



EC, ETD, EER and ER Cores

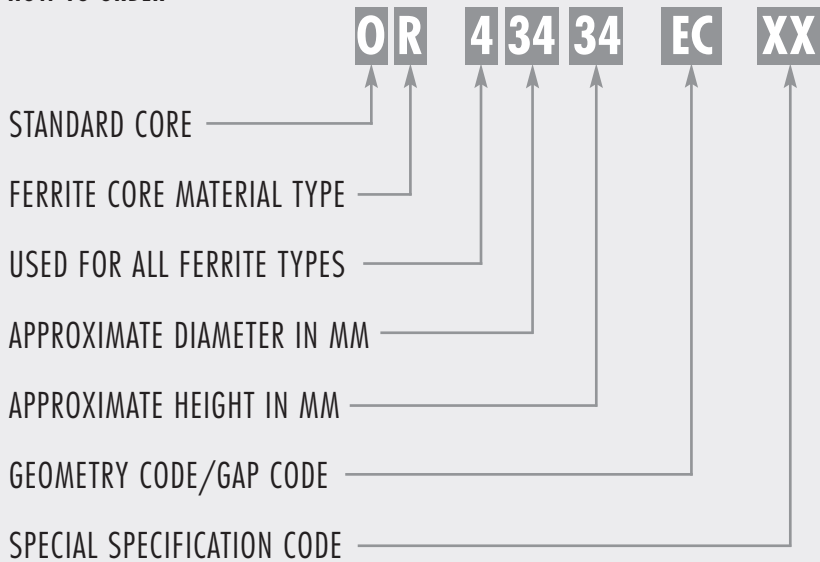
Section 12

EC, ETD, EER AND ER CORES

EC, ETD and EER cores are a cross between E cores and pot cores. Like E cores they provide a wide opening on each side. This gives adequate space for the large size wire required for low output voltage switched mode power supplies. It also allows for a flow of air which keeps the assembly cooler.

The center posts of these cores are 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 (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 also eliminates the sharp bend in the wire that occurs with winding on a square center post. The most common application is switched mode power supplies.

HOW TO ORDER



GEOMETRY CODE

EC — All E cores including ETD, EC, ER, EER, EEM, EFD, planar and lamination sizes.



EC, ETD, EER and ER Core Data (ungapped)

Any practical gap available. See pages 1.8-1.11

MECHANICAL DIMENSIONS												
PART	CORE TYPE	FIG.		A	B	C	D MIN	E	F	G	S	T
0_40906EC	ER 9.5	3	mm	9.5 +0, -.3	2.45 ± .05	5 +0, -.2	1.6+.15-0	7.5 + .25,-0	3.50 + 0, -.2	-	-	-
0_43434EC	ETD 34	2	mm	35 +0,-1.6	17.3 ± .2	11.1 +0, -.6	11.8+.6,0	25.6+1.4,-0	11.1 + 0, -.6	-	-	-
0_43517EC	EC 35	1	mm	34.5 ± .8	17.3 ± .15	9.5 ± .3	12.3 ± .4	22.75 ± .55	9.5 ± .3	-	2.75 ± .25	28.5 ± .8
0_43521EC	EER 35L	2	mm	35 ± .65	20.7 ± .20	11.4 ± .35	14.75 ± .35	26.15 ± .55	11.3 ± .25	-	-	-
0_43939EC	ETD 39	2	mm	40 +0, -1.8	19.8 ± .2	12.8 +0, -.6	14.2+.8,0	29.3 +1.6,-0	12.8 + 0, -.6	-	-	-
0_44119EC	EC41	1	mm	40.6 ± 1.0	19.5 ± .15	11.6 ± .3	13.9 ± .4	27 + .8, -.7	11.6 ± .3	-	3.25 ± .25	33.6 ± 1.0
0_44216EC	EER 42	2	mm	42.10 ± .81	21.60 ± .20	14.70 ± .30	15.60	31 ± .58	14.70 ± .30	-	-	-
			in	1.659 ± .032	.850 ± .008	.579 ± .012	0.614	1.220 ± .023	.579 ± .012	-	-	-
0_44444EC	ETD 44	2	mm	45 + 0, -.2	22.30 ± .20	15.2 + 0, -.6	16.10	32.5 + 1.6, -0	15.2 + 0, -.6	-	-	-
			in	1.732 ± .040	.878 ± .008	.583 ± .015	0.635	1.311 ± .032	.583 ± .015	-	-	-
0_44949EC	ETD 49	2	mm	49.8 +0,-2.2	24.7 ± .20	16.7 + 0, -.6	17.7+.8,0	36.1 + 0, -1.8	16.7 + 0, -.6	-	-	-
0_45032EC		2	mm	49.80 ± .76	15.90 ± .25	13.20 ± .38	9.50	39.10 ± .51	14.50 ± .25	-	-	-
			in	1.960 ± .030	.625 ± .010	.520 ± .015	0.373	1.540 ± .020	.570 ± .010	-	-	-
0_45224EC	EC52	1	mm	52.2 ± 1.3	24.2 ± .15	13.4 ± .35	15.9 ± .4	33 ± .9	13.4 ± .35	-	3.75 ± .25	44 ± 1.3
0_45959EC	ETD 59	2	mm	59.80 ± 1.30	31 ± .20	21.65 ± .45	22.10	44.70 ± 1.09	21.65 ± .45	-	-	-
			in	2.354 ± .051	1.220 ± .008	.852 ± .018	0.87	1.760 ± .043	.852 ± .018	-	-	-
0_47035EC	EC70	1	mm	70 ± 1.7	34.5 ± .15	16.4 ± .4	22.75 ± .45	44.5 ± 1.2	16.4 ± .4	-	4.75 ± .25	59.6 ± 1.7
0_47054EC		2	mm	68.58 ± 1.52	54 ± .38	20 ± .38	41.80	54.10 ± 1.27	20 ± .38	-	-	-
			in	2.700 ± .060	2.125 ± .015	.787 ± .015	1.647	2.130 ± .050	.787 ± .015	-	-	-

