25/25	**0_49925IC**	101.6 ± 1.5	25.4 ± 0.4	25.4 ± 0.6
I 104/66/18	**0_49966FB**	104.0 ± 2	66.0 ± 1.5	18.5 ± 0.4
I 100/85/25	**0_49985FB**	100.0 ± 2	85.0 ± 2	25.4 ± 0.5

EP Cores

EP cores are round center-post cubical shapes which enclose the coil completely except for the printed circuit board terminals. This particular shape minimizes the effect of air gaps formed at mating surfaces in the magnetic path and provides a larger volume ratio to total space used. EP cores provide excellent shielding.

Printed circuit bobbins, surface mount bobbins and mounting clamp assemblies are available.

Typical applications for EP cores include differential mode and telecom inductors and power transformers.

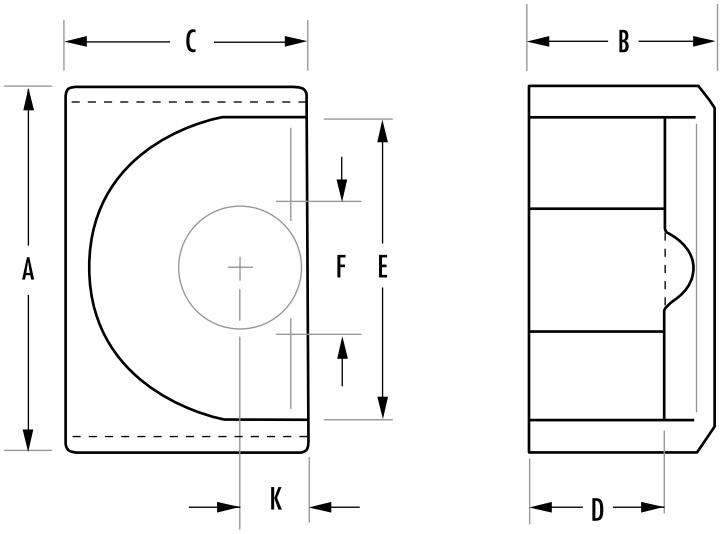
		NOMINAL A_L (MH/1000T)						
TYPE/SIZE	ORDERING CODE	L	R	P	F	T	J	W
EP 7	**P_40707UG**	590	1,080	1,173	1,240		2,573	5,143
EP 10	**P_41010UG**	530	1,040	1,133	1,200	1,360	2,467	4,800
EP 13	**P_41313UG**	760	1,533	1,667	2,000	2,000	3,733	7,143
EP 17	**P_41717UG**	1,120	2,387	2,600	3,100	3,100	5,867	11,429
EP 20	**P_42120UG**	1,930	4,227	4,600	5,000	5,000	9,600	19,286

HOW TO ORDER

P J 4 10 10 UG

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height (per set) in mm
- Geometry code

EP cores are sold in sets.
Any practical gap available. See page 15.



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
EP 7	**P_40707UG**	15.5	10.7	8.55	165	0.005	1.4	✓	✓
EP 10	**P_41010UG**	19.3	11.3	8.55	215	0.01	2.8	✓	✓
EP 13	**P_41313UG**	24.2	19.5	14.9	472	0.03	5.1	✓	✓
EP 17	**P_41717UG**	29.5	33.7	25.5	999	0.06	11.6	✓	✓
EP 20	**P_42120UG**	41.1	78.7	60.8	3,230	0.24	27.6	✓	✓

Refer to page 58 for hardware information.

		DIMENSIONS (mm)								
TYPE/SIZE	ORDERING CODE	A	B	2B	C	D	2D	E	F	K
EP 7	**P_40707UG**	9.2 ± 0.2	3.7 ± 0.5	7.4 ± 0.1	6.35 ± 0.15	2.5 min	5.0 min	7.2 min	3.4 max	1.7 ± 0.1
EP 10	**P_41010UG**	11.5 ± 0.3	5.15 ± 0.1	10.3 ± 0.2	7.6 ± 0.2	3.6 min	7.2 min	9.2 min	3.45 max	1.85 ± 0.1
EP 13	**P_41313UG**	12.8+0/-0.6	6.45 ± 0.08	12.9 ± 0.16	9.0 + 0/-0.4	4.5 + 0.2/-0	9.0 + 0.4/-0	9.7 + 0.6/-0	4.5 + 0/-0.3	2.4 ± 0.1
EP 17	**P_41717UG**	18.0 ± 0.4	8.4 ± 0.1	16.8 ± 0.2	11.0 ± 0.25	5.7 ± 0.15	11.4 ± 0.3	12.0 ± 0.4	5.7 ± 0.18	3.3 ± 0.2
EP 20	**P_42120UG**	24.0 ± 0.5	10.7 ± 0.1	21.4 ± 0.2	15.0 ± 0.35	7.2 ± 0.15	14.4 ± 0.3	16.5 ± 0.4	8.8 ± 0.25	4.5 ± 0.2

Pot Cores

The pot core shape is a convenient means of adjusting the ferrite structure to meet the specific requirements of an application. Both high circuit Q and good temperature stability of inductance can be obtained with these cores. Pot cores, when assembled, nearly surround the wound bobbin. This self-shielded geometry isolates the winding from stray magnetic fields or effects from other surrounding circuit elements.

Typical applications for pot cores include; differential mode inductors, power transformers, power inductors, converter and inverter transformers, filters, both broadband and narrow, transformers and telecom inductors.

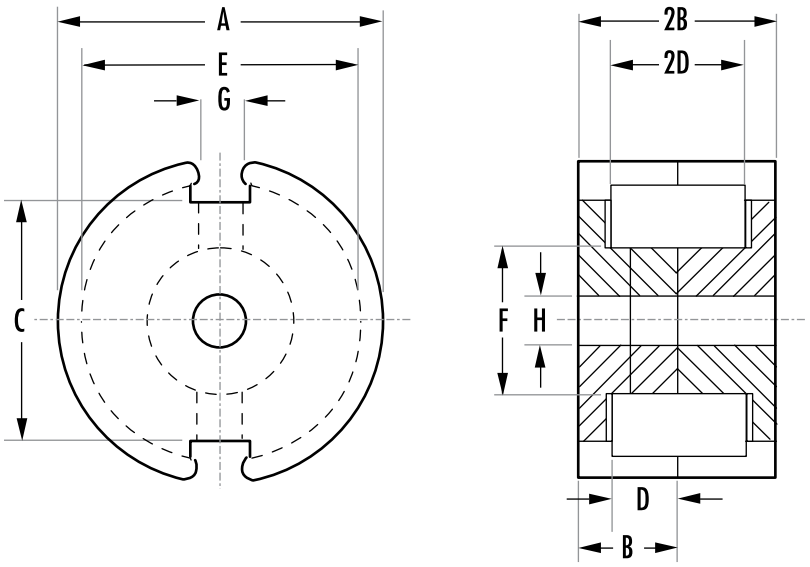
		NOMINAL A_L (MH/1000T)								
TYPE/SIZE	ORDERING CODE	R	P	F	T	J	W	C	E	V
PC 7/4	**0_40704UG**	886	964	1,200		2,257	4,286		900	950
PC 9/5	**0_40905UG**	1,013	1,100	1,365		2,727	6,029	640		
PC 11/7	**0_41107UG**	1,533	1,667	2,000		3,900	7,666	800	1,650	1,800
PC 11/9	**0_41109UG**	1,467	1,573	1,900						
PC 14/8	**0_41408UG**	2,053	2,240	2,800	2,800	5,073	8,400	1,100	2,100	2,240
PC 18/11	**0_41811UG**	3,067	3,333	4,000		7,500	12,000	1,400	3,000	3,650
PC 18/14	**0_41814UG**	3,076	3,268	3,350		5,088				
PC 22/13	**0_42213UG**	4,040	4,400	4,900	5,200	9,100	16,000	1,700	3,900	4,650
PC 26/16	**0_42616UG**	5,213	5,667	6,350		11,700	20,000			6,000
PC 28/23	**0_42823UG**			7,000						
PC 30/19	**0_43019UG**	6,680	7,267	8,100		15,100	25,000	2,800	8,000	7,000
PC 36/22	**0_43622UG**	8,700	9,467	10,200	10,800	17,500	32,667			9,000
PC 42/29	**0_44229UG**	9,200	10,000	12,000			40,000			9,000

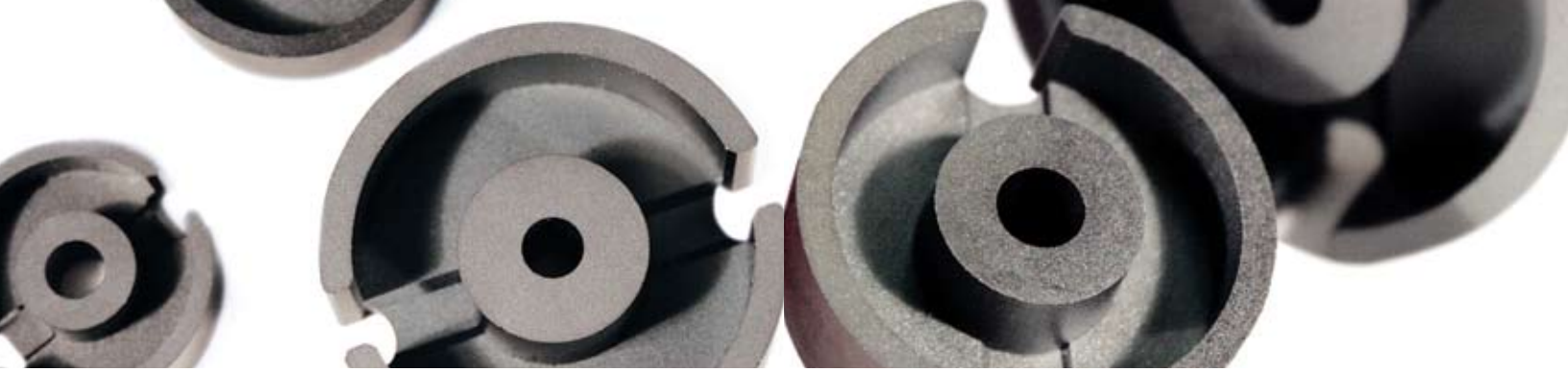
HOW TO ORDER

0 P 4 14 08 UG

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate diameter in mm
- Approximate height (per set) in mm
- Geometry code

Pot cores are sold in sets.
Any practical gap available. See page 15.





		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
PC 7/4	**0_40704UG**	9.9	7.0	5.9	69	0.002	0.5	✓	
PC 9/5	**0_40905UG**	12.5	10.1	8.0	126	0.003	0.8	✓	✓
PC 11/7	**0_41107UG**	15.5	16.2	13.2	251	0.006	1.8	✓	✓
PC 11/9	**0_41109UG**	16.2	16.3	13.2	264	0.01	1.9		
PC 14/8	**0_41408UG**	19.8	25.1	19.8	495	0.02	3.2	✓	✓
PC 18/11	**0_41811UG**	25.8	43.3	36.0	1,120	0.07	6.4	✓	✓
PC 18/14	**0_41814UG**	29.3	42.6	36.0	1,248	0.09	7.4		
PC 22/13	**0_42213UG**	31.5	63.4	50.9	2,000	0.18	13	✓	✓
PC 26/16	**0_42616UG**	37.6	93.9	77.4	3,530	0.39	20	✓	✓
PC 28/23	**0_42823UG**	48.1	128	101	6,160	0.58	32	✓	
PC 30/19	**0_43019UG**	45.2	137	116	6,190	0.74	34	✓	✓
PC 36/22	**0_43622UG**	53.2	202	172	10,700	1.53	57	✓	✓
PC 42/29	**0_44229UG**	68.6	265	214	18,200	3.68	104	✓	✓

Refer to page 58 for hardware information.

