FERRITE BEADS

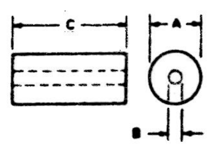
12 IN A PACKAGE

Ferrite Beads are little 'dowel-like' devices which are made from ferrite materials of various magnetic properties. They are electrically equivalent to tiny RF chokes when slipped over an electrical conductor or a component lead. They offer a simple, convenient, inexpensive, but yet a very effective method of RF shielding, RF decoupling and parasitic suppression.

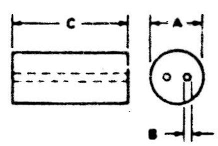
Noise is apt to be generated in various sections of a high frequency circuit and the most common suspects are power supply leads, inter-stage connections and ground connections. Conductors adjacent to components, adjacent to each other, and to the chassis can offer a convenient path for the transfer of RF energy from one circuit to another. Inductance and distributed capacitance of some conductors can support spurious oscillations in some high frequency circuits.

Part number	Bead type	Dimensions (inches)			Available materials					Price
		OD	ID	H	43	64	73	75-B	77	
FB - (- -) - 101	1	.138	.051	.118	X	X	X	X		2.00
FB - (- -) - 801	1	.295	.084	.297	X	X	X			3.00
FB - (- -) - 901	2	.250	.050	.417		X				3.50
FB - (- -) - 2401	1	.380	.197	.190	X					3.50
FB - (- -) - 5111	3	.236	.038	.394	X	X				3.50
FB - (- -) - 6301	1	.375	.194	.410					X	3.50
Complete the above part number with the addition of mix number in the space (- -) provided										

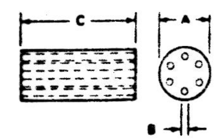
TYPE 1



TYPE 2



TYPE 3



Ferrite Beads offer little, or no impedance at the lower frequencies and at DC. As the frequency increases, the impedance will increase appreciably. See the chart below for frequency characteristics of various materials. Since the Ferrite bead operates as a bulk device, it cannot be detuned by stray capacitance. It does not have to be grounded and it can easily be added to an existing circuit simply by slipping it over the wire or component lead suspected of carrying the troublesome interference.

The point at which the attenuation will become effective will depend upon the choice of material. See chart below. The #64 material will offer the greatest impedance above 200 MHz, whereas the #43 material is best for frequencies between 50 and 200 MHz, and the #73 material is recommended for frequencies below 50 MHz. The #75-B material will give best results in the region of 10 MHz. Since the #75-B material is semi-conductive, care should be taken to keep the bead from coming into contact with any uninsulated conductor, or the chassis.

FERRITE TOROIDAL CORES

Ferrites are used extensively in the electronics field for a variety of valid reasons. The inductive magnifications resulting from their high permeability factors are employed to good advantage from Audio to UHF. The high electrical resistance, low magnetic circulatory losses and hi Mu's make them naturals for loading coils, wide-band transformers, filter circuit elements, pulse transformers and RF transformers. Where circuit criteria permit, Ferrite cores allow inductive values that are not otherwise obtainable unless the economies of space, cost and weight are ignored.

Ferrites are magnetic compounds that are formed with binders to create the desired core shapes. Iron oxide is combined with other metallic oxides to make a mix that possesses the required performance traits that the art demands. These additives usually include the oxides of Nickel, Manganese, Zinc or Magnesium. The manufacturing process results in a hard ceramic-like substance that provides the desirable qualities of physical ruggedness, high permeability factors and low eddy current losses.

