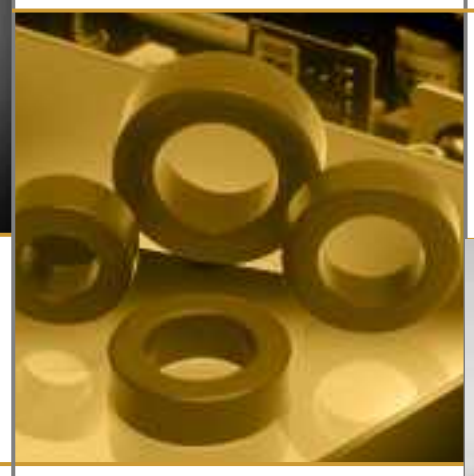
DMG
DELTA MAGNETS GROUP

PRODUCT CATALOGUE

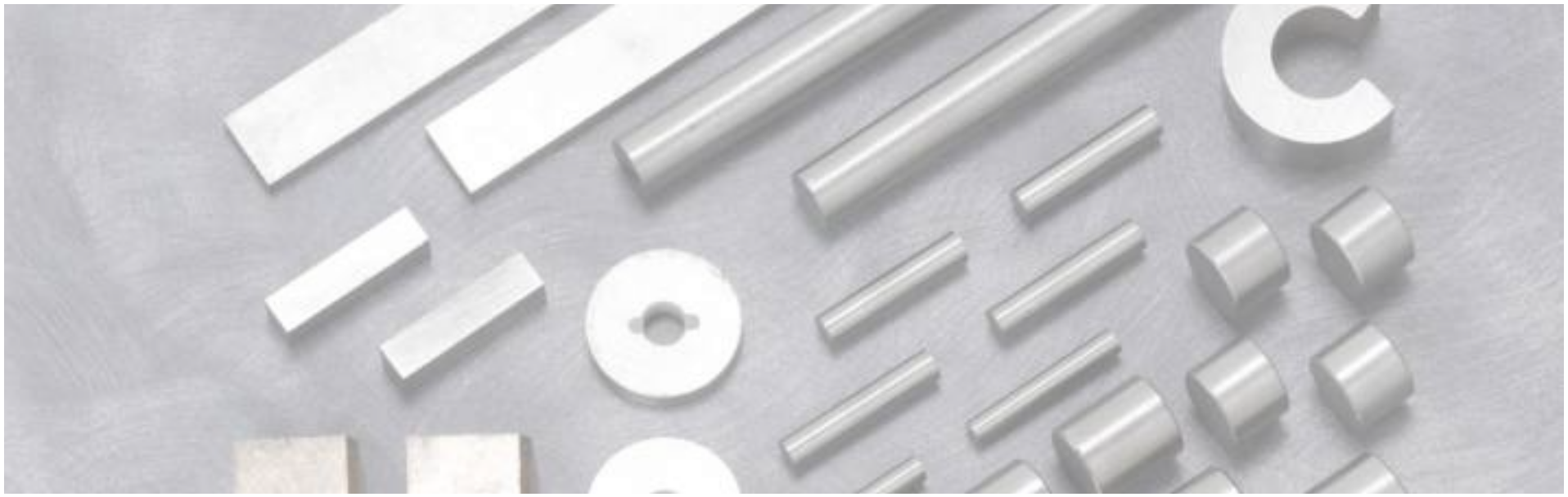
SOFT MAGNETICS



MAGDEV LTD

MMG INDIA PVT LTD

Company Profile



MMG India Pvt. Ltd. is located in Chennai, India. The company specializes in manufacturing of soft magnetic cores in an extensive range of shapes and sizes, and in several Manganese Zinc and Nickel Zinc grades with magnetic properties tuned to specific applications.

MMG India can assist with the design and supply of ferrites for many different applications and industries including Aerospace, Medical, Rail, Renewable Energy, Automotive and Power Electronics. We can also supply complete wound solutions from within our manufacturing facility or from one of our strategic partners.

Always sensitive to market changes MMG India is constantly developing new ferrite materials and component geometries to meet the ever changing requirements of our customers for improved efficiency and reduced weight and size of components. The experience gained from this allows us to continue to provide the very best of technical support and assistance to our customers at all stages of their project.

MMG India is an ISO 9001:2008 accredited company. We provide technical support for the Indian domestic market as well as the Asia Pacific region.

One of our group companies, MagDev Ltd. based in the UK supports European and North American markets for local technical assistance, testing, assembly, machining will manage the entire supply chain to ensure products are available locally within the region or as consignment stock at the customers facility.

Group Profile

Delta Magnet Group is currently made up of 3 companies Delta Magnets Ltd. located in Nashik, India manufacturing hard ferrite arc and segment magnets, MMG India Pvt. Ltd. located in Chennai, India manufacturing soft magnetic ferrite products and MagDev Ltd. located in Swindon, UK a specialist magnetic materials distributer with in-house testing facilities, machining and 12,000 sq. ft. of warehouse space. All the group companies are ISO 9001:2008 accredited. The group supplies soft magnetic, permanent magnet components and assemblies to leading manufactures across many industries including; renewable energy automotive, power electronics, rail and aerospace. The group continues to invest in new machines and technologies to ensure the ability to support our customers current and future product requirements.

MMG INDIA PVT LTD

MAGDEV LTD

DELTA MAGNETS LTD

Contents

MMG India Pvt. Ltd.
A Subsidiary of Delta Magnets Group

Materials - Manganese Zinc

Parameter	Symbol	Standard Conditions of Test	Unit	F58	P11	P12	F5	F5A	F5C	F44	F44A
Initial Permeability (nominal)	μ_i	B<0.1mT 10kHz 25°C	-	750 ±20%	2250 ±20%	2000 ±20%	2000 ±20%	2500 ±20%	3000 ±20%	1900 ±20%	2400 ±20%
Saturation Flux Density (typical)	B_{sat}	H=796 A/m = 10 Oe Static 25°C	mT	450	-	-	470	470	460	500	510
		100°C		-	-	-	350	350	330	400	-
Remanent Flux Density (typical)	B_r	H→0 (from near Saturation) 10kHz 25°C	mT	94	70	35	200	150	150	270	140
Coercivity (typical)	H_c	B→0 (from near Saturation) 10kHz 25°C	A/m	47	18	7	21	15	18	27	10
Loss Factor (maximum)	$\tan\delta/\mu_i$	B<0.1mT 25°C 10kHz	10^{-6}	-	1.5	0.8	-	-	-	-	-
		100kHz		<12	5	2.5	-	-	-	-	-
		200kHz		-	-	-	-	-	-	-	-
		500kHz		<20	-	-	-	-	-	-	-
		1MHz		-	-	-	-	-	-	-	-
		2MHz		-	-	-	-	-	-	-	-
		5MHz		-	-	-	-	-	-	-	-
		10MHz		-	-	-	-	-	-	-	-
Temperature Factor	α_F	B<0.1mT 10kHz +25°C to 55°C	10^{-6}/°C	0.5 - 2.3	0.5 - 1.5	0.4 – 1.0	-	-	-	-	-
Curie Temperature (minimum)	θ_C	B<0.1mT 10kHz	°C	200	150	150	200	200	180	230	210
Dis-accomodation Factor (max)	D_F	B<0.1mT 10kHz 50°C 10 to 100 mins	10^{-6}	<12	4	3	-	-	-	-	-
Hysteresis Material Constant (max)	η_B	B from 1.5 to 3mT 10kHz 25°C	10^{-6}/mT	<1.8	0.8	0.45	-	-	-	-	-
Resistivity (typical)	ρ	1 V/cm 25°C	ohm-cm	100	100	100	100	100	100	100	100
Amplitude Permeability (minimum)	μ_a	400mT 25°C	-	-	-	-	2400	2400	2400	2500	2500
		320mT 100°C		-	-	-	1825	1825	-	-	-
		340mT 100°C		-	-	-	-	-	-	1900	-
Total Power Loss Density (maximum)	P_v	200mT ; 16kHz 25°C	mW/cm³	-	-	-	120	120	120	-	-
		200mT ; 16kHz 60°C		-	-	-	110	110	120	-	-
		200mT ; 16kHz 100°C		-	-	-	110	110	110	-	-
		200mT ; 25kHz 25°C		-	-	-	-	-	-	200	-
		200mT ; 25kHz 60°C		-	-	-	190	190	190	-	-
		200mT ; 25kHz 100°C		-	-	-	190	190	210	130	-
		200mT ; 100kHz 100°C		-	-	-	-	-	-	750	380
		100mT ; 100kHz 25°C		-	-	-	-	-	-	250	-
		100mT ; 100kHz 100°C		-	-	-	-	-	-	160	80
		50mT ; 400kHz 25°C		-	-	-	-	-	-	-	-
		50mT ; 400kHz 100°C		-	-	-	-	-	-	-	-

F47	F48	F63	F49	F9	F9C/F82	F10	FT7	F39	FTA
1800 ±20%	2300 ±20%	3000 ± 25%	1000 ±20%	4400 ±20%	5000 ±20%	6000 ±20%	7500 ±20%	10000 ±30%	10000 ±30%
470 350	480 380	500 400	580 460	380 -	460 -	380 -	420 -	380 -	420 -
130	150	-	230	180	170	100	130	200	180
24	20	- -	20	13	13	11	10	16	8
- - - - - - - -	- - - - - - - -	- - - - - - - -	- 8 - - - - - -	- 20 - - - - - -	- 20 - - - - - -	- 20 - - - - - -	6 50 - - - - - -	- - - - - - - -	6 50 - - - - - -
-	-	-	-	0 to 2	-1 to 2	-1 to 2	-	-	-1 to 0
200	220	230	290	130	160	130	150	120	150
-	-	-	-	-	-	-	-	-	-
-	-	-	-	1.1	-	-	-	-	-
100	100	100	100	50	50	50	10	100	10
2000 2500 -	2500 2500 -	2500 2500 -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
- - - 120 - 100 - 110 80 150 150	- - - - - - 380 - 70 - -	- - - 150 - 120 340 - 120 - 170	- - - - 200 - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - -	- - - - - - - - - - -	- - - - - - - - - - -