		DIMENSIONS (mm)									
TYPE/SIZE	ORDERING CODE	A	B	2B	C	D	2D	E	F	G	H
PC 7/4	**0_40704UG**	7.24 ± 0.15	2.08 ± 0.05	4.16 ± 0.1	4.72 nom	1.4 min	2.79 min	5.74 min	3.0 max	1.52 min	1.09 ± 0.05
PC 9/5	**0_40905UG**	9.3 + 0/-0.3	2.7 + 0/-0.15	5.4 + 0/-0.3	6.5 ± 0.25	1.8 + 0.15/-0	3.6 + 0.3/-0	7.5 + 0.25/-0	3.9 + 0/-0.2	2.0 ± 0.2	2.04 + 0.06/-0
PC 11/7	**0_41107UG**	11.1 ± 0.2	3.25 ± 0.05	6.5 ± 0.1	6.8 ± 0.25	2.2 + 0.15/-0	4.4 + 0.3/-0	9.0 + 0.4/-0	4.7 + 0/-0.2	2.2 ± 0.3	2.1 ± 0.1
PC 11/9	**0_41109UG**	11.28 + 0/-0.4	3.43 ± 0.08	6.86 ± 0.16	7.54 ± 0.2	2.48 ± 0.08	4.96 ± 0.16	9.0 + 0.4/-0	4.7 + 0/-0.2	1.8 + 0.3/-0	2.0 + 0.08/-0
PC 14/8	**0_41408UG**	14.3 + 0/-0.5	4.18 ± 0.06	8.35 ± 0.13	9.5 ± 0.3	2.8 + 0.2/-0	5.6 + 0.4/-0	11.6 + 0.4/-0	6.0 + 0/-0.2	2.7 + 1.2/-0	3.1 ± 0.1
PC 18/11	**0_41811UG**	18.0 ± 0.4	5.3 ± 0.05	10.6 ± 0.1	13.4 ± 0.3	3.7 ± 0.1	7.4 ± 0.2	15.15 ± 0.25	7.45 ± 0.15	3.8 ± 0.6	3.1 ± 0.1
PC 18/14	**0_41814UG**	18.0 ± 0.4	7.1 ± 0.2	14.2 ± 0.4	11.8 ± 0.25	5.05 + 0.2/-0	10.1 + 0.4/-0	14.0 + 0.4/-0	7.4 + 0/-0.3	3.6 + 0.3/-0	3.1 ± 0.08
PC 22/13	**0_42213UG**	22.0 + 0/-0.8	6.7 ± 0.1	13.4 ± 0.2	15.0 ± 0.4	4.6 + 0.2/-0	9.2 + 0.4/-0	17.9 + 0.6/-0	9.4 + 0/-0.3	3.8 ± 0.6	4.4 + 0.3/-0
PC 26/16	**0_42616UG**	25.5 ± 0.5	8.05 ± 0.1	16.1 ± 0.2	18.0 ± 0.4	5.5 min	11.0 min	21.6 ± 0.4	11.3 ± 0.2	3.8 ± 0.6	5.5 ± 0.1
PC 28/23	**0_42823UG**	27.7 ± 0.4	11.43 ± 0.15	22.86 ± 0.3	19.7 nom	8.15 min	16.3 min	22.0 min	12.88 max	3.81 min	5.56 ± 0.1
PC 30/19	**0_43019UG**	30.0 ± 0.5	9.45 ± 0.05	18.9 ± 0.1	20.5 ± 0.5	6.5 min	13.0 min	25.4 ± 0.4	13.3 ± 0.2	4.3 ± 0.6	5.5 ± 0.1
PC 36/22	**0_43622UG**	35.6 ± 0.6	10.95 ± 0.05	21.9 ± 0.1	26.2 ± 0.6	7.3 min	14.6 min	30.4 ± 0.5	15.9 ± 0.3	4.9 ± 0.6	5.55 ± 0.15
PC 42/29	**0_44229UG**	42.4 ± 0.7	14.7 ± 0.05	29.4 ± 0.1	32.0 ± 0.7	10.15 min	20.3 min	36.3 ± 0.7	17.4 ± 0.3	5.1 ± 0.6	5.55 ± 0.15

RS-DS Cores

Slab cores are modified pot cores with the sides removed. The slabs can be paired with one round half of a standard pot core (RS combination) or two slabs can be paired together for a double slab (DS combination).

The RS geometry offers all the advantages of pot cores for filter applications, plus many additional features for power applications. DS cores accommodate large size wire and assist in removing heat from the assembly.

Typical applications for RS-DS combinations include: low and medium power transformers, switched-mode power supplies, and converter and inverter transformers.

		NOMINAL A_L (MH/1000T)				
TYPE/SIZE	ORDERING CODE	R	P	F	J	W
DS 14/08	**D_41408UG**	1,653	1,800	2,474	3,260	7,929
HS 14/08	**H_41408UG**	1,533	1,667	1,990	4,107	7,043
RS 14/08	**S_41408UG**	1,760	1,913	2,274	4,500	7,643
DS 18/11	**D_41811UG**	3,038	3,236	3,697	5,174	7,386
HS 18/11	**H_41811UG**	2,666	2,827	3,197	5,140	5,899
RS 18/11	**S_41811UG**	2,942	3,112	3,498	5,760	6,194
DS 23/11	**D_42311UG**	3,440	3,747	4,460	8,400	16,064
HS 23/11	**H_42311UG**	3,200	3,460	4,170	7,853	14,021
RS 23/11	**S_42311UG**	3,687	4,013	5,200	7,875	16,071
DS 23/18	**D_42318UG**	2,907	3,160	3,800	6,347	10,000
HS 23/18	**H_42318UG**	2,600	2,820	3,350	5,333	10,000
RS 23/18	**S_42318UG**	3,066	3,333	4,000	6,400	12,000
DS 26/16	**D_42616UG**	3,827	4,160	5,000	8,093	13,000
HS 26/16	**H_42616UG**	3,630	3,840	4,600	8,107	13,000
RS 26/16	**S_42616UG**	4,360	4,733	5,300	8,933	15,714
DS 30/19	**D_43019UG**	4,440	4,827	5,800	9,493	15,000
HS 30/19	**H_43019UG**	4,227	4,600	5,525	9,507	15,000
RS 30/19	**S_43019UG**	5,533	6,027	6,700	11,147	18,571
DS 36/22	**D_43622UG**	5,400	5,827	6,360	9,000	19,000
HS 36/22	**H_43622UG**	5,200	5,400	6,050	8,550	18,100
RS 36/22	**S_43622UG**	7,120	7,580	8,660	13,400	26,500
DS 42/29	**D_44229UG**	6,500	7,000	7,900	12,200	
RS 42/29	**S_44229UG**	8,300	8,900	10,400	17,500	

HOW TO ORDER

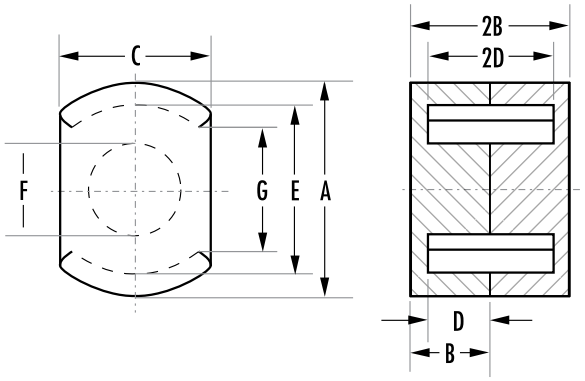
S P 4 23 11 UG

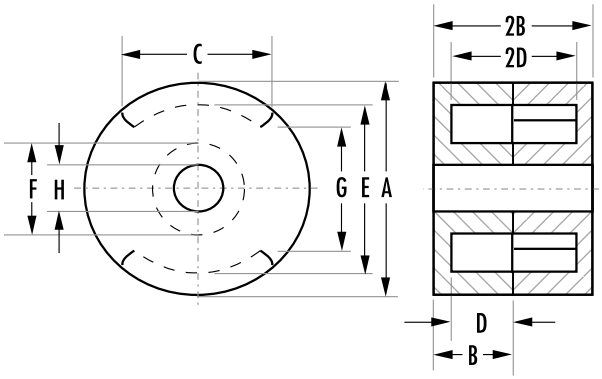
- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height (per set) in mm
- Geometry code

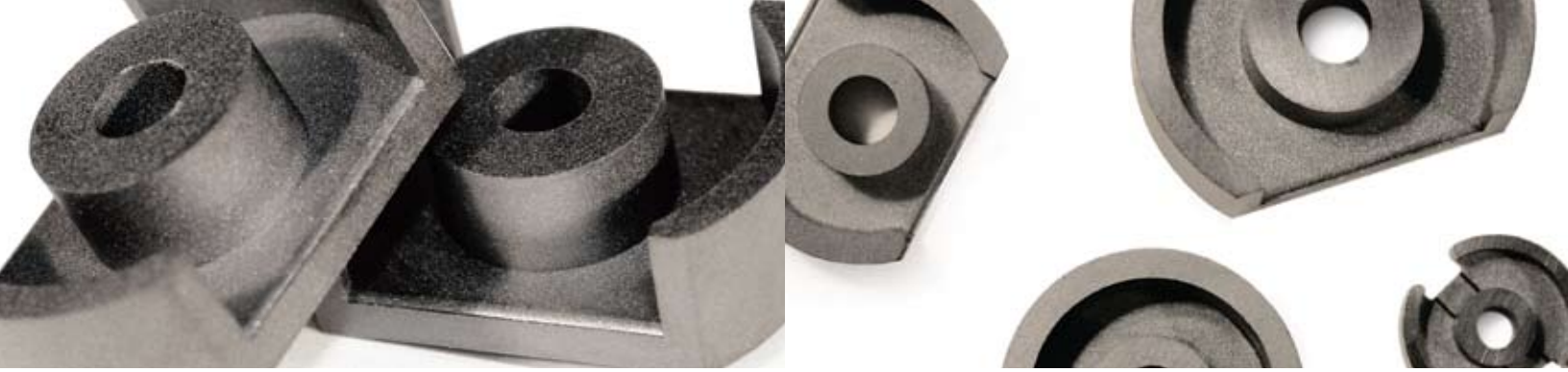
SHAPE CODE

D - DS Core with solid centerpost
H - DS Core with center hole
S - RS core

RS-DS cores are sold in sets.
Any practical gap available, see page 15.
For DS 42/29 size, see datasheets for drawings.







		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
DS 14/08	**D_41408UG**	22.6	24.6	23.5	556	0.02	3.4	✓	✓
HS 14/08	**H_41408UG**	20.6	21.0	19.2	433	0.02	2.6	✓	✓
RS 14/08	**S_41408UG**	20.2	23.0	19.2	460	0.02	2.8	✓	✓
DS 18/11	**D_41811UG**	29.1	40.0	36.3	1,167	0.07	7.1	✓	✓
HS 18/11	**H_41811UG**	28.7	37.2	31.0	1,070	0.05	6.6	✓	✓
RS 18/11	**S_41811UG**	27.2	40.6	32.9	1,110	0.07	6.8	✓	✓
DS 23/11	**D_42311UG**	26.8	51.2	37.8	1,370	0.08	10.0	✓	
HS 23/11	**H_42311UG**	27.0	48.2	37.8	1,300	0.08	9.1	✓	
RS 23/11	**S_42311UG**	28.6	61.0	53.6	1,740	0.10	10.5	✓	
DS 23/18	**D_42318UG**	39.9	58.0	40.7	2,310	0.21	13.0	✓	
HS 23/18	**H_42318UG**	40.1	53.4	40.7	2,130	0.20	12.1	✓	
RS 23/18	**S_42318UG**	41.6	62.2	53.6	2,590	0.22	14.0	✓	
DS 26/16	**D_42616UG**	38.9	77.0	62.7	3,000	0.32	15.0	✓	✓
HS 26/16	**H_42616UG**	39.0	72.1	62.7	2,810	0.30	14.4	✓	✓
RS 26/16	**S_42616UG**	38.3	82.6	62.7	3,180	0.35	15.5	✓	✓
DS 30/19	**D_43019UG**	49.5	120	111	5,940	0.63	31.0	✓	✓
HS 30/19	**H_43019UG**	46.1	111	96.0	5,110	0.60	26.0	✓	✓
RS 30/19	**S_43019UG**	45.6	123	96.0	5,610	0.67	30.5	✓	✓
DS 36/22	**D_43622UG**	56.9	162	140	9,250	1.22	47.6	✓	✓
HS 36/22	**H_43622UG**	57.6	157	140	9,030	1.19	46.3	✓	✓
RS 36/22	**S_43622UG**	55.4	179	140	9,944	1.36	51.0	✓	✓
DS 42/29	**D_44229UG**	76.0	232	211	17,600	3.22	90.5	✓	✓
RS 42/29	**S_44229UG**	72.3	244	211	17,641	3.35	90.6	✓	✓

Refer to page 58 for hardware information.