To order, add material code to part number.

FIGURE 1

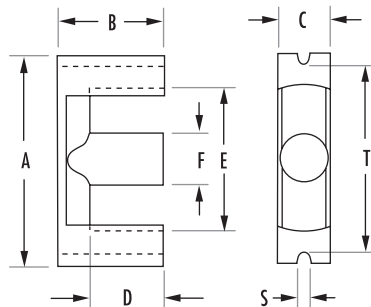
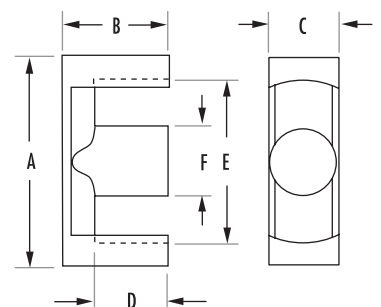


FIGURE 2



EC, ETD, EER and ER Core Data (ungapped)

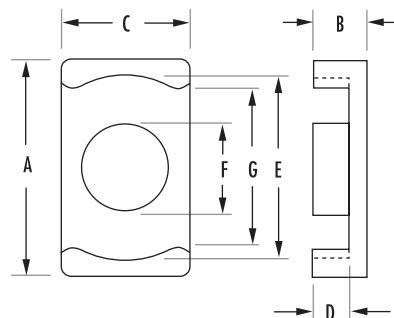
EO, ETD, EER, ER Cores

POWER MATERIALS			HIGH PERMEABILITY MATERIALS		MAGNETIC DATA							AVAILABLE HARDWARE
R	P	F*	J	W	l_e (mm)	A_e (mm ²)	A MIN (mm ²)	V_e (mm ³)	CORE WEIGHT (grams per set)	WdAc (cm ⁴)		
Min	730	790	1270	1550	2520	14.2	8.47	7.6	120	0.6	.0026	✓
Min	2030	2200	3600	-	-	78.6	97.1	91.6	7640	40	1.21	✓
Min	1660	1800	3000	-	-	77.4	84.3	71	6530	36	0.833	✓
Min	2020	2220	3550	-	-	90.8	107.0	100.0	9710	49	1.91	✓
Min	2230	2420	4050	-	-	92.2	125	123	11500	60	2.21	✓
Min	2210	2400	3700	-	-	89.3	121	106	10800	52	1.67	✓
Min	2880	3130	5000	-	-	98.7	175.0	166.0	17300	106	3.55	✓
Min	2750	3000	4950	-	-	103	173	172.0	17800	94	3.75	✓
Min	3070	3330	5400	-	-	114.0	211	209	24000	124	5.83	✓
Min	3010	3270	5230	7160	-	84.7	161.0	156.0	13640	66	2.75	✓
Min	2900	3150	5040	-	-	105	180	141	18800	111	3.87	✓
Min	4310	4680	7500	9320	-	139.0	368.0	368.0	51200	248	13.7	✓
Min	3310	3600	5760	-	-	144	279	211	40100	253	13.4	✓
Min	2440	2650	4240	-	-	231.0	339.0	314.0	78600	396	34	✓

