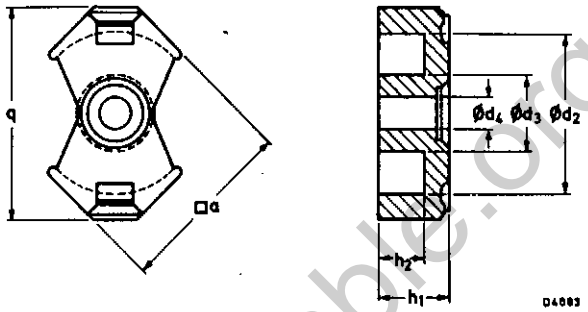
FERROXCUBE
RM TRANSFORMER CORES
for printed wiring applications

RM7
FX3434
FX3439

QUICK REFERENCE DATA		
Ferroxcube grade	A13	A8
Minimum inductance factor (A_L)	2230nH	4200nH
Type number	FX3434	FX3439

DIMENSIONS (millimetres)

Cores



Tol	a	q	d_2	d_3	d_4	h_1	h_2
Max	17.2	20.3	15.36	7.23	-	6.75	4.4
Min	16.5	19.5	14.76	6.97	2.85	6.65	4.2

EFFECTIVE PARAMETERS

For calculating the magnetic properties of a pair of cores, the following parameters should be used:

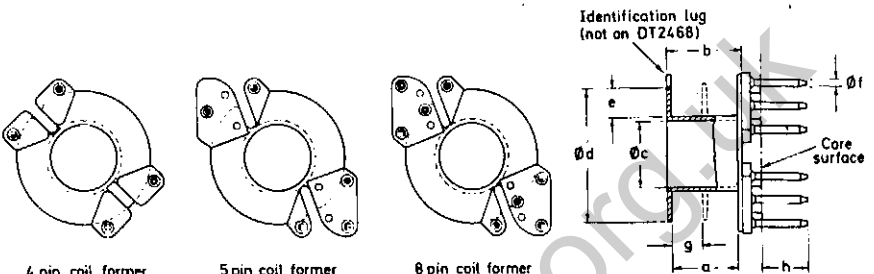
Parameter	Symbol	Value
Effective magnetic path length	ℓ_e	29.6 mm
Effective area of magnetic path	A_e	40.3 mm^2
Effective magnetic volume	V_e	1190 mm^3
$\sum \frac{\ell}{A}$	C_1	0.734mm^{-1}

ACCESSORIES

Coil formers

Winding data for these coil formers may be obtained from the winding tables on pages 4 and 5, by using the following multiplication factor:

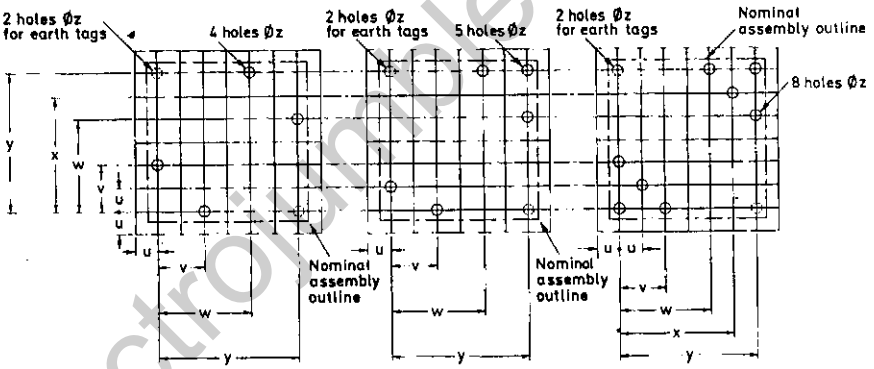
Type No.	Multiplication factor
DT2391, DT2392, DT2468	0.98
DT2522, DT2523	0.91



4 pin coil former
1 section
DT2468

5 pin coil former
1 section DT2391*
2 section DT2522*

8 pin coil former
1 section DT2392
2 section DT2523



4 pin position gauge
2.54mm (0.1in) p.w. grid

5 pin position gauge
2.54mm (0.1in) p.w. grid

8 pin position gauge
2.54mm (0.1in) p.w. grid

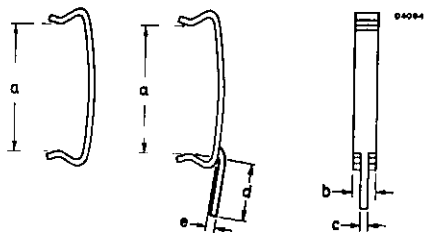
D3789a

* Available for current production, not intended for new designs

Tol	Dimensions (millimetres)													
	a	b	c	d	e	f	g	u	v	w	x	y	z	h†
Max	-	8.4	-	14.66	-	0.83	-	2.553	5.093	10.173	12.713	15.253	-	5.75
Min	7.2	-	7.3	-	3.05	-	3.32	2.527	5.067	10.147	12.687	15.227	1.2	4.95

†For DT2522 and DT2523, h max. 4.8, min. 3.8.
For DT2468, h max. 5.55, min. 4.75

Retaining clips (2 required per transformer)



DT2387 DT2487

Material: Spring steel (0.417mm thick) hot-dip tin with BS219 grade K solder thickness 0.005mm minimum average.

