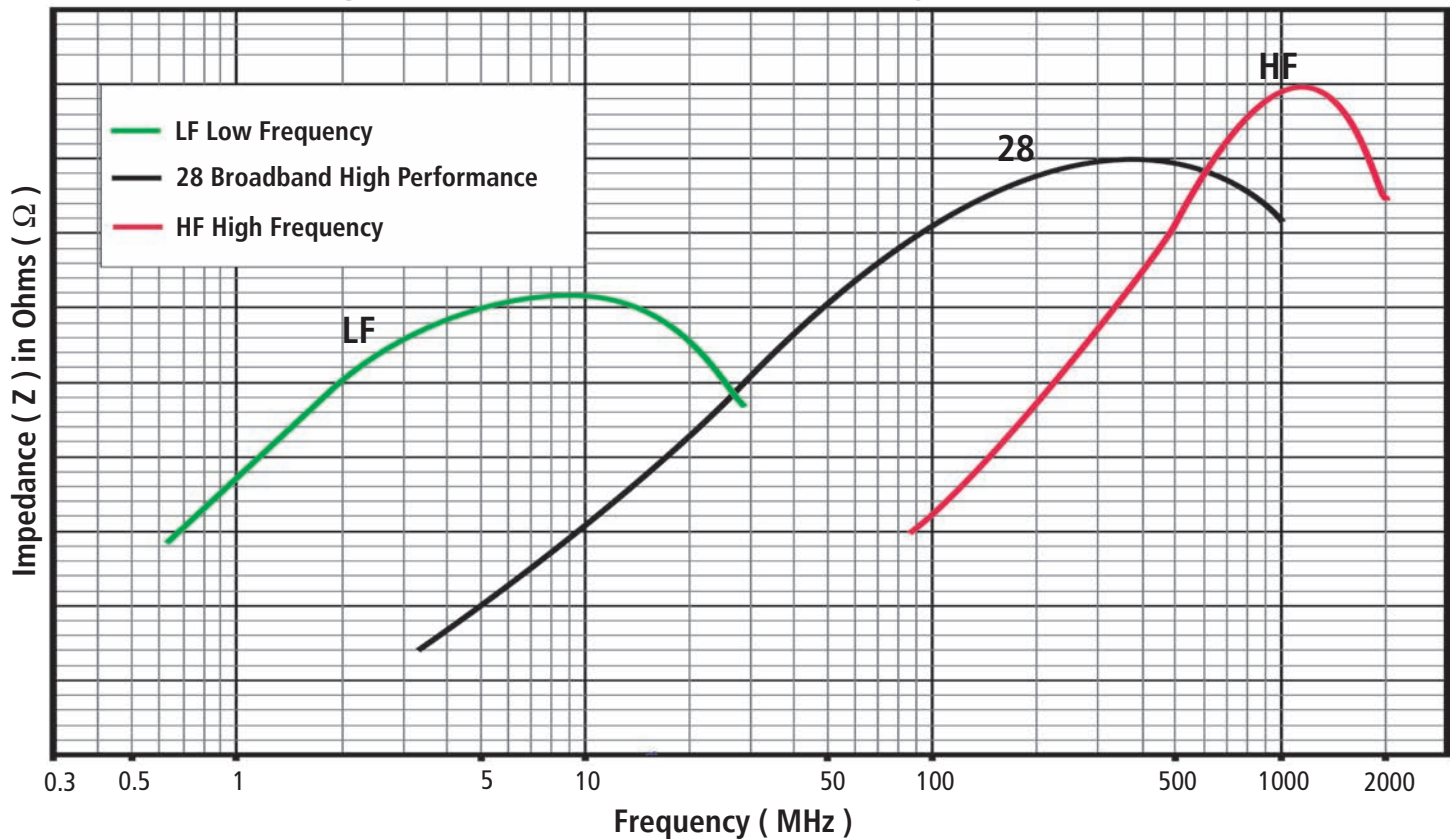


FERRITE MATERIAL COMPARISON

LF, 28, HF Material Impedance vs Frequency (300 KHz - 2 GHz) Impedance Materials for Cable & Wiring Harness Cores



DESIGN & SELECTION "RULES OF THUMB"

- **Select the appropriate ferrite material** for the EMI frequency range to be attenuated (refer to cable core material impedance vs. frequency chart above).
- **Ferrite material composition affects core performance most.** High performance material is best. Cheap, low performance materials require the use of larger, heavier cores.
- **Shape (design) and mass of the ferrite core significantly affect impedance.**
- **Don't over size.** Use high performance ferrite material and select the smallest core that will do the job. High performance material allows the use of smaller, lighter and lower cost cores.
- **Select a ferrite core that fits** over the cable's outside dimensions. Core should slide easily over the cable during installation.
- **When possible, install a cable core over wires in a common-mode configuration** (out and back lines inside the same ferrite cable core). A differential cable pair inside the same core will make the ferrite core a common mode choke that is not susceptible to saturation from very high currents.
- **Install the ferrite core near the noise source**
- **Additional turns through a core will provide multiple amounts of peak impedance.**
Example: Two wire turns provide 4 times the impedance of one turn (pass through) the ferrite core. Also, with each added turn, the peak impedance shifts to a slightly lower frequency.
- **Two piece split cores are available.** One-piece cylindrical or flat ribbon ferrite core shapes are usually preferable but, split cores can be used in applications where cores cannot slide over cable ends and connectors. Some split cores are available with snap-on plastic cases or metal clips.
- **Side by side impedance testing of ferrite cores is the best way to compare performance of different cores.**
Ferrite core impedance measurement equipment and test methods are not standardized in the industry. Every ferrite company has their own test methods. Catalog (web site) impedance data cannot be accurately compared.

