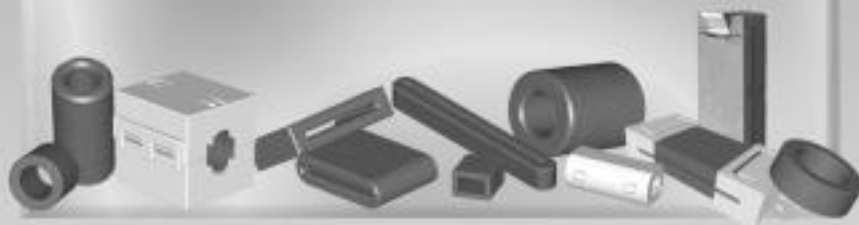


Ferrite EMI Cores

for Cables & Wiring Harnesses

Steward



www.steward.com

ISO 9001 and QS 9000 Certified



STEWARD EMI FERRITE CORES for Cables & Wiring Harnesses

TABLE OF CONTENTS



Page 03 - **High Frequency (HFB-)**
Cylindrical Cores



Page 12 - **Low Frequency (LFB-)**
Cylindrical Cores



Page 04 - **High Frequency (HFA-)**
Split, Snap-On Cores



Page 13 - **Broad Band (28R-)**
Ribbon & Flex Cable Cores



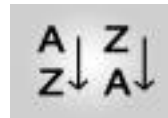
Page 05 - **Broad Band (28B-)**
Cylindrical Cores



Page 16 - **Broad Band (28S-)**
Split Ribbon & Flex Cable Cores



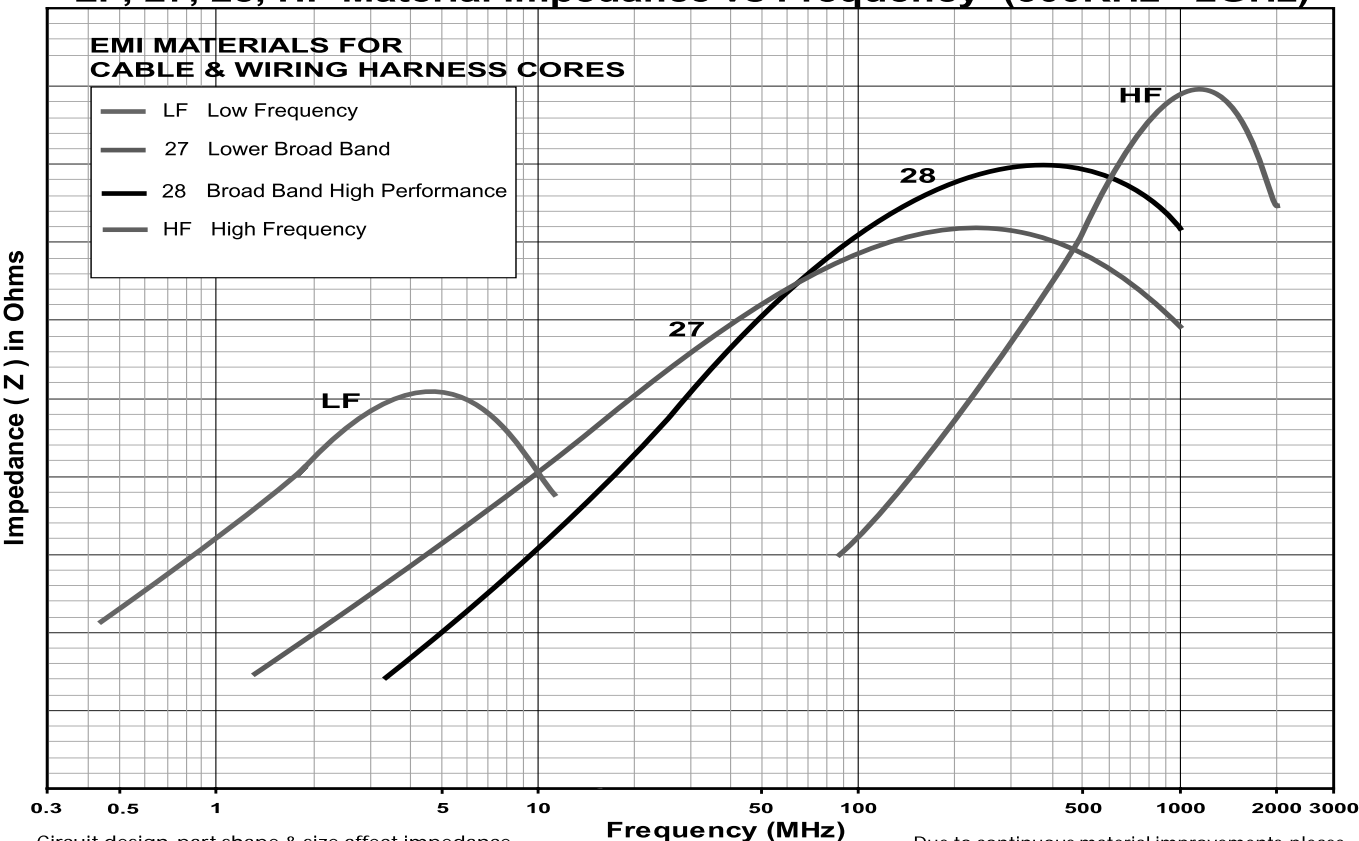
Page 08 - **Broad Band (28A-)**
Split, Snap-On Cores



Pages 10 & 18 -
Sorted Quick Reference Charts
for Broad Band (28) parts

STEWARD FERRITE MATERIAL COMPARISON

LF, 27, 28, HF Material Impedance vs Frequency (300KHz - 2GHz)



Circuit design, part shape & size affect impedance.
Additional wire turns multiply impedance.

Due to continuous material improvements, please
consult Steward's website for latest information.



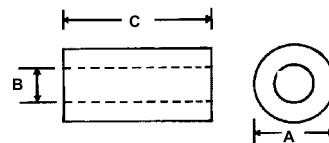
High Frequency Ferrite EMI Cores

300 MHz to 2 GHz



Cylindrical Solid Ferrite Cores for Round Cables & Wiring Harnesses

PART NUMBER	DIMENSIONS mm (inches)			NET Impedance (Z) in Ohms			
	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	135
HFB095051-100	9.52 (0.375)	5.08 (0.200)	10.00 (0.394)	64	74	85	89
HFB095051-200	9.52 (0.375)	5.08 (0.200)	19.00 (0.748)	120	135	183	194
HFB123049-000	12.32 (0.485)	4.88 (0.192)	5.00 (0.197)	50	56	62	65
HFB123049-100	12.32 (0.485)	4.88 (0.192)	10.00 (0.394)	97	110	127	130
HFB123049-300	12.32 (0.485)	4.88 (0.192)	25.40 (1.000)	258	287	305	268
HFB143064-000	14.27 (0.562)	6.35 (0.250)	5.00 (0.197)	43	50	64	70
HFB143064-100	14.27 (0.562)	6.35 (0.250)	10.00 (0.394)	85	100	113	121
HFB143064-300	14.27 (0.562)	6.35 (0.250)	28.58 (1.125)	270	315	306	257
HFB150070-200	15.00 (0.591)	6.99 (0.275)	28.58 (1.125)	224	267	279	242
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	216	215
HFB159079-100	15.88 (0.625)	7.87 (0.310)	28.58 (1.125)	235	290	302	288
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)	156	186	261	256
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	234	227
HFB187102-100	18.67 (0.735)	10.16 (0.400)	30.00 (1.181)	205	250	276	266
HFB259128-000	25.91 (1.020)	12.83 (0.505)	20.00 (0.787)	170	224	242	244
HFB259128-100	25.91 (1.020)	12.83 (0.505)	28.58 (1.125)	200	246	268	262



All impedance values for Steward 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.

Please visit www.Steward.com for the most up to date information. All dimensions & impedance values can be sorted and compared on the Steward website.