Tol	Dimensions (millimetres)				
	a	b	c	d	e
Max	10.8	2.6	0.6	4.7	0.5
Min	10.5	2.4	0.5	4.3	0.3

The winding tables have been calculated for a fully wound coil former. Multiplication factors referring to individual coil formers are given on page 2.

Enamelled copper wire to metric units in accordance with BS 4520 Part 1 (grade 1 covering)

d conductor diameter (mm)	d^4 (mm^4)	overall diameter		number of turns		resistance	
		nominal (mm)	maximum (mm)	typical (N_t)	minimum (N_m)	of N_t (Ω)	of N_m (Ω)
0.025	3.91×10^{-7}	0.0285	0.0310	24100	17100	29900	21300
0.032	1.05×10^{-6}	0.0355	0.0380	15500	11400	13400	9820
0.040	2.56×10^{-6}	0.0460	0.0500	9350	6670	4530	3230
0.050	6.25×10^{-6}	0.0575	0.0620	5990	4340	1860	1340
0.063	1.58×10^{-5}	0.0730	0.0780	3760	2770	735	541
0.071	2.54×10^{-5}	0.0820	0.0880	3010	2200	463	339
0.080	4.10×10^{-5}	0.0920	0.0920	2420	1800	293	218
0.090	6.56×10^{-5}	0.104	0.110	1910	1430	183	136
0.100	1.00×10^{-4}	0.115	0.121	1580	1190	122	92.3
0.112	1.57×10^{-4}	0.128	0.134	1270	971	78.7	60.0
0.125	2.44×10^{-4}	0.142	0.149	1040	794	51.5	39.4
0.140	3.84×10^{-4}	0.159	0.166	837	647	33.1	25.6
0.160	6.55×10^{-4}	0.180	0.187	660	515	20.0	15.6
0.180	1.05×10^{-3}	0.202	0.209	527	412	12.6	9.86
0.200	1.60×10^{-3}	0.223	0.230	437	344	8.47	6.67
0.224	2.52×10^{-3}	0.248	0.256	351	277	5.42	4.28
0.250	3.91×10^{-3}	0.275	0.284	289	228	3.58	2.83
0.280	6.15×10^{-3}	0.306	0.315	233	185	2.30	1.83
0.315	9.85×10^{-3}	0.343	0.352	184	147	1.44	1.15
0.355	1.59×10^{-2}	0.385	0.395	144	115	0.886	0.707

Enamelled copper wire to metric units in accordance with BS 4520 Part 1 (grade 1 covering)

d conductor diameter (mm)	d^4 (mm^4)	overall diameter		number of turns		resistance	
		nominal (mm)	maximum (mm)	typical (N_t)	minimum (N_m)	of N_t (Ω)	of N_m (Ω)
0.400	2.56×10^{-2}	0.431	0.442	115	92	0.557	0.446
0.450	4.10×10^{-2}	0.484	0.495	90	72	0.344	0.276
0.500	6.25×10^{-2}	0.536	0.548	73	59	0.226	0.183
0.560	9.83×10^{-2}	0.598	0.611	59	47	0.146	0.116
0.630	1.58×10^{-1}	0.670	0.684	46	37	0.0898	0.0723
0.710	2.54×10^{-1}	0.752	0.767	37	29	0.0569	0.0446
0.750	3.16×10^{-1}	0.793	0.809	33	26	0.0455	0.0358
0.800	4.10×10^{-1}	0.845	0.861	29	23	0.0351	0.0279
0.850	5.22×10^{-1}	0.896	0.913	26	21	0.0279	0.0225
0.900	6.56×10^{-1}	0.947	0.965	23	21	0.0220	0.0201
0.950	8.15×10^{-1}	0.998	1.02	20	14	0.0172	0.0120
1.00	1.00	1.05	1.07	14	12	0.0109	0.00930
1.06	1.26	1.11	1.13	12	12	0.00828	0.00828
1.12	1.57	1.17	1.19	12	12	0.00742	0.00742
1.18	1.94	1.23	1.25	12	10	0.00668	0.00557
1.25	2.44	1.30	1.33	10	10	0.00496	0.00496
1.32	3.04	1.37	1.40	10	10	0.00445	0.00445
1.40	3.84	1.45	1.48	10	4	0.00395	0.00158
1.50	5.06	1.56	1.58	4	4	0.00138	0.00138
1.60	6.55	1.66	1.68	4	4	0.00121	0.00121

Parameter (measured at 25°C)		Symbol	Frequency (kHz)	Value	
				FX3434 (A13)	FX3439 (A8)
Inductance factor (L nH for 1 turn)		A_L	<10	>2230	5600 ± 25%
Effective permeability		μ_e	<10	>1300	2450 to 4090
Turns factor (turns for 1mH)		α	<10	<21.2	15.7 to 12.2
Residual plus eddy current core loss factor		$\frac{\tan \delta_{r+F}}{\mu_e}$	100	$<12 \times 10^{-6}$	$<20 \times 10^{-6}$
			500	-	$<200 \times 10^{-6}$
Hysteresis loss factor at $\hat{B}_e$ = 3mT (note 3)		$\frac{\tan \delta_h}{\mu_e}$	4	$<4.6 \times 10^{-6}$	$<4.2 \times 10^{-6}$
Parallel resistance factor (Ω for 1 turn)		R_p/N^2	100	>89.6	>53.8
			500	-	>26.9
Temperature factor in ppm per deg C	5 to 25°C	α_F	<100	0 to 3	0 to 2.5
	25 to 55°C				
	25 to 70°C				

Notes:

(1) Except for hysteresis loss factor, the above parameters are measured at an effective flux density of $\hat{B}_e$ <0.1mT.

