TOROID : FT,T & BALUN

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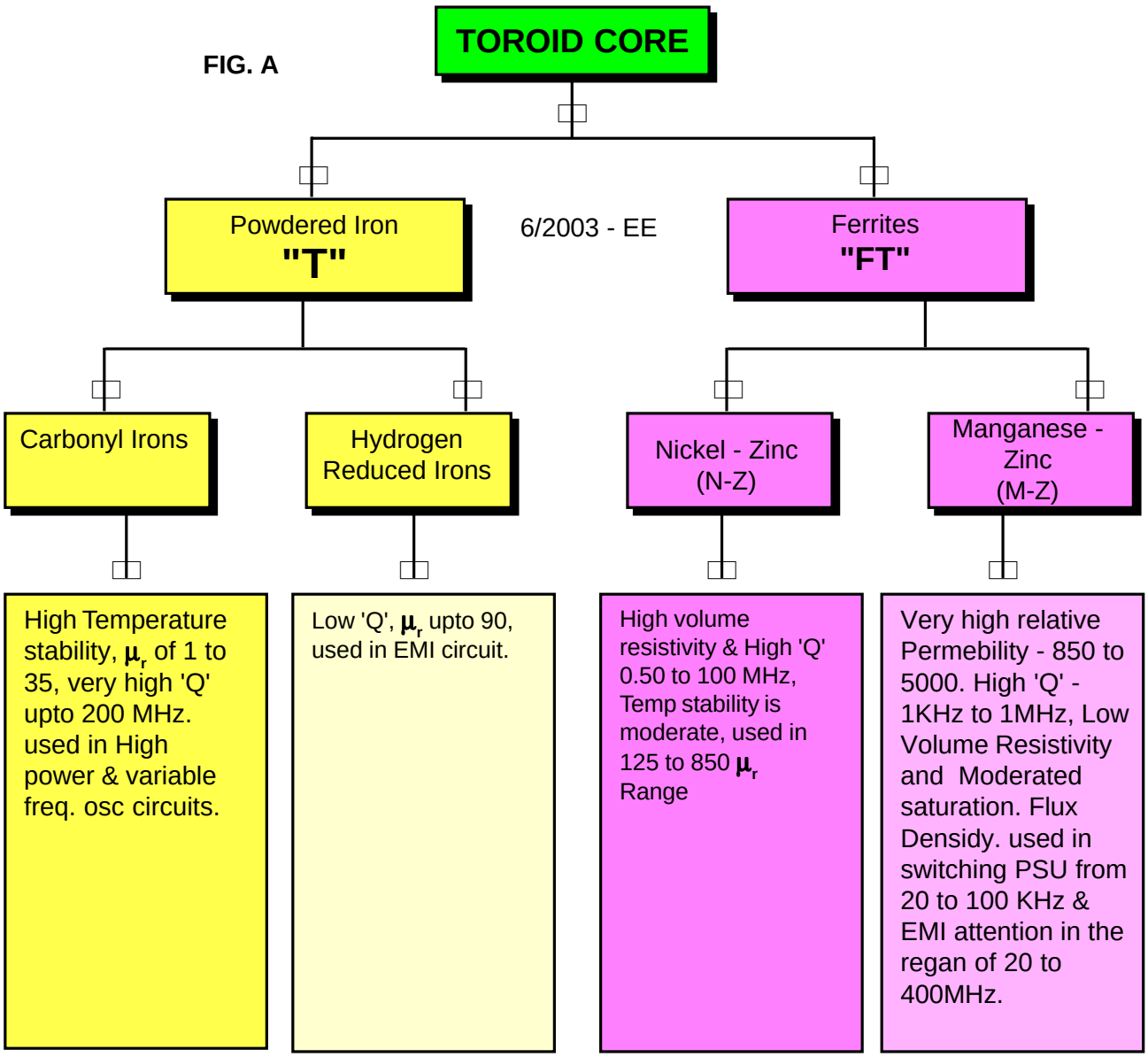
The Toroidal cores are grouped into two types. (a) powdered Iron and (b) Ferrites. The Ferrite materials are based on "**Nickel-Zinc**" and "**Manganese-Zinc**". Powdered Iron are based on " **Carbonyl Irons**" and "**Hydrogen Reduced Irons**". See fig.'A' general classes and its subdivisions. Powdered Iron Types are designated by "T" and Ferrite Types are designated by FT. The Type Number for this are like T - YY - XX or FT - YY - XX. So this are in three elements **1st classes of material** 2nd (YY) **Approximation of the outside diameter** (OD) 3rd it indicates the **Type of Mixture of Material**. Eg : FT50-61. ie., FT for "Ferrite", "50" for OD-0.50 inch (12.7mm) and The "61" for mixture No.2. Ref fig."B"

FIG. A



μ_r = Relative permeability
A_L = Value which relates Inductance per 100 or 1000 turns of wire

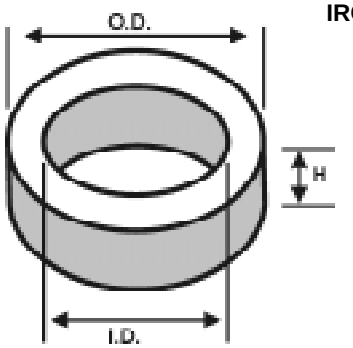
FIG-B

FT - 50 - 43

FERRITE | OD | MIXTURE

T - 68 - 2

POWDERED IRON | OD | MIXTURE COLOUR CODE "Red"