Materials - Nickel Zinc

Parameter	Symbol	Standard Conditions of Test	Unit	FF1	F53	F19	F19A	F52	F13	FA1	F24	F14	F16	F01[P]	F25[P]	F21[P]	F28[P]	F31[P]	F29[P]
Initial Permeability (nominal)	μ_i	B<0.1mT 10kHz 25°C	-	1500 ±20%	1050 ±20%	1000 ±20%	900 ±20%	850 ±20%	650 ±20%	370 ±20%	350 ±20%	220 ±20%	125 ±20%	120 ±20%	50 ±20%	40 ±20%	30 ±20%	15 ±20%	12 ±20%
Saturation Flux Density (typical)	B_{sat}	H=796 A/m = 10 Oe 25°C Static	mT	230	210	260	355	210	320	310	350	350	340	280	-	240	-	220	-
Remanent Flux Density (typical)	B_r	H→0 (from near Saturation) 10kHz 25°C	mT	175	130	165	190	130	141	217	200	270	165	190	-	155	-	135	-
Coercivity (typical)	H_c	B→0 (from near Saturation) 10kHz 25°C	A/m	30	50	53	20	50	59	60	65	172	200	30	-	1200	-	1600	-
Loss Factor (maximum)	$\tan\delta/\mu_i$	B<0.1mT 25°C 100kHz	10^{-6}	140	26	-	-	26	-	-	-	-	-	-	-	-	-	-	-
		400kHz		-	-	-	-	-	-	65	-	-	-	-	-	-	-	-	-
		500kHz		-	-	130	100	-	65	-	-	40	-	-	-	-	-	-	-
		1MHz		-	-	350	200	-	130	-	-	42	60	-	50	-	-	-	-
		2MHz		-	-	-	-	-	-	-	-	50	-	45	50	50	-	-	-
		3MHz		-	-	-	-	-	-	-	-	-	-	-	55	50	-	-	-
		5MHz		-	-	-	-	-	-	-	-	-	65	-	65	55	-	-	-
		10MHz		-	-	-	-	-	-	-	-	-	100	-	75	65	80	-	100
		15MHz		-	-	-	-	-	-	-	-	-	-	-	100	75	-	-	-
		20MHz		-	-	-	-	-	-	-	-	-	-	-	125	100	-	-	-
		40MHz		-	-	-	-	-	-	-	-	-	-	-	300	125	-	225	-
		100MHz		-	-	-	-	-	-	-	-	-	-	-	-	300	250	-	200
		200MHz		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1000
Temperature Factor	α_F	B<0.1mT 10kHz +25°C to 55°C	10^{-6}/°C	-	-	3 to 6.5	3 to 6.5	-	1.5	-	-	12 to 30	20 to 50	-	10 to 15	-	30	-	50
Curie Temperature (minimum)	θ_C	B<0.1mT 10kHz	°C	80	100	120	160	100	180	180	240	270	270	300	450	300	500	400	500
Resistivity (typical)	ρ	1 V/cm 25°C	ohm-cm	10^8	10^6	10^4	10^5	10^6	3×10^4	-	10^5	10^5	10^5	10^7	10^5	10^6	10^5	10^4	10^5

[P] Perminvar ferrites undergo irreversible changes to their electrical characteristics if subjected to strong magnetic fields or mechanical shock. The changes include an increase in permeability and loss factor. The increase in loss factor is especially pronounced at high frequency.

Data is derived from measurements on toroidal cores. These values cannot be directly transferred to products of another shape and size. The product –related data can be taken from the relevant product specifications.

Cross Reference List of Ferrite Materials

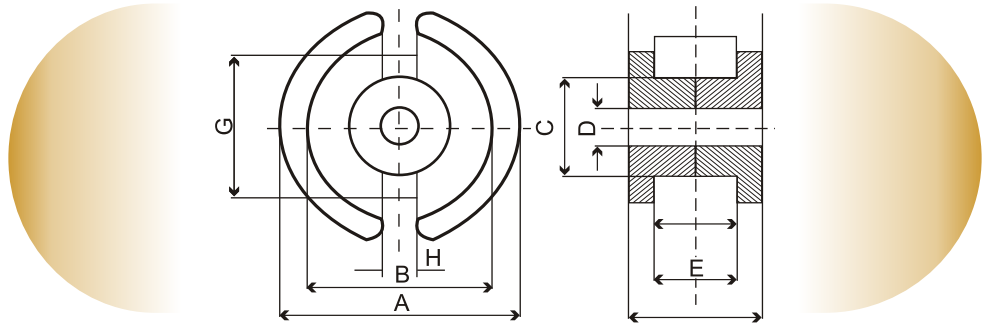
MMG India	Epcos	Cosmo	DGP	Ferrox Cube	Demeg	Samwha	Steward	Fair-Rite	Iskra
P12	N48	CF140		3H3					26G
P11				3H1		SM50			16G
F9	N30	CF195	HM040,HM045	3E28,3C11	RSK	PL-5, PL-7	34	75	19G
F9C	T65	CF265,CF255	MSQ-5C	3E27			35	75	
F10	T35/T36	CF197,CF275,CF190	HM070,HM060	3E25,3E27	R7K		37		22G,23G
F39	T38	CF199	MH100	3E55,3E5	R10K		40	76	12G
F5	N27	CF196			DMR40		32	77, 73	15G
F5A	N72	CF124		3C81					
F5C	N41	CF101,CF130	MSB-5S						25G
F44	N67	CF138	MSB-7C					78	
F48	N87	CF139,CF297	HP380,HP300,HP450	3C94,3C90		PL-F1			45G,65G
F47	N49		MSB-5F(H)	3F3					55G
F49	N92	CF292		3C92					
F63	N95	CF295		3C95					
F58	M33			3D3					10G
F19	K10,K8,K6			8C11,8C12			28,26	43	1C
F13				4A11					
F14	M11			4B1					2C,3C
F16	K1			4C65				61	3F

Pot Cores

As pot cores are one of the oldest core designs. They are available in a wide range of worldwide standardized sizes – according to IEC 62317-2. Originally produced for filter inductors, pot cores are becoming increasingly popular in power applications. With the introduction of EMC legislation, electromagnetic screening has become a prime concern in core selection. The pot core's shape almost completely encloses the windings and whilst this can be a hindrance for access purpose, it provides excellent screening.

Dimensional Details

Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	Effective parameters				Approx. Weight/ Set gms/ Set
								Σ l/A mm^{-1}	le mm^1	Ae mm^2	Ve mm^3	
29-290-	PC7x4	$7.35_{-0.25}$	$5.8^{0.2}$	$3_{-0.1}$	$1.4^{+0.05}$	$2.8^{+0.2}$	$4.2_{-0.1}$	1.43	10	7	70	0.5
29-350-	PC9x5	$9.3_{-0.3}$	$7.5^{+0.25}$	$3.9_{-0.2}$	$2^{+0.1}$	$3.6^{+0.3}$	$5.4_{-0.2}$	1.25	12.2	9.8	120	0.8
29-400-	PC11x7	$11.3_{-0.4}$	$9^{+0.4}$	$4.7_{-0.2}$	$2_{+0.1}$	$4.4_{+0.3}$	$6.6_{-0.2}$	1	15.9	15.9	252	1.7
29-450-	PC14x8	$14.3_{-0.5}$	$11.6^{+0.4}$	$6_{-0.2}$	$3^{+0.1}$	$5.6^{+0.4}$	$8.5_{-0.3}$	0.8	20	25	500	3.2
29-500-	PC18x11	$18.4_{-0.8}$	$14.9^{+0.5}$	$7.6_{-0.3}$	$3^{+0.1}$	$7.2^{+0.4}$	$10.7_{-0.3}$	0.6	25.9	43	1120	6
29-550-	PC22x13	$22-_{0.8}$	$17.9^{+0.6}$	$9.4_{-0.3}$	$4.4^{+0.2}$	$9.2^{+0.4}$	$13.6_{-0.4}$	0.5	31.5	63	2000	13
29-600-	PC26x16	26_{-1}	$21.2^{+0.8}$	$11.5_{-0.4}$	$5.4^{+0.2}$	$11^{+0.4}$	$16.3_{-0.4}$	0.4	37.5	94	3520	21
29-620-	PC30x19	30.5_{-1}	$25^{+0.8}$	$13.5_{-0.4}$	$5.4^{+0.2}$	$13^{+0.4}$	$19_{-0.4}$	0.33	45	136	6120	36
29-6500-	PC36x22	36_{-1}	$29.9^{+0.8}$	$16.2_{-0.4}$	$5.4^{+0.2}$	$14.6^{+0.4}$	$22^{-0.6}$	0.26	52	202	10600	57
29-674-	PC42x29	$42.4_{-0.7}$	$36.6^{+0.6}_{-0.1}$	$17.7_{-0.6}$	$5.4^{+0.2}$	$20.3^{+0.6}$	$29.4^{+0.2}_{-0.2}$	0.259	68.6	265	18200	104
29-675-	PC47x28	$47_{-1.3}$	$39^{+1.1}$	$20_{-0.6}$	$5.5^{+0.2}$	$19^{+0.6}$	$28_{-0.6}$	0.232	72.5	312	22600	120
29-680-	PC59x36	$59.3_{-1.8}$	$49^{+1.3}$	$25.5_{-0.8}$	$5.5^{+0.2}$	$23.6^{+0.8}$	$35.6_{-0.7}$	0.181	88	485	42600	229
29-690-	PC80x60	$78^{+2.0}$	69	33.5_{-1}	$9^{+0.5}$	43.8^{+1}	60_{-1}	0.164	154.6	945	145700	783
29-200-	PM50x39	$50_{-1.7}$	$39^{+1.3}$	$20_{-0.6}$	$54^{+0.2}$	$26.4^{+0.8}$	$39_{-0.4}$	0.227	84	370	31000	-
29-2010-	PM62x49	62_{-2}	$48.8^{+1.5}$	$25.5_{-0.8}$	$5.4^{+0.2}$	$33.4^{+0.8}$	$49_{-0.4}$	0.191	109	570	62000	280
29-2020-	PM74x59	$74_{-2.5}$	$57.5^{+1.8}$	29.5_{-1}	$5.4^{+0.3}$	$40.7^{+0.8}$	$59_{-0.6}$	0.162	128	790	101000	460