STANDARD BOBBIN
PRINTED CIRCUIT BOBBIN
MOUNTING CLAMP
SURFACE MOUNT BOBBIN

* F material nominal ± 25%

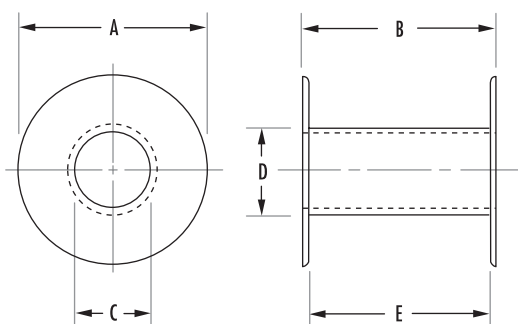
FIGURE 3



Bobbins

PART	CORE SIZE	FIG.		MECHANICAL DIMENSIONS					NOMINAL WINDING AREA PER SECTION		AVG. LENGTH OF TURN FT	MATERIAL
				A MAX	B MAX	C MAX	D MAX	E NOM	in ²	cm ²		
00B351701	43517EC	1	mm	21.9456	23.5712	9.8806	11.6586	21.7932	0.173	1.12	0.172	Glass filled Nylon*
			in	0.864	0.928	0.389	0.459	0.858				
00B411901	44119EC	1	mm	26.035	26.7462	12.065	14.097	24.6126	0.225	1.45	0.205	Glass filled Nylon*
			in	1.025	1.053	0.475	0.555	0.969				

FIGURE 1



Bobbins

PART	CORE TYPE FIG.			MECHANICAL DIMENSIONS					NOMINAL WINDING AREA PER SECTION		AVG. LENGTH OF TURN FT	MATERIAL
				A MAX	B MAX	C MAX	D MAX	E NOM	in ²	cm ²		
00B522401	45224EC	1	mm	31.75	30.734	13.766	15.595	28.346	0.352	2.27	0.242	Glass filled Nylon*
			in	1.250	1.210	0.542	0.614	1.116				
00B703501	47035EC	1	mm	42.799	44.323	16.916	19.481	41.605	0.748	4.82	.319	Glass filled Nylon*
			in	1.685	1.745	0.666	0.767	1.638				

