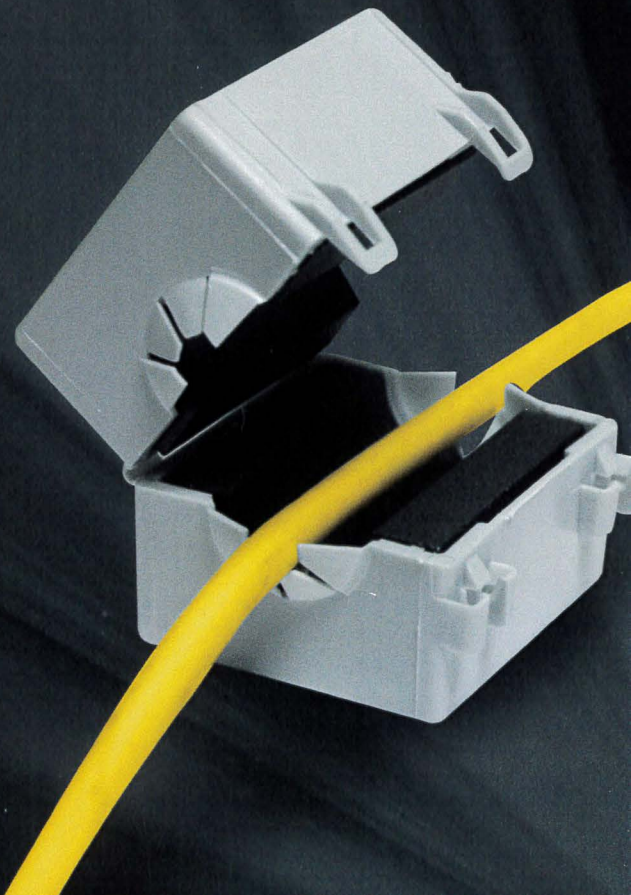




# LEADERTECH **FERRITES**

**BISECTED & SOLID BEAD STYLES  
FOR ROUND AND FLAT CABLES & WIRES**

- World's Largest In-Stock Selection
- Frequency-Specific Formulations
- Flexible Mounting Options



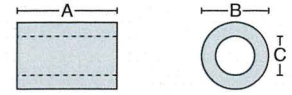
**LEADER  
TECH**   
a HEICO company

*The Leading Edge in EMI Shielding Technology*



## solid beads

Sizes up to .430" I.D. (10,9 mm) for applications where it is possible to assemble the ferrite suppressor before the cable ends are terminated.



Part No.	Material	A		B		C		D	E	F	Impedance in OHMS	Maximum recommended cable size
FS-1011	20	1.125	28,6	.562	14,2	.250	6,4					.250 6,4 dia.
FS-1012	20	1.125	28,6	.736	18,7	.430	10,9					.410 10,4 dia.



## miniature beads

Very small cylindrical suppressors for wire diameters below .25" (6,4mm). Handy for tight spaces, on-board suppression and general applications.



Part No.	Material	A		B		C		D	E	F	Impedance in OHMS	Maximum recommended cable size
FS-1031	28	.750	19,1	.375	9,5	.192	4,8				140 @ 100MHz	.200 5,0 dia.
FS-1032	28	1.125	28,6	.562	14,2	.250	6,4				257 @ 100MHz	.250 6,3 dia.

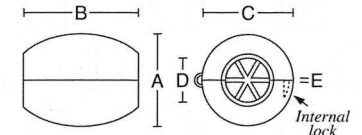


## jelly bean snap

MINIATURE SIZE WITH INTERNAL LOCKING SYSTEM.

Cannot be reopened after snapping closed into position. Ensures that suppressor cannot be removed. Grip-lock tabs at entry/exit ports prevent longitudinal slippage on a range of cable diameters from .060" to .120" (1,5 to 3,0mm).

Excellent for tight spaces and low profile applications. A cost-effective alternative to "molded-in" suppressors, shrink tubing, tie wraps, taping and other secondary installation operations.



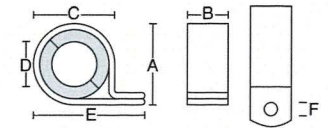
Patent Nos. 5,003,278, 5,162,772 and 5,764,125

Part No.	Material	A		B		C		D	E	F	Impedance in OHMS	Maximum recommended cable size
FS-1041	28	.670	17,0	.820	20,8	.670	17,0	.290	7,4	.055	1,4	160 @ 100MHz .060 1,5 to .120 3,1 dia.