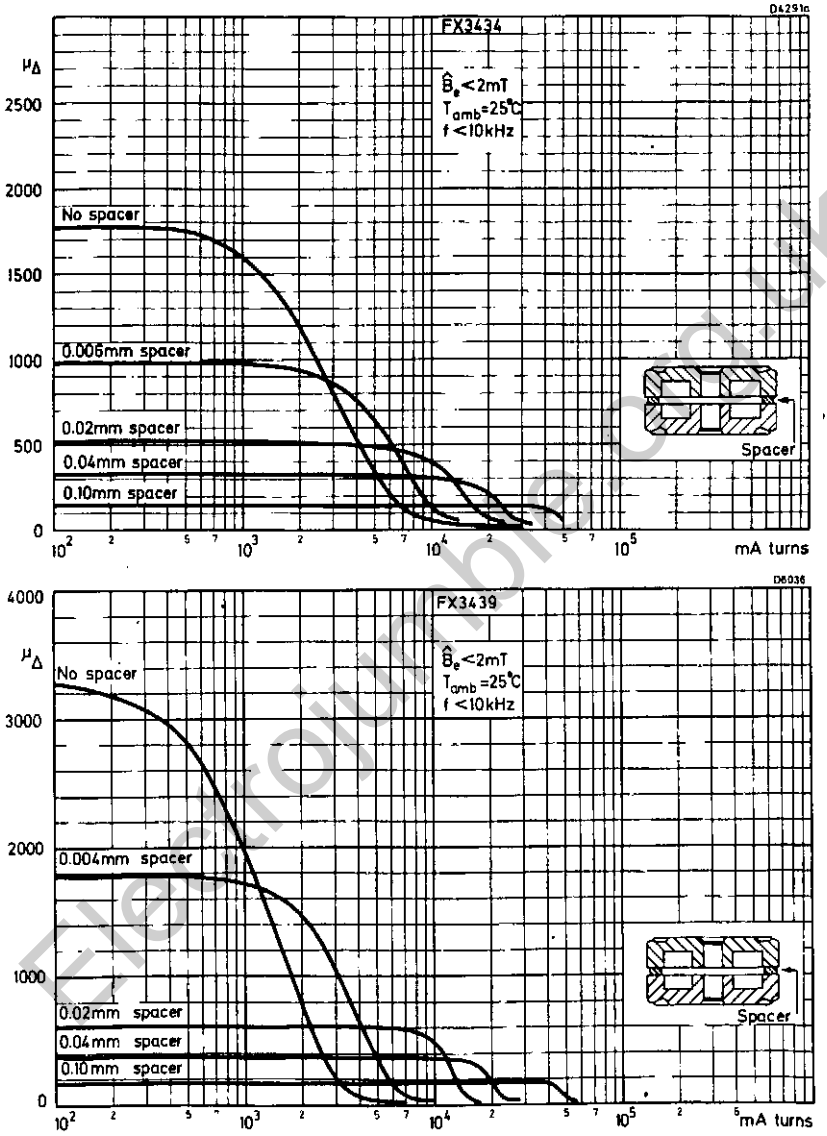
(2) Hysteresis loss factor, $F_h = \frac{2\pi \tan \delta_h}{I\sqrt{L}}$

where I = r.m.s. current in amperes, and L = inductance in henrys.

(3) Tan δ_h/μ_e is determined from measurements at 1.5 and 3mT.

(4) For material properties see data sheet LINEAR FERRITE MATERIALS.

(5) Measured with a clamping force of 44 newtons.



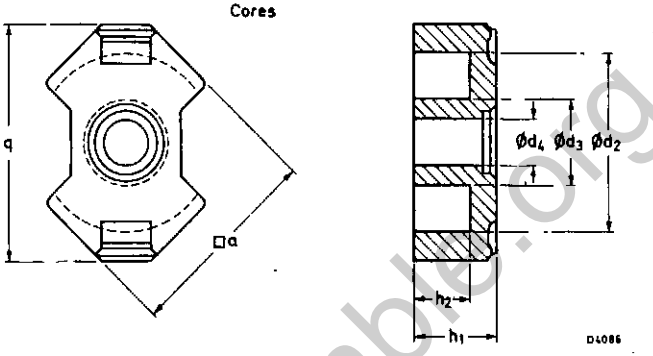
INCREMENTAL PERMEABILITY AS A FUNCTION OF MILLIAMPERE TURNS WITH SPACER THICKNESS AS A PARAMETER

FERROXCUBE
RM TRANSFORMER CORES
for printed wiring applications

RM8
FX3435
FX3440

QUICK REFERENCE DATA		
Ferroxcube grade	A13	A8
Minimum inductance factor (A_L)	2400nH	4725nH
Type number	FX3435	FX3440

DIMENSIONS (millimetres)



Tol	a	q	d_2	d_3	d_4	h_1	h_2
Max	19.7	23.2	17.6	8.55	-	8.25	5.6
Min	19.0	22.3	17.0	8.25	4.23	8.15	5.4