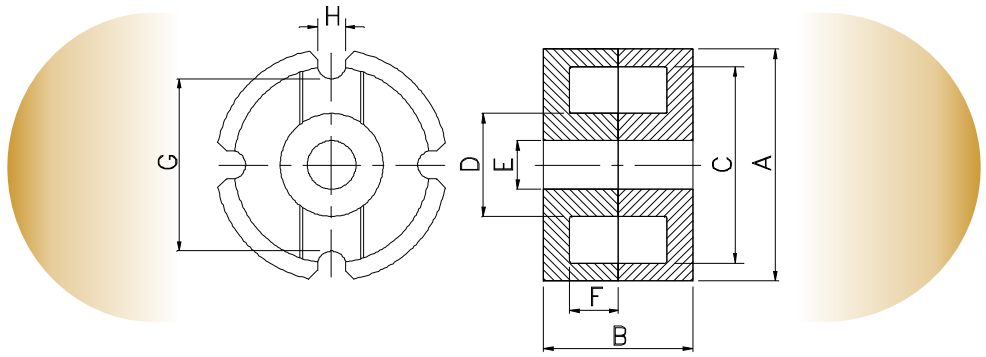
AL Values with Tolerance Code

F58	P11	F5	F5A	F44	F47	F48	F9	F9C	F10	F39	F16	F44A
-	-	-	-	900/R	-	-	-	-	-	-	-	-
560/R	1300/R	-	-	1160/R	-	1400/R	2500/R	2700/R	4000/R	5000Y	-	-
780/R	1600/R	-	1880/R	1580/R	1455/R	1600/R	3500/R	3800/R	-	-	-	-
970/R	2300/R	-	2500/R	2090/R	1875/R	2100/R	4600/R	-	-	9800Y	130 ±25%	2800/R
1300/R	2900/R	2800/R	3075/R	2600/R	2500/R	-	5600/R	6000/R	6450/R	12600Y	-	3600/R
1710/R	3800/R	-	4650/R	3500/R	-	-	6860/R	-	8600/R	16000Y	-	4400/R
-	5200/R	-	6000/R	4650/R	-	-	9000/R	-	12000/R	20000Y	-	5500/R
-	6300/R	6412/R	7500/R	6000/R	-	-	10500/R	-	14500/R	-	-	6400/R
-	8400/R	-	-	7600/R	-	-	15200/R	-	-	21000Y	-	-
-	9500/R	-	10500/R	-	-	-	16600 ±25%	-	-	-	-	-
-	-	10460/R	-	-	-	-	17500/R	-	-	-	-	-
-	12500/R	-	13850/R	-	-	-	-	-	-	-	6500/R	-
-	-	-	-	-	-	-	-	-	-	-	-	-
-	-	7400/R	-	-	-	-	-	-	-	-	-	-
-	-	9200/R	-	-	-	9200/R	-	-	-	-	-	-
-	-	10000/R	-	-	-	10000/R	-	-	-	-	-	-

- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request
- Adjusters to suit all the above cores are available on request.
- All above Cores are also available with Solid Center Spigot.
- All above Cores are available in other materials on request.

R–+30%, -20%
Y–+40%, -30%

4 Slot Pot Cores



MMG India offer a wide range of 4 Slot Pot cores based on the old 'VINKOR' series. The cores are supplied gapped to an effective permeability range and are adjustable for tuned filters up to 5MHz. The larger cross-sectional area offered by the 4 Slot range allows for a higher power setting than the conventional 2 Slot version. Also with the advantage of 2 more slots they can be used in applications where 1/2 and 1/4 turns are required. A full range of bobbins and mounting assemblies are also available.

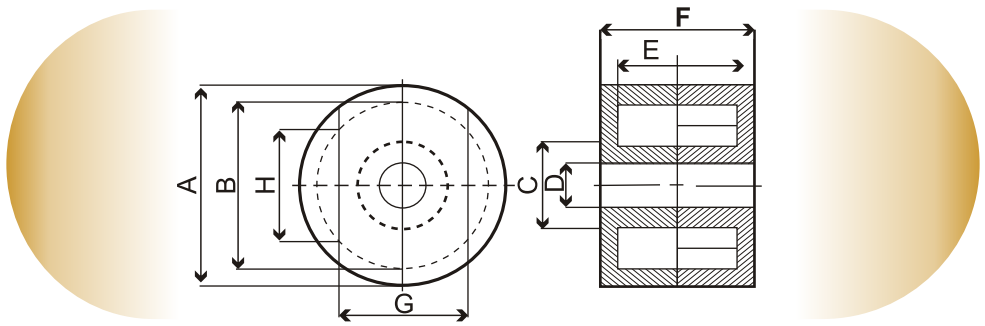
Dimensional Details

Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	Effective Parameters			P11
								le mm	Ae mm^2	Ve mm^3	
29-1040-	14x9	$14_{\pm 0.3}$	$4.50_{\pm 0.5}$	$11.66_{\pm 0.25}$	$6.05_{\pm 0.15}$	$3.63^{+0.02}_{-0.03}$	$2.90_{\pm 0.10}$	18.70	25.90	484	-
29-1080-	18x11	$18_{\pm 0.38}$	$11.20_{\pm 0.10}$	$15.17_{\pm 0.33}$	$7.94_{\pm 0.20}$	$4.56_{\pm 0.09}$	$3.70_{\pm 0.10}$	24.70	44.30	1090	3280R
29-1120-	21x14	$21_{\pm 0.05}$	$13.60_{\pm 0.10}$	$18.08_{\pm 0.39}$	$9.64_{\pm 0.23}$	$4.63_{\pm 0.02}$	$4.40_{\pm 0.10}$	30.70	73.20	2220	4290R
29-1160-	25x16	$25.4_{\pm 0.53}$	$21.5_{\pm 0.44}$	$16_{\pm 0.10}$	$11.32_{\pm 0.27}$	$5.33_{\pm 0.13}$	$5.20_{\pm 0.10}$	36.40	99.90	3630	5210R
29-1200-	30x19	$29.49_{\pm 0.61}$	$18.80_{\pm 0.10}$	$24.4_{\pm 0.52}$	$13.72_{\pm 0.33}$	5.20_{Min}	$6.10_{\pm 0.10}$	43.20	153	6590	7270R
29-1240-	35x23	$35.5_{\pm 0.75}$	$22.8_{\pm 0.12}$	$29.31_{\pm 0.6}$	$16.2_{\pm 0.4}$	5.2_{Min}	$7.39_{\pm 0.1}$	52.50	223	11700	8690R
29-1280-	45x29	$45_{\pm 0.92}$	$29.20_{\pm 0.10}$	$37.34_{\pm 0.79}$	$20.19_{\pm 0.49}$	$5.225_{\pm 0.225}$	$9.50_{\pm 0.10}$	67.00	362	24300	11040R

- Gapped Values can be provided on request
- All above Cores are also available with Solid Centre Spigot.
- All above Cores are available in other materials on request.

R+30%, -20%

Wide Slot Cores



These cores are used extensively in telecommunications and converter power supply circuits. The wide slot in the lower half of the assembly enables a large number of connections to be brought out. These cores are also referred to as Touch Tone (TT) pot cores as were originally designed for push-button telephone sets.

(CC Cores / Touch tone Cores) Dimensional details & AL Values with tolerance code

Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	Effective Parameters			P11	F5	F44A	F9	F10	F39
										le mm	Ae mm^2	Ve mm^3						
29-652-	14x8	$13.8^{+0.5}$	$11.6^{+0.4}$	$5.8^{+0.2}$	$3^{+0.2}$	$5.6^{+0.4}$	$8.5_{-0.3}$	$9.4^{\pm0.15}$	$8.65^{\pm0.3}$	25.3	25.3	539	2000R	1800R	1700R	3800R	5000R	7000R
29-632-	23x11	$22.4^{+0.9}$	$18^{+0.6}$	$9.5^{+0.4}$	$5^{+0.2}$	$7.4^{+0.4}$	$11^{+0.2}$	$15.25^{+0.25}_{-0.25}$	13.2_{-0}	31.2	68.8	2144	4375R	4000R	3850R	7200R	10000R	16000R
29-635-	23x18	$22.4^{+0.9}$	$18^{+0.6}$	$9.5^{+0.4}$	$5^{+0.2}$	$14.0^{+0.6}$	$18.2^{+0.2}$	$15.25^{+0.25}$	13.2_{-0}	45.1	73.1	3293	2720R	2500R	2400R	5300R	7000R	12000R
29-637-	30x19	$29.5^{+1.0}$	$25^{+0.8}$	$13.1^{+0.4}$	$5.4^{+0.4}$	$13.0^{+0.4}$	$19^{+0.4}$	$20.2^{+0.3}_{-0.3}$	$18^{+0.5}_{-0.5}$	46.4	119	5534	5400R	4700R	4500R	8000R	11100R	18500R

R – +30%, -20%

RM Cores - Regular

RM (Rectangular modulus) cores arose due to the demand for coil formers with integrated pins that allow for efficient winding and high PCB packing densities. Clamps engaging in recesses in the core base hold the cores in place, meaning glue is not normally required in this process. All the cores adhere to specifications laid down in IEC 62317-4 and in DIN 41980.

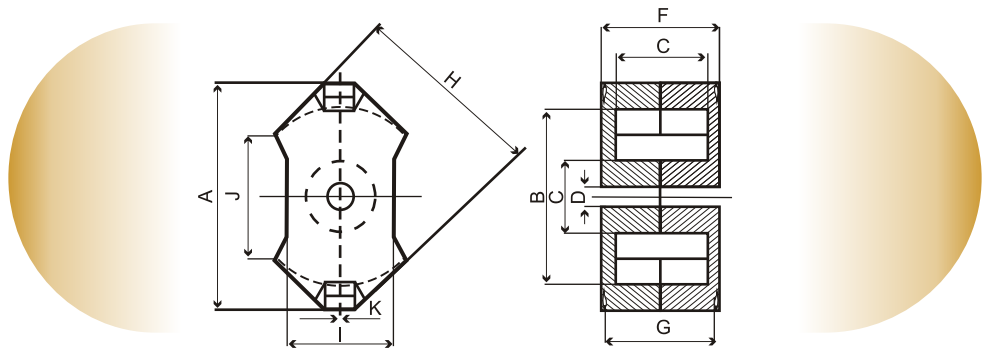
RM cores are designed for two main applications:

- Highly stable, extremely low loss filters inductors and other resonance determining inductors (F58, P11).
- Low distortion broadband transmission at low signal modulation (F39, F10, F9).

RM cores can also be supplied without the centre hole. These have a higher AL value and cross sectional area and are used for power transformer applications (F47, F44, and F5A).