		DIMENSIONS (mm)									
TYPE/SIZE	ORDERING CODE	A	B	2B	C	D	2D	E	F	G	H
DS 14/08	**D_41408UG**	14.05 ± 0.25	4.15 ± 0.08	8.3 ± 0.15	9.4 ± 0.15	2.9 ± 0.1	5.8 ± 0.2	11.8 ± 0.2	5.9 ± 0.1	7.6 min	
HS 14/08	**H_41408UG**	14 ± 0.25	4.24 +0/-0.13	8.48+0/-0.26	9.4 ± 0.15	2.8 min	5.58 min	11.6 min	5.99 max	7.6 min	3.1 ± 0.1
RS 14/08	**S_41408UG**	14 ± 0.25	4.24 +0/-0.13	8.48+0/-0.26	9.4 ± 0.15	2.8 min	5.58 min	11.6 min	5.99 max	7.6 min	3.1 ± 0.1
DS 18/11	**D_41811UG**	18 ± 0.4	5.3	10.6 ± 0.15	11.9 ± 0.2	3.7	7.4 ± 0.2	15.15 ± 0.25	7.45 ± 0.15	11.2 min	
HS 18/11	**H_41811UG**	18 ± 0.4	5.3 ± 0.07	10.6 ± 0.15	11.9 ± 0.2	3.7 ± 0.1	7.4 ± 0.2	15.15 ± 0.25	7.45 ± 0.15	11.2 min	3.1 ± 0.1
RS 18/11	**S_41811UG**	18 ± 0.4	5.3 ± 0.07	10.6 ± 0.15	11.9 ± 0.2	3.7 ± 0.1	7.4 ± 0.2	15.15 ± 0.25	7.45 ± 0.15	11.2 min	3.1 ± 0.1
DS 23/11	**D_42311UG**	22.86 ± 0.46	5.54 ± 0.13	11.08 ± 0.26	15.24 ± 0.25	3.63 min	7.26 min	17.93 min	9.9 max	13.21 min	
HS 23/11	**H_42311UG**	22.86 ± 0.46	5.54 ± 0.13	11.08 ± 0.26	15.24 ± 0.25	3.63 min	7.26 min	17.93 min	9.9 max	13.21 min	5.1 ± 0.1
RS 23/11	**S_42311UG**	22.9 ± 0.45	5.5 ± 0.13	11 ± 0.25	15.2 ± 0.25	3.75 ± 0.13	7.5 ± 0.25	18.3 ± 0.35	9.7 ± 0.2	13.2 min	5.1 ± 0.1
DS 23/18	**D_42318UG**	22.86 ± 0.46	9 ± 0.18	18 ± 0.36	15.24 ± 0.25	6.93 min	13.86 min	17.93 min	9.9 max	13.21 min	
HS 23/18	**H_42318UG**	22.86 ± 0.46	9 ± 0.18	18 ± 0.36	15.24 ± 0.25	6.93 min	13.86 min	17.93 min	9.9 max	13.2 min	5.08 ± 0.1
RS 23/18	**S_42318UG**	22.9 ± 0.45	9 ± 0.18	18 ± 0.35	15.25 ± 0.25	7.2 ± 0.18	14.4 ± 0.35	18.3 ± 0.35	9.7 ± 0.2	13.2 min	5.1 ± 0.1
DS 26/16	**D_42616UG**	25.5 ± 0.51	8.05 ± 0.1	16.1 ± 0.2	17.09 nom	5.51 min	11.02 min	21.21 min	11.48 max	15.5 min	
HS 26/16	**H_42616UG**	25.5 ± 0.51	8.05 ± 0.1	16.1 ± 0.2	17.09 nom	5.51 min	11.02 min	21.21 min	11.48 max	15.5 min	5.56 ± 0.1
RS 26/16	**S_42616UG**	25.5 ± 0.51	8.05 ± 0.1	16.1 ± 0.2	17.09 nom	5.51 min	11.02 min	21.21 min	11.48 max	15.5 min	5.56 ± 0.1
DS 30/19	**D_43019UG**	30 ± 0.51	9.4 ± 0.1	18.8 ± 0.2	20.3 ± 0.25	6.5 min	13 min	25 min	13.51 max	15.49 min	
HS 30/19	**H_43019UG**	30 ± 0.51	9.4 ± 0.1	18.8 ± 0.2	20.32 ± 0.25	6.5 min	13 min	25 min	13.51 max	15.49 min	5.56 ± 0.1
RS 30/19	**S_43019UG**	30 ± 0.51	9.4 ± 0.1	18.8 ± 0.2	20.32 ± 0.25	6.5 min	13 min	25 min	13.51 max	15.49 min	
DS 36/22	**D_43622UG**	35.61 ± 0.51	10.85 ± 0.12	21.7 ± 0.25	23.85 nom	7.29 min	14.58 min	29.9 min	16.1 max	20.3 min	
HS 36/22	**H_43622UG**	35.61 ± 0.51	10.85 ± 0.12	21.7 ± 0.25	23.85 nom	7.29 min	14.58 min	29.85 min	16.1 max	20.3 min	5.56 ± 0.1
RS 36/22	**S_43622UG**	35.61 ± 0.51	10.9 ± 0.07	21.8 ± 0.15	23.85 nom	7.4 ± 0.1	14.8 ± 0.2	29.9 min	16.1 max	20.3 min	
DS 42/29	**D_44229UG**	42.4 ± 0.71	14.8 ± 0.2	29.6 ± 0.4	28.4 nom	10.21 min	20.42 min	35.61 min	17.7 max	25.0 min	
RS 42/29	**S_44229UG**	42.4 ± 0.71	14.8 ± 0.2	29.6 ± 0.4	28.4 nom	10.21 min	20.42 min	35.61 min	17.7 max	25.0 min	5.56 ± 0.1

PQ Cores

PQ cores are designed specifically for switched mode power supplies. This design provides an optimized ratio of volume to winding area and surface area. As a result, both maximum inductance and winding area are possible with a minimum core size. The cores provide maximum power output with minimum assembled transformer weight and volume, in addition to taking up a minimum amount of area on the printed circuit board.

Assembly with printed circuit bobbins and one piece clamps is simplified. This efficient design provides a more uniform cross-sectional area; thus cores tend to operate with fewer hot spots than with other designs.

Typical applications include power transformers and power inductors.

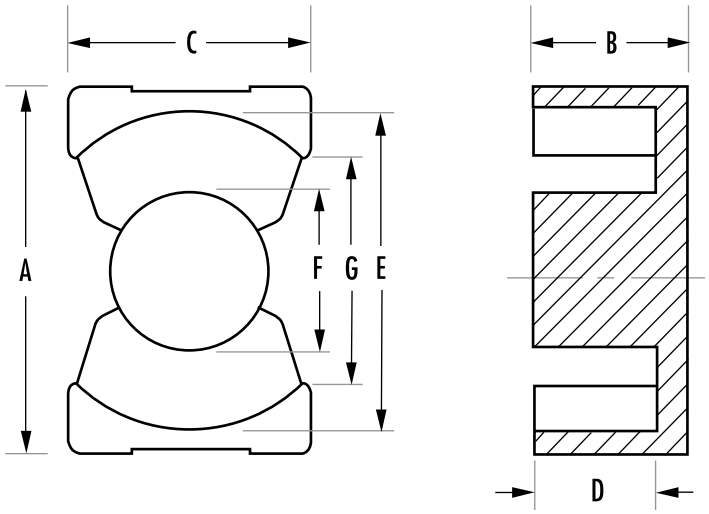
		NOMINAL A_L (MH/1000T)				
TYPE/SIZE	ORDERING CODE	L	R	P	F	T
PQ 20/16	**0_42016UG**	1,650	3,587	3,907	4,690	
PQ 20/20	**0_42020UG**	1,300	2,947	3,213	3,860	3,580
PQ 26/10	**0_42610UG**	3,900	7,733	8,413	8,080	
PQ 26/14	**0_42614UG**	2,700	5,613	6,113	7,335	
PQ 26/20	**0_42620UG**	2,640	5,560	6,053	7,270	7,020
PQ 26/25	**0_42625UG**	2,200	4,600	5,000	6,010	6,010
PQ 32/12	**0_43214UG**		6,867	7,467	8,960	
PQ 32/20	**0_43220UG**		6,640	7,213	8,875	7,560
PQ 32/30	**0_43230UG**		4,667	5,080	6,100	6,570
PQ 35/35	**0_43535UG**		4,813	5,240	7,347	6,000
PQ 40/40	**0_44040UG**		4,267	4,640	5,580	6,100
PQ 50/50	**0_45050UG**		7,400	8,195	9,639	9,500

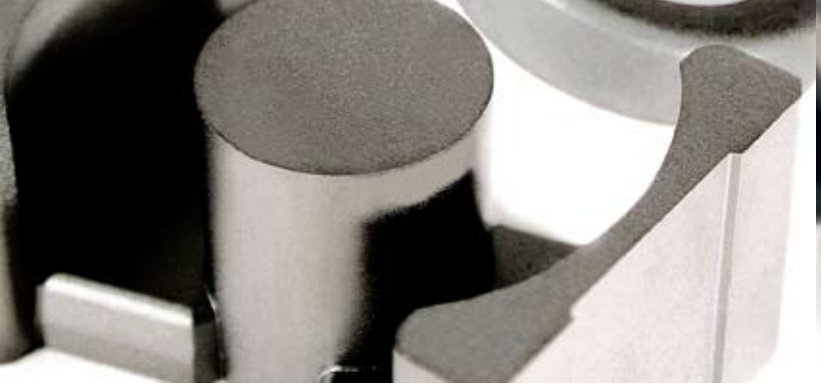
HOW TO ORDER

0 R 4 20 16 UG

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate length in mm
- Approximate height (per set) in mm
- Geometry code

PQ cores are sold in sets.
For clip slot dimensions see individual data sheets.
Any practical gap is available. See page 15.





		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
PQ 20/16	**0_42016UG**	37.6	61.9	59.1	2,330	0.17	13	✓	✓
PQ 20/20	**0_42020UG**	45.7	62.6	59.1	2,850	0.23	16	✓	✓
PQ 26/10	**0_42610UG**	29.4	105	93.8	3,090	0.07	17		
PQ 26/14	**0_42614UG**	33.3	86.4	70.9	2,880	0.17	16		
PQ 26/20	**0_42620UG**	45.0	121	109	5,470	0.40	31	✓	✓
PQ 26/25	**0_42625UG**	54.3	120	108	6,530	0.60	36	✓	✓
PQ 32/12	**0_43214UG**	34.4	109	92.0	3,750	0.29	21		
PQ 32/20	**0_43220UG**	55.9	169	142	9,440	0.79	42	✓	✓
PQ 32/30	**0_43230UG**	74.7	167	142	12,500	1.66	57	✓	✓
PQ 35/35	**0_43535UG**	86.1	190	162	16,300	3.02	73	✓	✓
PQ 40/40	**0_44040UG**	102	201	175	20,500	4.84	97	✓	✓
PQ 50/50	**0_45050UG**	113	328	314	37,100	8.28	195	✓	

Refer to page 58 for hardware information.