* UL 94 HB rated

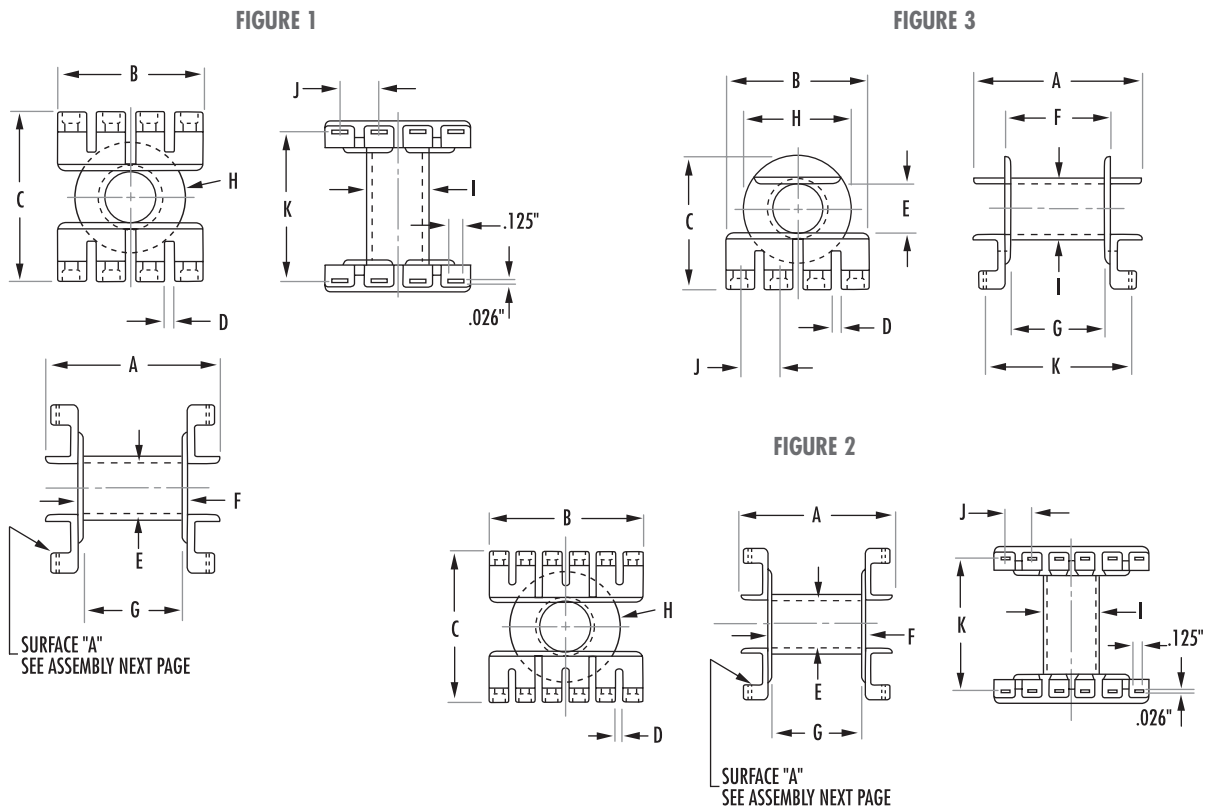
EO, ETD, EER, ER Hardware

Printed Circuit Bobbins

MECHANICAL DIMENSIONS

PART	CORE SIZE	FIG.†		A MAX	B MAX	C MAX	D NOM	E NOM	F MAX	G NOM	H NOM	I NOM
PCB3434FA	43434EC	5	mm	40.513	21.488 nom	13.8938	11.01 min	25.5016	26.01 ref	5.08	35.20 min	-
			in	1.595	.846 nom	0.547	.437 min	1.004	1.024 ref	0.200	1.386 min	-
PCB351701	43517EC	1	mm	34.1122	28.8036	31.6484	2.032	10.0076	23.749	21.4884	21.6408	12.192
			in	1.343	1.134	1.246	0.080	0.394	0.935	0.846	0.852	0.480
PCH351701	43517EC	3	mm	34.163	29.0068	26.6954	2.032	10.0076	23.622	21.4884	21.6408	12.192
			in	1.345	1.142	1.051	0.08	0.394	0.930	0.846	0.852	0.480
PCB3521LA	43521EC	10	mm	29.21 nom	26.162 nom	14.1732	11.6586 min	25.4	39.8272 ref	4.826	29.21 min	-
			in	1.15 nom	1.03 nom	0.558	0.459 min	1.00	1.568 ref	0.190	1.15 min	-
PCB3939SA	43939EC	6	mm	44.2976	26.1874 nom	15.2908	12.7 min	30.2006	32.791 ref	5.588	40.1066 min	-
			in	1.744	1.031 nom	0.602	0.500 min	1.189	1.291 ref	0.220	1.579 min	-
PCB411901	44119EC	1	mm	38.6334	28.6258	36.5506	2.032	12.0904	26.9494	24.511	25.654	14.097
			in	1.521	1.127	1.439	0.080	0.476	1.061	0.965	1.010	0.555
PCH411901	44119EC	3	mm	38.6588	28.9052	31.1912	2.032	12.0904	26.8224	24.511	25.654	14.097
			in	1.522	1.138	1.228	0.080	0.476	1.056	0.965	1.010	0.555

† Figures 7-12 found on pages 12.8-12.9



Printed Circuit Bobbins

MECHANICAL DIMENSIONS			NOMINAL WINDING AREA PER SECTION		AVG. LENGTH OF TURN FT	BOBBIN MATERIAL	PIN MATERIAL	PIN DIAMETER	BOARD CLEARANCE (in)†		
J NOM	K MAX	M NOM	in ²	cm ²					L	W	H
11.30 min .445 min	25.2984 0.996	5.0038 0.197	0.19000	1.23	0.200	Phenolic*			1.675	1.575	1.350
7.62 0.300	30.48 1.200	- -	0.150	0.970	0.164	Glass Filled Nylon**			-	-	-
7.62 0.300	30.48 1.200	- -	0.15	0.97	0.164	Glass Filled Nylon**			-	-	-
12.7 0.500	25.5016 1.004	5.08 0.200	0.230	1.48	0.20	Rynite FR530**	CP Wire	.031"	-	-	-
13.0048 min 0.512 min	28.9052 1.138	5.0038 0.197	0.270	1.740	0.220	Phenolic*			1.900	1.800	1.475
7.62 0.300	33.02 1.300	- -	0.21	1.35	0.197	Glass Filled Nylon**			-	-	-
7.62 0.300	33.02 1.300	- -	0.21	1.35	0.197	Glass Filled Nylon**			-	-	-