Optimized, high performance, low cost custom part designs are available.

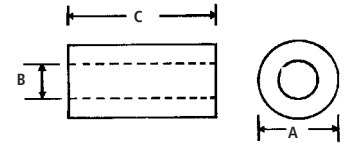


High Frequency Ferrite Cylindrical EMI Cores

300 MHz to 2 GHz Optimized

Cylindrical Solid Ferrite Cores for Round Cables & Wiring Harnesses

Part Number	DIMENSIONS mm (inches)			Net Impedance (Z) in Ohms (Ω)			
	A	B	C	@ 300 MHz	@ 500 MHz	@ 800 MHz	@ 1 GHz
HFB075024-000	7.52 (0.296)	2.39 (0.094)	10.00 (0.394)	124	136	138	138
HFB095051-100	9.52 (0.375)	5.08 (0.200)	10.00 (0.394)	64	74	89	85
HFB095051-200	9.52 (0.375)	5.08 (0.200)	19.00 (0.748)	120	135	151	147
HFB123049-000	12.32 (0.485)	4.88 (0.192)	5.00 (0.197)	50	56	63	61
HFB123049-100	12.32 (0.485)	4.88 (0.192)	10.00 (0.394)	97	110	120	115
HFB123049-300	12.32 (0.485)	4.88 (0.192)	25.40 (1.000)	258	287	300	246
HFB143064-000	14.27 (0.562)	6.35 (0.250)	5.00 (0.197)	43	50	58	60
HFB143064-100	14.27 (0.562)	6.35 (0.250)	10.00 (0.394)	85	100	113	115
HFB143064-300	14.27 (0.562)	6.35 (0.250)	28.58 (1.125)	270	315	270	200
HFB150070-200	14.99 (0.590)	6.99 (0.275)	28.58 (1.125)	242	287	270	204
HFB152034-000	15.24 (0.600)	3.38 (0.133)	10.00 (0.394)	165	190	189	185
HFB157070-000	15.65 (0.616)	6.99 (0.275)	20.00 (0.787)	170	200	220	205
HFB159079-100	15.88 (0.625)	7.87 (0.310)	28.58 (1.125)	235	290	302	260
HFB160093-200	16.00 (0.630)	9.25 (0.364)	19.00 (0.748)	120	145	155	170
HFB160093-300	16.00 (0.630)	9.25 (0.364)	27.99 (1.102)	170	198	232	220
HFB170070-000	16.99 (0.669)	7.01 (0.276)	10.00 (0.394)	97	115	127	140
HFB170070-100	16.99 (0.669)	7.01 (0.276)	20.00 (0.787)	185	215	239	220
HFB187102-100	18.67 (0.735)	10.16 (0.400)	30.00 (1.181)	205	250	270	210
HFB259128-100	25.91 (1.020)	12.83 (0.505)	28.58 (1.125)	175	210	254	250



All impedance values for high frequency cores are NET; NET impedance is impedance of the ferrite core only. All impedance contribution from the test wire and fixtures has been removed.

This catalog lists a limited sample of available parts. Custom parts are also available.



Split, Snap-On Ferrite Cores in Plastic Cases 300 MHz to 2 GHz Optimized

For retrofit and post-assembly operations a selection of high frequency EMI “split” cores are offered. Similar in performance to one piece cylindrical core designs, these split ferrite cores provide excellent common and differential mode high frequency EMI suppression on round cable and wire assemblies. Black plastic snap-on cases provide secure closure of the split cores onto the cable or wire bundle.

PART NUMBERING SYSTEM EXAMPLE

HF	A	100049	-0	A	2
Material Type	Product Code	Part Size Code (mm)	Selected Dimension Code (Usually Length)	Additional Part Description	Plastic Case Color Code

All impedance values for high frequency cores are NET; NET impedance is impedance of the ferrite core only. All impedance contribution from the test wire and fixtures has been removed.