		DIMENSIONS (mm)								
TYPE/SIZE	ORDERING CODE	A	B	2B	C	D	2D	E	F	G
PQ 20/16	**0_42016UG**	21.3 ± 0.4	8.1 ± 0.1	16.2 ± 0.2	14.0 ± 0.4	5.15 ± 0.15	10.3 ± 0.3	18.0 ± 0.4	8.8 ± 0.2	12.0 min
PQ 20/20	**0_42020UG**	21.3 ± 0.4	10.1 ± 0.1	20.2 ± 0.2	14.0 ± 0.4	7.15 ± 0.15	14.3 ± 0.3	18.0 ± 0.4	8.8 ± 0.2	12.0 min
PQ 26/10	**0_42610UG**	27.2 ± 0.45	5.1 ± 0.1	10.2 ± 0.2	19.0 ± 0.45	1.2 min	2.39 min	22.05 min	12.2 max	15.5 min
PQ 26/14	**0_42614UG**	27.2 ± 0.45	5.94 ± 0.1	11.9 ± 0.2	19.0 ± 0.45	3.4 min	6.7 min	22.05 min	12.2 max	15.5 min
PQ 26/20	**0_42620UG**	27.3 ± 0.46	10.1 ± 0.13	20.2 ± 0.25	19.0 ± 0.45	5.75 ± 0.15	11.5 ± 0.3	22.5 ± 0.45	12.0 ± 0.2	15.5 min
PQ 26/25	**0_42625UG**	27.3 ± 0.46	12.35 ± 0.13	24.7 ± 0.25	19.0 ± 0.45	8.05 ± 0.15	16.1 ± 0.3	22.5 ± 0.46	12.0 ± 0.2	15.5 min
PQ 32/12	**0_43214UG**	33.0 ± 0.5	5.94 ± 0.1	11.9 ± 0.2	22.0 ± 0.5	3.4 min	6.7 min	27.0 min	13.75 max	19.0 min
PQ 32/20	**0_43220UG**	33.0 ± 0.5	10.3 ± 0.13	20.6 ± 0.25	22.0 ± 0.5	5.75 ± 0.15	11.5 ± 0.3	27.5 ± 0.5	13.5 ± 0.25	19.0 min
PQ 32/30	**0_43230UG**	33.0 ± 0.5	15.15 ± 0.13	30.3 ± 0.25	22.0 ± 0.5	10.65 ± 0.15	21.3 ± 0.3	27.5 ± 0.5	13.5 ± 0.25	19.0 min
PQ 35/35	**0_43535UG**	36.1 ± 0.6	17.35 ± 0.13	34.7 ± 0.25	26.0 ± 0.5	12.5 ± 0.15	25.0 ± 0.3	32.0 ± 0.5	14.4 ± 0.25	23.5 min
PQ 40/40	**0_44040UG**	41.5 ± 0.9	19.9 ± 0.15	39.8 ± 0.3	28.0 ± 0.6	14.75 ± 0.2	29.5 ± 0.4	37.0 ± 0.6	14.9 ± 0.3	29.0 ± 1.0
PQ 50/50	**0_45050UG**	51.0 ± 0.7	25.0 ± 0.25	50.0 ± 0.5	32.0 ± 0.6	18.05 ± 0.3	36.1 ± 0.6	44.0 ± 0.7	20.0 ± 0.35	32.0 min

RM Cores

RM cores are square-designed cores that offer all the magnetic and mechanical advantages of pot cores, plus the added feature of maximizing magnetic performance while minimizing PC board space.

Easy to assemble and adaptable to automation, completed units provide at least 40% savings in mounting area compared to a similar size pot core assembly.

Typical applications include differential mode inductors, power inductors, filter inductors, telecom inductors and broadband transformers.

		NOMINAL A_L (MH/1000T)								
TYPE/SIZE	ORDERING CODE	L	R	P	F	T	J	W	C	V
RM 4 N	**N_41110UG**	560	1,125	1,191	1,333		1,752	3,518		
RM 4	**R_41110UG**		920	1,000	1,200		1,973	3,000		
RM 5 N	**N_41510UG**	900	1,720	1,867	2,100		4,133	6,000		
RM 5	**R_41510UG**		1,720	1,867	2,100		4,133	6,000	800	1,960
RM 6R N	**N_41812UG**	1,230	2,387	2,600	3,080		6,707	8,600		
RM 6R	**R_41812UG**		2,187	2,333	2,800		5,973	7,714		2,700
RM 6S N	**N_41912UG**	1,250	2,213	2,400	2,880		6,000	8,600		
RM 6S	**R_41912UG**		1,987	2,160	2,600		5,387	7,714		
RM 7 N	**N_42013UG**	1,450	3,058	3,244	3,675		5,001	9,571		
RM 8 N	**N_42316UG**	1,700	2,700	2,933	5,210		8,000	12,200		
RM 8	**R_42316UG**		2,347	2,560	3,500		6,960	10,600		
RM 10 N	**N_42819UG**	2,200	4,047	4,400	5,500	5,500	9,987	16,000		
RM 10	**R_42819UG**				4.750					
RM 12 N	**N_43723UG**		4,600	5,000	6,000	6,790	11,800	22,600		
RM 14 N	**N_44230UG**		7,000	7,540	8,782	8,130	13,096	20,735		

HOW TO ORDER

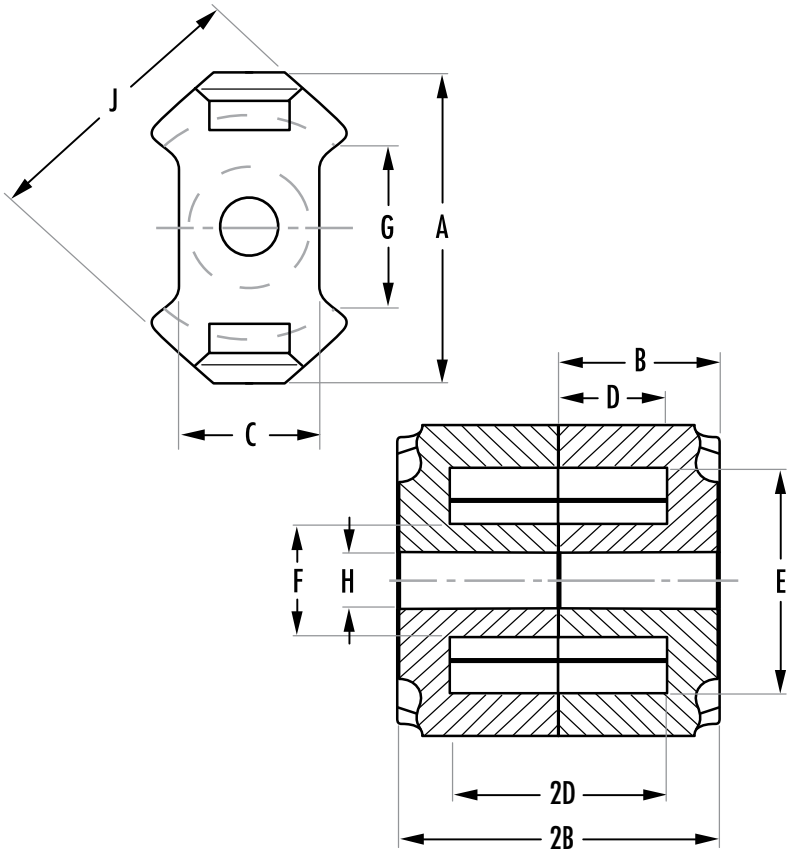
R P 4 15 10 UG

- Shape code
- Ferrite core material
- Used for all ferrite types
- Approximate diameter in mm
- Approximate height (per set) in mm
- Geometry code

SHAPE CODE

N – RM core with solid centerpost
R – RM core with center hole

RM cores are sold in sets.
Any practical gap available. See page 15.



		MAGNETIC DATA						HARDWARE	
TYPE/SIZE	ORDERING CODE	l_e (mm)	A_e (mm^2)	A min (mm^2)	V_e (mm^3)	WaAc (cm^4)	Weight (grams per set)	Bobbins	Clips
RM 4 N	**N_41110UG**	23.3	13.8	11.5	322	0.01	1.7	✓	✓
RM 4	**R_41110UG**	20.6	10.8	7.9	222	0.01	1.5	✓	✓
RM 5 N	**N_41510UG**	23.2	24.8	18.1	574	0.02	3.2	✓	✓
RM 5	**R_41510UG**	21.4	21.0	13.9	449	0.02	3.1	✓	✓
RM 6R N	**N_41812UG**	27.5	38.0	31.2	1,040	0.06	5.4	✓	✓
RM 6R	**R_41812UG**	25.6	32.0	22.6	819	0.05	4.5	✓	✓
RM 6S N	**N_41912UG**	29.2	37.0	31.2	1,090	0.06	5.5	✓	✓
RM 6S	**R_41912UG**	27.0	31.0	22.6	837	0.05	5.1	✓	✓
RM 7 N	**N_42013UG**	30.0	44.1	39.6	1,325	0.17	7.5		
RM 8 N	**N_42316UG**	38.4	63.0	55.4	2,440	0.19	13	✓	✓
RM 8	**R_42316UG**	35.5	52.0	36.9	1,850	0.16	11	✓	✓
RM 10 N	**N_42819UG**	44.6	96.6	89.1	4,310	0.44	22	✓	✓
RM 10	**R_42819UG**	41.7	83.2	65.3	3,470	0.41	18	✓	✓
RM 12 N	**N_43723UG**	56.6	146	125	8,340	1.07	46	✓	
RM 14 N	**N_44230UG**	70.0	198	168	13,900	1.73	69		

Refer to page 58 for hardware information.

		DIMENSIONS (mm)										
TYPE/SIZE	ORDERING CODE	A	B	2B	C	D	2D	E	F	G	H	J
RM 4 N	**N_41110UG**	11.0 +0/-0.5	5.2 ± 0.05	10.4 ± 0.1	4.6 +0/-0.2	3.5 +0.2/-0	7.0 +0.4/-0	7.95 +0.4/-0	3.9 +0/-0.2	5.8 min		9.8 +0/-0.4
RM 4	**R_41110UG**	11.8 max	5.2 ± 0.05	10.4 ± 0.1	4.45 nom	3.61 ± 0.1	7.21 ± 0.2	8.15 ± 0.2	3.8 ± 0.1	5.79 ref	2.05 ± 0.05	9.6 ± 0.2
RM 5 N	**N_41510UG**	14.6 +0/-0.6	5.2 ± 0.05	10.4 ± 0.1	6.8 +0/-0.4	3.25 ± 0.1	6.5 ± 0.2	10.2 +0.4/-0	4.9 +0/-0.2	6.0 min		12.3 +0/-0.5
RM 5	**R_41510UG**	14.9 max	5.2 ± 0.05	10.4 ± 0.1	6.6 nom	3.25 ± 0.1	6.5 ± 0.2	10.4 ± 0.2	4.8 ± 0.1	6.71 nom	2.05 ± 0.05	12.05 ± 0.25
RM 6R N	**N_41812UG**	17.9 +0/-0.7	6.2 ± 0.05	12.4 ± 0.1	7.4 +0/-0.4	4.0 +0.2/-0	8.0 +0.4/-0	12.4 +0.5/-0	6.4 +0/-0.2	5.85 nom		14.7 +0/-0.6
RM 6R	**R_41812UG**	18.3 max	6.2 ± 0.05	12.4 ± 0.1	7.4 nom	4.1 ± 0.1	8.2 ± 0.2	12.65 ± 0.25	6.25 ± 0.15	5.85 nom	3.05 ± 0.05	14.4 ± 0.3
RM 6S N	**N_41912UG**	18.3 max	6.2 ± 0.05	12.4 ± 0.1	8.2 nom	4.1 ± 0.1	8.2 ± 0.2	12.65 ± 0.25	6.25 ± 0.15	9.0 nom		14.4 ± 0.3
RM 6S	**R_41912UG**	18.3 max	6.2 ± 0.05	12.4 ± 0.1	8.2 nom	4.1 ± 0.1	8.2 ± 0.2	12.65 ± 0.25	6.25 ± 0.15	9.0 nom	3.05 ± 0.05	14.4 ± 0.3
RM 7 N	**N_42013UG**	20.3 +0/-0.8	6.7 ± 0.05	13.4 ± 0.1	7.25 +0/-0.3	4.2 +0.25/-0	8.4 +0.5/-0	14.75 +0.6/-0	7.25 +0/-0.3	9.3 min		17.2 +0/-0.7
RM 8 N	**N_42316UG**	23.2 +0/-0.9	8.2 ± 0.05	16.4 ± 0.1	11.0 +0/-0.5	5.5 ± 0.1	11.0 ± 0.2	17.0 +0.6/-0	8.55 +0/-0.3	9.5 min		19.7 +0/-0.8
RM 8	**R_42316UG**	23.2 max	8.2 ± 0.05	16.4 ± 0.1	10.8 nom	5.53 ± 0.13	11.05 ± 0.25	17.5 ± 0.35	8.4 ± 0.15	11.7 nom	4.5 ± 0.1	19.3 ± 0.4
RM 10 N	**N_42819UG**	28.5 +0/-1.3	9.3 ± 0.05	18.6 ± 0.1	13.5 +0/-0.5	6.2 +0.3/-0	12.4 +0.6/-0	21.2 +0.9/-0	10.9 +0/-0.4	10.9 min		24.7 +0/-1.1
RM 10	**R_42819UG**	28.5 +0/-1.3	9.3 ± 0.05	18.6 ± 0.1	13.5 +0/-0.5	6.2 +0.3/-0	12.4 +0.6/-0	21.2 +0.9/-0	10.9 +0/-0.4	10.9 min	5.4 +0.2/-0	24.7 +0/-1.1
RM 12 N	**N_43723UG**	37.4 +0/-1.3	12.25 ± 0.05	24.5 ± 0.1	16.1 +0/-0.5	8.4 +0.3/-0	16.8 +0.6/-0	24.9 +1.1/-0	12.8 +0/-0.4	12.9 min		29.8 +0/-1.1
RM 14 N	**N_44230UG**	42.2 +0/-1.4	15.05 ± 0.05	30.1 ± 0.1	19.0 +0/-0.6	10.4 +0.3/-0	20.8 +0.6/-0	29.0 +1.2/-0	15.0 +0/-0.6	17.0 nom		34.8 +0/-1.3