* UL 94 V-1 rated **UL 94 V-0 rated
† Reference figure 12 for board clearance

FIGURE 4

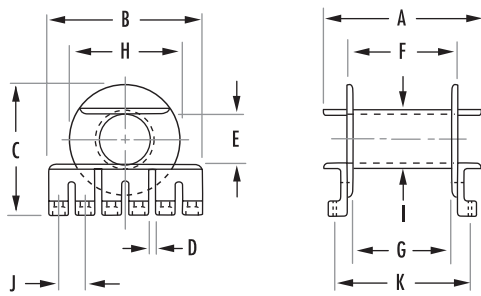


FIGURE 5

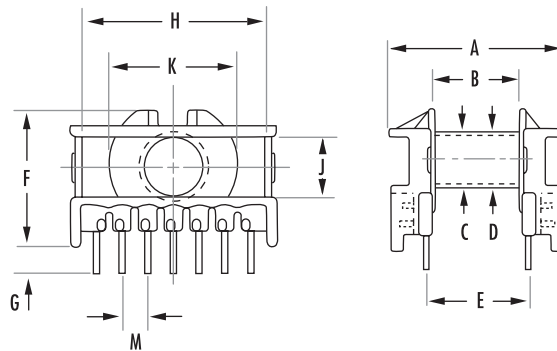
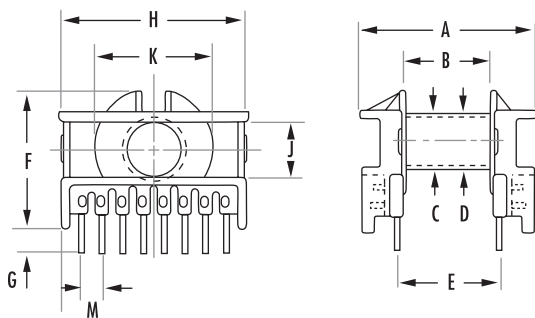


FIGURE 6



Printed Circuit Bobbins (con't)

MECHANICAL DIMENSIONS												
PART	CORE SIZE	FIG.†		A MAX	B MAX	C MAX	D NOM	E NOM	F MAX	G NOM	H NOM	I NOM
PCB4216FA	44216EC	11	mm	30.988	27.305 nom	17.983	15.392 min	24.993	45.593	5.08	39.878	-
			in	1.220	1.075 nom	0.708	0.606 min	0.984	1.795	0.200	1.570	-
PCB4444WA	44444EC	7	mm	51.308	29.997 nom	17.805	15.189 min	35.712	39.700 ref	5.08	45.135 min	-
			in	2.02	1.181 nom	0.701	0.598 min	1.406	1.563 ref	0.200	1.777 min	-
PCB4949WA	44949EC	8	mm	53.797	33.0962 nom	19.507	16.484 min	40.386	40.690 ref	5.08	49.504 min	-
			in	2.118	1.303 nom	0.768	0.649 min	1.590	1.602 ref	0.2	1.949 min	-
PCB522401	45224EC	2	mm	44.526	44.018	41.630	2.032	13.944	30.708	28.2956	31.445	16.205
			in	1.753	1.733	1.639	0.080	0.549	1.209	1.114	1.238	0.638
PCH522401	45224EC	4	mm	44.551	44.094	36.499	2.032	13.944	30.708	28.2956	31.445	16.205
			in	1.754	1.736	1.437	0.08	0.549	1.209	1.114	1.238	0.638
PCB5959AA	45959EC	9	mm	66.04	41.376 nom	24.866	22.352 min	50.8	48.514 ref	4.191	61.341 min	-
			in	2.600	1.629 nom	0.979	0.88 min	2	1.91 ref	0.165	2.415 min	-
PCB703501	47035EC	2	mm	57.937	56.794	51.816	4.4958	17.145	44.2722	41.4528	42.443	19.507
			in	2.281	2.236	2.040	0.177	0.675	1.743	1.632	1.671	0.768
PCH703501	47035EC	4	mm	57.937	56.896	47.117	4.4958	17.145	44.2722	41.4528	42.545	19.507
			in	2.281	2.24	1.855	0.177	0.675	1.743	1.632	1.675	0.768