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

High Frequency Ferrite EMI Cores



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



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

Steward PART NUMBERING SYSTEM

HF	A	100049	-	0	A	*0 (white case) *2 (black case)
MATERIAL TYPE	PRODUCT CODE	PART SIZE CODE	SELECTED DIMENSION CODE (Usually Length)	ADDITIONAL PART DESCRIPTION	PLASTIC CASE COLOR CODE	

All impedance values for Steward 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	Figure #	PLASTIC CASE DIMENSIONS mm (inches)				NET Impedance (Z) in Ohms				Steward Solid Cylindrical Core Similar Parts (for reference)
		A	B	C	D	@ 300 MHz	@ 500 MHz	@ 800 MHz	@ 1 GHz	
HFA100049-0A *	1	12.80 (0.504)	5.30 (0.209)	29.30 (1.154)	12.40 (0.488)	133	152	193	201	HFB095051-200
HFA150066-0A *	2	17.88 (0.704)	6.99 (0.275)	32.51 (1.280)	18.39 (0.724)	310	390	339	265	HFB143064-300
HFA150068-0A *	1	21.03 (0.828)	8.13 (0.320)	41.68 (1.641)	21.03 (0.828)	275	340	309	261	HFB150070-200
HFA163090-0A *	1	19.10 (0.752)	9.09 (0.358)	40.36 (1.589)	20.80 (0.819)	200	250	277	260	HFB160093-300
HFA187102-0A *	2	21.77 (0.857)	10.00 (0.394)	32.64 (1.285)	21.84 (0.860)	220	290	292	268	HFB187102-100
HFA259131-0A *	2	29.01 (1.142)	13.00 (0.512)	32.51 (1.280)	29.60 (1.165)	250	315	286	220	HFB259128-100

Plastic Cases are available in black (-0A2) or white (-0A0).

Figure 1

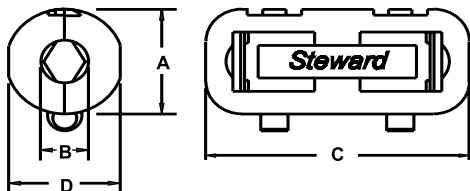
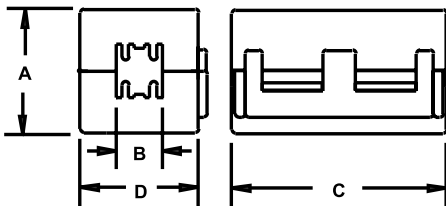


Figure 2



Custom parts are also available.



Broad Band EMI Ferrite

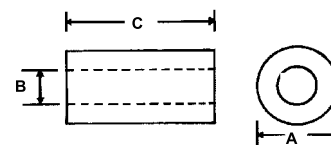
Cylindrical Cores For Round Cables & Wiring Harnesses

Steward PART NUMBERING SYSTEM

<u>28</u>	<u>B</u>	<u>0250</u>	-	<u>1</u>	<u>0</u>	<u>0</u>
MATERIAL TYPE	PRODUCT CODE	PART SIZE CODE		SELECTED DIMENSION CODE (Usually Length)	ADDITIONAL PART DESCRIPTION	ADDITIONAL PART DESCRIPTION OR COATING

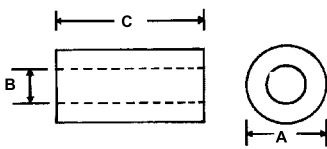
Broad band (28) round cable parts are sorted by inside diameter on page 10 and sorted by impedance on page 11.

PART NUMBER	DIMENSIONS mm (inches)			Typical Impedance (Z) in ohms		
	A	B	C	@ 25 MHz	@ 100 MHz	@ 300 MHz
28B0250-100	6.35 (0.250)	3.18 (0.125)	15.88 (0.625)	90	182	300
28B0268-000	6.78 (0.267)	3.99 (0.157)	14.22 (0.560)	65	138	260
28B0315-000	8.00 (0.315)	3.17 (0.125)	4.78 (0.188)	43	100	220
28B0355-000	9.00 (0.354)	4.75 (0.187)	20.00 (0.787)	110	205	360
28B0375-000	9.53 (0.375)	5.08 (0.200)	10.41 (0.410)	57	125	245
28B0375-100	9.53 (0.375)	5.08 (0.200)	14.48 (0.570)	74	154	282
28B0375-300	9.53 (0.375)	5.08 (0.200)	19.05 (0.750)	100	194	310
28B0375-400	9.53 (0.375)	5.08 (0.200)	4.83 (0.190)	33	81	200
28B0471-000	11.90 (0.470)	7.00 (0.275)	15.00 (0.590)	68	142	270
28B0472-090	10.00 (0.394)	3.50 (0.138)	20.00 (0.787)	100	240	395
28B0485-000	12.32 (0.485)	4.88 (0.192)	25.40 (1.000)	170	320	450
28B0500-100	12.70 (0.500)	7.92 (0.312)	6.35 (0.250)	33	83	200
28B0500-300	12.70 (0.500)	7.92 (0.312)	12.70 (0.500)	54	118	230
28B0562-000	14.27 (0.562)	6.35 (0.250)	10.16 (0.400)	69	145	270
28B0562-100	14.27 (0.562)	6.35 (0.250)	13.46 (0.530)	89	184	303
28B0562-200	14.27 (0.562)	6.35 (0.250)	28.58 (1.125)	177	317	470
28B0563-000	14.27 (0.562)	7.26 (0.286)	15.24 (0.600)	85	173	295
28B0563-100	14.27 (0.562)	7.26 (0.286)	20.30 (0.800)	109	217	333
28B0563-200	14.27 (0.562)	7.26 (0.286)	28.57 (1.125)	149	287	406



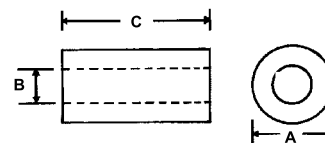
Please refer to Steward's separate Toroid Catalog for an extensive list of small ferrite inductor toroid core sizes and materials.

PART NUMBER	DIMENSIONS mm (inches)			Typical Impedance (Z) in ohms		
	A	B	C	@ 25 MHz	@ 100 MHz	@ 300 MHz
28B0570-000	14.48 (0.570)	8.51 (0.335)	5.51 (0.217)	32	82	200
28B0590-000	15.00 (0.591)	7.00 (0.275)	27.94 (1.100)	170	300	450
28B0591-200	15.00 (0.591)	5.90 (0.232)	35.00 (1.378)	250	450	580
28B0616-000	15.65 (0.616)	7.00 (0.275)	28.58 (1.125)	170	310	450
28B0625-000	15.88 (0.625)	7.87 (0.310)	14.27 (0.563)	79	163	273
28B0625-100	15.88 (0.625)	7.87 (0.310)	28.58 (1.125)	150	280	400
28B0631-000	16.00 (0.630)	9.25 (0.364)	12.00 (0.472)	60	130	250
28B0631-100	16.00 (0.630)	9.25 (0.364)	28.00 (1.102)	124	243	370
28B0669-000	17.00 (0.669)	7.01 (0.276)	25.00 (0.984)	169	323	445
28B0672-000	17.07 (0.672)	8.76 (0.345)	25.40 (1.000)	130	245	360
28B0686-000	17.42 (0.686)	9.52 (0.375)	6.35 (0.250)	39	91	214
28B0686-100	17.42 (0.686)	9.52 (0.375)	12.70 (0.500)	66	139	265
28B0686-200	17.42 (0.686)	9.52 (0.375)	28.58 (1.125)	124	242	390
28B0734-000	18.67 (0.735)	11.18 (0.440)	28.58 (1.125)	116	229	370
28B0735-000	18.67 (0.735)	10.16 (0.400)	28.58 (1.125)	135	250	400
28B0735-300	18.67 (0.735)	10.16 (0.400)	14.27 (0.562)	73	150	270
28B0748-000	19.00 (0.748)	13.00 (0.512)	29.00 (1.142)	90	180	310
28B0825-000	20.95 (0.825)	13.21 (0.520)	6.35 (0.250)	31	79	204
28B0870-000	22.10 (0.870)	13.72 (0.540)	6.35 (0.250)	34	85	205
28B0870-100	22.10 (0.870)	13.72 (0.540)	12.70 (0.500)	56	122	236
28B0999-000	25.40 (1.000)	15.49 (0.610)	12.70 (0.500)	56	122	247
28B0999-100	25.40 (1.000)	15.49 (0.610)	6.35 (0.250)	34	82	210
28B1000-000	25.40 (1.000)	12.70 (0.500)	12.70 (0.500)	73	151	278
28B1020-100	25.91 (1.020)	12.83 (0.505)	28.58 (1.125)	147	276	412
28B1122-100	28.50 (1.122)	13.77 (0.542)	28.58 (1.125)	160	307	440
28B1142-000	29.01 (1.142)	19.00 (0.748)	7.49 (0.295)	34	85	200