Hardware

SIZE	TYPE	P/N
0200	TC	SMC06018A
		SMH05025A
		SMH07058A
0301	TC	SMC06018A
		SMH05025A
		SMH07058A
0401	TC	SMC06018A
		SMH05025A
		SMH07058A
0402	TC	SMC06018A
		SMH05025A
		SMH07058A
0502	TC	SMC06018A
		SMH05025A
		SMH07058A
0503	TC	SMC06018A
		SMH05025A
		SMH07058A
0601	TC	SMC06018A
		SMH07058A
0603	TC	SMC06018A
		SMH07058A
0704	PC	00B070401
0705	TC	SMH07058A
0707	EP	0AC070716
		0BC070712
		PCB07076B
		SMB07076A
0905	PC	00B090501
		00C090511
0906	ER	00C09061A
		SMB09068A
1009	EFD	00C1009B1
		PCB1009B1
1010	EP	00C10102A
		PCB10108A
		SMB10108A
1107	PC	00B110701
		00B1107A2
		00C110711
		SMH11078A
1110	RM	00C111012
		PCB11104B
1212	EFD	00C1212B1
		PCB1212B1
1313	EP	0AC131316
		0BC131314
		PCB1313B1
		SMB1313B1
1406	TC	TVB22066A
		TVH22064A
1407	TC	TVB22066A
		TVH22064A

SIZE	TYPE	P/N
1408	PC	00B140801
	RS/DS	00B140802
		00C140811
		00W140815
		PCB140811
		PCB140812
		PCB140821
		PCB140822
		PCB140861
		PCB1408S1
		SMH1408TA
		TBA140800
		TCA1408B1
		TCA1408C3
1434	P-EC	00C143420
1450	TC	TVB22066A
		TVH22064A
1506	TC	TVB22066A
		TVH22064A
1510	RM	00C111012
		PCB15104A
		PCB15104B
		PCB151061
		PCB151081
		TBP151000
		TCF1510R1
1515	EFD	SMB1515TA
		00C1515B1
		PCB1515B1
1605	TC	TVB22066A
		TVH22064A
1717	EP	00C17172A
		PCB17178A
1805	P-EC	00C180520
1808	EC	00B180801
		PCB1808B1
1809	TC	TVB22066A
		TVH22064A
1811	PC	00B181101
	RS/DS	00B181102
		00B181103
		00C181111
		00W181118
		PCB181111
		PCB181112
		PCB181121
		PCB181122
		SMH1811LA
		TCA1811B1
1812	RM	00C181211
		PCB181241
		PCB181261
		TBA181201
		TCA1812C2

SIZE	TYPE	P/N
1912	RM	00C181211
		PCB181241
		PCB181261
		TBA181201
		TCA1812C2
2016	PQ	00C201612
		PCB2016FB
2019	EFD	00C2019B1
		PCB2019B1
2020	PQ	00C202012
		PCB2020FB
2106	TC	TVB22066A
		TVB2908TA
		TVH22064A
		TVH25074A
2109	TC	TVB22066A
		TVB2908TA
		TVH22064A
		TVH25074A
2120	EP	0AC212016
		0BC212016
		PCB2120TB
2206	TC	TVB22066A
		TVB2908TA
		TVH22064A
		TVH25074A
2207	TC	TVB22066A
		TVB2908TA
		TVH22064A
		TVH25074A
2212	TC	TVB22066A
		TVB2908TA
		TVH22064A
		TVH25074A
2213	PC	00B221301
		00B221302
		00B221303
		00C221314
		00W221324
		0PC221314
		PCB221311
		PCB221312
		PCB221321
		PCB221322
		TBP221300
		TBP2213A0
		TCF2213B1
2216	P-EC	00C221620
2311	RS/DS	PCB2311T1
2316	RM	00C231615
		PCB231651
		PCB231652
		PCB231681
2318	RS/DS	PCB2318T1

SIZE	TYPE	P/N
2507	TC	TVB2908TA
		TVH22064A
		TVH25074A
2508	TC	TVB2908TA
		TVH22064A
		TVH25074A
2510	EC	00B251001
		PCB2510V1
		PCB2510V2
2515	EC-EC	00B251501
2520	EC	PCB2520TA
2523	EFD	00C2523B1
		PCB2523B1
2616	PC	00B261601
	RS/DS	00B261602
		00B261603
		00C261614
		0PC261614
		PCB261611
		PCB261612
		PCB261613
		PCB261621
		PCB261622
		PCB2616TA
		TBP669000
		TCF2800B1
2620	PQ	00C262012
		PCB2620LA
2625	PQ	00C262512
		PCB2625LA
2819	RM	00C281916
		PCB2819L1
2823	PC	00B282301
2908	TC	TVB2908TA
		TVB3610FA
		TVH25074A
2915	TC	TVB2908TA
		TVB3610FA
		TVH25074A
2929	ETD	00C2929B1
		PCB2929B1
3007	EC	PCB3007T1
3009	EC	PCB3009LA
3019	PC	00B301901
	RS/DS	00B301902
		00B301903
		00C301917
		PCB301911
		PCB301921
		PCB3019T1
		TBP669000
		TCF2800B1
3030	EFD	00C3030B1
		PCB3030B1

SIZE	TYPE	P/N
3113	TC	TVB2908TA
		TVB3610FA
3205	TC	TVB3610FA
		TVH38134A
3220	PQ	00C322017
		PCB3220B1
3230	PQ	00C323017
		PCB3230B1
3434	ETD	00C343416
		PCB3434FB
3515	EC	00B351501
		PCB3515M1
		PCB3515M2
3517	EC	00B351701
		0AC351717
		0CC351700
		PCB351701
		PCH351701
3521	EER	PCB3521LA
3535	PQ	00C353517
		PCB3535LA
3610	TC	TVH38134A
3615	TC	TVB3610FA
		TVH38134A
3622	PC	00B362201
	RS/DS	00B362202
		00C362200
		00C362217
		PCB362211
		PCB3622L1
		TBP669000
		TCF2800B1
		TCF4000B1
3723	RM	PCB3723L1
3806	TC	TVB3610FA
		TVH38134A
3813	TC	TVB3610FA
		TVH38134A
		TVH49164A
3825	TC	TVB3610FA
		TVH38134A
		TVH49164A
3939	ETD	00C393916
		PCB3939SB
4015	TC	TVH49164A
4020	EC-IC	00B402021
		PCB4020N1
4022	EC	PCB4022N1
4040	PQ	00C404017
		PCB4040FA
4119	EC	00B411901
		0AC411919
		0BC411940
		0CC411900
		PCB411901

SIZE	TYPE	P/N
4119	EC	PCH411901
4216	EER	PCB4216FA
4229	PC	00B422901
	RS/DS	00B422902
		00C422917
		PCB4229L1
		TBP669000
		TCF2800B1
		TCF4000B1
4317	EC	PCB4317M1
4416	TC	TVH49164A
4444	ETD	00C444416
		PCB444418
4715	TC	TVH49164A
4721	EC	PCB4721M1
4916	TC	TVH49164A
4920	TC	TVH49164A
4925	TC	TVH49164A
4932	TC	TVH49164A
4949	ETD	00C494916
		PCB494920
		PCB4949WA
5050	PQ	00B5050B1
5224	EC	0AC522423
		0BC522440
		0CC522400
		PCB522401
		PCH522401
		00B5224B1
5454	ETD	00C5454B1
		PCB5454B1
5528	EC	00B5528B1
		PCB5528WC
5530	EC	PCB5530FA
5724	EC	00B572401
		PCB5724M1
5810	EC-IC	00C581001
		00C581002
5959	ETD	00C595916
		PCB5959AA
6113	TC	TVH49164A
		TVH61134A
6326	TC	TVH49164A
		TVH61134A
6410	EC-IC	00C641001
		00C641002
6527	EC	00B652701
7035	EC	00B703501
		0AC703531
		0BC703540
		PCB703501
		PCH703501
7228	EC	00B722801
8020	EC	00B802001

Power Design

Ferrite is an ideal core material for transformers, inverters and inductors in the frequency range 20 kHz to 3 MHz, due to the combination of low core cost and low core losses. Ferrites may be used in the saturating mode for low power, low frequency operation (<50 watts and 10 kHz). Ferrite cores may also be used in fly-back transformer designs, which offer low core cost, low circuit cost and high voltage capability. Powder cores (MPP, High Flux, Kool Mμ® XFLUX®, and AmoFlux®) offer soft saturation, higher B max and better temperature stability and may be the best choice in some flyback or inductor applications.

CORE GEOMETRIES

POT CORES

Pot Cores, when assembled, nearly surround the wound bobbin. This aids in shielding the coil from pickup of EMI from outside sources. The pot core dimensions follow IEC standards so that there is interchangeability between manufacturers. Both plain and printed circuit bobbins are available, as are mounting and assembly hardware.

ROUND SLAB, DOUBLE SLAB & RM CORES

Slab-sided solid center post cores resemble pot cores, but have a section cut off on either side of the skirt. The additional openings allow larger wires to be accommodated and assist in removing heat from the assembly. RM cores are also similar to pot cores, but are designed to minimize board space, providing at least a 40% savings in mounting area. Printed circuit or plain bobbins are available. One piece clamps permit simple assembly. Low profile is possible. The solid center post generates less core loss and minimizes heat buildup.

PQ CORES

PQ cores are designed specifically for switched mode power supplies. The design optimizes the ratio of core volume to winding and surface area. As a result, power output, inductance and winding area are maximized with a minimal core weight, volume and PCB footprint. Assembly is simple using printed circuit bobbins and one piece clamps. This efficient design provides a more uniform cross-sectional area; cores tend to operate with fewer hot spots than with other geometries.

EC, ETD AND EER CORES

These shapes combine the benefits of E cores and pot cores. Like E cores, they have a wide opening on each side. This provides ample space for the large wires used for low output voltage switched mode power supplies. It also increases the flow of air which keeps the assembly cooler. The center post is round, like that of the pot core. One of the advantages of the round center post is that the winding has a shorter path length around it (11% shorter) than the wire around a square center post with an equal area. This reduces the losses of the windings by 11% and enables the core to handle a higher output power. The round center post eliminates the sharp bend in the wire that occurs with winding on a square center post.

E, ER AND PLANAR E CORES

E cores offer the advantage of simple bobbin winding and ease of assembly. A wide variety of standard lamination-size, metric and DIN sizes are available. E cores are a low-cost choice in designs that do not require self-shielding. Planar cores are the best selection for low profile applications. Copper traces that are layered in the printed circuit board are the windings in most planar applications. This type of design provides superior thermal characteristics, economical assembly, low leakage inductance, and excellence in consistency of performance.

EP CORES

EP Cores are round center-post cubical shapes which enclose the coil completely except for the printed circuit board terminals. The particular shape minimizes the effect of air gaps formed at mating surfaces in the magnetic path and provides a larger volume ratio to total space used. Shielding is excellent.