EFFECTIVE PARAMETERS

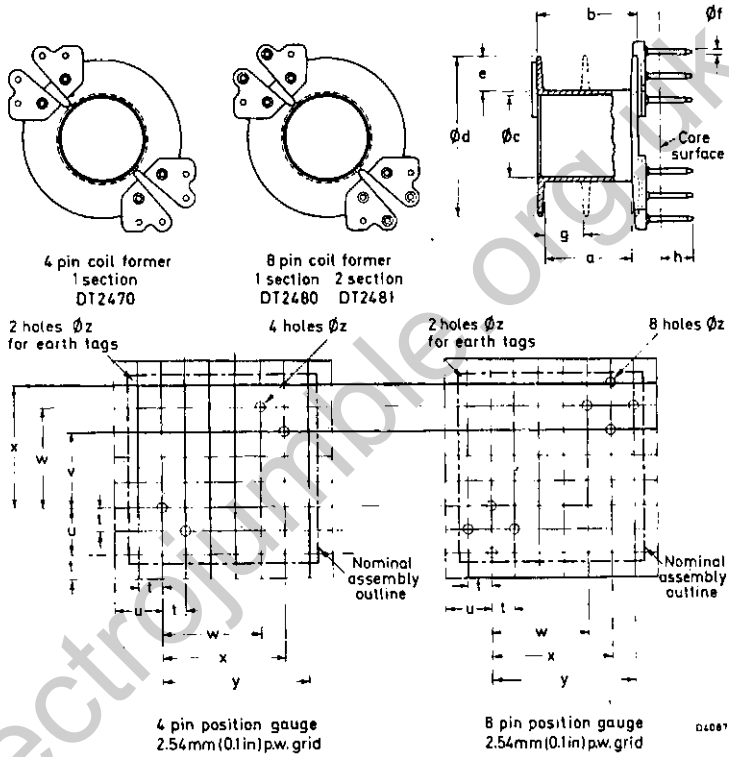
For calculating the magnetic properties of a pair of cores, the following parameters should be used:

Parameter	Symbol	Value
Effective magnetic path length	ℓ_e	35.5 mm
Effective area of magnetic path	A_e	52.0 mm^2
Effective magnetic volume	V_e	1850 mm^3
$\sum \frac{\ell}{A}$	C_1	0.682mm^{-1}

Coil formers

- Winding data for these coil formers may be obtained from the winding tables on pages 4 and 5, by using the following multiplication factor:

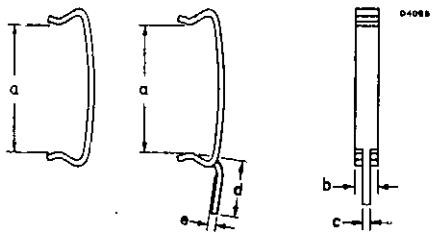
Type No.	Multiplication factor
DT2470, DT2480	0.960
DT2481	0.909



Dimensions (millimetres)							
Tol	a	b	c	d	e	f	g
Max	-	10.6	-	16.9	-	0.62	-
Min	9.1	-	8.7	-	3.4	-	4.25

Tol	t	u	v	w	x	y	z	h
Max	2.553	5.093	7.633	10.173	12.713	15.253	-	5.55
Min	2.527	5.067	7.607	10.147	12.687	15.227	1.0	4.75

Retaining clips (2 required per transformer)



DT2396 DT2496

Material: Spring steel (0.457mm thick) hot-dip tin with BS219 grade K solder thickness 0.005mm minimum average.

Tol	Dimensions (millimetres)				
	a	b	c	d	e
Max	13.75	3.6	0.6	4.7	0.85
Min	13.45	3.4	0.5	4.3	0.65

The winding tables have been calculated for a fully wound coil former. Multiplication factors referring to individual coil formers are given on page 2.

Enamelled copper wire to metric units in accordance with BS 4520 Part 1 (grade 1 covering)

d conductor diameter (mm)	d^4 (mm^4)	overall diameter		number of turns		resistance	
		nominal (mm)	maximum (mm)	typical (N_t)	minimum (N_m)	of N_t (Ω)	of N_m (Ω)
0.025	3.91×10^{-7}	0.0285	0.0310	34400	24600	49200	35200
0.032	1.05×10^{-6}	0.0355	0.0380	22200	16400	22000	16200
0.040	2.56×10^{-6}	0.0460	0.0500	13400	9570	7450	5340
0.050	6.25×10^{-6}	0.0575	0.0620	8550	6220	3050	2220
0.063	1.58×10^{-5}	0.0730	0.0780	5370	3980	1210	895
0.071	2.54×10^{-5}	0.0820	0.0880	4300	3160	762	560
0.080	4.10×10^{-5}	0.0920	0.0980	3460	2580	482	360
0.090	6.56×10^{-5}	0.104	0.110	2730	2050	301	226
0.100	1.00×10^{-4}	0.115	0.121	2260	1710	201	153
0.112	1.57×10^{-4}	0.128	0.134	1820	1390	129	99.2
0.125	2.44×10^{-4}	0.142	0.149	1480	1140	84.7	65.2
0.140	3.84×10^{-4}	0.159	0.166	1200	928	54.4	42.3
0.160	6.55×10^{-4}	0.180	0.187	943	739	32.9	25.8
0.180	1.05×10^{-3}	0.202	0.209	752	592	20.7	16.3
0.200	1.60×10^{-3}	0.223	0.230	623	494	13.9	11.0
0.224	2.52×10^{-3}	0.248	0.256	502	399	8.93	7.10
0.250	3.91×10^{-3}	0.275	0.284	412	327	5.89	4.67
0.280	6.15×10^{-3}	0.306	0.315	333	266	3.79	3.03
0.315	9.85×10^{-3}	0.343	0.352	263	211	2.37	1.90
0.355	1.59×10^{-2}	0.385	0.395	206	165	1.46	1.17