Additional wire turns multiply impedance

PART NUMBER	DIMENSIONS mm (inches)			Typical Impedance (Z) in ohms		
	A	B	C	@ 25 MHz	@ 100 MHz	@ 300 MHz
28B1142-100	29.01 (1.142)	19.00 (0.748)	13.84 (0.545)	54	114	235
28B1225-000	31.12 (1.225)	19.05 (0.750)	15.93 (0.627)	68	140	270
28B1225-100	31.12 (1.225)	19.05 (0.750)	7.92 (0.312)	39	93	210
28B1225-300	31.12 (1.225)	19.05 (0.750)	10.00 (0.394)	46	110	240
28B1250-000	31.75 (1.250)	19.05 (0.750)	22.22 (0.875)	92	186	292
28B1417-200	36.00 (1.417)	23.00 (0.905)	12.70 (0.500)	52	115	320
**28B1531-000	38.86 (1.530)	12.95 (0.510)	28.58 (1.125)	109	210	347
28B1540-000	39.12 (1.540)	16.76 (0.660)	22.22 (0.875)	130	254	405
28B2400-000	60.96 (2.400)	35.56 (1.400)	12.70 (0.500)	60	129	268

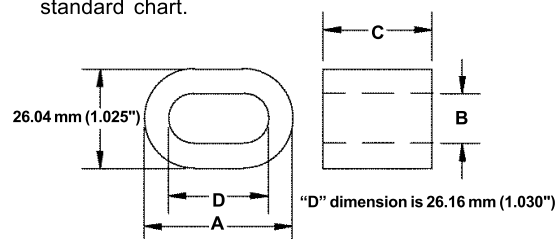


Broad band (28) round cable parts are sorted by inside diameter on page 10 and sorted by impedance on page 11.

Custom Parts are also available

Coating		
Cylindrical and toroid ferrite cores with inside diameters larger than 4.50mm (0.177") may be purchased as custom parts with epoxy coating. To specify coating, replace the last part number character (0) with the appropriate letter from the table below. For example, a 28B0562-000 with double epoxy coating is a 28B0562-00H.		
Part Number Coating Code	Coating Thickness mm (inches)	Minimum Dielectric Strength
G single coat	0.03 - 0.05 mm (0.001 - 0.002)	500 VAC
H double coat	0.05 - 0.10 mm (0.002 - 0.004)	1000 VAC

** For oval shaped part # 28B1531-000, see the part diagram below for dimensions not referenced in the standard chart.



Please visit www.Steward.com for the most up-to-date information. All dimensions & impedance values can be sorted and compared on the Steward website.



Broad Band EMI Ferrite

Split / Snap-on Cores in Plastic Cases

for Round Cables & Wiring Harnesses

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

Steward PART NUMBERING SYSTEM						*0 (white case)
28	A	0350	-	0	B	*2 (black case)
MATERIAL TYPE	PRODUCT CODE	PART SIZE CODE	SELECTED DIMENSION CODE (Usually Length)	ADDITIONAL PART DESCRIPTION	PLASTIC CASE COLOR CODE	
						Lower Broad Band Material is 27
						Broad Band High Performance Material is 28
						High Frequency Material is HF

PART NUMBER	Figure # on page 9	PLASTIC CASE DIMENSIONS mm (inches)				Maximum Cable Diameter mm (inches)	Typical Impedance (Z) in ohms			Steward Solid Cylindrical Core Similar Parts (for reference)
		A	B	C	D		@ 25 MHz	@ 100 MHz	@ 300 Mhz	
28A0350-0B2	1	13.00 (0.511)	3.50 (0.138)	25.20 (0.992)	11.50 (0.453)	3.50 (0.138)	100	240	400	28B0472-090
28A0392-0A*	1	12.80 (0.504)	5.44 (0.214)	29.08 (1.145)	12.32 (0.485)	4.57 (0.180)	75	170	320	28B0375-300
28A0393-0A*	2	12.17 (0.479)	5.59 (0.220)	25.02 (0.985)	10.06 (0.396)	4.57 (0.180)	88	190	330	28B0375-300
28A0640-0A*	1	19.10 (0.752)	9.09 (0.358)	40.36 (1.589)	20.80 (0.819)	8.95 (0.352)	105	240	390	28B0631-100
28A2024-0A*	3	29.00 (1.142)	13.00 (0.512)	32.50 (1.280)	29.60 (1.165)	12.70 (0.500)	130	280	440	28B1020-100
28A2025-0A*	3	17.90 (0.705)	7.00 (0.276)	32.50 (1.280)	18.40 (0.724)	6.35 (0.250)	130	320	510	28B0562-200
28A2026-0A2	1	21.03 (0.828)	8.13 (0.320)	41.68 (1.641)	21.03 (0.828)	6.35 (0.250)	95	270	460	28B0562-200
28A2029-0A*	3	21.77 (0.857)	10.00 (0.394)	32.84 (1.293)	21.84 (0.860)	9.91 (0.390)	95	250	420	28B0734-000
28A2432-0A2	4	19.20 (0.756)	8.20 (0.323)	19.90 (0.783)	-	8.13 (0.320)	62	160	300	28B0672-000
28A2736-0A2	1	18.00 (0.709)	9.00 (0.354)	35.10 (1.380)	19.70 (0.776)	9.00 (0.354)	120	220	360	28B0631-100
28A3039-0A2	4	24.55 (0.967)	10.20 (0.402)	13.60 (0.535)	-	10.19 (0.401)	55	130	250	28B0735-300
28A3344-0A2	4	27.80 (1.094)	11.40 (0.449)	17.63 (0.694)	-	11.35 (0.447)	70	160	300	28B0736-200
28A3851-0A2	1	30.00 (1.181)	13.00 (0.512)	33.70 (1.327)	30.00 (1.181)	12.85 (0.506)	150	260	410	28B1020-100
28A4155-0A2	4	28.80 (1.134)	13.60 (0.535)	15.40 (0.606)	-	13.55 (0.533)	50	120	230	28B0825-100
28A5776-0A2	3	29.20 (1.150)	19.30 (0.760)	42.00 (1.654)	29.40 (1.157)	18.80 (0.740)	115	210	360	28B1250-000

* - 0A0 = White Plastic Snap On Case
* - 0A2 = Black Plastic Snap On Case

A selection of Lower Broad Band Material (27) parts is listed on the Steward website.

Broad Band (28) round cable parts are sorted by inside diameter on page 10 and sorted by impedance on page 11.

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

PART NUMBER	Figure #	PLASTIC CASE DIMENSIONS mm (inches)				NET Impedance (Z) in Ohms				Steward Solid Cylindrical Core Similar Parts (for reference)
		A	B	C	D	@ 300 MHz	@ 500 MHz	@ 800 MHz	@ 1 GHZ	
HFA100049-0A*	1	12.80 (0.504)	5.30 (0.209)	29.30 (1.154)	12.40 (0.488)	133	152	193	201	HFB095051-200
HFA150066-0A*	2	17.88 (0.704)	6.99 (0.275)	32.51 (1.280)	18.39 (0.724)	310	390	339	265	HFB143064-300
HFA150068-0A*	1	21.03 (0.828)	8.13 (0.320)	41.68 (1.641)	21.03 (0.828)	275	340	309	261	HFB150070-200
HFA163090-0A*	1	19.10 (0.752)	9.09 (0.358)	40.36 (1.589)	20.80 (0.819)	200	250	277	260	HFB160093-300
HFA187102-0A*	2	21.77 (0.857)	10.00 (0.394)	32.64 (1.285)	21.84 (0.860)	220	290	292	268	HFB187102-100
HFA259131-0A*	2	29.01 (1.142)	13.00 (0.512)	32.51 (1.280)	29.60 (1.165)	250	315	286	220	HFB259128-100

* - 0A0 = White Plastic Snap On Case

* - 0A2 = Black Plastic Snap On Case

All impedance values for Steward 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.