TOROIDS

Toroids are the least expensive ferrite shape. Available in a variety of sizes, outer diameters of 2.54 mm – 140 mm, toroids have good self-shielding properties. The fact that the core is a solid with no sections to assemble makes it a good choice if mechanical integrity is important in a high vibration environment. Toroid cores are available uncoated or with an epoxy, nylon or Parylene coating.

CORE MATERIALS

POWER

Magnetics R, P, F, T and L materials provide superior saturation, high temperature performance, low losses and product consistency.

T material is ideal for consistent performance over a wide temperature range. Applications for T include: Automotive, Electronic Lighting, Outdoor LCD Screens, Mobile Hand-held Devices and AC adapters and chargers.

L material was formulated for high-frequency and high-temperature applications. L is designed for DC-DC converters, Filters and Power Supplies that operate from 0.5 – 3 Megahertz. Curie temperature is high for a ferrite material at 300°C.

R material provides the best core losses for frequencies up to 500 kHz.

P material offers similar properties to R material, but is more readily available in some sizes.

F material is an established material with a relatively high permeability and 210°C Curie temperature.

Power Supplies, DC-DC Converters, Handheld Devices, High Power Control (gate drive) and EMI Filters are just a few of the applications that are typical for Magnetics ferrite power materials.

FILTER

Magnetics high permeability materials are engineered for optimum frequency and impedance performance in signal, choke and filter applications.

J and W materials offer high impedance for broad band transformers, and are also suitable for low-level power transformers.

J material is a medium perm general-purpose material.

J's properties are well suited both for EMI/RFI filtering and broadband transformers.

W material has set the industry standard for high perm materials. In filter applications, W perm has 20-50% more impedance below 1 MHz than J perm.

LINEAR FILTERS AND SENSORS

Magnetics C, E and V materials offer excellent properties for low-level signal applications. These materials set the standard for high quality factor, long-term stability and precise and adjustable inductance. Applications for these materials include high Q filters, wideband transformers, pulse transformers and RLC tuned circuits.

Inductor Design

Ferrite E cores and pot cores offer the advantages of decreased cost and low core losses at high frequencies. For switching regulators, power materials are recommended because of their temperature and DC bias characteristics. By adding air gaps to these ferrite shapes, the cores can be used efficiently while avoiding saturation.

These core selection procedures simplify the design of inductors for switching regulator applications. One can determine the smallest core size, assuming a winding factor of 50% and wire current carrying capacity of 500 circular mils per ampere.

Only two parameters of the design applications must be known:
(a) Inductance required with DC bias
(b) DC current

1. Compute the product of LI^2 where:
   L = inductance required with DC bias (millihenries)
   I = maximum DC output current + 1/2 AC Ripple

2. Locate the LI^2 value on the Ferrite Core Selector charts on the following page. Follow this coordinate in the intersection with the first core size curve. Read the maximum nominal inductance, A_L, on the Y-axis. This represents the smallest core size and maximum A_L at which saturation will be avoided.

3. Any core size line that intersects the LI^2 coordinate represents a workable core for the inductor if the core's A_L value is less than the maximum value obtained on the chart.

4. Required inductance L, core size, and core nominal inductance (A_L) are known. Calculate the number of turns using

$$N = 10^3 \sqrt{\frac{L}{A_L}}$$

   where L is in millihenries.

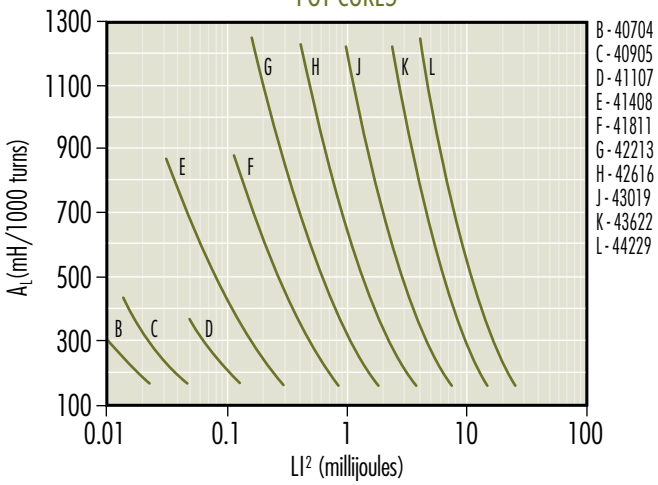
5. Example: If I_{MAX} = 8 Amps; L, inductance required = 100 µHenries
   LI^2 = (0.100 mH) X (8^2 Amps) = 6.4 millijoules

6. There are many ferrite cores available that will support the energy required. Any core size that the LI^2 coordinate intersects can be used at the A_L value shown on the chart.

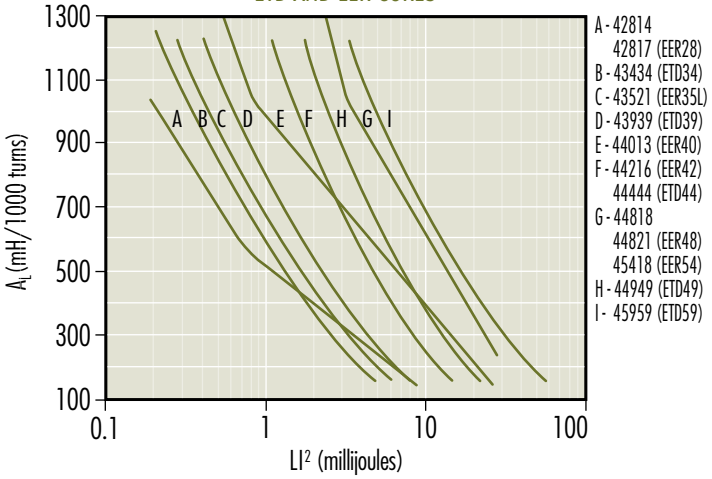
7. Some choices based upon an LI^2 value of 6.4 millijoules are:
   Pot core 43622 A_L = 400 Double Slab 43622 A_L = 250
   PQ core 43220 A_L = 300 E core 44317 A_L = 250

8. For the following A_L values the number of turns required is:
   A_L = 400, N = 16 A_L = 300, N = 19 A_L = 250, N = 20
   Make sure the wire size chosen will support the current and fit into the core set.