## cable clamp

Ferrite assembly bonded to nylon strap; functional with wires and cables up to a 1.00" (25,4 mm) diameter. Holes are provided for screw mounting.



Part No.	Material	A		B		C		D	E	F	Impedance in OHMS	Maximum recommended cable size
FS-1054	28	.785	19,9	.630	16,0	.785	19,9	.320	8,1	1.335	33,9	.195 5,0 100 @ 100MHz .320 8,1 dia.
FS-1055	28	1.127	28,6	.551	14,0	1.127	28,6	.449	11,4	1.677	42,6	.195 5,0 117 @ 100MHz .449 11,4 dia.



## very high impedance multi-turn sleeve snap

WITH SERPENTINE CABLE THREADING CAPABILITY.

By increasing the number of times the circuit passes through the ferrite core, the effective magnetic path is lengthened yielding a significant increase in impedance. The gain is equal to  $N^2$ , the square of the number of turns, and depending on the circuit cable load and frequencies involved, much of the increase can be realized.

Cables may be "looped back through" as shown at left; or, "looped over the top" as shown at left (insert).

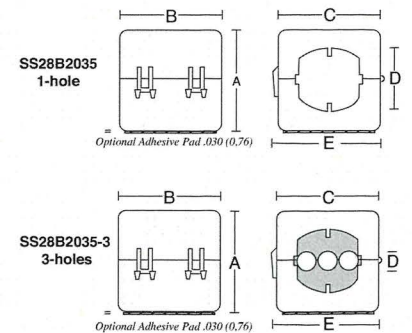
In an alternate configuration, separate cable circuits can be accommodated without saturation. Two styles permit different approaches:

The 1-hole allows two passes of a cable with a diameter up to .365"

(9,3mm) or three passes of a cable with a diameter up to .243" (6,2mm).

The 3-hole allows three passes of cable with a diameter up to .203" (5,8mm).

Each is available with an optional adhesive foam pad mounting base.



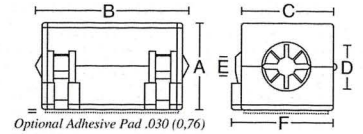
Part No.	Material	Description	A		B		C		D	E	Impedance in OHMS	Maximum recommended cable size	
FS-1049	28	1-hole	1.155	29,3	1.250	31,8	1.125	28,6	.780	19,8	1.230	31,2	1N=129 @ 100MHz 2N=2 <sup>2</sup> =4NΩ ref .730 18,5 dia.
FS-1050	28	3-hole	1.155	29,3	1.250	31,8	1.125	28,6	.203	5,2	1.230	31,2	1N=340 @ 100MHz depending on circuit load and frequency 3 holes ea. @ .203 5,2 dia.



## sleeve snap

### WITH VARIABLE DIAMETER END PORTS.

Box-shaped ferrite assembly in fully enclosed nylon case. End ports are surrounded with flexible spring flutes to grip a range of cable diameters from .125" to .500" (3,2 to 12,7 mm). Special mounting options include foam adhesive pad on bottom.



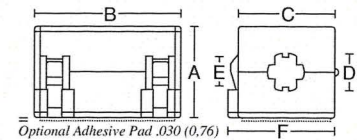
Patent No. 5,003,278 and Patent No. 5,764,125

Part No.	Material	A	B	C	D	E	F	Impedance in OHMS	Maximum recommended cable size			
FS-1013	20	.585	14,9	1.250	31,8	.585	14,9	.250 6,4	.120 3,0	.680 17,3	N/A	.125 3,2 to .170 4,3 dia.
FS-1014	20	.790	20,1	1.450	36,8	.770	19,6	.350 8,8	.200 5,1	.885 22,5	N/A	.210 5,3 to .300 7,6 dia.
FS-1015	20	.965	24,5	1.480	37,6	.930	23,6	.425 10,8	.170 4,3	1.035 26,3	N/A	.250 6,3 to .400 10,2 dia.
FS-1024	25	1.155	29,3	1.450	36,8	1.125	28,6	.500 12,7	.200 5,1	1.230 31,2	510 @ 700MHz	.250 6,3 to .500 12,7 dia.
FS-1025	25	.790	20,1	1.450	36,8	.770	19,6	.350 8,8	.200 5,1	.885 22,5	390 @ 700MHz	.210 5,3 to .300 7,6 dia.
FS-1047	28	1.155	29,3	1.450	36,8	1.125	28,6	.500 12,7	.200 5,1	1.230 31,2	230 @ 100MHz	.250 6,3 to .500 12,7 dia.
FS-1048	28	.585	14,9	1.250	31,8	.585	14,9	.250 6,4	.120 3,0	.680 17,3	220 @ 100MHz	.125 3,2 to .170 4,3 dia.
FS-1052	28	.790	20,1	1.450	36,8	.770	19,6	.350 8,8	.200 5,1	.885 22,5	200 @ 100MHz	.210 5,3 to .300 7,6 dia.