Figure 1

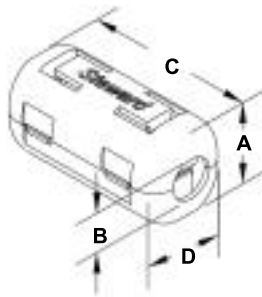


Figure 2

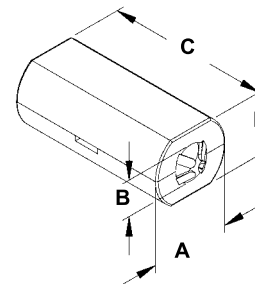


Figure 3

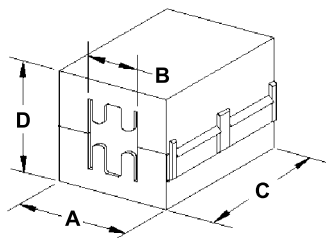
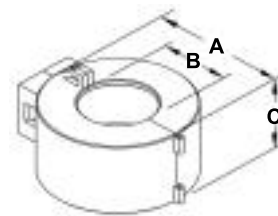


Figure 4



QUICK REFERENCE CHART - SORTED BY INSIDE DIAMETER (B)

page 10

Steward Broad Band 28 Material

One Piece (28B) & Split / Snap-on (28A) Cores for Round Cables & Wires

PART NUMBER Sorted by ID	DIMENSIONS mm			
	A	B	C	D
28B0315-000	8.00	3.17	4.78	-
28B0250-100	6.35	3.18	15.88	-
28B0472-090	10.00	3.50	20.00	
28A0350-0B2	13.00	3.50	25.20	11.50
28B0268-000	6.78	3.99	14.22	-
28B0355-000	9.00	4.75	20.00	-
28B0485-000	12.32	4.88	25.40	-
28B0375-400	9.53	5.08	4.83	-
28B0375-000	9.53	5.08	10.41	-
28B0375-100	9.53	5.08	14.48	-
28B0375-300	9.53	5.08	19.05	-
28A0392-0A*	12.80	5.44	29.08	12.32
28A0393-0A*	12.17	5.59	25.02	10.06
28B0591-200	15.00	5.90	35.00	-
28B0562-000	14.27	6.35	10.16	-
28B0562-100	14.27	6.35	13.46	-
28B0562-200	14.27	6.35	28.58	-
28B0471-000	11.90	7.00	15.00	-
28B0590-000	15.00	7.00	27.94	-
28B0616-000	15.65	7.00	28.58	-
28A2025-0A*	17.90	7.00	32.50	18.40
28B0669-000	17.00	7.01	25.00	-
28B0563-000	14.27	7.26	15.24	-
28B0563-100	14.27	7.26	20.30	-
28B0563-200	14.27	7.26	28.57	-
28B0625-000	15.88	7.87	14.27	-
28B0625-100	15.88	7.87	28.58	-
28B0500-100	12.70	7.92	6.35	-
28B0500-300	12.70	7.92	12.70	-
28A2026-0A2	21.03	8.13	41.68	21.03
28A2432-0A2	19.20	8.20	19.90	-
28B0570-000	14.48	8.51	5.51	-
28B0672-000	17.07	8.76	25.40	-
28A2736-0A2	18.00	9.00	35.10	19.70
28A0640-0A*	19.10	9.09	40.36	20.80

PART NUMBER Sorted by ID	DIMENSIONS mm			
	A	B	C	D
28B0631-000	16.00	9.25	12.00	-
28B0631-100	16.00	9.25	28.00	-
28B0686-000	17.42	9.52	6.35	-
28B0686-100	17.42	9.52	12.70	-
28B0686-200	17.42	9.52	28.58	-
28A2029-0A*	21.77	10.00	32.84	21.84
28B0735-300	18.67	10.16	14.27	-
28B0735-000	18.67	10.16	28.58	-
28A3039-0A2	24.55	10.20	13.60	-
28B0734-000	18.67	11.18	28.58	-
28A3344-0A2	27.80	11.40	17.63	-
28B1000-000	25.40	12.70	12.70	-
28B1020-100	25.91	12.83	28.58	-
28B1531-000	38.86	12.95	28.58	26.16
28B0748-000	19.00	13.00	29.00	-
28A2024-0A*	29.00	13.00	32.50	29.60
28A3851-0A2	30.00	13.00	33.70	30.00
28B0825-000	20.95	13.21	6.35	-
28A4155-0A2	28.80	13.60	15.40	-
28B0870-000	22.10	13.72	6.35	-
28B0870-100	22.10	13.72	12.70	-
28B1122-100	28.50	13.77	28.58	-
28B0999-100	25.40	15.49	6.35	-
28B0999-000	25.40	15.49	12.70	-
28B1540-000	39.12	16.76	22.22	-
28B1142-000	29.01	19.00	7.49	-
28B1142-100	29.01	19.00	13.84	-
28B1225-100	31.12	19.05	7.92	
28B1225-300	31.12	19.05	10.00	-
28B1225-000	31.12	19.05	15.93	-
28B1250-000	31.75	19.05	22.22	-
28A5776-0A2	29.20	19.30	42.00	29.40
28B1417-200	36.00	23.00	12.70	-
28B2400-000	60.96	35.65	12.70	-

Custom Parts are also available

Steward Broad Band 28 Material

One Piece (28B) & Split / Snap-on (28A) Cores for Round Cables & Wires

PART NUMBER Sorted by Impedance	TYPICAL IMPEDANCE (Z) IN OHMS		
	@ 25 MHz	@ 100 MHz	@ 300 MHz
28B0825-000	31	79	204
28B0375-400	33	81	200
28B0570-000	32	82	200
28B0999-100	34	82	210
28B0500-100	33	83	200
28B1142-000	34	85	200
28B0870-000	34	85	205
28B0686-000	39	91	214
28B1225-100	39	93	210
28B0315-000	43	100	220
28B1225-300	46	110	240
28B1142-100	54	114	235
28B1417-200	52	115	320
28B0500-300	54	118	230
28A4155-0A2	50	120	230
28B0870-100	56	122	236
28B0999-000	56	122	247
28B0375-000	57	125	245
28B2400-000	60	129	268
28A3039-0A2	55	130	250
28B0631-000	60	130	250
28B0268-000	65	138	260
28B0686-100	66	139	265
28B1225-000	68	140	270
28B0471-000	68	142	270
28B0562-000	69	145	270
28B0735-300	73	150	270
28B1000-000	73	151	278
28B0375-100	74	154	282
28A2432-0A2	62	160	300
28A3344-0A2	70	160	300
28B0625-000	79	163	273
28A0392-0A*	75	170	320
28B0563-000	85	173	295
28B0748-000	90	180	310

PART NUMBER Sorted by Impedance	TYPICAL IMPEDANCE (Z) IN OHMS		
	@ 25 MHz	@ 100 MHz	@ 300 MHz
28B0250-100	90	182	300
28B0562-100	89	184	303
28B1250-000	92	186	292
28A0393-0A*	88	190	330
28B0375-300	100	194	310
28B0355-000	110	205	360
28B1531-000	109	210	347
28A5776-0A2	115	210	360
28B0563-100	109	217	333
28A2736-0A2	120	220	360
28B0734-000	116	229	370
28A0640-0A*	105	240	390
28B0472-090	100	240	395
28A0350-0B2	100	240	400
28B0686-200	124	242	390
28B0631-100	124	243	370
28B0672-000	130	245	360
28B0735-000	135	250	400
28A2029-0A*	95	250	420
28B1540-000	130	254	405
28A3851-0A2	150	260	410
28A2026-0A2	95	270	460
28B1020-100	147	276	412
28B0625-100	150	280	400
28A2024-0A*	130	280	440
28B0563-200	149	287	406
28B0590-000	170	300	450
28B1122-100	160	307	440
28B0616-000	170	310	450
28B0562-200	177	317	470
28B0485-000	170	320	450
28A2025-0A*	130	320	510
28B0669-000	169	323	445
28B0591-200	250	450	580

Custom Parts are also available



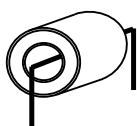
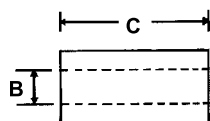
Low Frequency Ferrite EMI Cores for Round Cables & Wiring Harnesses 300 KHz to 30 MHz

Steward PART NUMBERING SYSTEM

LF	B	090050	-	0	0	0
MATERIAL TYPE	PRODUCT CODE	PART SIZE CODE (MM)	SELECTED DIMENSION CODE (Usually Length)	ADDITIONAL PART DESCRIPTION	ADDITIONAL PART DESCRIPTION OR COATING	