Enamelled copper wire to metric units in accordance with BS4520 Part 1 (grade 1 covering)

d conductor diameter (mm)	d^4 (mm^4)	overall diameter		number of turns		resistance	
		nominal (mm)	maximum (mm)	typical (N_t)	minimum (N_m)	of N_t (Ω)	of N_m (Ω)
0.400	2.56×10^{-2}	0.431	0.442	164	132	0.915	0.737
0.450	4.10×10^{-2}	0.484	0.495	129	104	0.569	0.459
0.500	6.25×10^{-2}	0.536	0.548	105	85	0.375	0.304
0.560	9.83×10^{-2}	0.598	0.611	84	68	0.239	0.194
0.630	1.58×10^{-1}	0.670	0.684	66	54	0.149	0.122
0.710	2.54×10^{-1}	0.752	0.767	52	43	0.0921	0.0762
0.750	3.16×10^{-1}	0.793	0.809	47	38	0.0746	0.0603
0.800	4.10×10^{-1}	0.845	0.861	41	34	0.0572	0.0474
0.850	5.22×10^{-1}	0.896	0.913	37	30	0.0457	0.0371
0.900	6.56×10^{-1}	0.947	0.965	33	27	0.0364	0.0298
0.950	8.15×10^{-1}	0.998	1.02	29	24	0.0287	0.0237
1.00	1.00	1.05	1.07	26	21	0.0232	0.0188
1.06	1.26	1.11	1.13	24	16	0.0191	0.0127
1.12	1.57	1.17	1.19	21	16	0.0150	0.0114
1.18	1.94	1.23	1.25	14	14	0.00898	0.00898
1.25	2.44	1.30	1.33	14	14	0.00800	0.00800
1.32	3.04	1.37	1.40	14	12	0.00718	0.00615
1.40	3.84	1.45	1.48	12	12	0.00547	0.00547
1.50	5.06	1.56	1.58	12	12	0.00476	0.00476
1.60	6.55	1.66	1.68	10	5	0.00349	0.00174

ELECTRICAL AND MAGNETIC DESIGN DATA FOR A PAIR OF CORES

Parameter (measured at 25°C)		Symbol	Frequency (kHz)	Value	
				FX3435 (A13)	FX3440 (A8)
Inductance factor (L nH for 1 turn)		A_L	<10	>2400	6300 ± 25%
Effective permeability		μ_e	<10	>1300	2565 to 4275
Turns factor (turns for 1mH)		α	<10	<20.4	14.5 to 11.3
Residual plus eddy current core loss factor		$\frac{\tan \delta_{r+F}}{\mu_e}$	100	$<14 \times 10^{-6}$	$<20 \times 10^{-6}$
			500	-	$<200 \times 10^{-6}$
Hysteresis loss factor at $\hat{B}_e$ = 3mT (note 3)		$\frac{\tan \delta_h}{\mu_e}$	4	$<4.6 \times 10^{-6}$	$<4.2 \times 10^{-6}$
Parallel resistance factor (Ω for 1 turn)		R_p/N^2	100	>82.7	>57.9
			500	-	>29.0
Temperature factor in ppm per deg C	5 to 25°C	α_F	<100	0 to 3	0 to 2.5
	25 to 55°C				
	25 to 70°C				

Notes:

(1) Except for hysteresis loss factor, the above parameters are measured at an effective flux density of $\hat{B}_e$ <0.1mT.

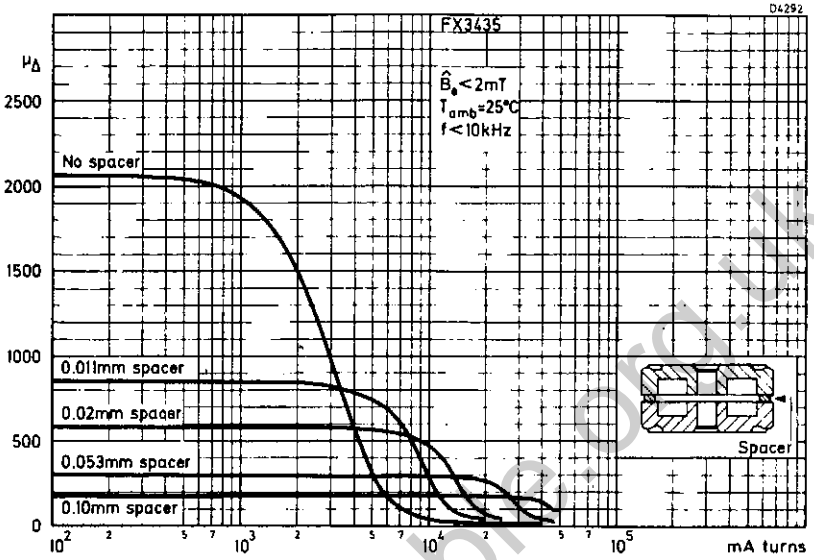
(2) Hysteresis loss factor, $F_h = \frac{2\pi \tan \delta_h}{I\sqrt{L}}$