Dimensional Details

Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	Effective parameters				Approx. Weight/Set gms/set
										ΣI/A mm^{-1}	le mm	Ae mm^2	Ve mm^3	
29-900-	RM4	$11_{-0.4}$	$8^{+0.3}$	$3.9_{-0.2}$	$2^{+0.1}$	$7^{+0.4}$	$10.5_{-0.2}$	$9^{+0.25}_{-0.25}$	$9.8_{-0.4}$	1.9	21	11	232	1.45
29-700-	RM5	$14.6_{-0.6}$	$10.2+^{0.4}$	$4.9_{-0.2}$	$2^{+0.1}$	$6.3^{+0.4}$	$10.5_{-0.2}$	$9^{+0.25}_{-0.25}$	$12.3_{-0.5}$	1	20.8	20.8	430	2.9
29-730-	RM6	$17.9_{-0.6}$	$12.4^{+0.5}$	$6.4_{-0.2}$	$3^{+0.1}$	$8^{+0.4}$	$12.5_{-0.2}$	$10.34^{+0.25}_{-0.25}$	$14.7_{-0.6}$	0.86	26.9	31.3	840	4.9
29-7600-	RM7	$20.3_{-0.8}$	$14.75^{+0.65}$	$7.25_{-0.3}$	$3^{+0.1}$	$8.5^{+0.4}$	$13.5_{-0.2}$	$11.3^{+0.25}_{-0.25}$	$17.2_{-0.7}$	0.74	29.8	40	1200	6.5
29-790-	RM8	$23.2_{-0.9}$	$17^{+0.6}$	$8.55_{-0.3}$	$4.4^{+0.2}$	$10.8^{+0.4}$	$16.5_{-0.2}$	$14.3^{+0.25}_{-0.25}$	$19.7_{-0.8}$	0.67	35.50	52	1850	10.3
29-830-	RM10	$28.5_{-1.3}$	$21.2^{+0.9}$	$10.9_{-0.4}$	$5.4^{+0.2}$	$12.4^{+0.6}$	$18.7_{-0.2}$	$16.2^{+0.25}_{-0.25}$	$24.7_{-1.1}$	0.5	42	83	3470	20
29-9xx	RM12	$37.6_{-1.5}$	$24.9^{+1.1}$	$12.8_{-0.4}$	$5.4^{+0.2}$	$16.8^{+0.6}$	$24.6_{-0.2}$	$21.6^{+0.25}_{-0.25}$	$29.8_{-1.2}$	0.39	56.6	146	8340	44
29-880-	RM14	$42.2_{-1.2}$	29^{+1}	$15_{-0.5}$	$5.4^{+0.2}$	$20.8^{+0.6}$	$30.2_{-0.2}$	$27^{+0.25}_{-0.25}$	$34.8_{-1.3}$	0.35	70	200	14000	72
29-950-	R6	$17.6^{-0.6}$	$12.4^{+0.4}$	$6.4_{-0.2}$	$3^{+0.1}$	$8^{+0.4}$	$12.5_{-0.2}$	$10.34^{+0.25}_{-0.25}$	$14.7_{-0.5}$	0.8	25.6	32	820	5.1



AL Values with T olerance Code

F58	P11	F5	F5A	F5C	F44	F47	F9	F9C	F10	F39	F44A
-	900R	-	-	-	800R	-	1700R	-	2800R	3700Y	1100R
-	1800R	-	-	2600R	1570R	-	3170R	6000Y	5200R	6700Y	1800R
890R	2000R	2250R	-	3100R	2200R	-	4625R	4270R	6200R	8600Y	2200R
-	2800R	-	2850R	3400R	2370R	-	4690R	5040R	7000R	10000Y	2700R
1170R	2500R	3000R	4000R	4300R	2906R	-	5700R	5670R	8375R	12500Y	3300R
1600R	3960R	4000R	4490R	3300+60%	3800R	3650R	7600R	8060R	11000R	16000Y	4200R
-	-	4400R	5800R	6000R	5000R	4750R	8400R	-	12800R	-	5300R
-	-	-	6600R	6800R	6000R	5400R	9500R	-	-	-	6000R
732R	2300R	-	-	-	-	-	4300R	4900R	6000R	8600Y	-

- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request.
- Adjusters to suit all the above cores are available on request.
- All above Cores are also available with Solid Centre Spigot.
- All above Cores are available in other materials on request.

R – +30%, -20%
Y – +40%, -30%

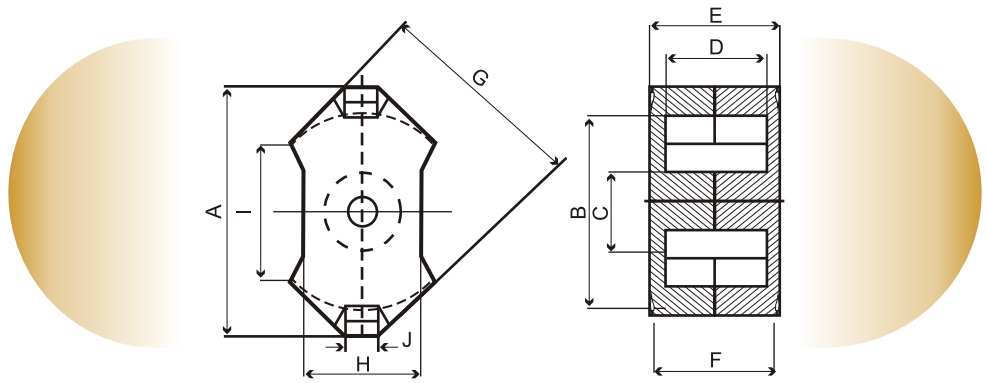
RM Cores - Low Profile

The increasing miniaturization of electronic circuits and Switched Mode power supplies being integrated into PCB philosophy, low profile components are necessary to overcome height restrictions. In some cases the conventional Windings can be replaced by printed circuit tracks directly onto the PCB.

The RM core's low profile shape and ease of construction give significant advantages including, fast error free winding and efficient repeatable performance.

Dimensional Details

Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	G mm	Effective parameters				Approx. Weight/Set gms/set
									$\Sigma l/A$ mm^{-1}	le mm	Ae mm^2	Ve mm^3	
29-210-	RM4 LP	$11_{-0.4}$	$8^{+0.3}$	$3.9_{-0.2}$	$4.3^{+0.4}$	7.8_{-02}	$6.3^{+0.2}_{-0.2}$	$9.8_{-0.4}$	1.2	17.3	14.5	251	1.2
29-2100-	RM5 LP	$14.6_{-0.6}$	$10.2+^{0.4}$	$4.9_{-0.2}$	$3.6^{+0.4}$	$7.8_{-0.2}$	$6.3^{+0.25}_{-0.25}$	$12.3_{-0.5}$	0.17	17.5	24.5	430	2.6
29-220-	RM6 LP	$17.9_{-0.6}$	$12.4^{+0.5}$	$6.4_{-0.2}$	$4.5^{+0.4}$	$9._{-0.2}$	$6.84^{+0.25}_{-0.25}$	$14.7_{-0.6}$	0.58	21.8	37.5	820	4
29-230-	RM7 LP	$20.3_{-0.8}$	$14.75^{+0.65}$	$7.25_{-0.3}$	$4.7^{+0.5}$	$9.8_{-0.2}$	$7.8^{+0.25}_{-0.25}$	$17.2_{-0.7}$	0.52	23.5	45.3	1060	5.7
29-240-	RM8 LP	$23.2_{-0.9}$	$17^{+0.6}$	$8.55_{-0.3}$	$5.9^{+0.4}$	$11.6_{-0.2}$	$9.4^{+0.25}_{-0.25}$	$19.7_{-0.8}$	0.44	28.7	64.9	1860	9.2
29-250-	RM10LP	$28.5_{-1.3}$	$21.2^{+0.9}$	$10..9_{-0.4}$	$6.7^{+0.4}$	$13.0_{-0.2}$	$10.5^{+0.25}_{-0.25}$	$24.7_{-1.1}$	0.34	33.9	99.1	3360	17.2
29-260-	RM12LP	$37.6_{-1.5}$	$24.9^{+1.1}$	$12.8_{-0.4}$	$9^{+0.5}$	$16.8_{-0.2}$	$13.8^{+0.25}_{-0.25}$	29.8_{-12}	0.28	42	147.5	6195	33.6
29-270-	RM14LP	$42.2_{-1.2}$	29^{+1}	$15_{-0.5}$	$11.1^{+0.6}$	$20.5_{-0.2}$	$17.3^{+0.25}_{-0.25}$	$34.8_{-1.3}$	0.25	50.9	201	10230	55



AL Values with T olerance Code

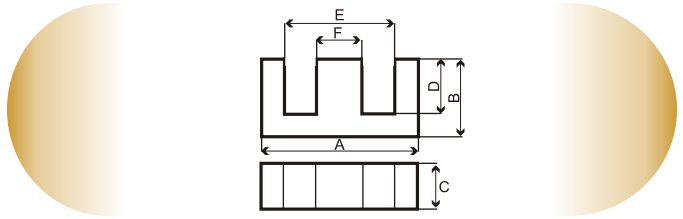
F44	F47	F48	F9C	F10	F39	F44A	F45
-	-	-	-	-	5000Y	1200R	-
-	-	-	-	-	7700Y	2400R	-
2500R	2400R	-	5500R	6600R	10500Y	3000R	2600R
-	-	3120R	-	-	11500Y	3300R	-
3600R	-	-	7050R	-	15000Y	4100R	3750R
4700R	-	-	10500R	-	19500Y	5200R	4900R
6000R	5600R	-	12750R	-	23800Y	6300R	6300R
6710R	6280R	-	16275R	-	26640Y	7100R	7040R

- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request
- Adjusters to suit all the above cores are available on request
- All above Cores are also available with Solid Centre Spigot.
- All above Cores are available in other materials on request.

R–+30%, -20%
Y–+40%, -30%

E E Cores

EE Cores were one of the first ferrite cores to be manufactured, being derived from their respective iron lamination size. Having rectangular limbs they are relatively easy to manufacture and as such a vast range exists in the marketplace. MMG-India's range reflects a selection of cores that have become, over many years, worldwide standards through continued use. E cores are particularly suitable for power transformers and filters at low frequencies. They are not suitable in high frequency applications as the rectangular centre limb leads to higher leakage inductance and winding resistance. EE cores are available in a range of sizes and materials as per IEC 62317-8