FERRITE TOROIDS PHYSICAL PROPERTIES

CORE SIZE	OD	ID	Hgt	A_e	l_e	V_e	A_s	A_w	No. in Pack
FT 23	.230	120	.060	00330	529	00174	.1264	.01131	Four
FT 37	.375	187	125	.01175	846	00994	3860	02750	Four
FT 50	.500	281	188	.02060	1 190	02450	.7300	.06200	Three
FT 82	.825	520	.250	03810	2.070	07890	1.7000	21200	Three
FT 114	1 142	.748	.295	.05810	2 920	.16950	2.9200	43900	One

OD Outer diameter (inches) — A_e Effective magnetic cross sectional area $(in)^2$

ID Inner diameter (inches) — l_e Effective magnetic path length (inches)

Hgt Height (inches) — V_e Effective magnetic volume $(in)^3$

A_w Total window area $(in)^2$ — A_s Surface area exposed for cooling $(in)^2$

FERRITE TOROIDS A_L–CHART (mh/1000 t)

CORE SIZE	63-Mix u=40	61-Mix u=125	43-Mix u=950	72-Mix u=2000	75-Mix u=5000	Price
FT 23	7.9	24.8	189.0	396.0	990.0	2.05
FT 37	17.7	55.3	420.0	884.0	2210.0	2.45
FT 50	22.0	68.0	523.0	1100.0	2750.0	2.20
FT 82	23.4	73.3	557.0	1172.0	2930.0	2.65
FT 114	25.4	79.3	603.0	1268.0	3170.0	1.70

Number turns $= 1000 \sqrt{\text{desired L (mh)} \div A_L \text{ value (above)}}$

4 Toroidal Per Package

IRON-POWDER TOROIDAL CORES

WINDING DATA

AMIDON

The following data is intended as a guide to help in the selection of suitable toroidal cores for your application. Each core - winding combination is shown at near maximum 'Q'.

Price	Core	L/100t ±5%	Wire	Turns	L(mh)	Q Test-Freq. (KHz)	Q
4.48	T-94-41	590 uh	#33	800	38	15	46
3.20	T-80-41	450 uh	#30	400	7.9	30	43
6.48	T106-41	900 uh				low R.F.	
9.00	T-130-3	•330uh	#28	200	1.14	60	142
			#28	400	4.2	80	176
			#30	800	18.	50	150
6.48	T-106-3	•405uh	#24	200	1.41	120	160
			#28	400	5.6	60	164
			#32	800	22.	30	126
4.48	T-94-3	248 uh	#28	100	.24	300	148
			#28	200	.88	200	148
			#30	400	3.58	100	158
3.52	T-80-3	180 uh	#28	100	.18	400	132
			#30	400	2.9	100	137
			#30	800	11.80	40	120
2.85	T-68-3	420 uh	#32	200	.82	200	130
			#33	400	3.4	100	125
2.45	T-50-3	175 uh	#32	100	.175	500	110
			#34	200	.620	200	108
2.00	T-37-3	110 uh	#33	100	.116	500	86
			#34	200	.480	300	96
1.80	T-25-3	100 uh	#34	50	.028	1000	66
			#34	100	.102	600	78
			#36	200	.380	400	86
1.12	T-12-3	60 uh	#36	25	.004	2000	32
			#40	50	.016	1500	32
1.65	88MH	Telephone Toroides					