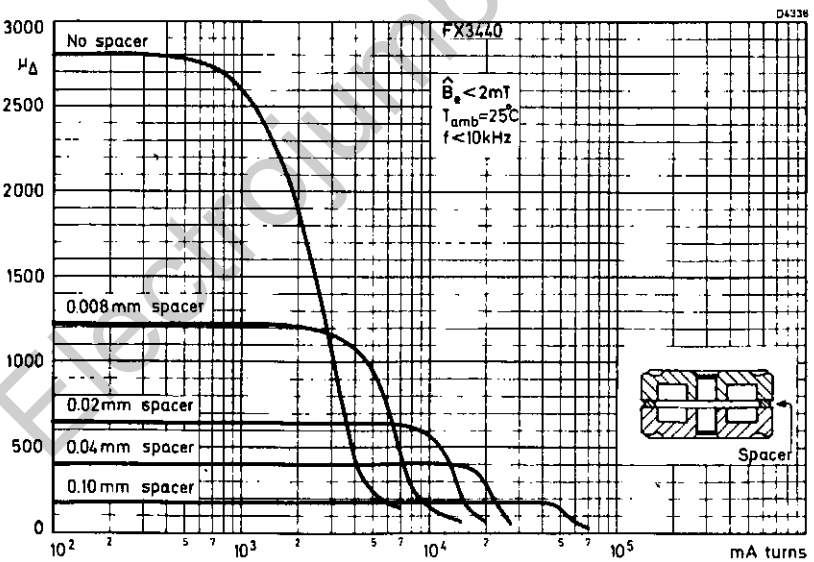
where I = r.m.s. current in amperes, and L = inductance in henrys.

(3) Tan δ_h/μ_e is determined from measurements at 1.5 and 3mT.

(4) For material properties see data sheet LINEAR FERRITE MATERIALS.

(5) Measured with a clamping force of 44 newtons.





INCREMENTAL PERMEABILITY AS A FUNCTION OF MILLIAMPERE TURNS WITH SPACER THICKNESS AS A PARAMETER

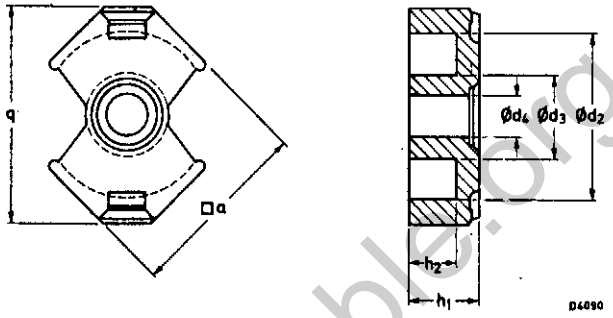
FERROXCUBE
RM TRANSFORMER CORES
for printed wiring applications

RM10
FX3436
FX3441

QUICK REFERENCE DATA		
Ferroxcube grade	A13	A8
Minimum inductance factor (A_L)	3260nH	6450nH
Type number	FX3436	FX3441

DIMENSIONS (millimetres)

Cores



Tol	a	q	d_2	d_3	d_4	h_1	h_2
Max	24.60	28.46	22.05	10.90	-	9.35	6.4
Min	23.64	27.34	21.19	10.52	5.09	9.25	6.2

EFFECTIVE PARAMETERS

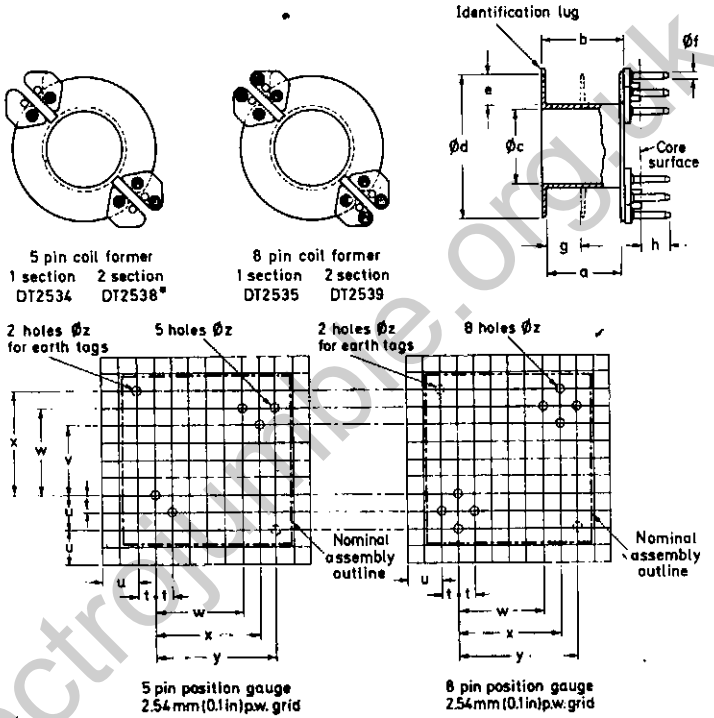
For calculating the magnetic properties of a pair of cores, the following parameters should be used:

Parameter	Symbol	Value
Effective magnetic path length	ℓ_e	41.7 mm
Effective area of magnetic path	A_e	83.2 mm^2
Effective magnetic volume	V_e	3470 mm^3
$\sum \frac{\ell}{A}$	C_1	0.501mm^{-1}