All impedance values for Steward Low 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	DIMENSIONS mm (inches)			Typical NET Impedance (Z) in ohms								
				@ 500 KHz			@ 1 MHz			@ 5 MHz		
				# of Wire Turns			# of Wire Turns			# of Wire Turns		
	A	B	C	1	2	3	1	2	3	1	2	3
LFB090050-000	9.00 (0.354)	5.00 (0.197)	7.00 (0.276)	12	58	132	21	90	200	36	140	320
LFB095051-000	9.50 (0.374)	5.10 (0.201)	19.05 (0.750)	36	150	350	63	240	540	86	340	480
LFB127079-000	12.70 (0.500)	7.92 (0.312)	7.00 (0.276)	9	45	100	16	70	158	25	102	228
LFB143064-000	14.27 (0.562)	6.35 (0.250)	28.58 (1.125)	70	290	650	122	490	1100	120	480	1080
LFB143064-100	14.27 (0.562)	6.35 (0.250)	13.46 (0.530)	33	145	325	57	220	500	53	215	475
LFB159079-000	15.88 (0.625)	7.87 (0.310)	28.58 (1.125)	61	250	570	105	410	920	100	390	880
LFB174095-000	17.40 (0.685)	9.50 (0.374)	28.58 (1.125)	52	200	460	91	350	800	85	340	770
LFB180100-000	18.10 (0.713)	10.00 (0.394)	10.00 (0.394)	18	75	170	31	138	310	29	115	260
LFB187102-000	18.70 (0.736)	10.16 (0.400)	28.58 (1.125)	53	200	430	91	350	780	84	330	770
LFB220140-000	22.10 (0.870)	14.00 (0.551)	12.70 (0.500)	18	72	163	30	120	270	28	110	250
LFB250150-000	25.00 (0.984)	15.00 (0.591)	13.00 (0.512)	16	70	155	34	105	240	26	80	180
LFB259128-000	25.91 (1.020)	12.83 (0.505)	28.58 (1.125)	61	220	520	106	420	960	62	240	560
LFB290190-000	28.98 (1.141)	19.05 (0.750)	15.21 (0.599)	19	90	200	34	155	355	22	70	200
LFB310190-000	31.00 (1.220)	19.00 (0.748)	13.00 (0.512)	19	80	182	33	143	322	22	88	196



1 Turn



2 Turns



3 Turns

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

Steward
www.steward.com

North America - U.S.A. • Phone: +1 423 308 1690 • Fax: +1 423 308 1622 • e-mail: americas@steward.com
 North America - Mexico • Phone: +52 662 260-4832 • Fax: +52 662 260-5074 • e-mail: mexico@steward.com
 Europe - Scotland, UK • Phone: +44 (0)1506 414200 • Fax: +44 (0)1506 410694 • e-mail: europe@steward.com
 Asia / Pacific - Singapore • Phone: +65 6272 2646 • Fax: +65 6272 6165 • e-mail: asia@steward.com
 China • Phone: +86-765-563 8860 • Fax: +86-765-563 8862 • e-mail: china@steward.com

BROCH 046
REV 3 10/2003



Broad Band Ferrite EMI Cores for Ribbon & Flex Cables

Steward PART NUMBERING SYSTEM

<u>28</u>	<u>R</u>	<u>0315</u>	-	<u>2</u>	<u>0</u>	<u>0</u>
MATERIAL TYPE	PRODUCT CODE	PART SIZE CODE		SELECTED DIMENSION CODE (Usually Length)	ADDITIONAL PART DESCRIPTION	ADDITIONAL PART DESCRIPTION

Broad Band (28) ribbon and flex cable cores are sorted by slot width on page 18 and sorted by impedance on page 19.

Parts with double sided mounting tape are available

PART NUMBER	Figure # on page 15	DIMENSIONS mm (inches)					Typical Impedance (Z) in Ohms		
		A	B	C	D	E	@ 25 MHz	@ 100 MHz	@ 300 MHz
28R0315-200	2	8.00 (0.315)	6.00 (0.236)	12.00 (0.472)	2.70 (0.106)	0.70 (0.028)	48	102	250
28R0393-100	3	10.00 (0.394)	7.00 (0.276)	20.02 (0.788)	7.00 (0.276)	4.00 (0.157)	67	142	246
28R0453-100	2	11.50 (0.453)	8.00 (0.315)	6.00 (0.236)	3.00 (0.118)	0.70 (0.028)	28	76	220
28R0453-200	2	11.50 (0.453)	8.00 (0.315)	12.00 (0.472)	3.00 (0.118)	0.70 (0.028)	43	104	260
28R0453-300	2	11.50 (0.453)	8.00 (0.315)	20.00 (0.787)	3.00 (0.118)	0.70 (0.028)	65	153	335
28R0480-000	2	12.20 (0.480)	8.00 (0.315)	18.00 (0.709)	5.50 (0.217)	1.00 (0.039)	100	190	320
28R0480-100	2	12.20 (0.480)	8.00 (0.315)	12.00 (0.472)	5.50 (0.217)	1.00 (0.039)	68	150	290
28R0592-010	2	15.01 (0.591)	10.00 (0.394)	22.86 (0.900)	7.49 (0.295)	1.50 (0.059)	121	227	370
28R0610-000	4	15.50 (0.610)	13.50 (0.531)	10.00 (0.394)	3.40 (0.134)	1.40 (0.055)	29	80	216
28R0614-100	2	15.60 (0.614)	13.60 (0.535)	12.00 (0.472)	2.80 (0.110)	0.70 (0.028)	36	98	245
28R0614-200	2	15.60 (0.614)	13.60 (0.535)	16.00 (0.630)	2.80 (0.110)	0.70 (0.028)	43	116	270
28R0669-000	2	17.00 (0.669)	13.00 (0.512)	12.00 (0.472)	3.50 (0.138)	0.75 (0.030)	41	110	270
28R0669-100	2	17.00 (0.669)	13.00 (0.512)	8.00 (0.315)	3.50 (0.138)	0.75 (0.030)	32	95	240
28R0756-000	4	19.20 (0.756)	15.00 (0.591)	10.00 (0.394)	5.35 (0.211)	1.15 (0.045)	40	100	260
28R0756-200	4	19.20 (0.756)	15.00 (0.591)	16.00 (0.630)	5.35 (0.211)	1.15 (0.045)	58	150	300
28R0880-000	2	22.35 (0.880)	14.00 (0.551)	19.05 (0.750)	7.75 (0.305)	1.50 (0.059)	93	187	356
28R0898-100	2	22.80 (0.898)	18.70 (0.736)	12.00 (0.472)	2.80 (0.110)	0.70 (0.028)	37	110	255
28R0898-200	2	22.80 (0.898)	18.70 (0.736)	16.00 (0.630)	2.80 (0.110)	0.70 (0.028)	43	127	290
28R0984-000	4	25.00 (0.984)	18.00 (0.709)	24.00 (0.945)	7.70 (0.303)	0.90 (0.035)	100	220	430
28R0984-200	4	25.00 (0.984)	18.00 (0.709)	16.00 (0.630)	7.70 (0.303)	0.90 (0.035)	70	170	370