Price	Core	L/100t ±5%	Wire	Turns	L(uh)	Q Test-Freq. (MHz)	Q
9.00	T-130-2	110 uh	150/44	200	430.	.16	420
			220/44	170	253.	.20	500
6.48	T-106-2	135 uh	15/44	100	135.	.30	475
			#24	80	84	1.	290
			#20	40	21.6	2.	360
4.48	T-94-2	84 uh	#30	125	130.	.90	232
			15/44	200	328.	.78	278
			15/44	400	1420.	.37	276
3.52	T-80-2	55 uh	#20	36	7.8	4.	280
			#26	80	37.	2.5	246
			#34	220	276.	.8	188
2.85	T-68-2	57 uh	#20	26	3.9	5.5	260
			#28	79	33.	2.5	240
			#34	187	192.	1.	190
2.45	T-50-2	50uh	#20	19	2.08	6.4	207
			#30	79	33.	2.5	240
			#32	200	218.	.4.	124
2.00	T-37-2	42 uh	#20	12	.64	8.	158
			#24	22	2.16	7.	170
			#26	28	3.34	6.	183
1.80	T-25-2	34 uh	#26	14	.72	12.	136
			#30	30	3.22	8.	162
			#36	65	14.5	.5.	148
1.12	T-12-2	21 uh	#28	9	.19	21.	75
			#32	17	.65	15.	84
			#40	40	3.37	10.	85
2.25	T44-15	160 uh				1-2	
2.45	T50-12	18 uh	#20	6	.13	100-200	190
2.85	T68-12	21 uh				100-200	
2.85	T68-41	420 uh				low R.F.	
3.50	T-200-2	1 toroidal in a package					
3.52	T80-12	22 uh				100-200	
1.12	T12-0	3 uh				150-300	
2.45	T50-0	6.4 uh				150-300	
3.52	T80-0	8.5 uh				150-300	
9.00	T130-0					150-300	
6.49	T106-0	19.2 uh				150-300	
9.00	T130-1	200 uh				.5-5	
1.80	T30-12	16 uh				100-200	

Core	L/100t ±5%	Wire	Turns	L(uh)	Q Test-Freq. (MHz)	Q	Price
T-94-6	70 uh	#16	25	4.7	5.	350	4.48
		#20	20	3.	6.	340	
		#20	35	8.7	3.	339	
T-80-6	45 uh	#20	15	1.1	10.	255	3.52
		#16	20	1.88	9.	317	
		#20	28	3.6	6.	299	
T-68-6	47 uh	#20	23	2.42	10.	304	2.85
		#20	15	1.08	10.	270	
		#22	33	5.1	6.	305	
T-50-6	40 uh	#18	14	.86	14.	252	2.45
		#22	25	2.60	10.	260	
		#26	42	7.5	6.	244	
T-37-6	30 uh	#20	12	3	18.	181	2.00
		#22	17	97	14.	194	
		#26	28	2.45	10.	195	
T-25-6	27 uh	#24	10	.30	21.	152	1.80
		#28	20	1.10	15.	164	
		#36	67	11.7	6.	138	
T-12-6	19 uh	#30	11	.23	25.	92	1.12
		#34	18	.56	20.	90	
		#36	25	1.06	15.	96	
T106-6	116 uh				10-90		6.48
T-80-10	34 uh	#16	10	.41	20.	195	3.52
		#18	15	.83	15.	202	
		#26	30	2.91	10.	188	
T-68-10	32 uh	#18	10	.37	20.	156	2.85
		#20	15	.79	15.	172	
		#22	30	2.96	10.	176	
T-50-10	31 uh	#20	10	.37	25.	178	2.45
		#20	15	.81	18.	190	
		#22	20	1.38	13.	188	
T-37-10	25 uh	#20	8	.20	30.	138	2.00
		#22	15	.61	20.	165	
		#26	25	1.54	15.	163	
T-25-10	19 uh	#22	7	.12	45.	136	1.80
		#24	9	.18	35.	141	
T-12-10	12 uh	#28	7	.06	60.	120	1.12
		#30	11	.16	40.	101	
		#32	14	.26	35.	87	
T-37-12	15 uh	#20	4	.05	120.	142	2.00
		#20	6	.09	80.	132	
T-25-12	13 uh	#22	6	.07	120.	127	1.80
		#26	10	.16	60	130	
		#26	14	.28	45.	130	
T-12-12	8.5 uh	#28	5	.04	160.	113	1.12
		#28	7	.06	120.	134	
		#30	11	.11	100.	100	

USEFUL INDUCTANCE AND TURNS FORMULA:

The desired inductance or number of turns, using a particular core, may be calculated with this formula when the inductance per 100 turns is known.

$$\frac{L_1}{N_1^2} = \frac{L_2}{N_2^2}$$

L_1 = Known inductance per 100 turns

N_1 = 100 turns

L_2 = Inductance (known or unknown

N_2 = Number of turns (known or unknown)