Coil formers

Winding data for these coil formers may be obtained from the winding tables on pages 4 and 5, by using the following multiplication factors:

Type No.	Multiplication factor
DT2534, DT2535	1.0
DT2538, DT2539	0.95

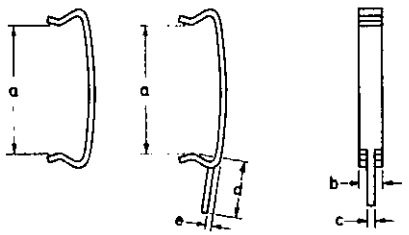


*Available for current production, not intended for new designs

Dimensions (millimetres)						
Tol	a	b	c	d	e	f
Max	-	12.4	-	21.09	-	0.83
Min	11	-	11	-	4.24	-

Tol	g	t	u	v	w	x	y	z	h
Max	-	2.553	5.093	10.173	12.713	15.253	17.793	-	5.15
Min	5.2	2.527	5.067	10.147	12.687	15.227	17.767	1.2	4.35

Retaining clips (2 required per transformer)



DT2408 DT2506 D6034

Material: Spring steel (0.457mm thick) hot-dip tin with BS219 grade K solder thickness 0.005mm minimum average.

Tol	Dimensions (millimetres)				
	a	b	c	d	e
Max	15.55	4.6	0.6	5.7	0.2
Min	15.25	4.4	0.5	5.3	-

The winding tables have been calculated for a fully wound coil former. Multiplication factors referring to individual coil formers are given on page 2.

Enamelled copper wire to metric units in accordance with BS4520 Part 1 (grade 1 covering)

d conductor diameter (mm)	d^4 (mm^4)	overall diameter nominal (mm)	overall diameter maximum (mm)	number of turns typical (N_t)	number of turns minimum (N_m)	resistance of N_t (Ω)	resistance of N_m (Ω)
0.025	3.91×10^{-7}	0.0285	0.0310	50200	36300	90900	65800
0.032	1.05×10^{-6}	0.0355	0.0380	32300	24200	40700	30400
0.040	2.56×10^{-6}	0.0460	0.0500	19500	14100	13800	9990
0.050	6.25×10^{-6}	0.0575	0.0620	12500	9180	5650	4160
0.063	1.58×10^{-5}	0.0730	0.0780	7830	5870	2230	1670
0.071	2.54×10^{-5}	0.0820	0.0880	6270	4660	1410	1050
0.080	4.10×10^{-5}	0.0920	0.0980	5040	3800	891	673
0.090	6.56×10^{-5}	0.104	0.110	3980	3020	556	422
0.100	1.00×10^{-4}	0.115	0.121	3290	2520	372	286
0.112	1.57×10^{-4}	0.128	0.134	2650	2060	239	186
0.125	2.44×10^{-4}	0.142	0.149	2160	1680	157	122
0.140	3.84×10^{-4}	0.159	0.166	1740	1370	101	79.2
0.160	6.55×10^{-4}	0.180	0.187	1370	1090	60.8	48.3
0.180	1.05×10^{-3}	0.202	0.209	1100	873	38.3	30.5
0.200	1.60×10^{-3}	0.223	0.230	909	729	25.7	20.6
0.224	2.52×10^{-3}	0.248	0.256	731	588	16.5	13.3
0.250	3.91×10^{-3}	0.275	0.284	601	483	10.9	8.75
0.280	6.15×10^{-3}	0.306	0.315	485	392	7.01	5.66
0.315	9.85×10^{-3}	0.343	0.352	383	311	4.37	3.55
0.355	1.59×10^{-2}	0.385	0.395	300	244	2.70	2.19

Enamelled copper wire to metric units in accordance with BS 4520 Part 1 (grade 1 covering)

d conductor diameter (mm)	d^4 (mm^4)	overall diameter		number of turns		resistance	
		nominal (mm)	maximum (mm)	typical (N_t)	minimum (N_m)	of N_t (Ω)	of N_m (Ω)
0.400	2.56×10^{-2}	0.431	0.442	239	195	1.69	1.38
0.450	4.10×10^{-2}	0.484	0.495	188	154	1.05	0.861
0.500	6.25×10^{-2}	0.536	0.548	153	125	0.693	0.566
0.560	9.83×10^{-2}	0.598	0.611	123	101	0.444	0.365
0.630	1.58×10^{-1}	0.670	0.684	97	79	0.277	0.225
0.710	2.54×10^{-1}	0.752	0.767	77	63	0.173	0.142
0.750	3.16×10^{-1}	0.793	0.809	69	57	0.139	0.115
0.800	4.10×10^{-1}	0.845	0.861	61	50	0.108	0.0885
0.850	5.22×10^{-1}	0.896	0.913	54	44	0.0847	0.0690
0.900	6.56×10^{-1}	0.947	0.965	48	40	0.0671	0.0559
0.950	8.15×10^{-1}	0.998	1.02	43	35	0.0540	0.0439
1.00	1.00	1.05	1.07	39	32	0.0442	0.0362
1.06	1.26	1.11	1.13	35	28	0.0353	0.0282
1.12	1.57	1.17	1.19	31	25	0.0280	0.0226
1.18	1.94	1.23	1.25	28	23	0.0228	0.0187
1.25	2.44	1.30	1.33	25	21	0.0181	0.0152
1.32	3.04	1.37	1.40	22	14	0.0143	0.00910
1.40	3.84	1.45	1.48	20	14	0.0116	0.00809
1.50	5.06	1.56	1.58	14	12	0.00705	0.00604
1.60	6.55	1.66	1.68	12	12	0.00531	0.00531