PART NUMBER	Figure # on page 15	DIMENSIONS mm (inches)					Typical Impedance (Z) in ohms		
		A	B	C	D	E	@ 25 MHz	@ 100 MHz	@ 300 MHz
28R1101-000	1	27.97 (1.101)	22.94 (0.903)	14.66 (0.577)	7.75 (0.305)	1.50 (0.059)	55	140	300
28R1102-000	2	28.00 (1.102)	23.00 (0.906)	15.00 (0.591)	5.80 (0.228)	0.80 (0.031)	61	154	340
28R1102-100	2	28.00 (1.102)	23.00 (0.906)	20.00 (0.787)	5.80 (0.228)	0.80 (0.031)	75	192	380
28R1103-000	2	28.00 (1.102)	23.00 (0.906)	27.00 (1.063)	6.10 (0.240)	1.10 (0.043)	95	230	480
28R1127-000	4	28.58 (1.125)	23.50 (0.925)	31.00 (1.220)	7.70 (0.303)	1.70 (0.067)	100	220	430
28R1127-200	4	28.58 (1.125)	23.50 (0.925)	24.89 (0.980)	7.70 (0.303)	1.70 (0.067)	85	191	410
28R1127-400	4	28.58 (1.125)	23.50 (0.925)	17.00 (0.669)	7.70 (0.303)	1.70 (0.067)	60	150	330
28R1127-500	4	28.58 (1.125)	23.50 (0.925)	9.70 (0.382)	7.70 (0.303)	1.70 (0.067)	39	100	260
28R1141-010	4	37.00 (1.457)	27.00 (1.063)	18.25 (0.718)	8.00 (0.315)	1.50 (0.059)	67	168	380
28R1227-100	2	31.12 (1.225)	24.77 (0.975)	13.30 (0.525)	8.26 (0.325)	1.91 (0.075)	52	128	300
28R1236-000	2	31.40 (1.236)	23.00 (0.906)	19.00 (0.748)	7.75 (0.305)	1.50 (0.059)	78	162	370
28R1240-010	2	31.40 (1.236)	23.00 (0.906)	21.00 (0.827)	7.75 (0.305)	1.00 (0.039)	84	211	440
28R1259-200	4	32.00 (1.260)	27.80 (1.094)	25.00 (0.984)	7.75 (0.305)	1.50 (0.060)	78	192	418
28R1259-300	4	32.00 (1.260)	27.80 (1.094)	17.00 (0.669)	7.75 (0.305)	1.50 (0.060)	62	154	323
28R1261-100	4	32.00 (1.260)	25.10 (0.988)	35.00 (1.378)	7.75 (0.305)	0.90 (0.035)	140	300	580
28R1261-200	4	32.00 (1.260)	25.10 (0.988)	9.70 (0.382)	7.75 (0.305)	0.90 (0.035)	50	135	310
28R1262-000	2	32.00 (1.260)	26.00 (1.024)	30.00 (1.181)	7.00 (0.276)	1.00 (0.039)	110	260	520
28R1339-000	4	34.00 (1.339)	29.58 (1.165)	25.00 (0.984)	7.75 (0.305)	1.50 (0.059)	58	150	330
28R1450-100	4	36.83 (1.450)	29.58 (1.165)	10.00 (0.394)	7.75 (0.305)	0.75 (0.030)	48	130	290
28R1457-400	4	37.01 (1.457)	33.00 (1.299)	13.46 (0.530)	4.50 (0.177)	0.51 (0.020)	44	140	310
28R1467-000	4	37.00 (1.457)	31.08 (1.224)	25.00 (0.984)	7.75 (0.305)	1.50 (0.059)	85	212	467
28R1517-000	2	38.10 (1.500)	26.67 (1.050)	25.40 (1.000)	12.07 (0.475)	1.91 (0.075)	110	230	520
28R1518-000	1	38.50 (1.516)	26.80 (1.055)	25.40 (1.000)	12.09 (0.476)	1.91 (0.075)	105	235	478
28R1654-010	4	42.00 (1.654)	37.50 (1.476)	5.00 (0.197)	5.00 (0.197)	0.70 (0.028)	27	84	200
28R1775-000	2	45.08 (1.775)	34.42 (1.355)	28.58 (1.125)	12.45 (0.490)	1.52 (0.060)	115	260	530
28R1779-000	2	63.50 (2.500)	52.07 (2.050)	28.58 (1.125)	12.70 (0.500)	1.68 (0.066)	114	298	588

PART NUMBER	Figure #	DIMENSIONS mm (inches)					Typical Impedance (Z) in ohms		
		A	B	C	D	E	@ 25 MHz	@ 100 MHz	@ 300 MHz
28R1779-100	2	63.50 (2.500)	52.07 (2.050)	12.98 (0.511)	12.70 (0.500)	1.68 (0.066)	65	170	375
28R1799-010	4	45.60 (1.795)	37.00 (1.457)	18.40 (0.724)	7.90 (0.311)	1.40 (0.055)	57	172	388
28R1800-010	2	45.72 (1.800)	35.05 (1.380)	27.94 (1.100)	12.70 (0.500)	1.52 (0.060)	110	260	555
28R1860-310	2	47.70 (1.878)	40.00 (1.576)	31.75 (1.250)	15.24 (0.600)	2.74 (0.108)	115	270	558
28R1953-000	4	49.61 (1.953)	44.00 (1.732)	12.00 (0.472)	7.62 (0.300)	1.45 (0.058)	45	127	300
28R2000-010	2	50.80 (2.000)	40.64 (1.600)	15.24 (0.600)	12.19 (0.480)	2.03 (0.080)	63	170	380
28R2170-000	2	55.12 (2.170)	43.69 (1.720)	25.40 (1.000)	12.70 (0.500)	1.27 (0.050)	110	280	550
28R2170-100	2	55.12 (2.170)	43.69 (1.720)	12.70 (0.500)	12.70 (0.500)	1.27 (0.050)	65	170	370
28R2240-130	4	56.90 (2.240)	52.32 (2.060)	9.00 (0.354)	5.59 (0.220)	1.02 (0.040)	40	110	260
28R3149-000	2	79.98 (3.149)	68.58 (2.700)	12.70 (0.500)	11.99 (0.472)	1.91 (0.075)	51	135	318

Core shape and size affect frequency response and impedance.

Broad band (28) ribbon and flex cable cores are sorted by slot width on page 18 and sorted by impedance on page 19.

FIGURE 1

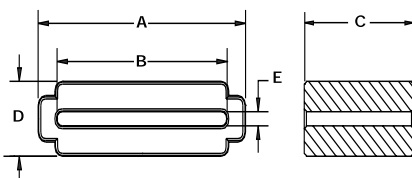


FIGURE 2

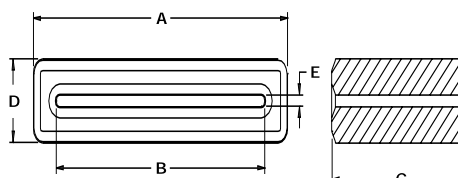


FIGURE 3

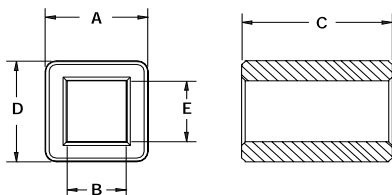
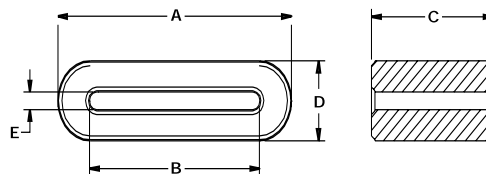


FIGURE 4



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



Broad Band Split Ferrite Cores for Ribbon & Flex Cables

Steward offers a selection of "split" cores for retrofit and post-assembly operations. Similar in performance to Steward's one piece core designs, these split ferrite cores provide excellent differential and common mode EMI suppression on flat cable assemblies. Lightweight, inexpensive metal or plastic end clips and cases provide secure closure of the ferrite onto the flat cable.

Steward PART NUMBERING SYSTEM

28	S	0651	-	0	0*	0
MATERIAL TYPE	PRODUCT CODE	PART SIZE CODE	SELECTED DIMENSION CODE (Usually Length)	CASE OR CLIP CODE	SPECIAL PACKAGING OR FINISH CODE	

*0 = No Clip
 *M = Metal Clip
 *P = Plastic Clip
 *A = Hinged Case

Parts with double sided mounting tape are available.

Part Number	Figure # on page 17	*Available End Clip Types	SPLIT CORE DIMENSIONS mm (inches)					Typical Impedance (Z) in Ohms		
			A	B	C	D**	E**	@ 25 MHz	@ 100 MHz	@ 300 MHz
28S0651-000	2	NA	16.50 (0.650)	12.50 (0.492)	10.25 (0.404)	2.00 (0.079)	0.51 (0.020)	33	95	240
28S0670-000	3	NA	17.02 (0.670)	12.50 (0.492)	14.99 (0.590)	3.40 (0.134)	0.51 (0.020)	60	150	310
28S1517-000	2	NA	43.59 (1.716)	35.05 (1.380)	28.00 (1.102)	5.26 (0.207)	0.95 (0.037)	85	220	480
28S2001-0*0	1	0, M, P	63.50 (2.500)	52.07 (2.050)	28.58 (1.125)	6.35 (0.250)	0.84 (0.033)	100	280	590
28S2001-0A2	4	Hinged Case	67.08 (2.641)	53.75 (2.116)	31.67 (1.247)	16.66 (0.656)	1.62 (0.064)	100	280	590
28S2001-1*0	1	0, M	63.50 (2.500)	52.07 (2.050)	12.98 (0.511)	6.35 (0.250)	0.84 (0.033)	50	150	340
28S2001-2A2	4	Hinged Case	67.08 (2.641)	53.75 (2.116)	27.53 (1.084)	16.66 (0.656)	1.62 (0.064)	80	230	480
28S2011-0*0	1	0, M, P	76.20 (3.000)	65.28 (2.570)	28.58 (1.125)	6.35 (0.250)	0.84 (0.033)	100	280	600
28S2011-1*0	1	0, M	76.20 (3.000)	65.28 (2.570)	15.01 (0.591)	6.35 (0.250)	0.84 (0.033)	60	180	390
28S2012-0*0	1	0, M	88.90 (3.500)	78.23 (3.080)	28.58 (1.125)	6.48 (0.255)	0.84 (0.033)	80	240	630
28S2022-0*0	1	0, M, P	45.09 (1.775)	34.42 (1.355)	28.58 (1.125)	6.35 (0.250)	0.84 (0.033)	100	250	550
28S2023-0*0	1	0, M	38.10 (1.500)	26.67 (1.050)	25.40 (1.000)	6.35 (0.250)	0.84 (0.033)	115	250	520
28S2827-210	2	NA	21.00 (0.827)	17.00 (0.669)	12.01 (0.473)	3.99 (0.157)	0.94 (0.037)	43	120	270

** The "D" & "E" dimensions for 28S, split, two piece cores must be doubled for total assembled dimensions. "D" & "E" dimensions shown for hinged case parts are for complete assemblies.