Dimensional details & AL Values with Tolerance Code

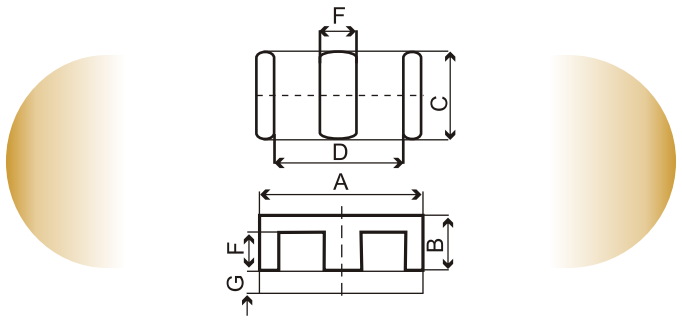
Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	Effective Parameters			F5	F9	F5A	F44	F48	F9C	F10
								le mm	Ae mm^2	Ve mm^3							
32-200-	EF12.6	$12.6^{+0.5}_{-0.4}$	$6.5_{-0.2}$	$3.7_{-0.3}$	$4.5^{+0.3}$	$8.9^{+0.6}$	$3.7_{-0.3}$	29.6	13.0	384	-	-	-	760/R	-	-	-
32-040-	E13/6.6/3	$12.7_{\pm0.25}$	$6.6_{\pm0.05}$	$3.18_{\pm0.2}$	$5.105_{\pm0.155}$	$9.725_{\pm0.725}$	$3.18_{\pm0.2}$	31.70	9.68	307	550/R	-	-	-	600/R	-	-
32-370-	E16/8/5	$16^{+0.7}_{0.5}$	$8.2_{-0.3}$	$4.7_{-0.4}$	$5.7_{+0.4}$	$11.3^{+0.6}$	$4.7_{-0.3}$	37.6	20.1	754	1000/R	1400/R	-	960R	1100/R	-	-
32-140-	E20/10/5	$20^{+0.7}_{0.4}$	$10.1^{+0.1}_{-0.3}$	$5.3_{-0.4}$	$6.5_{\pm0.2}$	$13.1_{\pm0.3}$	$5.00_{\pm0.2}$	43	31	1330	1500/R	2500/R	-	1390/R	1550/R	-	-
32-180-	EF20/10/6	$20.4_{-0.8}$	$9.95_{\pm0.15}$	$5.9_{-0.4}$	$7^{+0.3}$	$14.1^{+0.6}$	$5.9_{-0.3}$	44.9	33.5	1500	1300/R	2500/R	-	1300/R	1450/R	-	-
32-160-	E19x8x5	$19.3_{\pm0.5}$	$8.085_{\pm0.115}$	$4.75_{\pm0.18}$	$5.75_{\pm0.125}$	$14.5_{\pm0.53}$	$4.75_{\pm0.18}$	40	22.5	900	-	2160/R	1190/R	970/R	-	2350/R	2650/R
32-190-	E25/13/7	$25^{+0.8}_{-0.7}$	$12.8_{-0.5}$	$7.5_{-0.6}$	$8.7^{+0.5}$	$17.5^{+0.8}$	$7.5_{-0.5}$	57.5	52.5	3020	1750/R	3100/R	-	1712/R	1900/R	-	-
32-030-	E25/9.5/6	$25.4_{\pm0.63}$	$9.53_{\pm0.13}$	$6.27_{\pm0.2}$	$6.49_{\pm0.19}$	$19.56_{\pm0.51}$	$6.27_{\pm0.2}$	48.70	38.10	1860	2000/R	-	1830/R	1480/R	-	-	4000/R
32-130-	E30/15/7	$30^{+0.8}_{-0.6}$	$15.2^{-0.4}$	$7.3_{-0.5}$	$9.7^{+0.5}$	$19.5^{+0.8}$	$7.2_{-0.5}$	67	60	4000	1800/R	3300/R	-	1800/R	-	-	-
32-010-	E34/13/8	$34.14_{\pm0.86}$	$13.11_{\pm0.1}$	$7.87_{\pm0.18}$	$8.485_{\pm0.205}$	$24.59_{\pm0.63}$	$11.12_{\pm0.25}$	62.50	77.4	4840	2240/R	4100/R	-	2360/R	-	-	-
32-020-	E41/22/9	$41_{\pm1.27}$	$22.28_{\pm0.1}$	$8.78_{\pm0.19}$	$16.715_{\pm0.455}$	$28.58_{\pm0.53}$	$11.76_{\pm0.20}$	102	105	10600	-	-	-	2000/R	-	-	-
32-110-	E42/21/15	$42^{+1}_{-0.7}$	$21.2_{-0.4}$	$15.2_{-0.5}$	$14.8^{+0.6}$	$29.5^{+1.2}$	$12.2_{-0.5}$	97	181	17600	3500/R	-	-	3500/R	4200/R	-	-
32-120-	E42/21/20	$42^{+1}_{-0.7}$	$21.2_{-0.4}$	$20_{-0.6}$	$14.8^{+0.6}$	$29.5^{+1.2}$	$12.2_{-0.5}$	98	240	23300	4750/R	-	-	4560/R	-	-	-
32-150-	E55/27/21	$55^{+1.2}_{-0.9}$	$27.8_{-0.6}$	$21_{-0.6}$	$18.5^{+0.8}$	$37.5^{+1.2}$	$17.2_{-0.5}$	120	354	42500	5800/R	10000/R	-	-	6050/R	-	-
32-240-	E65/32/27	$65^{+1.5}_{-1.2}$	$32.8_{-0.6}$	$26.8^{+0.6}$	$22.2^{+0.7}$	$44.2^{+1.5}$	$20_{-0.7}$	147	532	78200	-	-	10250/R	7430/R	7840/R	-	-
32-250-	E70/32/32	$70_{\pm1.35}$	$32^{+0.5}$	$31.75_{\pm0.33}$	$21.57_{\pm0.17}$	$48.38_{\pm0.75}$	$22.13_{\pm0.35}$	146.27	691.03	101076	-	-	11125/R	9060/R	11100/R	-	-

- All values mentioned above are for an un gapped pair of cores.
- Gapped Values can be provided on request.
- All above Cores are available in other materials on request.

R - +30%, - 20%
Y - +40%, - 30%

Planar E Cores

Many new electronics equipment will use switched mode power supplies where the voltage transformation unit is integrated on a circuit card. As cards may be racked with minimal clearances, low profile components are necessary. Planar assemblies differ radically from conventional transformers as wire windings are replaced by stacks or flat spiral laminations. In some cases the winding can be replaced by printing circuit tracks, with the E core inserted through the board. The planar E core's low profile shape and ease of construction offers significant advantages including: Fast error-free winding; excellent heat sinking properties and efficient repeatable performance at low cost. All the cores adhere to specifications laid down in IEC 62317-9

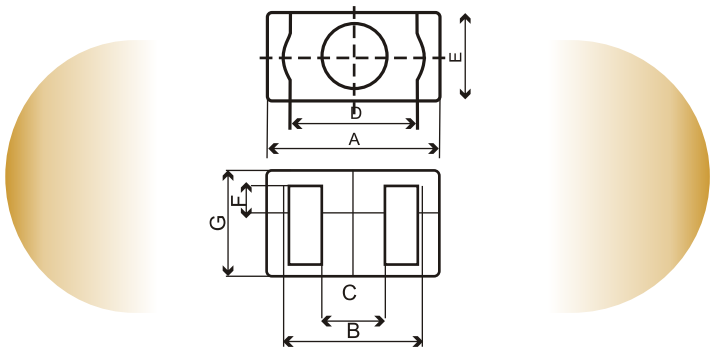


Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	G mm	Effective Parameters			F44	F48	F47
									le mm	Ae mm^2	Ve mm^3			
32-9140-	EE14x3.5x5	$14_{\pm0.3}$	$3.5_{\pm0.1}$	$4.9_{\pm0.2}$	$11_{\pm0.25}$	$2.9_{\pm0.15}$	$2.05_{\pm0.15}$	-	20.70	14.50	300	-	-	$1100_{\pm25\%}$
32/33-9140-	E+I 14	$14_{\pm0.3}$	-	$4.9_{\pm0.2}$	-	-	-	$1.50_{\pm0.05}$	16.70	14.50	240	-	-	$1300_{\pm25\%}$
32-9180-	EE18x4x10	$18_{\pm0.35}$	$4_{\pm0.10}$	$10_{\pm0.2}$	$14_{\pm0.3}$	$3.95_{\pm0.15}$	$2.05_{\pm0.15}$	-	24.30	39.50	960	-	-	$2700_{\pm25\%}$
32/33-9180-	E+I18	$18_{\pm0.35}$	-	$10_{\pm0.2}$	-	-	-	$2.0_{\pm0.1}$	20.30	39.50	800	-	2900/R	$3100_{\pm25\%}$
32-9210-	EE22x5.7x15.8	$21.8_{\pm0.4}$	$5.7_{\pm0.1}$	$15.8_{\pm0.3}$	$16.8_{\pm0.4}$	$4.9_{\pm0.2}$	$3.20_{\pm0.1}$	-	32.50	78.50	2550	-	-	$4300_{\pm25\%}$
32/33-9210-	E+I22	$21.8_{\pm0.4}$	-	$15.8_{\pm0.3}$	-	-	-	$2.5_{\pm0.05}$	26.1	78.50	2040	-	-	$5000_{\pm25\%}$
32-9320-	EE31.8x6.3x20.3	$31.75_{\pm0.64}$	$6.35_{\pm0.13}$	$20.32_{\pm0.41}$	$25.4_{\pm0.5}$	$6.28_{\pm0.2}$	$3.23_{\pm0.15}$	-	41.70	129	5380	$6425_{\pm25\%}$	-	$5900_{\pm25\%}$
32/33-9320-	E+I31.8	$31.75_{\pm0.64}$	-	$20.32_{\pm0.41}$	-	-	-	$3.18_{\pm0.13}$	35.90	129	4560	$7350_{\pm25\%}$	-	$6780_{\pm25\%}$
32-9380-	EE38.1x8.26x25.4	$38.1_{\pm0.76}$	$8.26_{\pm0.13}$	$25.4_{\pm0.51}$	$30.85_{\pm0.6}$	$7.6_{\pm0.2}$	$4.52_{\pm0.2}$	-	52.60	194	10200	$7940_{\pm25\%}$	-	$7250_{\pm25\%}$
32/33-9380-	E+I38.1	$38.1_{\pm0.76}$	-	$25.4_{\pm0.51}$	-	-	-	$3.81_{\pm0.13}$	43.70	194	8460	$9290_{\pm25\%}$	-	$8500_{\pm25\%}$
32-9640-	EE63.8x10.2x50.3	$63.8_{\pm1.3}$	$10.2_{\pm0.13}$	$50.3_{\pm1}$	$53.6_{\pm1.1}$	$10.2_{\pm0.2}$	$5.17_{\pm0.2}$	-	79.70	511	40700	$13300_{\pm25\%}$	-	$12720_{\pm25\%}$
32/33-9640-	E+I63.8	$63.8_{\pm1.3}$	-	$50.3_{\pm1}$	-	-	-	$5.08_{\pm0.13}$	69.60	511	35500	$15050_{\pm25\%}$	-	$14360_{\pm25\%}$

All above Cores are available in clipped version for clamping purpose.