Part Number	Fig #	PLASTIC CASE DIMENSIONS mm (inches)				Maximum Cable Diameter mm (inches)	Net Impedance (Z) in Ohms (Ω)				Steward Solid Cylindrical Core Similar Parts (for reference)
		A	B	C	D		@ 300 MHz	@ 500 MHz	@ 800 MHz	@ 1 GHz	
HFA100049-0A2	1	13.72 (0.540)	5.44 (0.214)	30.56 (1.203)	13.72 (0.540)	4.88 (0.192)	133	152	168	162	HFB095051-200
HFA150066-0A2	2	18.15 (0.715)	7.05 (0.278)	32.50 (1.280)	18.90 (0.744)	6.60 (0.260)	274	350	340	256	HFB143064-300
HFA150068-0A2	1	21.00 (0.827)	6.80 (0.268)	41.70 (1.642)	21.00 (0.827)	6.76 (0.266)	275	340	281	200	HFB150070-200
HFA163090-0A2	1	19.10 (0.752)	9.09 (0.358)	40.36 (1.589)	20.80 (0.819)	9.01 (0.355)	210	260	262	200	HFB160093-300
HFA187102-0A2	2	22.88 (0.877)	10.00 (0.394)	32.77 (1.290)	21.84 (0.860)	10.16 (0.400)	220	290	281	210	HFB187102-100
HFA259131-0A2	2	29.00 (1.142)	13.00 (0.512)	32.50 (1.280)	29.62 (1.166)	13.06 (0.514)	250	315	272	200	HFB259128-100

- 0A2 part number suffix designates black plastic case. Additional colors may be available, please inquire with Laird Technologies' customer service.

Figure 1

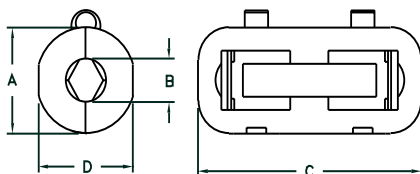
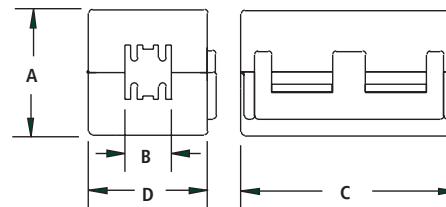


Figure 2



Please visit www.Lairdtech.com for the most up to date information. All dimensions & impedance values can be sorted and compared on www.Lairdtech.com. Custom parts are available.

High Frequency Split, Snap-On, Ferrite Cores in Plastic Cases

PART NUMBER	Figure #	PLASTIC CASE DIMENSIONS mm (inches)				Maximum Cable Diameter mm (inches)	Typical Impedance (Z) in Ohms (Ω)			Steward Solid Cylindrical Core Similar Parts (for reference)
		A	B	C	D		@ 500 MHz	@ 800 MHz	@ 1 GHz	
HFA100049-0A2	1	13.72 (0.540)	5.44 (0.214)	30.56 (1.203)	13.72 (0.540)	4.88 (0.192)	152	168	162	HFB095051-200
HFA150066-0A2	2	18.15 (0.715)	7.05 (0.278)	32.50 (1.280)	18.90 (0.744)	6.60 (0.260)	350	350	256	HFB143064-200
HFA150068-0A2	1	21.00 (0.827)	6.80 (0.268)	41.70 (1.642)	21.00 (0.827)	6.76 (0.266)	340	280	200	HFB150070-200
HFA163090-0A2	1	19.10 (0.752)	9.09 (0.358)	40.36 (1.589)	20.80 (0.819)	9.01 (0.355)	260	260	200	HFB160093-300
HFA187102-0A2	2	22.28 (0.877)	10.00 (0.394)	32.77 (1.290)	21.84 (0.860)	10.16 (0.400)	290	281	210	HFB187102-100
HFA259131-0A2	2	29.00 (1.142)	13.00 (0.512)	32.50 (1.280)	29.62 (1.166)	13.06 (0.514)	315	274	200	HFB259128-100

-0A2 = Black Plastic Snap On Case

- Other parts may be available.

Please contact Steward, a unit of Laird Technologies.

All impedance values for high frequency cores are NET; NET impedance is impedance of the ferrite core only. All impedance contribution from the test wire and fixtures has been removed.

Plastic Case Split / Snap-On Part Diagrams

Figure 1

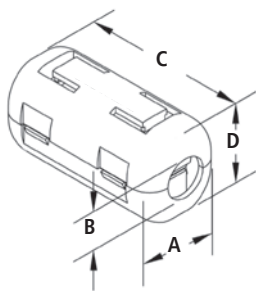


Figure 2

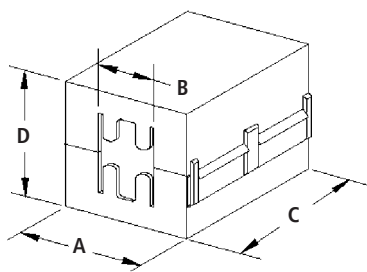


Figure 3

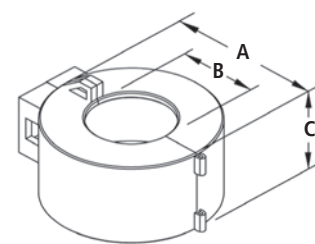


Figure 4

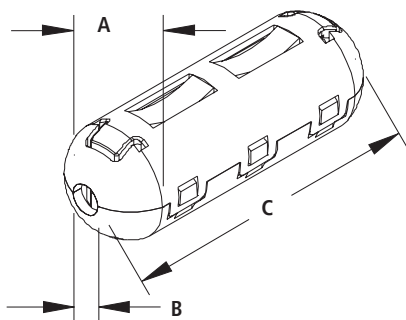


Figure 5