Broad band (28) ribbon and flex cable cores are sorted by slot width on page 18 and sorted by impedance on page 19.

** To determine total slot gap of an assembled split ferrite ribbon core, multiply the “E” dimension by 2. Both the “D” and “E” dimensions must be doubled for assembled core dimensions.

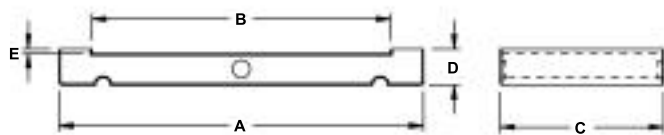


Figure 1

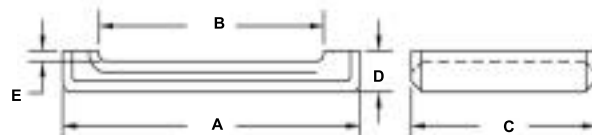


Figure 2

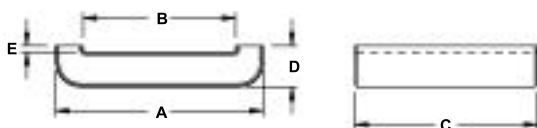


Figure 3

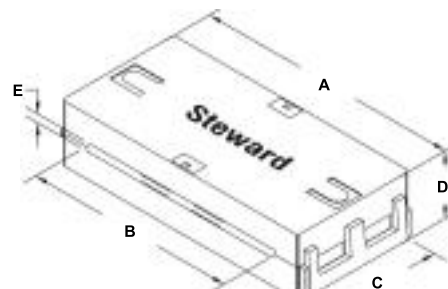


Figure 4

Split ferrite core assembly with hinged black plastic case

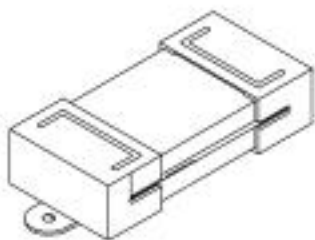
Steward split ferrite cores for flat / ribbon cables are sold as single sides. It is necessary to order two sides to form one set. [Except 28S2001-0A2 and -2A2 (Figure 4) which is sold assembled]

Plastic Clip Assemblies: To specify one core side and one white plastic clip together, replace the second ferrite core part number character after the dash with the letter “P” (example: 28S2022-0P0). One complete assembly of two ferrite core sides (28 material) with two plastic clips would be specified as follows: 2 of part # 28S2022-0P0. Attachment ears are standard.

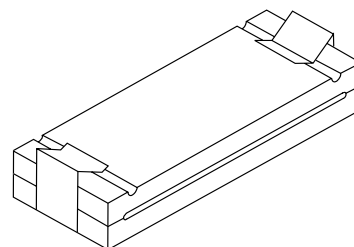
Metal Clip Assemblies: To specify one core side and one metal clip together, replace the second ferrite core part number character after the dash with the letter “M” (example: 28S2022-0M0). One complete assembly of two ferrite cores (28 material) with two metal clips would be specified as follows: 2 of part # 28S2022-0M0

Clips for Bulk Shipment: To order white plastic end clips (with attachment ears) separately in bulk, specify part number ASSE001-2. To order white plastic end clips without attachment ears separately in bulk, specify part number ASSE010-2. To order metal end clips separately in bulk, specify part number ASSE017-2.

Split Core with white Plastic Clips



Split Core with Metal Clips



QUICK REFERENCE CHART - SORTED BY SLOT WIDTH (B)

page 18

Steward Broad Band 28 Material One Piece (28R) & Split (28S) Cores for Ribbon & Flex Cables

PART NUMBER Sorted by Slot Width	DIMENSIONS mm				
	A	B	C	D**	E**
28R0315-200	8.00	6.00	12.00	2.70	0.70
28R0393-100	10.00	7.00	20.02	7.00	4.00
28R0453-100	11.50	8.00	6.00	3.00	0.70
28R0453-200	11.50	8.00	12.00	3.00	0.70
28R0480-100	12.20	8.00	12.00	5.50	1.00
28R0480-000	12.20	8.00	18.00	5.50	1.00
28R0453-300	11.50	8.00	20.00	3.00	0.70
28R0592-010	15.01	10.00	22.86	7.49	1.50
28S0651-000	16.50	12.50	10.25	2.00	0.51
28S0670-000	17.02	12.50	14.99	3.40	0.51
28R0669-100	17.00	13.00	8.00	3.50	0.75
28R0669-000	17.00	13.00	12.00	3.50	0.75
28R0610-000	15.50	13.50	10.00	3.40	1.40
28R0614-100	15.60	13.60	12.00	2.80	0.70
28R0614-200	15.60	13.60	16.00	2.80	0.70
28R0880-000	22.35	14.00	19.05	7.75	1.50
28R0756-000	19.20	15.00	10.00	5.35	1.15
28R0756-200	19.20	15.00	16.00	5.35	1.15
28S2827-210	21.00	17.00	12.01	3.99	0.94
28R0984-200	25.00	18.00	16.00	7.70	0.90
28R0984-000	25.00	18.00	24.00	7.70	0.90
28R0898-100	22.80	18.70	12.00	2.80	0.70
28R0898-200	22.80	18.70	16.00	2.80	0.70
28R1101-000	27.97	22.94	14.66	7.75	1.50
28R1102-000	28.00	23.00	15.00	5.80	0.80
28R1236-000	31.40	23.00	19.00	7.75	1.50
28R1102-100	28.00	23.00	20.00	5.80	0.80
28R1240-010	31.40	23.00	21.00	7.75	1.00
28R1103-000	28.00	23.00	27.00	6.10	1.10
28R1127-500	28.58	23.50	9.70	7.70	1.70
28R1127-400	28.58	23.50	17.00	7.70	1.70
28R1127-200	28.58	23.50	24.89	7.70	1.70
28R1127-000	28.58	23.50	31.00	7.70	1.70
28R1227-100	31.12	24.77	13.30	8.26	1.91
28R1261-200	32.00	25.10	9.70	7.75	0.90