POWDERED IRON CORE DATA

(Carbonyl Irons & Hydrogen Reduced Irons)

(1) Table : 1a - Powdered Iron Core "T-YY-XX"

Material	μ_r	Comments
0	1	Used up to 200 MHz. Inductance varies with method of winding.
1	20	Made of Carbonyl C. Similar to Mixture No. 3 but is more stable, and has a higher volume resistivity
2	10	Made of Carbonyl E, High Q and good volume resistivity over range of 1 to 30 MHz.
3	35	Made of Carbonyl HP, Very good stability and good Q over range of 50 kHz to 500 kHz.
6	8	Made of Carbonyl SF, is similar to mixture no.2, but has higher Q over range 20 to 50 MHz.
10	6	Type W powdered iron. Good Q and high stability from 40 to 100 MHz.
12	3	Made of synthetic oxide material. Good Q but only moderate stability over the range 50 to 100 MHz.
15	25	Made of Carbonyl GS6. Excellent stability and good Q over range 0.1 to 2 MHz. Recommended for AM BCB and VLF applications.
17	3	Carbonyl material similar to mixture no. 12, but has greater temperature stability but lower Q than no. 12.
26	75	Made of Hydrogen Reduced Iron. Has very high permeability. Used in EMI filters and DC chokes.

Table : 1b - Powdered Iron core size & A_L Values

Core size	Core material type (mix)								
	26	3	15	1	2	6	10	12	0
12	-	60	50	48	20	17	12	7	3
16	-	61	55	44	22	19	13	8	3
20	-	90	65	52	27	22	16	10	3.5
37	275	120	90	80	40	30	25	15	4.9
50	320	175	135	100	49	40	31	18	6.4
68	420	195	180	115	57	47	32	21	7.5
94	590	248	200	160	84	70	58	32	10.6
130	785	350	250	200	110	96	-	-	15
200	895	425	-	250	120	100	-	-	-

Table : 1C - Colour code of Powdered Iron core & properties

Material type	Colour code	μ_r	Frequency (MHz)
41	green	75	-
3	grey	35	0.05 - 0.5
15	red / white	25	0.1 - 2
1	blue	20	0.5 - 5
2	red	10	1 - 30
6	yellow	8	10 - 90
10	black	6	60 - 150
12	green / white	3	100 - 200
0	tan	1	150 - 300

FERRITE CORE DATA

(Nickel - Zinc & Manganese - Zinc)

Table : 2a - Ferrite Core "FT-YY-XX"

Material	μ_r	Remarks
33	850	M-Z. Used over 1 kHz to 1 MHz for loopstick antenna rods. Low volume resistivity.
43	850	N-Z. Medium wave inductors and wideband transformers to 50 MHz. High attenuation over 30 to 400 MHz. High volume resistivity
61	125	N-Z. High Q over 0.2 to 15 to 25 MHz. Moderate temperature stability. used for wideband transformers to 200 MHz.
63	40	High Q over 15 to 25 MHz. Low permeability and high volume resistivity.
67	40	N-Z, High Q operation over 10 to 80 MHz. Relatively high flux density and good temperature stability, is similar to Type 63, but has lower volume resistivity. Used in wideband transformers to 200 MHz.
68	20	N-Z, Excellent temperature stability and high Q over 80 to 180 MHz. High volume resistivity.
72	2000	High Q to 0.50 MHz, but used in EMI filters from 0.50 to 50 MHz. Low volume resistivity.
J/75	5000	Used in pulse and wideband transformers from 1 kHz to 1 MHz, and in EMI filters from 0.50 to 20 MHz. Low volume resistivity and low core losses.
77	2000	0.001 to 1 MHz. Used in wideband transformers and power converters, and in EMI and noise filters from 0.5 to 50 MHz.
F	3000	is similar to Type 77 above, but offers a higher volume resitivity, higher initial permeability, and higher flux saturation density. Used for power converters and in EMI/noisefilters from 0.50 to 50 MHz.

Table : 2b - Ferrite core size & A_L Valve

Core type no. prefix : FT-YY-XX

Core size	Material type					
	43	61	63	72	75	77
23	188	24.8	7.9	396	990	356
37	420	55.3	17.7	884	2210	796
50	523	68	22	1100	2750	990
50A	570	75	24	1200	2990	1080
50B	1140	150	48	2400	-	2160
82	557	73.3	22.8	1170	3020	1060
114	603	79.3	25.4	1270	3170	1140
114A	-	146	-	2340	-	-
240	1249	173	53	3130	6845	3130

Balun Cores

Balun No.	Typical Impedance (ohms)[1]		AL_2
	25 MHz	100MHz	
BN - 43 - 2402	-	100	1275
BN - 61 - 2402	-	88	150
BN - 73 - 2402	75	-	3750
BN - 43 - 202	-	180	2890
BN - 61 - 202	-	150	425
BN - 73 - 202	106	-	8500
BN - 43 - 3312	-	400	5400
BN - 43 - 7051	-	500	6000

* 1 : Impedance checked with single turn through 2 holes

* 2 : $nH/turn^2$