Planar ER Cores

MMG India offers low profile ER cores for SMD transformer application in power, signal and high permeability grades and these cores can also be gapped to suit customer requirements. Key features are; Very low total height, Low stray inductance, and High DC magnetic bias. Suitable applications are; Low power DC-DC converters, Pulse transformers, Broadband transformers, and Driver transformers. Planar ER cores are available in a range of sizes and materials as per IEC 62317-9



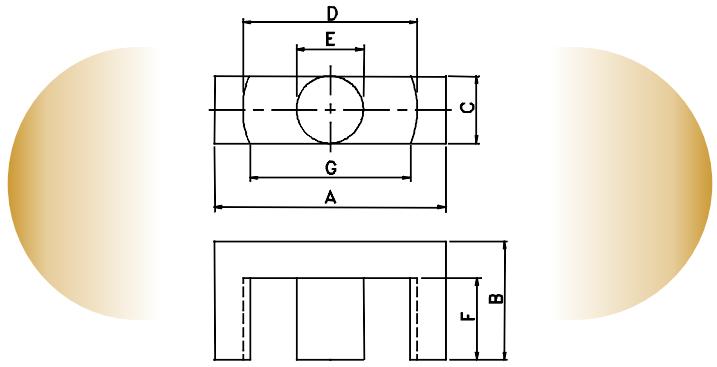
Part No.	Core	A	B	C	D	E	F	G	le mm	Ae mm^2	Ve mm^3	F44	F47	F48	F39
32-869-	ER9.5x5	$9.5_{-0.3}$	$7.5^{+0.25}$	$3.5_{-0.2}$	$7.00_{Mini.}$	$5_{-0.2}$	$1.6^{+0.15}$	$5_{-0.2}$	13.6	8.81	120	740R	720/R	800R	4500Y
32-870-	ER11x5	$11.00_{-0.35}$	$8.7^{+0.3}$	$4.25_{-0.2}$	$7.90_{Mini.}$	$6_{-0.2}$	$1.5^{+0.15}$	$5_{-0.2}$	14.1	12.4	174	1100R	-	1200R	6400Y
32-880-	ER14.5x6	$14.5_{\pm0.2}$	$11.8_{\pm0.2}$	$4.7_{\pm0.1}$	-	$6.7_{\pm0.1}$	$1.65_{\pm0.1}$	$5.9_{\pm0.2}$	19	17.6	333	1500R	-	1500R	-

- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request
- All above Cores are available in other materials on request

R- +30%, -20%
Y- +40%, -30%

ETD Cores

ETD (Economical Transformer Design) cores were developed specifically for Power Transformer cores used in Switched Mode power supplies. The combined cross-sectional area of the two outer limbs equals the cross-sectional area of the centre limb allowing an even flux distribution throughout the core. This ensures the absence of localised 'hot spots' that can reduce performance at high frequencies or high flux levels. Their round centre limb provides for minimal winding resistance, leakage inductance and copper eddy current losses. ETD Cores are available in a range of sizes and materials as per IEC 62317-6 together with their associated coil formers (both Horizontal and Vertical mounting) and clips.



Dimensional details & AL Values with Tolerance Code

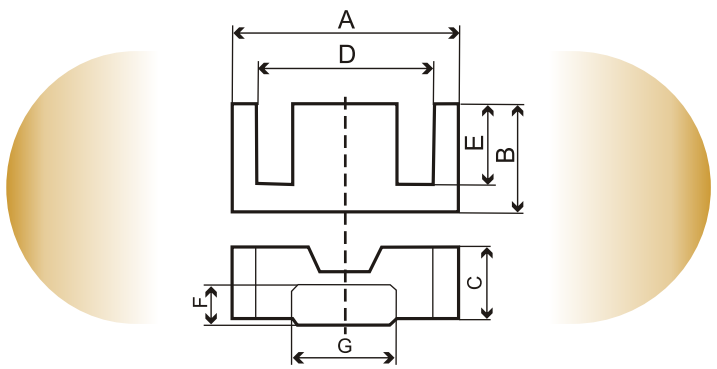
Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	Effective Parameters			F5	F9	F5A	F44	F48	F9C	F10
								le mm	Ae mm^2	Ve mm^3							
32-580-	ETD29/16/10	$30.6_{-1.6}$	$16_{-0.4}$	$9.8_{-0.6}$	$22^{+1.4}$	$9.8_{-0.6}$	$10.7^{+0.6}$	70.4	76	5376	-	-	2350/R	1950/R	2250/R	-	-
32-500-	ETD34/17/11	$34^{+1}_{-0.6}$	$17.5^{-0.4}$	$11.1^{-0.6}$	$25.6^{+1.4}$	$11.1_{-0.6}$	$11.8^{+0.6}$	78.6	97.10	7640	2400/R	-	2840/R	2250/R	2711/R	-	-
32-520-	ETD39/20/13	$38.9^{+1.1}_{-0.7}$	$20_{-0.4}$	$12.8_{-0.6}$	$29.3^{+1.6}$	$12.8_{-0.6}$	$14.2^{+0.8}$	92.20	125	11500	2700/R	-	3210/R	2470/R	2800/R	-	-
32-540-	ETD44/25/15	$43.8^{+1.2}_{-0.8}$	$22.5_{-0.4}$	$15.2_{-0.8}$	$32.5^{+1.6}$	$15.2_{-0.8}$	$16.1^{+0.8}$	103	173	17800	3300/R	-	3920/R	3100/R	-	-	-
32-560-	ETD49/25/17	$48.5^{+1.3}_{-0.9}$	$24.9_{-0.4}$	$16.7_{-0.8}$	$36.1^{+1.8}$	$16.7_{-0.8}$	17.80_{Mini}	114	211	24000	3700/R	-	4400/R	3525/R	4090/R	-	-
32-490-	ETD59/31/22	$59.8_{\pm 1.4}$	$31.2_{-0.4}$	$22.1_{-0.9}$	$43.6^{+2.2}$	$22.1_{-0.9}$	$22^{+0.9}$	139	368	51200	5000/R	-	-	4900/R	5800/R	-	-

- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request
- All above Cores are available in other materials on request

R - +30%, - 20%
Y - +40%, - 30%

EFD Cores

EFD (Economical Flat Design) cores were developed to meet the increasing demand for low profile components in power transformer design. A combination of very low height and excellent throughput power, when compared to other cores of a similar height, make these cores ideal where space considerations are a priority. EFD Cores are available in a range of sizes and materials as per IEC 62317-14 together with their associated coil formers and clips.



Part No.	Core	A	B	C	D	E	F	G	le mm	Ae mm^2	Ve mm^3	F44	F47	F48
32-720-	EFD15x8x5	$15_{\pm0.4}$	$7.5^{+0.15}$	$4.65_{\pm0.15}$	$11_{\pm0.35}$	$5.55_{\pm0.2}$	$2.4_{\pm0.1}$	$5.3_{\pm0.15}$	34	15	510	675R	650R	780R
32-740-	EFD20x10x7	$20_{\pm0.55}$	$10_{\pm0.15}$	$6.65_{\pm0.15}$	$15.4_{\pm0.5}$	$7.75_{\pm0.2}$	$3.6_{\pm0.15}$	$8.9_{\pm0.2}$	47	31	1460	1120R	1075R	1200/R
32-760-	EFD25x13x9	$25_{\pm0.65}$	$12.5_{\pm0.15}$	$9.1_{\pm0.2}$	$18.7_{\pm0.6}$	$9.3_{\pm0.25}$	$5.2_{\pm0.15}$	$11.4_{\pm0.2}$	57	58	3300	1790R	1720R	2200R

- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request
- All above Cores are available in other materials on request

R- +30%, -20%
Y- +40%, -30%

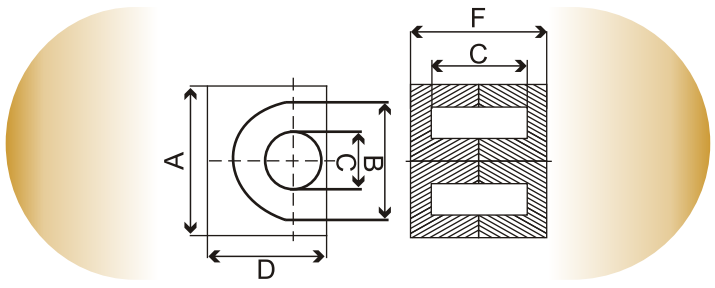
EP Cores

EP Cores have a particularly compact, low profile shape and offer excellent shielding from adjacent cores due to the winding being almost completely surrounded by the ferrite core. This allows for high packing densities on printed circuit boards. Originally designed for broadband, small power transformers and signal transmission applications, EP cores are well suited for the demanding properties required from modern electronic components.

EP Cores are available in a range of sizes and materials as per IEC 62317-5.

All Dimensional Details in mm.

Part No.	Core	A	B	C	D	E	F	Effective Parameters		
								le mm	Ae mm^2	Ve mm^3
32-810-	EP7	$9.4_{-0.4}$	$7.2^{+0.4}$	$3.4_{-0.2}$	$6.5_{-0.3}$	$5^{+0.4}$	$7.5_{-0.2}$	15.7	10.3	162
32-820-	EP10	$11.8_{-0.6}$	$9.2^{+0.4}$	$3.45_{-0.3}$	$7.85_{-0.4}$	$7.2^{+0.4}$	$10.4_{-0.2}$	19.2	11.3	217
32-800-	EP13	$12.8_{-0.6}$	$9.7^{+0.6}$	$4.5_{-0.3}$	$9_{-0.4}$	$9^{+0.4}$	$13^{-0.3}$	24.2	19.5	472
32-830-	EP17	$18.4_{-0.8}$	$11.6^{+0.8}$	$5.85_{-0.35}$	$11.25_{-0.5}$	$11^{+0.6}$	$17_{-0.6}$	28.5	33.9	966
32-840-	EP20	24.5_{-1}	$16.1^{+0.8}$	$9_{-0.5}$	$15.3_{-0.7}$	$14^{+0.6}$	$21.6_{-0.4}$	40	78	3120
32-850-	EOP7	$9.2_{\pm0.2}$	$7.4_{\pm0.2}$	$3.3_{\pm0.1}$	$8.8_{\pm0.2}$	$4.8_{\pm0.2}$	$7.4_{\pm0.1}$	15.6	17.7	276



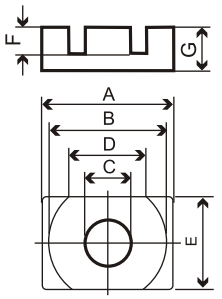
AL Values with Tolerance Code

P11	F5	F5A	F44	F44A	F47	F48	F9	F10	F39	FTA
980/R	1200/R	1200/R	920/R	1100/R	960/R	1100/R	2000/R	3400/R	5200/Y	5200/Y
940/R	-	1063/R	855/R	1100/R	980/R	980/R	2000/R	3200/R	4800/Y	-
1500/R	1275/R	1460/R	1235/R	1600/R	1300/R	1400/R	2800/R	4400/R	7000/Y	7000/Y
2250/R	2300/R	-	2130/R	2400/R	-	2400/R	4300/R	6875/R	11400/Y	-
-	-	4100/R	4000/R	-	-	3900/R	6700/R	11200/R	18700/Y	-
-	-	-	-	-	-	-	-	-	-	8780/Y

- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request
- All above Cores are available in other materials on request