## sleeve snap

Box-shaped ferrite assembly in enclosed nylon case. Various sizes are functional with wires up to .500" (12,7 mm) diameter. Simply clamp around cable or wire; plastic tabs at entry/exit ports apply pressure to cable surface to maintain mounting position. Options include foam adhesive pad on bottom.



Patent No. 5,764,125

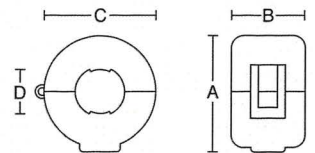
Part No.	Material	A	B	C	D	E	F	Impedance in OHMS	Maximum recommended cable size			
FS-1044	28	.420	10,7	.468	11,9	.106	2,7	.072 1,8	.468 11,9	105 @ 100MHz	.085 2,2 dia.	
FS-1045	28	.790	20,1	1.265	32,1	.770	19,6	.270 6,9	.220 5,6	.885 22,5	200 @ 100MHz	.235 6,0 dia.
FS-1046	28	.700	17,8	1.255	31,9	.675	17,1	.230 5,8	.187 4,7	.768 19,5	200 @ 100MHz	.200 5,1 dia.
FS-1051	28	1.155	29,3	1.250	31,8	1.125	28,6	.415 10,5	.350 8,8	1.230 31,2	230 @ 100MHz	.380 9,7 dia.
FS-1053	28	1.155	29,3	1.250	31,8	1.125	28,6	.550 14,0	.480 12,2	1.230 31,2	230 @ 100MHz	.500 12,7 dia.
FS-1063	33	.790	20,1	1.265	32,1	.770	19,6	.270 6,9	.220 5,6	.885 22,5	23 @ 30MHz	.235 6,0 dia.
FS-1064	33	.790	20,1	1.265	32,1	.770	19,6	.350 8,8	.290 7,4	.885 22,5	23 @ 30MHz	.300 7,6 dia.
FS-1065	33	1.155	29,3	1.250	31,8	1.125	28,6	.415 10,5	.350 8,8	1.230 31,2	27 @ 30MHz	.380 9,7 dia.



## cable snap

Ferrite assembly in fully enclosed nylon case; functional with wires and cables up to a 2.0" (50,8mm) diameter. Snap closed around wire by clasping shut to position assembly.

May also be mounted with a flat-head screw through the .120" (3,0mm) diameter hole in the bottom by temporarily removing lower ferrite half.

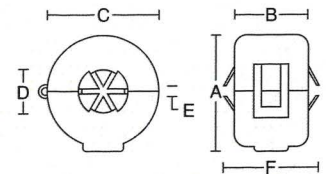


Part No.	Material	A	B	C	D	E	F	Impedance in OHMS	Maximum recommended cable size		
FS-1021	25	1.182	30,0	.780	19,8	1.188	30,2	.425 10,8		305 @ 700MHz	.400 10,2 dia.
FS-1034	28	.852	21,6	.885	22,5	.840	21,3	.282 7,2		100 @ 100MHz	.300 7,6 dia.
FS-1035	28	1.218	30,9	.705	17,9	1.220	31,0	.525 13,3		62 @ 100MHz	.520 13,2 dia.
FS-1036	28	2.350	59,7	1.851	47,0	2.309	58,6	.960 24,4		380 @ 100MHz	1.000 25,4 dia.
FS-1061	33	1.040	26,4	.667	16,9	1.025	26,4	.340 8,6		22 @ 30MHz	.345 8,7 dia.
FS-1062	33	2.350	59,7	1.851	47,0	2.309	58,6	.960 24,4		210 @ 30MHz	1.000 25,4 dia.