† Figures 1-6 found on pages 12.6-12.7

FIGURE 7

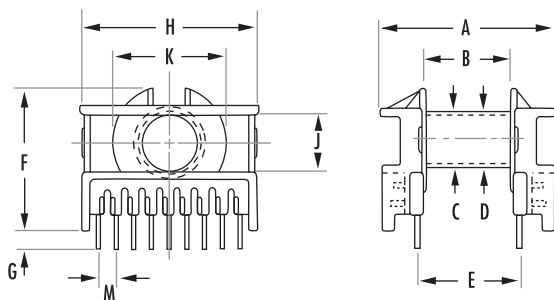


FIGURE 8

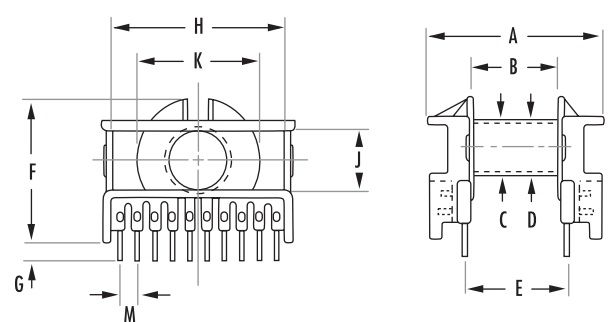


FIGURE 9

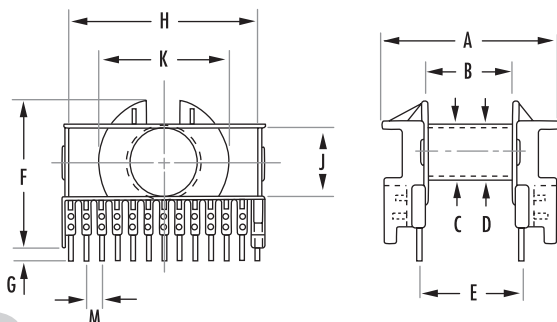
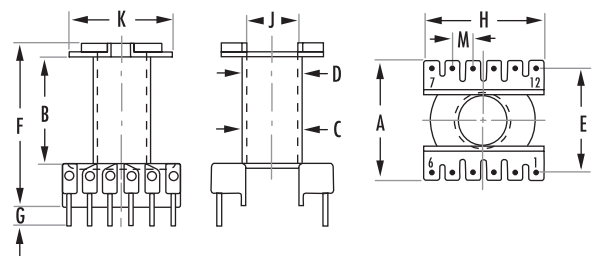


FIGURE 10



Printed Circuit Bobbins (con't)

MECHANICAL DIMENSIONS			NOMINAL WINDING AREA PER SECTION		AVG. LENGTH OF TURN FT	BOBBIN MATERIAL	PIN MATERIAL	PIN DIAMETER	BOARD CLEARANCE (in)†		
J NOM	K MAX	M NOM	in ²	cm ²					L	W	H
15.6972 0.618	30.48 ref 1.20 ref	5.0038 0.197	0.488	3.15	0.30	Rynite FR530**	CP Wire	.039"	-	-	-
15.3924 min 0.606 min	32.512 1.280	5.0038 0.197	0.33	2.13	0.25	Phenolic*			2.075	2.000	1.580
16.891 min 0.665 min	35.5092 1.398	5.0038 0.197	0.420	2.71	0.28	Phenolic*			2.275	2.175	1.680
7.62 0.300	38.1 1.500	- -	0.33	2.13	0.239	Glass Filled Nylon**			-	-	-
7.62 0.300	38.1 1.500	- -	0.33	2.13	0.239	Glass Filled Nylon**			-	-	-
22.352 min 0.88 min	43.18 1.700	5.08 0.200	0.58	3.72	0.35	Rynite FR530L**			2.845	2.635	1.940
10.16 0.400	50.8 2.000	- -	0.74	4.77	0.312	Glass Filled Nylon**			-	-	-
10.16 0.400	50.8 2.000	- -	0.74	4.77	0.312	Glass Filled Nylon**			-	-	-

* UL 94 V-1 rated **UL 94 V-0 rated. † Reference figure 12 for board clearance

FIGURE 11

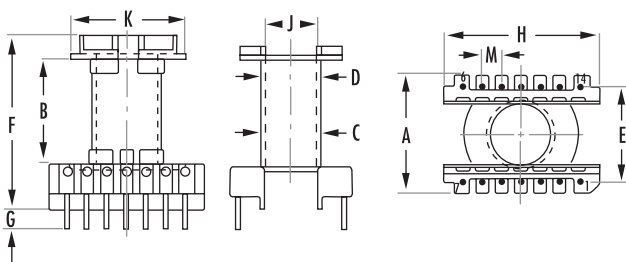
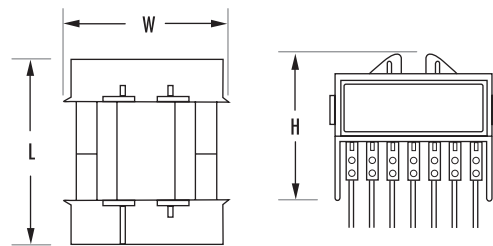
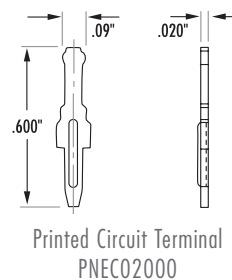
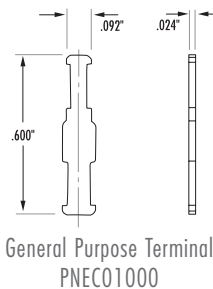
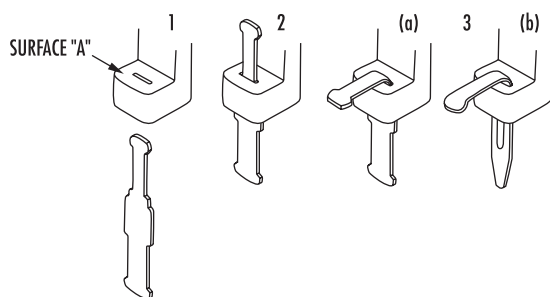


FIGURE 12



TERMINAL ASSEMBLY



NOTE: Terminals are not normally inserted but shipped separately in strip form. See above Terminal Assembly.