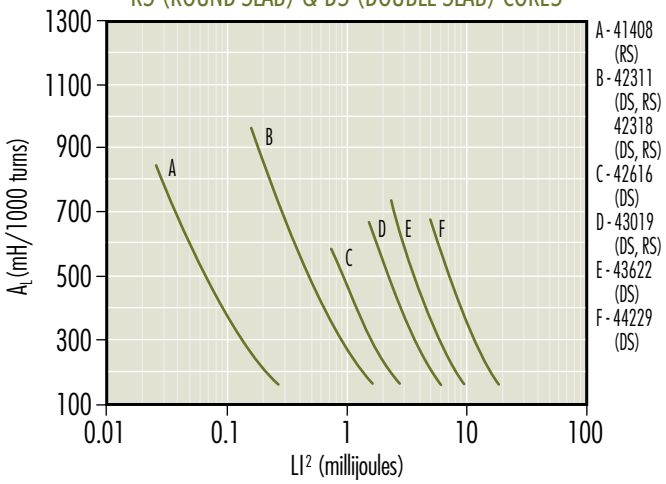
POT CORES



ETD AND EER CORES

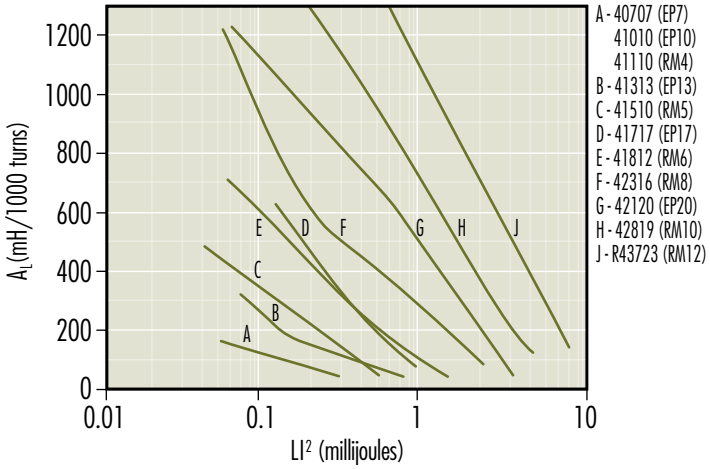


RS (ROUND-SLAB) & DS (DOUBLE-SLAB) CORES

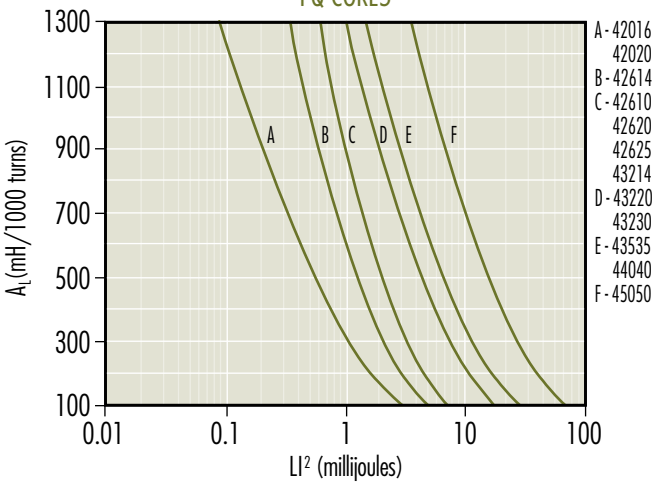


Inductor Design

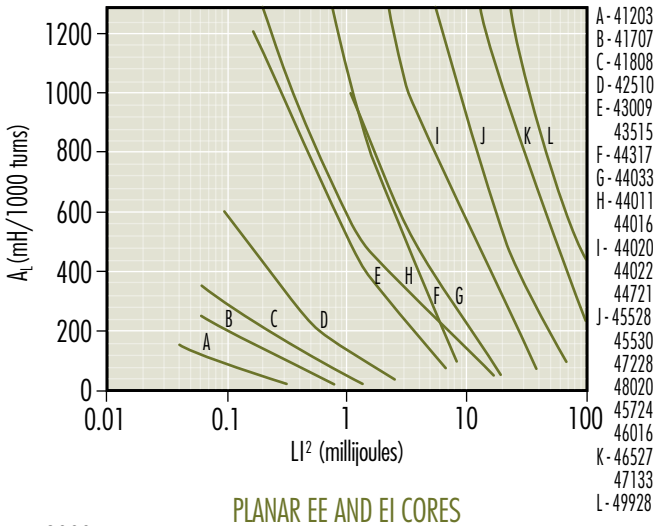
RM AND EP CORES



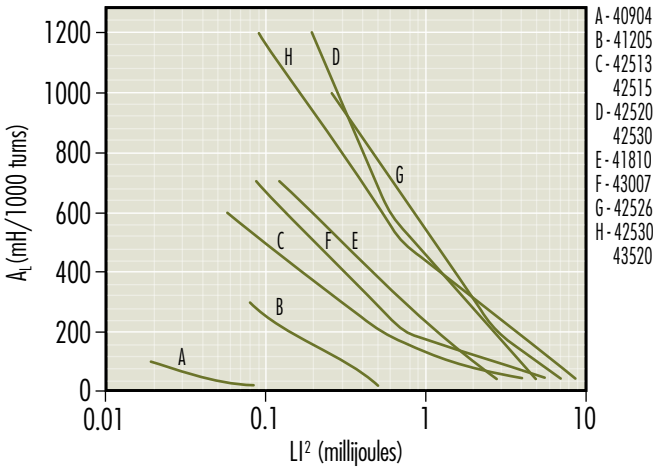
PQ CORES



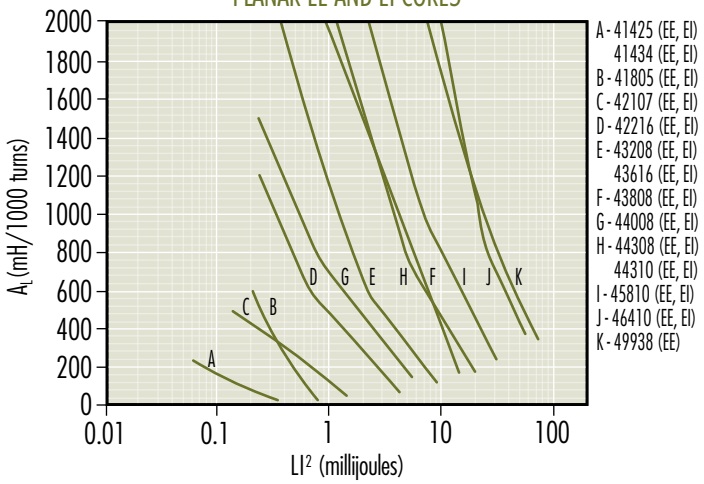
LAMINATION SIZE E CORES



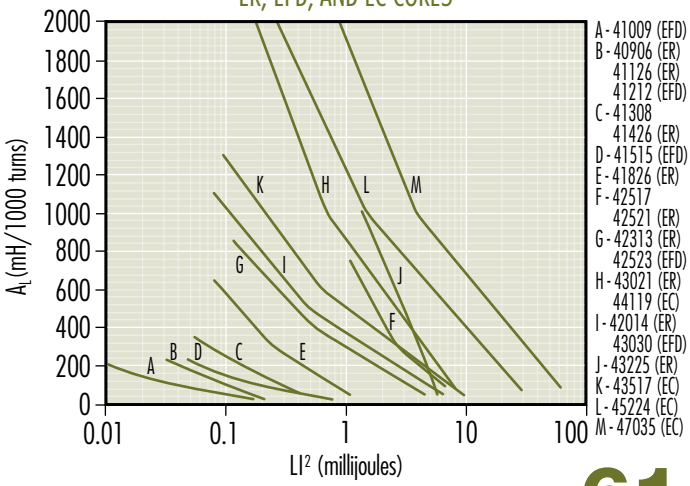
E CORES



PLANAR EE AND EI CORES

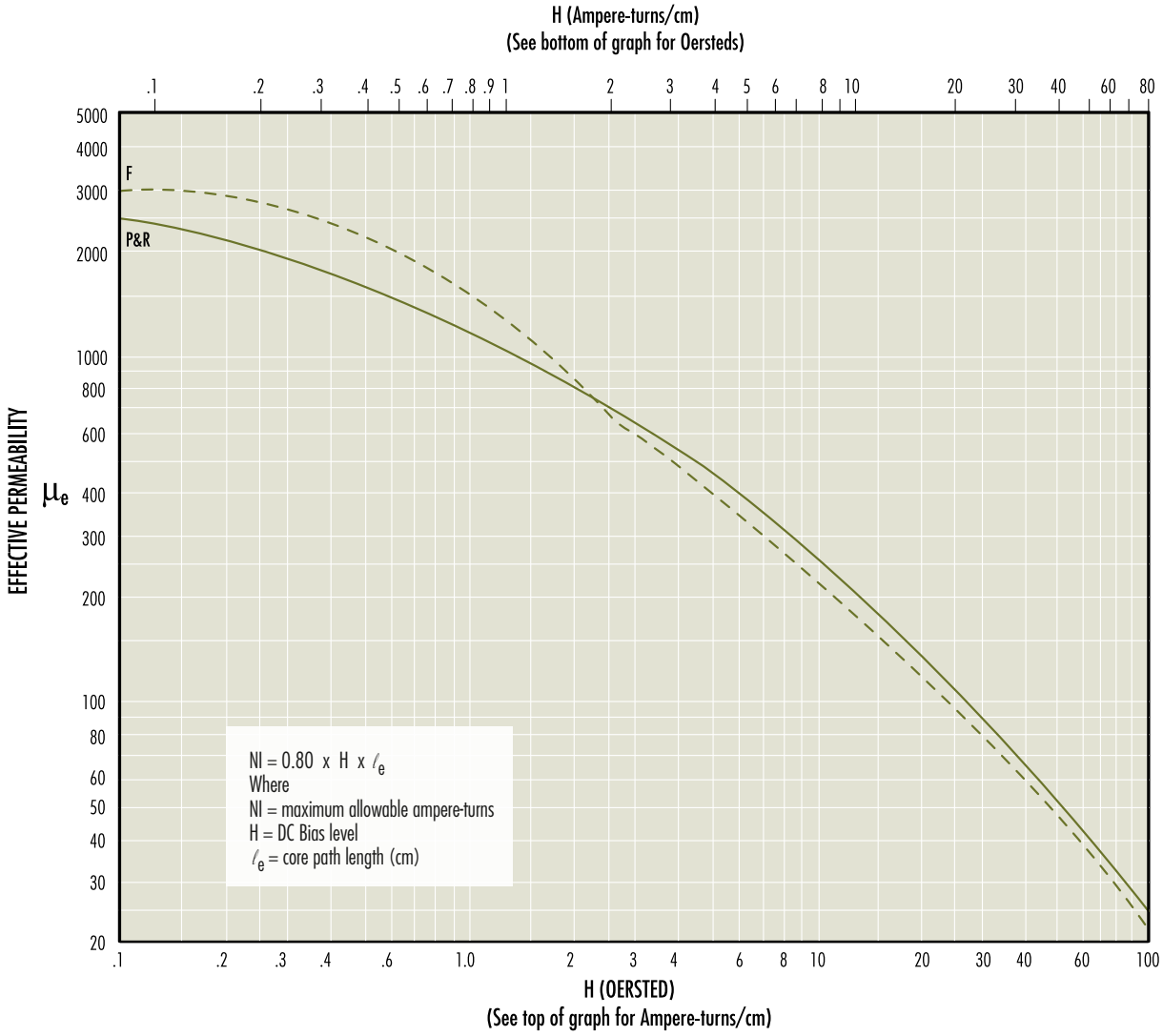


ER, EFD, AND EC CORES



Inductor Design

DC BIAS DATA — FOR GAPPED APPLICATIONS



The above curves are limit curves, up to which *effective permeability* remains constant. They show the maximum allowable DC bias, in ampere-turns, without a reduction in inductance. Beyond this level (see insert), inductance drops rapidly.

Example: How many ampere-turns can be supported by an R42213A315 pot core without a reduction in inductance value?
ℓ_e = 3.12 cm μ_e = 125

Maximum allowable H = 25 Oersted (from the graph above)
NI (maximum) = 0.80 x H x ℓ_e = 62.4 ampere-turns
or (Using top scale, maximum allowable H = 20 A•T/cm.)
NI (maximum) = A•T/cm x ℓ_e
= 20 x 3.12
= 62.4 A•T

$$\mu_e = \frac{A_L \bullet \ell_e}{4\,\pi\,A_e}$$

$$\frac{1}{\mu_e} = \frac{1}{\mu_i} + \frac{\ell_g}{\ell_e}$$

A_e = effective cross sectional area (cm^2)
A_L = inductance/1,000 turns (mH)
μ_i = initial permeability
ℓ_g = gap length (cm)

Inductance falls off rapidly above the limit curve. The dashed lines illustrate the μ_e curve for individual gapped core sets.

Transformer Design

Magnetics offers two methods to select a ferrite core for a power application.

CORE SELECTION BY POWER HANDLING CAPACITY

The Power Chart characterizes the power handling capacity of each ferrite core based upon the frequency of operation, the circuit topology, the flux level selected, and the amount of power required by the circuit. If these four specifics are known, the core can be selected from the Power Chart on page 64.

CORE SELECTION BY WaAc PRODUCT

The power handling capacity of a transformer core can also be determined by its WaAc product, where Wa is the available core window area, and Ac is the effective core cross-sectional area. Using the equation shown below, calculate the WaAc product and then use the Area Product Distribution (WaAc) Chart to select the appropriate core.

$$WaAc = \frac{P_o D_{cma}}{K_t B_{max} f}$$

WaAc = Product of window area and core area (cm^4)

P_o = Power Out (watts)

D_{cma} = Current Density (cir. mils/amp) Current density can be selected depending upon the amount of heat rise allowed. 750 cir. mils/amp is conservative; 500 cir. mils is aggressive.

B_{max} = Flux Density (gauss) selected based upon frequency of operation. Above 20 kHz, core losses increase. To operate ferrite cores at higher frequencies, it is necessary to operate the core flux levels lower than ± 2 kg. The Flux Density vs. Frequency chart shows the reduction in flux levels required to maintain 100 mW/cm^3 core losses at various frequencies, with a maximum temperature rise of 25°C. for a typical power material, MAGNETICS P.

A_c = Core area in cm^2

f = frequency (hertz)

K_t = Topology constant (for a space factor of 0.4)

V = Voltage

I_p = Primary current

I_s = Secondary current

N_p = Number of turns on the primary

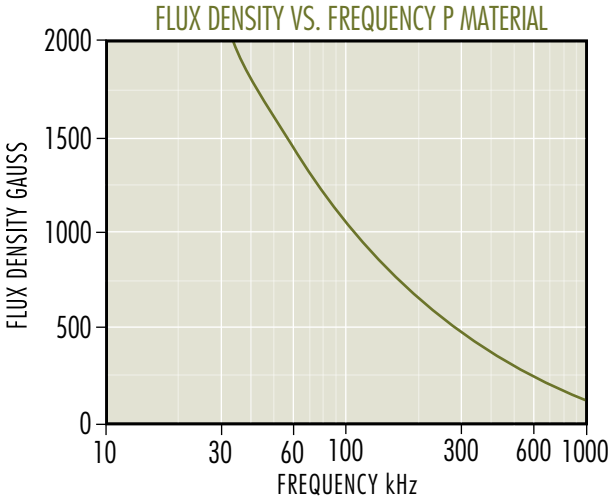
N_S = Number of turns on the secondary

TOPOLOGY CONSTANTS K_t

Forward converter = 0.0005
Half-bridge = 0.0014
Flyback = 0.00033 (single winding)
Push-Pull = 0.001
Full-bridge = 0.0014
Flyback = 0.00025 (multiple winding)

For individual cores, WaAc is listed in this catalog under "Magnetic Data."

The WaAc formula was obtained from derivations in Chapter 7 of A. I. Pressman's book, "Switching Power Supply Design. Choice of B_{max} at various frequencies, D_{cma} and alternative transformer temperature rise calculations are also discussed in Chapter 7 of the Pressman book.



Once a core is chosen, the calculation of primary and secondary turns and wire size is readily accomplished.

$$N_p = \frac{V_p \times 10^8}{4BA_c f} \qquad N_s = \frac{V_s}{V_p} N_p$$

$$I_p = \frac{P_{in}}{V_{in}} \qquad I_s = \frac{P_{out}}{V_{out}}$$

$KWa = N_p A_{wp} + N_s A_{ws}$
Where
A_{wp} = primary wire area A_{ws} = secondary wire area
Assume K = .4 for toroids; .6 for pot cores and E-U-I cores
Assume $N_p A_{wp} = 1.1\ N_s A_{ws}$ to allow for losses and feedback winding

$$\text{efficiency } e = \frac{P_{out}}{P_{in}} = \frac{P_{out}}{P_{out} + \text{wire losses} + \text{core losses}}$$

$$\text{Voltage Regulation (\%)} = \frac{|V_{\text{no load}}| - |V_{\text{full load}}|}{|V_{\text{full load}}|} \times 100$$

Typical Power Handling Chart

Power in Watts				Pot, RS, DS	E Cores	RM, PQ, EP	UU, UI, UR	ETD, EER, EC	EFD, Planar	Toroid
20 kHz	50 kHz	100 kHz	250 kHz							
2	3	4	7	41811 RS DS PC	41205 EE 41707 EE	41313 EP 41812 RM 41912 RM			42107 EE 41805 EE	40907 TC 41406 TC 41303 TC 41435 TC 41304 TC 41206 TC 41506 TC 41407 TC 41405 TC 41305 TC
5	8	11	21	41814 PC 42311 RS DS HS	41808 EE	41717 EP 42013 RM 42016 PQ 42610 PQ			42019 EFD 42216 EI 43208 EI	41410 TC 41306 TC 41450 TC 41605 TC
12	18	27	52		41810 EE 42510 EE	42316 RM				
13	20	29	56	42213 PC		42614 PQ				41610 TC
15	22	32	62	42318 RS DS HS						
18	28	40	78			42020 PQ			42523 EFD	
19	30	42	83	42616 RS DS HS	42513 EE 42515 EI	42120 EP 43214 PQ	42515 UI		42216 EE 43618 EI 44008 EI	42106 TC 41809 TC
26	42	58	113						43208 EE	42206 TC
28	45	63	122		42520 EE				43030 EFD	
30	49	67	131	42616 RS PC		42620 PQ				42109 TC
33	53	74	144		42515 EE	42819 RM				42207 TC
40	61	90	175		42526 EE 43007 EE					
42	70	94	183	43019 HS		42625 PQ			43618 EE	
48	75	108	210	42823 PC 43019 RS DS PC	43009 EE		42512 UU 42515 UU	42929 ETD	44008 EE	42507 TC
60	97	135	262		42530 EE 43515 EE	43220 PQ		43517 EC	43808 EI	42212 TC
70	110	157	306	43622 DS HS		43723 RM	42220 UU 42530 UU	42814 EER 42817 EER 43434 ETD		42508 TC 42908 TC 42712 TC
105	160	235	460	43622 RS	44011 EE 44317 EE				44308 EI 44310 EI	
120	195	270	525	43622 PC		43230 PQ			43808 EE	43806 TC
130	205	290	570		43520 EE	44230 RM		44119 EC		
150	240	337	656		44016 EE 44020 EI			43521 EER 43939 ETD	44308 EE	43113 TC 42915 TC
190	300	470	917							
200	310	450	875						44310 EE	43610 TC