## cable snap

### WITH VARIABLE DIAMETER END PORTS.

Ferrite assembly in fully enclosed nylon case; various sizes are functional with wires and cables up to a .500 (12,7 mm) diameter. End ports are surrounded with flexible spring flutes to grip a range of cable diameters from .120" to .500" (3,2 to 12,7 mm). The grip-locking action prevents lateral movement along the cable or wire bundle.



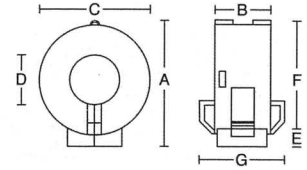
Patent No. 5,003,278

Part No.	Material	A	B	C	D	E	F	Impedance in OHMS	Maximum recommended cable size			
FS-1037	28	1.182	30,0	.780	19,8	1.188	30,2	.375 9,5	.120 3,0	.950 24,1	117 @ 100MHz	.200 5,1 to .400 10,2 dia.



## cable snap

Ferrite assembly in fully enclosed nylon case; functional with wires and cables up to a .520" (13,2mm) diameter. Snap closed around wire by clasping shut to position assembly. Cable tie-wraps may be threaded through the loops on each side.



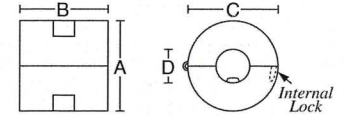
Part No.	Material	A	B	C	D	E	F	G	Impedance in OHMS	Maximum recommended cable size									
FS-1033	28	1.095	27,8	.476	12,1	.965	24,5	.345	8,8	.100	2,5	1.003	25,5	.890	22,6	73 @ 100MHz	.345	8,7	dia.



## internal locking snap

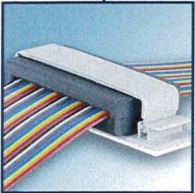
### WITH SECURE INTERNAL LOCKING SYSTEM.

Cannot be reopened after snapping closed into position. Ensures that suppressor cannot be removed. Grip-lock tabs at entry/exit ports prevent longitudinal slippage on a range of cable diameters from .275" to .300" (7,0 to 7,6mm). Standard colors are computer gray (PMS#413), computer beige (PMS#468), black and natural white. A cost-effective alternative to over-molding.



Patent Nos. 5,003,278, 5,162,772 and 5,764,125

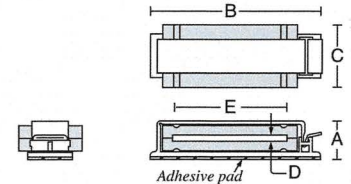
Part No.	Material	A	B	C	D	E	F	Color	Impedance in OHMS	Maximum recommended cable size				
FS-1023	25	.780	19,8	.780	19,8	.780	19,8	.316	8,0	BLACK	290 @ 700MHz	.320	8,1	dia.



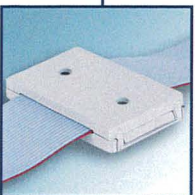
## flat cable clamp

### WITH ADHESIVE MOUNT.

Ferrite assembly bonded in nylon mounting clamp; easily installed by peeling protective paper strip from base and pressing into place. Nine sizes accommodate all flat cables up to 50-conductor width.



Part No.	Material	A	B	C	D	E	F	Impedance in OHMS	Maximum recommended cable size					
FS-1022	25	.800	20,3	3.180	80,8	1.125	28,6	.060	1,5	2.047	52,0	790 @ 700MHz	40 conductor, .060 X 2.00	1,5 X 50,8
FS-1038	28	.520	13,2	1.790	45,5	.750	19,1	.060	1,5	1.010	25,7	97 @ 100MHz	20 conductor, .060 X 1.00	1,5 X 25,4
FS-1039	28	.800	20,3	2.430	61,7	1.125	28,6	.060	1,5	1.355	34,4	200 @ 100MHz	26 conductor, .060 X 1.25	1,5 X 31,8
FS-1040	28	.800	20,3	3.700	94,0	1.125	28,6	.060	1,5	2.540	64,5	286 @ 100MHz	50 conductor, .060 X 2.50	1,5 X 63,5



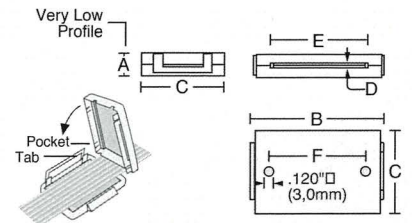
## low profile flat cable clamp

### SLIM-LINE FLAT CABLE CLAMP WITH CABLE GRIP OPENINGS.

Ferrite pair snaps together into the lowest profile nylon enclosure available. Three sizes accommodate flat cables up to 40-conductors. Internal grip-lock tabs maintain mounting position. Mounts also with flat-head screws through the .120" (3,0mm) diameter holes in the bottom by temporarily removing the lower ferrite half.