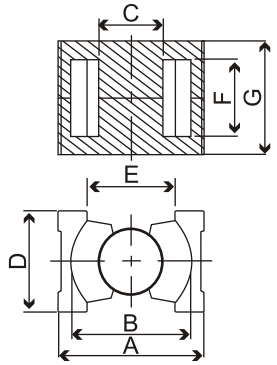
R - +30%, - 20%
Y - +40%, - 30%

EQ Cores



Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	G mm	le mm^2	Ae mm^2	Ve mm^3	F47	F48	F49	FTA
32-670-	EQ20	$20_{\pm 0.35}$	$18_{\pm 0.35}$	$8.8_{\pm 0.15}$	$12.86_{\pm 0.35}$	$14_{\pm 0.3}$	$4.1_{\pm 0.15}$	$6.3_{\pm 0.1}$	33.2	59.0	1960	-	$3500^{\pm 25}$	-	$13500^{+40\%}_{-30\%}$
32-640-	EQ 25	$25_{\pm 0.4}$	$22_{\pm 0.4}$	$11_{\pm 0.2}$	14.5_{Min}	$18_{\pm 0.3}$	$5.15_{\pm 0.15}$	$8.0_{\pm 0.1}$	41.4	100	4145	$4200^{+30\%}_{-20\%}$	-	$2150^{+30\%}_{-20\%}$	$21300^{+40\%}_{-30\%}$
32-650-	EQ 25 LP	$25_{\pm 0.4}$	$22_{\pm 0.4}$	$11_{\pm 0.2}$	14.5_{Min}	$18_{\pm 0.3}$	$3.1_{\pm 0.15}$	$5.3_{\pm 0.05}$	-	-	-	$5500^{+30\%}_{-20\%}$	-	-	-

PQ Cores

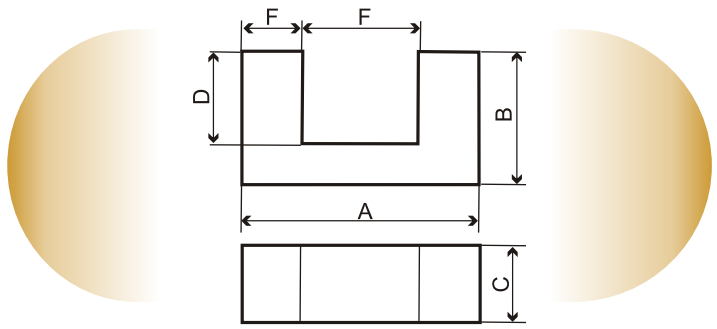


Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	G mm	le mm^2	Ae mm^2	Ve mm^3	F48	F49
29-060-	PQ26x20	$27.3^{\pm 0.46}$	$22.5^{\pm 0.46}$	$12^{\pm 0.2}$	$19^{\pm 0.45}$	15.50^{Min}	$11.5^{\pm 0.3}$	$20.2^{\pm 0.25}$	45	121	5470	-	$3000^{\pm 25\%}$
29-070-	PQ26x25	$27.3^{\pm 0.46}$	$22.5^{\pm 0.46}$	$12^{\pm 0.2}$	$19^{\pm 0.45}$	15.50^{Min}	$16.1^{\pm 0.3}$	$24.7^{\pm 0.25}$	54.30	120	6530	$5250^{\pm 25\%}$	$2500^{\pm 25\%}$

- As per IEC 62317-13
- All values mentioned above are for an un gapped pair of cores
- Gapped Values can be provided on request
- All above Cores are available in other materials on request

U U & UR Cores

These cores are used for the construction of transformers in the frequency range from 10 to 500 kHz. The transferable outputs will be determined by core geometry and the upper frequency limits by the material selected. In previous years a major application was for in line transformers producing an electron deflection beam for CRT's. Materials used for these applications are characterized by high flux density, low specific power losses and the decline of losses dependent on temperature in the range from 20o to 100oC.



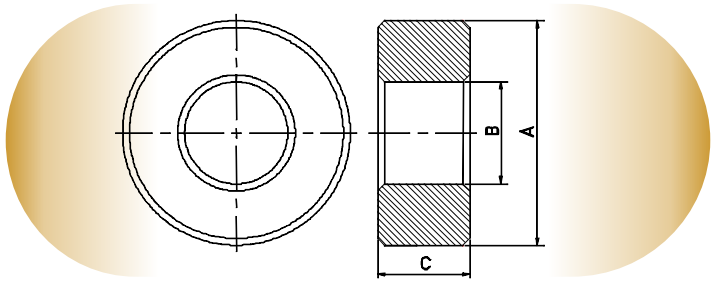
Dimensional details & AL Values with Tolerance Code

Part No.	Core	A mm	B mm	C mm	D mm	E mm	F mm	Effective Parameters le mm	Effective Parameters Ae mm^2	Effective Parameters Ve mm^3	F5	F5A	F9	F10	F39	F44	F48	F49
34-009-	UU 10.5	$10.5^{+0.2}_{-0.2}$	$7.9_{\pm0.2}$	$5.2^{+0.3}$	$5.3^{+0.15}_{-0.15}$	$2.70_{-0.3}$	$5.5^{+0.2}$	40	13	520	800/R	-	1000/R	1700/R	2400/Y			
34-490-	U12.7	$12.7_{\pm0.38}$	$6.35_{\pm0.05}$	$4.95_{\pm0.25}$	$3.81_{\pm0.18}$	$2.54_{\pm0.13}$	7.30_{Mini}	33	12.60	416	-	-	1000/R	-	-			
34-010-	U15/11/6.5	$15.2^{+0.7}_{-0.6}$	$11.2^{+0.5}_{-0.5}$	$6.45_{\pm0.25}$	$6_{\pm0.25}$	5.00	$5^{+0.4}$	48	32	1540	1200/R	-	2625/R	-	5000/Y			
34-015-	U25/20/13	$24.75_{\pm0.75}$	$19.43^{+0.57}_{-0.58}$	$12.75_{\pm0.25}$	$11.33^{+0.32}_{-0.33}$	8.0_{Mini}	$8.25_{\pm0.25}$	86	105	9030	-	-	4120/R	-	-			
34-540-	U26.5/20.2/9.7	$26.54_{\pm0.78}$	$20.07_{\pm0.13}$	$9.40_{\pm0.25}$	$14.60_{\pm0.13}$	-	$7.87_{\pm0.5}$	95.40	60.90	5724	-	1790/R	-	-	-			
34-025-	U31/15.5/16	$31_{\pm0.6}$	$16.0_{\pm0.3}$	$16.0_{\pm0.3}$	$8.5_{\pm0.5}$	$7_{\pm0.2}$	$17.0_{\pm0.4}$	90	112	10079			$4500^{+30\%}_{-10\%}$	-	-			
34-521-	U37/25/18	$36.9_{\pm0.8}$	$25.2_{\pm0.20}$	$18_{\pm0.4}$	$16.30_{Mini.}$	$14.7_{\pm0.3}$	$14.9_{\pm0.1}$	125	150	18750	-	3125/R	-	-	-			
34-041-	U46/20/28	$47_{\pm0.8}$	$40_{\pm0.4}$	$28_{\pm0.6}$	$25.8_{\pm0.25}$	-	$19_{\pm0.85}$	-	-	-	-	5880/R	-	-	-			
34-520-	U60/36/23	60.50_{Nomi}	$35.8_{\pm0.2}$	$23.0_{\pm0.4}$	$26.5_{\pm0.4}$	$17.0_{\pm0.4}$	$26.75_{\pm0.75}$	189	210	39700	2410/R	-	-	-	-			
34-537-	U82/44/16	$80.8_{\pm1.2}$	$44.53_{\pm0.2}$	-	$30.53_{\pm0.25}$	$15.0_{\pm0.25}$	50.80_{Mini}	268.6	177.20	47600	-	1810/R	-	-	-			
34-544-	U91/44.4/15	$91_{\pm1.36}$	$44.53_{\pm0.2}$	$15.0_{\pm0.25}$	$30.53_{\pm0.25}$	$15.0_{\pm0.25}$	61.0_{Mini}	275.2	177.20	48751.3	-	1840/R	-	2410/R	-			
34-050-	U93/76/30	$93_{\pm1.8}$	$76_{\pm0.5}$	$30_{\pm0.6}$	$48_{\pm0.90}$	-	$36.2_{\pm1.2}$	352.98	847.98	299320	-	-	-	-	-	5440/R	6000/R	-
34-029-	U101.6/57/25.4	104.14_{Max}	$57.15_{\pm0.38}$	$25.4_{\pm0.76}$	$31.75_{\pm0.25}$	-	49.78_{Mini}	308.39	645.16	198965	-	-	-	-	-	4500/R	5060/R	$6000_{\pm25\%}$

Available shapes: Square, Square/Round, and Round. I-bars also available.

Toroids

Ring cores or Toroids manufactured from ferrites offer an efficient shape for variety of wide band, pulse, power transformers and inductors. Toroids Cores are available in a range of sizes and materials as per IEC 62317-12