Typical Power Handling Chart

Power in Watts				Pot, RS, DS	E Cores	RM, PQ, EP	UU, UI, UR	ETD, EER, EC	EFD, Planar	Toroid
20 kHz	50 kHz	100 kHz	250 kHz							
220	350	495	962		44721 EE		44119 UR			
230	350	550	1073	44229 RS DS		43535 PQ	44121 UR	44013 EER		
260	400	585	1137							43813 TC
280	430	630	1225	44229 PC	44020 EE			44216 EER		
300	450	675	1312					44444 ETD 44818 EER 45224 EC	45810 EI	43615TC
340	550	765	1487		44033 EE		44125 UR			
360	580	810	1575		44022 EE	44040 PQ		45418 EER		43620 TC
410	650	922	1793		44033 EE 45724 EE		44130 UR	44821 EER 44949 ETD	46410 EI	44416 TC 44419 TC 43825 TC
550	800	1237	2406		46016 EE					44015 TC 44715 TC
650	1000	1462	2843			45050 PQ			45810 EE	
700	1100	1575	3062		45528 EE		45716 UR	45454 ETD	46410 EE	44920 TC 44916 TC
900	1500	2000	3900		45530 EE					44925 TC
1000	1600	2250	4375		47228 EE		45917 UR	45959 ETD 47035 EC		46013 TC 46113 TC
1400	2500	3200	6240							
1600	2600	3700	7215				46420 UR			44932 TC 46019 TC
2000	3000	4500	8750		46527 EE 47133 EE 48020 EE					46325 TC 46326 TC 47313 TC
2800	4200	6500	12675				49316 UI 49316 UU		49938 EE	47325 TC 48613 TC 48625TC 48626 TC 49715 TC 49718 TC
11700	19000	26500	51500		49928 EE		49330 UU 49332 UU 49920 UU 49925 UI 49925 UU			49725 TC 49740 TC

Ferrite Core selection listed by typical Power Handling Capabilities (Chart is for Power Ferrite Materials, F, P, R, L and T, Push-Pull Square wave operation)

Wattage values shown above are for push-pull converter design. De-rate by a factor of 3 or 4 for flyback. De-rate by a factor of 2 for feed-forward converter.
Example: For a feed-forward converter to be used at 300 watts select a core that is rated at 600 watts based on the converter topology.

Note: Assuming Core Loss to be Approximately 100 mW/cm^3, B Levels Used in this Chart are:
@ 20 kHz - 200 mT, 2000 gauss; @ 50 kHz - 130 mT, 1300 gauss; @ 100 kHz - 90 mT, 900 gauss; @ 250 kHz - 70 mT, 700 gauss

Area Product Distribution (WaAc) Chart

WaAc (cm^4)	RS, DS, HS	E	EC, EER, EFD, ETD	EP, RM	ER	Planar	Pot	PQ	TC	U, UR
<0.001									40200 TC 40301 TC 40502 TC	
0.001									40401 TC 40402 TC 40503 TC 40601 TC	
0.002		40904 EE					40704 UG			
0.003					40906 EE		40905 UG		40603 TC	
0.004			41009 EFD		41126 EE					
0.005				40707 EP						
0.006					41308 EI		41107 UG			
0.008						41434 EI			40705 TC	
0.01			41212 EFD	41010 EP 41110 RM	41308 EE 41426 EE	41425 EE	41109 UG		41003 TC	41106 UI
0.02	41408 RS DS HS	41203 EE	41515 EFD	41510 RM		41434 EE	41408 UG		41005 TC	41106 UU
0.03		41205 EE 41707 EE		41313 EP	41826 EE	42107 EI 41805 EI			40907 TC	
0.04						41805 EI			41303 TC 41435 TC	
0.05	41811 HS			41812 RM	42313 EE				41206 TC 41304 TC 41405 TC 41407 TC 41506 TC	
0.06				41717 EP 41912 RM		42107 EE	41410 UG		41305 TC	
0.07	41811 RS DS				42014 EI	42107 EE 41805 EE	41811 UG	42610 UG	41306 TC 41406 TC	
0.08	42311 DS HS	41808EE			42517EI				41450TC	
0.09			42019 EFD				41814 UG			
0.1	42311 RS	41810 EE			42014 EE	42216 EI			41605 TC	
0.2	42318 RS DS HS	42510 EE 42515 EI	42523 EFD	42013 RM 42120 EP 42316 RM	42517 EE 43021 EI		42213 UG	42016 UG 42020 UG 42614 UG	41410 TC 41610TC	
0.3	42616 RS DS HS	42513 EE	43030 EFD		42521 EE 43225 EE	43618 EI 42216 EE		43214 UG	41809 TC 42106 TC	42515 UI
0.4		42526 EE		42819 RM		44008 EI 43208 EI	42616 UG	42620 UG	42109 TC 42206 TC	
0.5		42520 EE 43007 EE	42814 EER		43021 EE				42207 TC	
0.6	43019 DS HS	42515 EE 43009 EE				43618 EE	42823 UG	42625 UG		42220 UU 42515 UU
0.7	43019 RS	42530 EE	42929 EFD 42817 EER			43208 EE	43019 UG		42507 TC	
0.8			43517 EC			44008 EE		43220 UG	42212 TC	42512 UU
0.9						43808 EI			42508 TC	

Area Product Distribution (WaAc) Chart

WaAc (cm^4)	RS, DS, HS	E	EC, EER, EFD, ETD	EP, RM	ER	Planar	Pot	PQ	TC	U, UR
1	43622 RS DS HS	43515 EE 44011 EE 44020 EI	43434 ETD	43723 RM		44308 EI			42712 TC 42908 TC	42530 UU
2		44016 EE 44317 EE 43520 EE	43521 EER 43939 ETD 44013 EER 44119 EC	44230 RM		43808 EE 44310 EI	43622 UG	43230 UG	42915 TC 43113 TC 43806 TC	
3	44229 RS DS	44721 EE	44216 EER 44818 EER			44308 EE 44310 EE		43535 UG	43610 TC 43813 TC	44119 UR 44121 UR
4		44020 EE 44022 EE	44444 ETD 44821 EER 45224 EC 45418 EER			45810 EI	44229 UG		43615 TC	44125 UR
5								44040 UG	43620 TC 44416 TC	44130 UR
6		44033 EE 46016 EE	44949 ETD			46410 EI			44419 TC	
7		45724 EE							43825 TC 44015 TC	
8						45810 EE		45050 UG	44715 TC	
9			45454 ETD						44920 TC	45716 UR
10		45528 EE								
11						46410 EE			44916 TC	
12		45530 EE								
13			47035 EC						44925 TC	
14			45959 ETD							45917 UR
15		47228 EE								
16									46013 TC 46113 TC	
21									44932 TC	
22										46420 UU
23		47133 EE								
24		46527 EE								
25									46019 TC 47313 TC	
32		48020 EE								
33									46325 TC	
34									46326 TC	
46									48613 TC	49316 UI
50									47325 TC	
51						49938 EE				
61										49925 UI
90		49928 EE								
91									48625 TC 48626 TC 49715 TC	49316 UU
106									49718 TC	
121										49925 UU
171									49725 TC	
286										49920 UU
372									49740 TC	

Website

For updates and more in-depth product information, visit mag-inc.com or mag-inc.com.cn

- Design Equations
- Area Product Distribution (WaAc) and Power Charts
- Product Datasheets
- Product Catalogs
- Design Software
- Distributor Stock Check
- Part Number Search
- Cross Reference Tool

Other Products from Magnetics

POWDER CORES

Powder cores are excellent as low loss inductors for switched-mode power supplies, switching regulators and noise filters. Most core types can be shipped immediately from stock.

Kool Mμ® powder cores have a higher energy storage capacity than MPP cores and are available in six permeabilities from 14μ through 125μ. Kool Mμ is available in a variety of core types, for maximum flexibility. Toroids offer compact size and self-shielding. E cores and U cores afford lower cost of winding, use of foil inductors, and ease of fixturing. Very large cores and structures are available to support very high current applications. These include toroids and racetrack shapes up to 102 mm, 133 mm and 165 mm; jumbo E cores; stacked shapes; and blocks.

Molypermalloy powder cores (MPP) are available in ten permeabilities ranging from 14 through 550, and have guaranteed inductance limits of ±8%. Insulation on the cores is a high dielectric strength finish not affected by normal potting compounds and waxes. Thirty sizes include I.D.s from 0.070" (1.78 mm) to 4.032" (102.4 mm) and O.D.s from 0.140" (3.56 mm) to 6.5" (165.1 mm). Standard cores include either temperature stabilized (as wide as -65° C to 125° C for stable operation) or standard stabilization.

High Flux powder cores have a much higher energy storage capacity than MPP cores and are available in six permeabilities from 14μ through 160μ. High Flux cores are available in sizes identical to MPP cores.

Magnetics **XFlux**® distributed air gap cores are made from 6.5% silicon iron powder and are available in 26μ and 60μ. A true high temperature material, with no thermal aging, XFlux® offers lower losses than powder iron cores and superior DC Bias performance. The soft saturation of XFlux® material offers an advantage over ferrite cores. XFlux® cores are ideal for low and medium frequency chokes where inductance at peak current is critical. Toroids are available in sizes up to 133 mm and blocks with lengths of 50, 60, and 80 mm.

Magnetics **AmoFlux**® is a new powder alloy distributed gap material that is ideal for power factor correction (PFC) and output chokes. This alloy starts with low core loss ribbon that is pulverized into powder and then pressed into a toroid. By converting the ribbon into a powder, the resulting AmoFlux cores have the same excellent properties, including soft saturation, as Magnetics other powder core materials: Kool Mμ®, MPP, High Flux, and XFlux®. What makes this amphorous powder core material unique is the combination of low core loss and high DC bias. These attributes make AmoFlux an excellent choice for computer, server, and industrial power supplies that require PFC or output chokes.

NEW AmoFlux®

TAPE WOUND CORES

Tape wound cores are made from high permeability alloys of nickel-iron, cobalt-iron, and grain oriented silicon-iron. The alloys are known as Orthonol®, Alloy 48, Square Permalloy 80, Supermalloy, Supermendur and Magnesil®. Cores are available in more than 50 standard sizes. For a wide range of frequency applications, materials are produced in thicknesses from 1/2 mil (0.013 mm) through 4 mils (0.102 mm). Cases are robust nylon and aluminum boxes, rated for 200° C continuous operation and 2,000 voltage minimum breakdown. Applications include: magnetic amplifiers, reactors, regulators, static magnetic devices and current transformers.

Miniature Tape Wound Bobbin Cores are manufactured from Permalloy 80 and Orthonol ultra-thin tape (0.000125" to 0.001" thick). They are available in widths from 0.031" to 0.250" (wider on special request). Wound on non-magnetic stainless steel bobbins, core diameters are available down to 0.159", with flux capacities as low as several Maxwells. Magnetics' sophisticated pulse test equipment reproduces most test programs and can measure accurately in the millivoltmicrosecond region. Applications include: magnetometers, flux gates, oscillators, inverters and magnetic amplifiers.

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