Excellent for flex-circuits.

1. Place cable over lower half.
2. Align tabs and pockets on one end.
3. Rotate top half onto bottom clipping both sides in one smooth motion.



Part No.	Material	A	B	C	D	E	F	Impedance in OHMS	Maximum recommended cable size							
FS-1042	28	.370	9,4	1.065	27,1	1.312	33,3	.038	0,97	.547	13,9	.250	6,4	142 @ 100MHz	10 conductor, .038 X .500	1,0 X 12,7
FS-1043	28	.370	9,4	1.560	39,6	1.312	33,3	.038	0,97	1.047	26,6	.750	19,1	148 @ 100MHz	20 conductor, .038 X 1.00	1,0 X 25,4

Simply one of the most flexible and cost-effective cable shielding solutions on the market



# Product Profile

Ferrite shielding materials are widely accepted as providing the simplest, most convenient and most cost-effective solution for radio frequency interference problems in cables and connectors. Further, they accomplish both RF attenuation and suppression of unwanted high frequency oscillations with no loss in dc or low frequency signal strength.

The basic composition of ferrite materials is a combination of ferrous oxide and one or more other powdered metals - most often manganese, zinc, cobalt or nickel. An extensive selection of shapes and sizes is already available, and custom geometries may be manufactured for special situations.

There are infinite varieties of formulas and performance levels possible. Each discrete ferrite formulation results in a stoichiometric ratio which is its performance characteristic signature regarding electrical, magnetic and mechanical relationships. The most common expression of ferrites' performance capabilities is in terms of their permeability ( $\mu$ ). This property expresses the ratio of the magnitude of magnetic induction to magnetizing force. The materials are normally categorized according to initial permeability ( $\mu_i$ ).

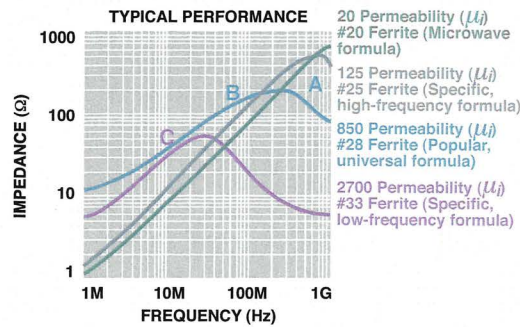


fig.1 Typical attenuation profiles

FerriShield has developed four principal formulations which together serve the common spectrum of today's RFI needs. For frequencies from 10 MHz to 1 GHz, #28 formulation is recommended, especially when higher frequency harmonics are a consideration. For frequencies typified by microprocessor speeds in excess of 100MHz and harmonics peak interference at nominally 700MHz, #25 formulation is designed to cover this range with even some effect beyond that. For frequencies from 1 MHz to 30 MHz, #33 material offers a concentration of impedance in that range with a decreasing effect above 30 MHz. For microwave frequencies relating to Bluetooth™ 2.45GHz operations, the #20 material is available. See figure 1 above.

## Choose a ferrite material

FerriShield ferrites are offered in (4) unique formulations. The chart below offers an overview of typical material properties.

Ferrite	Performance
28	Material- Most Popular Wideband 10MHz-1GHz (250MHz peak)
33	Material- Low-Frequency Ferrite 1MHz-60MHz (30MHz peak)
25	Material- High-Frequency Ferrite 1MHz-1.2GHz (700MHz peak)
20	Material- Bluetooth/Microwave 2.45GHz peak

## Helpful Tips and Insider Hints

- Ferrite performance typically increases as ferrite volume increases. The larger the ferrite mass, the better the RF attenuation.
- Smaller cables can be looped through larger ferrites to increase performance. Impedance increase by the square of the number of loops. For example, by looping a cable through a ferrite 2 times ( $2^2$ ), impedance increases by a factor of 4.

[www.LEADERTECHINC.COM](http://www.LEADERTECHINC.COM)



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