Mounting Clamps

MECHANICAL DIMENSIONS									
PART	ITEM	CORE SIZE	FIG.		A	B	C	D	E
00C09061A	Clamp	40906EC	7	mm	10.007	5.384	3.988	13.97	-
				in	0.394	.212	.157	.055	-
00C343416	Clamp (2 required per set)	43434EC	4	mm	22.8854	10.8458	39.624	-	-
				in	0.901	0.427	1.56	-	-
0AC351717	U Bolt		3	mm	32.385	42.164	2.1082	12.7	-
				in	1.275	1.66	0.083	0.500	-
0BC351740	Plate	43517EC	2	mm	39.37	9.525	31.5976	3.8862	4.445
				in	1.55	0.375	1.244	0.153	0.175
0CC351700	Nut (2 required)		-	-	-	-	-	-	-
00C393916	Clamp (2 required per set)	43939EC		mm	25.3238	12.5476	44.704	-	-
				in	0.997	0.494	1.76	-	-
0AC411919	U Bolt		1	mm	38.100	46.99	2.3622	12.7	-
				in	1.500	1.850	0.093	0.500	-
0BC411940	Plate	44119EC	2	mm	46.736	11.1252	37.211	4.7752	4.699
				in	1.840	0.438	1.465	0.188	0.185
0CC411900	Nut (2 required)		-	-	-	-	-	-	-

FIGURE 1

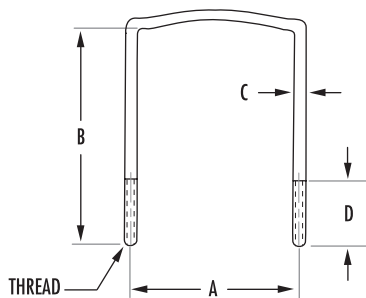


FIGURE 2

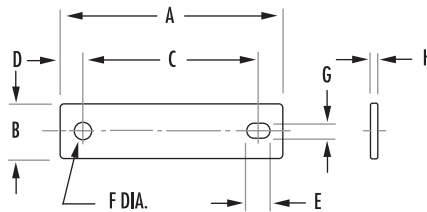
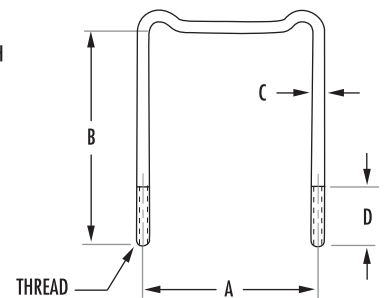


FIGURE 3



Mounting Clamps

EO, ETD, EER, ER Hardware

MECHANICAL DIMENSIONS									
PART	ITEM	CORE SIZE	FIG.		F	G	H	THREAD	MATERIAL
00C09061A	Clamp	40906EC	7	mm in	- -	- -	- -	-	-
00C343416	Clamp (2 required per set)	43434EC	4	mm in	- -	- -	- -	-	Stainless Steel
0AC351717	U Bolt		3	mm in	- -	- -	- -	#3-48-2A	Brass
0BC351740	Plate	43517EC	2	mm in	2.6416 0.104	2.6416 0.104	1.016 0.040		Aluminum
0CC351700	Nut (2 required)		-	-	-	-	-		-
00C393916	Clamp (2 required per set)	43939EC		mm in	- -	- -	- -	-	Stainless Steel
0AC411919	U Bolt		1	mm in	- -	- -	- -	#4-40-2A	Brass
0BC411940	Plate	44119EC	2	mm in	3.048 0.120	3.048 0.120	1.016 0.040		Aluminum
0CC411900	Nut (2 required)		-	-	-	-	-		-

FIGURE 4

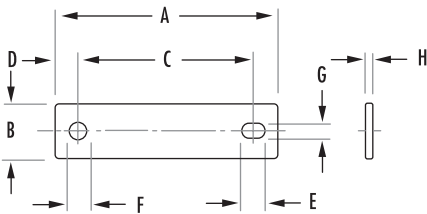
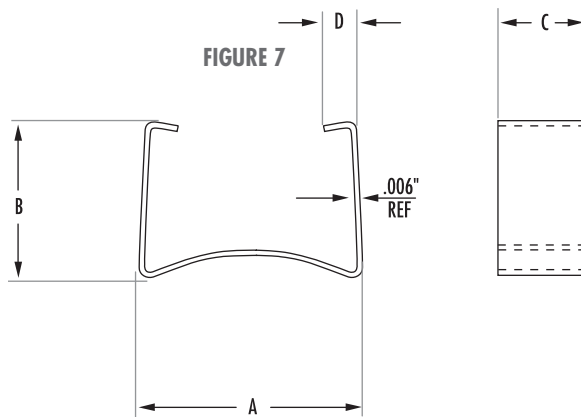