Parameter (measured at 25°C)		Symbol	Frequency (kHz)	Value	
				FX3436 (A13)	FX3441 (A8)
Inductance factor (L nH for 1 turn)		A_L	<10	>3260	8600 ± 25%
Effective permeability		μ_e	<10	>1300	2570 to 4280
Turns factor (turns for 1mH)		α	<10	<17.5	12.5 to 9.6
Residual plus eddy current core loss factor		$\frac{\tan \delta_r + F}{\mu_e}$	100	$<16 \times 10^{-6}$	$<20 \times 10^{-6}$
			500	-	$<200 \times 10^{-6}$
Hysteresis loss factor at $\hat{B}_e$ = 3mT (note 3)		$\frac{\tan \delta_h}{\mu_e}$	4	$<4.6 \times 10^{-6}$	$<4.2 \times 10^{-6}$
Parallel resistance factor (Ω for 1 turn)		R_p/N^2	100	>98.5	>78.8
			500	-	>39.4
Temperature factor in ppm per deg C	5 to 25°C	α_F	<100	0 to 3	0 to 2.5
	25 to 55°C				
	25 to 70°C				

Notes:

(1) Except for hysteresis loss factor, the above parameters are measured at an effective flux density of $\hat{B}_e$ <0.1mT.

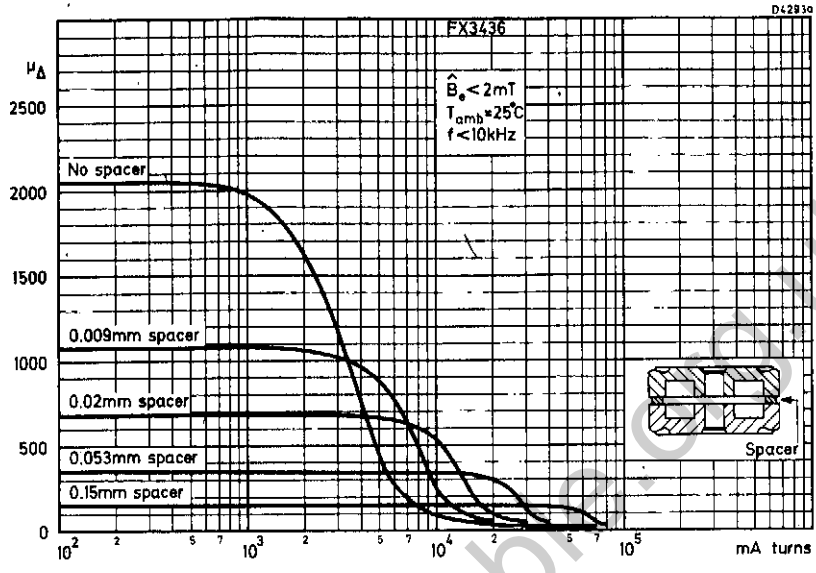
(2) Hysteresis loss factor, $F_h = \frac{2\pi \tan \delta_h}{I\sqrt{L}}$

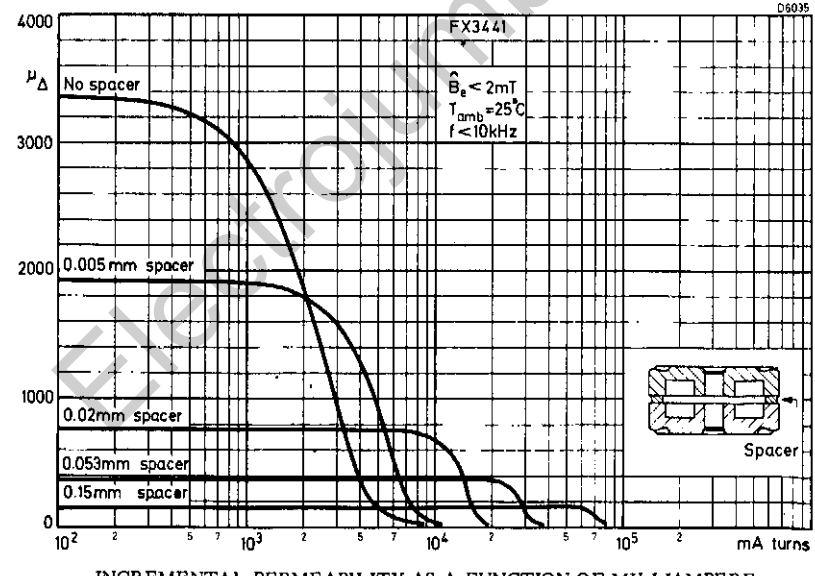
where I = r.m.s. current in amperes, and L = inductance in henrys.

(3) Tan δ_h/μ_e is determined from measurements at 1.5 and 3mT.

(4) For material properties see data sheet LINEAR FERRITE MATERIALS.

(5) Measured with a clamping force of 44 newtons.





INCREMENTAL PERMEABILITY AS A FUNCTION OF MILLIAMPERE TURNS WITH SPACER THICKNESS AS A PARAMETER