Dimensional details & AL Values with Tolerance Code

Part No.		A mm	B mm	C mm	le mm	Ae mm^2	Ve mm^3	F5A	P12	F8	F9	F9C	F14	F19	F5C	F10	F39	F47	F48	F44	F16	F57	F5
28-0611-	T4.5x2.5x2.0	$4.5_{\pm0.18}$	$2.495_{\pm0.105}$	$2.0_{\pm0.18}$	-	-	-	-	$470_{\pm30\%}$	-	-	940/R	-	-	-	-	-	-	-	-	-	-	-
28-119-	T5.8x3.0x3.05	$5.84_{\pm0.16}$	$3.05_{\pm0.13}$	$3.05_{\pm0.13}$	13.029	4.108	53.52	-	-	-	-	1900/R	-	-	-	-	-	-	-	764/R	-	-	-
28-001-	T6.35x3.18x1.52	$6.35_{\pm0.19}$	$3.17_{\pm0.15}$	$1.52_{\pm0.13}$	13.81	2.32	32.05	-	-	-	-	1052/R	-	-	-	-	-	-	-	$399^{+30\%}_{-10\%}$	-	-	-
28-002-	T6.35x3.18x3.96	$6.35_{\pm0.19}$	$3.17_{\pm0.15}$	$3.96_{\pm0.25}$	13.82	6.049	83.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28-003-	T6.35x3.18x7.92	$6.35_{\pm0.19}$	$3.17_{\pm0.15}$	$7.93_{\pm0.3}$	13.80	12.06	166.0	-	1983_{Mini}	1322_{Mini}	$4820^{\pm30\%}_{-20\%}$	-	242/R		-	-	-	-	-	-	-	-	-
28-070-	T9.52x4.75x3.18	$9.52_{\pm0.25}$	$4.75_{\pm0.25}$	$3.18_{\pm0.12}$	20.70	7.29	151	$1250_{\pm25\%}$	-	-	$2000^{\pm20\%}$	2210/R	-	$442_{\pm30\%}$	$1330_{\pm30\%}$	3000/R	-	-	-	840/R	53/R	$3320_{\pm25\%}$	-
28-107-	T10x6x4	$10^{\pm0.4}$	$6.0_{\pm0.30}$	$4.0_{\pm0.2}$	24.07	7.84	188.70	-	-	-	-	2046/R	-	-	-	2460/R	-	-	-	-	-	-	-
28-011-	T12.7x6.35x3.18	$12.7_{\pm0.30}$	$6.35_{\pm0.25}$	$3.17_{\pm0.25}$	27.6	9.68	268	-	-	-	-	-	-	-	-	2645/R	-	-	-	-	-	-	-
28-012-	T12.7x6.35x6.35	$12.7_{\pm0.3}$	$6.35_{\pm0.25}$	$6.35_{\pm0.3}$	27.65	19.37	535.7	-	-	1317/R	3864/R	4401/R	193/R	-	-	4224_{Mini}	$7570_{\pm30\%}$	-	-	-	-	-	-
28-013-	T12.7x6.35x9.52	$12.7_{\pm0.30}$	$6.35_{\pm0.25}$	$9.52_{\pm0.36}$	27.6	29.04	804	-	-	-	-	-	290/R	-	-	-	-	-	-	-	-	-	-
28-017-	T12.7x7.1x5.0	$12.85_{\pm0.45}$	$7.35_{\pm0.25}$	$5_{\pm0.25}$	30.13	13.45	405	-	-	-	$2468_{\pm25\%}$	-	-	-	-	-	-	-	-	-	-	-	-
28-018-	T12.7x7.1x6.35	$12.85_{\pm0.45}$	$7.35_{\pm0.25}$	$5_{\pm0.25}$	30.13	17.02	513.0	-	-	-	-	$3548_{\pm20\%}$	-	-	-	-	-	-	-	-	-	-	-
28-0627-	T12.7x7.2x3.2	$12.7_{\pm0.32}$	$7.3_{\pm0.3}$	$3.3_{\pm0.18}$	2.962	0.08858	0.2623	-	-	-	-	1500/R	-	-	$1130_{\pm30\%}$	-	-	-	-	-	-	-	-
28-019-	T12.7x7.9x6.35	$12.7_{\pm0.3}$	$7.9_{\pm0.15}$	$6.35_{\pm0.2}$	31.17	14.96	466	1507/R	-	-	-	3020/R	-	442/R	-	2800_{Mini}	$4600_{Mini.}$	-	-	-	-	$4500_{\pm25\%}$	-
28-085-	T14x9x5	$14_{\pm0.4}$	$9_{\pm0.4}$	$5_{\pm0.4}$	34.9	12.3	430	-	-	-	-	2200/R	-	442/R	-	2650/R	-	795/R	-	-	-	-	-
28-059-	T16.7x9.6x5.0	$16.76_{\pm0.5}$	$9.65_{\pm0.25}$	$5_{\pm0.25}$	39.45	17.33	683	-	-	-	1943_{Mini}	$2730^{\pm25\%}$	-	-	-	-	5520/Y	993/R	-	-	-	-	-
28-063-	T16.7x9.65x6.35	$16.76_{\pm0.5}$	$9.65_{\pm0.25}$	$6.3_{\pm0.25}$	39.45	21.84	864	-	-	-	3055/R	3470/R	-	-	-	4165/R	-	-	-	1320/R	-	-	-

28-076-	T17.5x9.6x28.5	17.5 ±0.5	9.6 ±0.3	28.52 ±0.6	40.11	109.3	4386	-	-	-	-	-	-	-	-	-	-	-	-	-	3921 ±30%	-	-
28-023-	T19.05x12.7x9.52	19.05 ±0.76	12.7 ±0.51	9.52 ±0.36	48.50	29.88	1449	-	-	930 Mini	3410/R	3880/R											
28-0116-	T20x10x6.8	20.45 ±0.55	10 ±0.2	6.8 ±0.2	43.98	34.05	1497.5	-	-	-	4189/R	4860/R	-	-	-	-	-	-	-	1790/R	-	-	-
28-095-	T22.1x13.7x12.7	22 ±0.3	13.72 ±0.25	12.70 ±0.25	54.08	51.61	2791	2400 Mini	-	5277/R	6110 ±20%	-	-	1196 ±30%	-	7125/R	10000 ±30%	-	-	-	-	-	-
28-0631-	T24x12x6	24 ±0.59	12.18 ±0.49	6 ±0.25	52.26	34.59	1808	-	-	-	-	3330 +30% −10%	-	-	-	-	-	-	-	-	-	-	-
28-055-	T24x12x12	24 ±0.6	11.85 ±0.35	11.85 ±0.35	51	69.57	3548	-	-	-	-	8571/R	366/R										
28-080-	T25x15x10	25 ±1.30	15 ±0.77	10 ±0.30	60.20	49.00	2950	-	-	-	4000 Mini	4080 Mini	-	-	-	6130/R	10220 ±40%	-	-	1522 Mini	-	-	2040 ±25%
28-056-	T31.5x19.6x12.5	31.5 ±1.0	19.6 ±0.6	12.5 ±1.25	76.04	76.48	5816	2970/R	-	-	5000/R	6320/R		2970 +30% −25%	3843 +30% −25%	-	11800Y	-	-	-	-	-	-
28-141-	T36x23x16	36.4 ±1.1	22.6 ±0.9	15.4 ±0.8	89.65	95.89	8597	-	-	-	-	-	-	-	-	-	13600Y	-	-	-	-	-	-
28-044-	T38.1x25.4x15.87	38.1 ±1.52	25.4 ±1.02	15.87 ±0.38	97.06	99.41	9650	3217/R	-	-	5663/R	6500 ±20%	-	-	-	-	-	-	-	2445/R	-	-	-
28-043-	T38.1x25.4x19.05	38.1 ±1.52	25.4 ±1.02	19.05 ±0.41	97.10	119.40	11580	-	-	2480 ±25%	6830/R	7725/R	341/R	-	-	-	13285 ±30%	-	-	2935/R	-	-	-
28-029-	T45x19x16	45 ±1.0	19 ±1	16 ±0.5	89	195.4	17370	5000/R	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28-132-	T49x31.8x19	49.1 ±0.8	31.8 ±0.5	19.05 ±0.4	123	162	19926	-	-	-	-	8215/R	-	-	4970/R	9860 ±30%	-	-	-	-	-	-	-
28-089-	T54x15x19	54 ±2.10	15.6 ±0.6	19.0 ±0.4	85.72	321.7	27594	-	-	-	21200/R	-	1070 ±20%	-	14600/R								
28-052-	T56x32x18	55.4 ±1.6	32.4 ±0.7	18 ±0.7	131.5	202.10	26578	-	-	-	7724 +30% −20%	-	-	-	-	-	-	-	-	-	-	-	-
28-061-	T63x38x25	63 ±2	38 ±1.2	25 ±0.8	152	305.93	46530	6319/R	-	-	11100/R	12640 +30% −20%	-	-	-	15160 ±25%	-	-	5450/R	-	-	-	5054/R
28-0797-	T78x45x14	78.00 ±1.98	44.65 ±1.72	14.00 ±0.44	181.6	231.8	42098	-	3210 ±30%	-	-	6410 +30% −10%	-	1600 +30% −25%	4810 ±30%	-	-	-	-	-	-	-	-
28-0660-	T102x66x15	102 ±2.0	65.8 ±1.3	15.00 ±0.5	255.32	267.21	68225	-	-	-	-	-	-	-	-	7890/R	-	-	-	-	-	-	-

- All values mentioned above are for an un coated Ring core
- All the above cores are available in epoxy coating to provide dielectric break down strength
- Ring cores below the size of 6mm are available in paralyene coating
- Cores are also available enamel coated for identification purposes only.They can be either fully or partially coated and no breakdown strength can be guaranteed
- For coated cores the AL Value and dimensional tolerance changes
- Gapped Ring cores are available on request
- All above Cores are available in other materials on request

R- +30%, -20%
Y- +40%, -30%

Additional Ferrite Geometries

- Small and long rods of various sizes from 2mm diameter onwards, length up to 50.8mm
- Balun and multi aperture cores of various sizes especially in NiZn materials
- Ribbon cable suppressors – solid and split in various sizes in NiZn Materials
- Small bead cores of various sizes for suppression application
- Sleeve cores of various sizes for suppression application
- Axial leaded choke coils using NiZn beads

Additional Materials and Services

Soft Magnetics
MMG India Pvt. Ltd. and MagDev Ltd. can supply a full range of Soft Magnetic materials including:

- Soft Ferrites – Manganese Zinc, Nickel Zinc, Fully sintered crushed powder, Bobbins and Accessories
- Strip Wound Cores
- Wound Components
- Iron Powder Cores – Carbonyl Iron, Sendust, MPP and High flux
- Amorphous Material – Iron and Cobalt base, Nanocrystalline, Powdered Cores, C-cores and Choke Cores

We are also able to assist with the design and supply of high frequency and high power chokes and transformers for various applications such as rail and renewable energy. These are manufactured within our own facilities or by one of our strategic partners.

Permanent Magnets

In Addition to the soft magnetic components MMG India & MagDev can supply an extensive range of permanent magnets, accessories and magnet assemblies. These products are widely used in the Industrial, Audio, Renewable energy, Automotive, Aerospace and Consumer Electronics industries. We supply an extensive range of materials including:

- Neodymium Iron Boron – sintered, bonded
- Ferrite – anisotropic, isotropic
- Alnico
- Samarium Cobalt
- Injection Moulded Magnets
- Magnet Assemblies - including metal work
- Pot Holding Magnets - deep, shallow
- Strontium Ferrite Powder

This Company's policy is one of continuous improvement and development and the right to change materials, designs, dimensions and descriptive matter, etc. at any time without notice is reserved. Specifications and information contained within this catalogue are intended for guidance only.

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DMG
DELTA MAGNETS GROUP

QUALITY POLICY

OUR COMMITMENT

For all of us at **MMG INDIA PRIVATE LIMITED,**
Customer satisfaction is the primary goal.
We are **COMMITED** to offer product of **CONSISTENT QUALITY** and
TIMELY DELIVERY meeting customer requirements on a **CONTINUOUS BASIS.**

OUR ACTION

Implementation, Maintenance and **IMPROVEMENT** of **QUALITY SYSTEM**
and evolving methods of **DOING IT RIGHT FIRST TIME** shall be the way of life at
MMG INDIA PRIVATE LIMITED.

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