FIGURE 7



Mounting Clamps (con't)

MECHANICAL DIMENSIONS									
PART	ITEM	CORE SIZE	FIG.		A	B	C	D	E
00C444416	Clamp (2 required per set)	44444EC	4	mm	28.6766	14.9098	49.657	-	-
				in	1.129	0.587	1.955	-	-
00C494916	Clamp (2 required per set)	44949EC	4	mm	30.8864	16.383	54.61	-	-
				in	1.216	0.645	2.15	-	-
0AC522423	U Bolt		3	mm	48.895	57.15	2.921	15.24	-
				in	1.925	2.25	0.115	0.600	-
0BC522440	Plate	45224EC	2	mm	59.69	12.70	48.1076	5.9182	5.715
				in	2.350	0.500	1.894	0.233	0.225
0CC522400	Nut (2 required)		-	-	-	-	-	-	-
00C595916	Clamp (2 required per set)	45959EC	5	mm	12.9032	22.098	65.405	-	-
				in	0.508	0.87	2.575	-	-
0AC703531	U Bolt		3	mm	65.405	78.74	2.921	15.24	-
				in	2.575	3.100	0.115	0.600	-
0BC703540	Plate	47035EC	4	mm	76.962	15.875	64.6938	6.2738	5.715
				in	3.03	0.625	2.547	0.247	0.225
00C522400	Nut		-	-	-	-	-	-	-

FIGURE 2

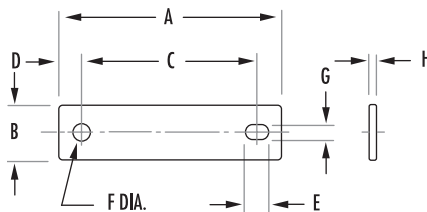
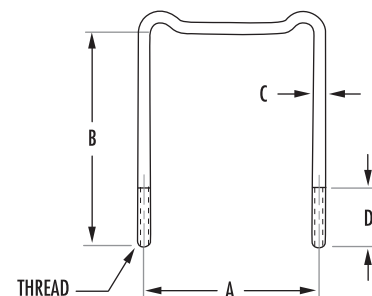


FIGURE 3



Mounting Clamps (con't)

MECHANICAL DIMENSIONS									
PART	ITEM	CORE SIZE	FIG.		F	G	H	THREAD	MATERIAL
00C444416	Clamp (2 required per set)	44444EC	4	mm in	- -	- -	- -	-	Stainless Steel
00C494916	Clamp (2 required per set)	44949EC	4	mm in	- -	- -	- -	-	Stainless Steel
0AC522423	U Bolt		3	mm in	- -	- -	- -	#6-32-2A	Brass
0BC522440	Plate	45224EC	2	mm in	3.6576 0.144	3.6576 0.144	1.016 0.040	-	Aluminum
0CC522400	Nut (2 required)		-	-	-	-	-	-	-
00C595916	Clamp (2 required per set)	45959EC	5	mm in	- -	- -	- -	-	Stainless Steel
0AC703531	U Bolt		3	mm in	- -	- -	- -	#6-32-2A	Brass
0BC703540	Plate	47035EC	4	mm in	5.715 0.225	3.6576 0.144	1.016 0.04	-	Aluminum
00C522400	Nut		-	-	-	-	-	-	-

FIGURE 4

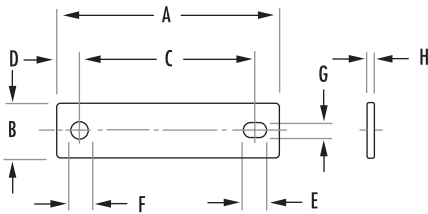
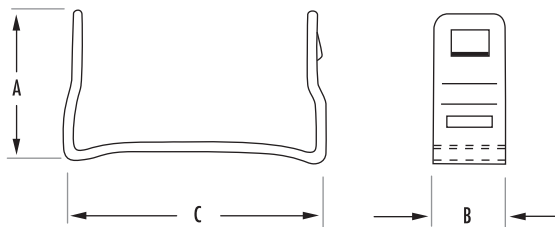


FIGURE 5



Surface Mount Bobbin

PART	CORE SIZE	FIG.	MECHANICAL DIMENSIONS											NOMINAL WINDING AREA PER SECTION		AVERAGE LENGTH OF TURN FT
			A NOM	B NOM	C MAX	D MIN	E NOM	F MAX	G MAX	H NOM	J TYP	K NOM	in ²	cm ²		
SMB09068A	40906EC	1	mm	8.509	8.102	4.55	3.505	2.159	7.391	2.997	4.292	2.006	11.557	.0047	.030	.06
			in	.335	.319	.179	.138	.085	.291	.118	1.69	.079	.455			

FIGURE 1