PART NUMBER Sorted by Slot Width	DIMENSIONS mm				
	A	B	C	D**	E**
28R1261-100	32.00	25.10	35.00	7.75	0.90
28R1262-000	32.00	26.00	30.00	7.00	1.00
28R1517-000	38.10	26.67	25.40	12.07	1.91
28S2023-0*0	38.10	26.67	25.40	6.35	0.84
28R1518-000	38.50	26.80	25.40	12.09	1.91
28R1141-010	37.00	27.00	18.25	8.00	1.50
28R1259-300	32.00	27.80	17.00	7.75	1.50
28R1259-200	32.00	27.80	25.00	7.75	1.50
28R1450-100	36.83	29.58	10.00	7.75	0.75
28R1339-000	34.00	29.58	25.00	7.75	1.50
28R1467-000	37.00	31.08	25.00	7.75	1.50
28R1457-400	37.01	33.00	13.46	4.50	0.51
28R1775-000	45.08	34.42	28.58	12.45	1.52
28S2022-0*0	45.09	34.42	28.58	6.35	0.84
28R1800-010	45.72	35.05	27.94	12.70	1.52
28S1517-000	43.59	35.05	28.00	5.26	0.95
28R1799-010	45.60	37.00	18.40	7.90	1.40
28R1654-010	42.00	37.50	5.00	5.00	0.70
28R2000-010	50.80	40.64	15.24	12.19	2.03
28R1860-310	47.24	40.74	31.75	15.24	2.74
28R2170-100	55.12	43.69	12.70	12.70	1.27
28R2170-000	55.12	43.69	25.40	12.70	1.27
28R1953-000	49.61	44.00	12.00	7.62	1.45
28R1779-100	63.50	52.07	12.98	12.70	1.68
28S2001-1*0	63.50	52.07	12.98	6.35	0.84
28R1779-000	63.50	52.07	28.58	12.70	1.68
28S2001-0*0	63.50	52.07	28.58	6.35	0.84
28R2240-130	56.90	52.32	9.00	5.59	1.02
28S2001-0A2	67.08	53.75	31.70	16.66	1.62
28S2001-2A2	67.08	53.75	27.53	16.66	1.62
28S2011-1*0	76.20	65.28	15.01	6.35	0.84
28S2011-0*0	76.20	65.28	28.58	6.35	0.84
28R3149-000	79.98	68.58	12.70	11.99	1.91
28S2012-0*0	88.90	78.23	28.58	6.48	0.84

** The "D" & "E" dimensions for 28S split two-piece cores must be doubled for total assembled dimensions

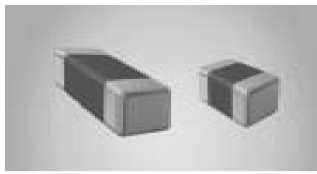
Steward Broad Band 28 Material

One Piece (28R) & Split (28S) Cores for Ribbon & Flex Cables

PART NUMBER Sorted by Impedance	TYPICAL IMPEDANCE (Z) IN OHMS		
	@ 25 MHz	@ 100 MHz	@ 300 MHz
28R0453-100	28	76	220
28R0610-000	29	80	216
28R1654-010	27	84	200
28R0669-100	32	95	240
28S0651-000	33	95	240
28R0614-100	36	98	245
28R1127-500	39	100	260
28R0756-000	40	100	260
28R0315-200	48	102	250
28R0453-200	43	104	260
28R0898-100	37	110	255
28R2240-130	40	110	260
28R0669-000	41	110	270
28R0614-200	43	116	270
28S2827-210	43	120	270
28R0898-200	43	127	290
28R1953-000	45	127	300
28R1227-100	52	128	300
28R1450-100	48	130	290
28R1261-200	50	135	310
28R3149-000	51	135	318
28R1101-000	55	140	300
28R1457-400	44	140	310
28R0393-100	67	142	246
28R0480-100	68	150	290
28R0756-200	58	150	300
28S0670-000	60	150	310
28R1127-400	60	150	330
28R1339-000	58	150	330
28S2001-1*0	50	150	340
28R0453-300	65	153	335
28R1259-300	62	154	323
28R1102-000	61	154	340
28R1236-000	78	162	370
28R1141-010	67	168	380

PART NUMBER Sorted by Impedance	TYPICAL IMPEDANCE (Z) IN OHMS		
	@ 25 MHz	@ 100 MHz	@ 300 MHz
28R2170-100	65	170	370
28R0984-200	70	170	370
28R1779-100	65	170	375
28R2000-010	63	170	380
28R1799-010	57	172	388
28S2011-1*0	60	180	390
28R0880-000	93	187	356
28R0480-000	100	190	320
28R1127-200	85	191	410
28R1102-100	75	192	380
28R1259-200	78	192	418
28R1240-010	84	211	440
28R1467-000	85	212	467
28R0984-000	100	220	430
28R1127-000	100	220	430
28S1517-000	85	220	480
28R0592-010	121	227	370
28S2001-2A2	80	230	480
28R1103-000	95	230	480
28R1517-000	110	230	520
28R1518-000	105	235	478
28S2012-0*0	80	240	630
28S2023-0*0	115	250	520
28S2022-0*0	100	250	550
28R1262-000	110	260	520
28R1775-000	115	260	530
28R1800-010	110	260	555
28R1860-310	115	270	558
28R2170-000	110	280	550
28S2001-0*0	100	280	590
28S2001-0A2	100	280	590
28S2011-0*0	100	280	600
28R1779-000	114	298	588
28R1261-100	140	300	580

Custom parts are also available



Ultra High Current EMI Ferrite Chip Beads



Steward's family of monolithic surface mount ferrites provide compact, cost effective EMI filtering for today's densely packed single and double sided surface mount PCB designs. Successful EMI filtering often depends on reducing high frequency noise at its source, our small footprint SMT ferrite enables designers to place high performance filtering very close to troublesome high frequency devices.

Features:

- High current performance (up to **10 amps** continuous operation) • Peak impedance at approximately 2 GHz • Small footprint
- Economical component for high current applications requiring discrete signal filtering • High impedance retention under DC Bias
- Superior retention under bias when compared to older wire wound components • Vibration resistant, monolithic construction
- Lead Free

Applications:

- High current products • Differential mode filtering of power input pins of oscillators and logic devices using high speed clocks
- Filtering of low frequency input/output signals entering/leaving shielded enclosures • High frequency filtering of medium speed clocks and video signals • Preventing oscillations in high frequency amplifiers • Discrete component filtration in power supplies

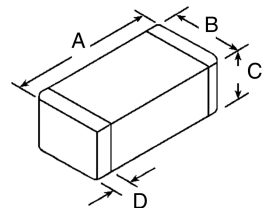
Test Specifications:

- Maximum current ratings (rated I MAX) are determined by testing to a maximum temperature rise of 40°C with continuous current.
- Board level components are rated up to a maximum of 75 volts

Tested with: •HP4396A (100KHz - 1.8 GHz) or HP8753 (to 6 GHz) Network/Spectrum Analyzer •HP43961A Impedance Test Kit •HP16192A Test Fixture or Inter-Continental Microwave custom fixtures •HP16200A DC Bias Adapter •Philips PM2811 DC Power Supply •Ambient Temperature 23.5°C ± 2° •Bandwidth 3 kHz •Sweep Time 423 ms •Impedance is rated at ± 25% @ 100MHz

Steward PART NUMBERING SYSTEM EXAMPLE

<u>DM</u>	<u>1612</u>	<u>X</u>	<u>560</u>	<u>R</u>	<u>-10</u>
Product Series Code	Part Size Code	Rated Continuous Current Code	Impedance Value Code	Packaging Code	Additional Description



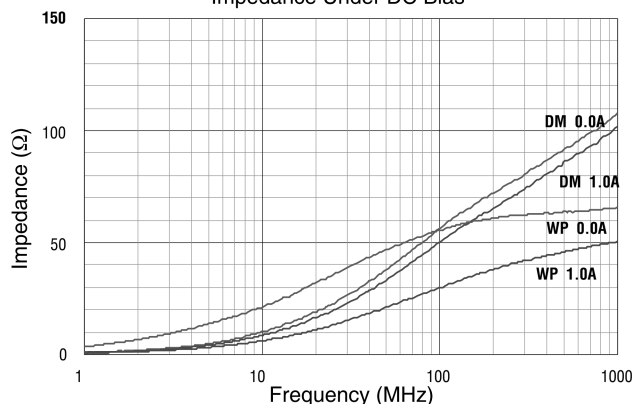
Ambient Temperature Range: -55°C to +125°C

PART NUMBER	FIGURE # (ON BACK)	A mm (inches)	B mm (inches)	C mm (inches)	D mm (inches)	IMPEDANCE (Z) TYPICAL OHMS @			DCR MAX (Ohms)	RATED I MAX (continuous) mA
						100 MHz	500 MHz	1 GHz		
DM1612X560R-10	1	4.06 ± 0.200 (0.160 ± 0.008)	3.05 ± 0.200 (0.120 ± 0.008)	2.28 ± 0.200 (0.090 ± 0.008)	0.46 ± 0.200 (0.018 ± 0.008)	56	90	100	0.004	10000
DM3312X101R-10	2	8.50 ± 0.200 (0.335 ± 0.008)	3.05 ± 0.200 (0.120 ± 0.008)	2.28 ± 0.200 (0.090 ± 0.008)	0.51 ± 0.200 (0.020 ± 0.010)	100	175	225	0.004	10000

Comparison of impedance (under bias) to older wire type parts

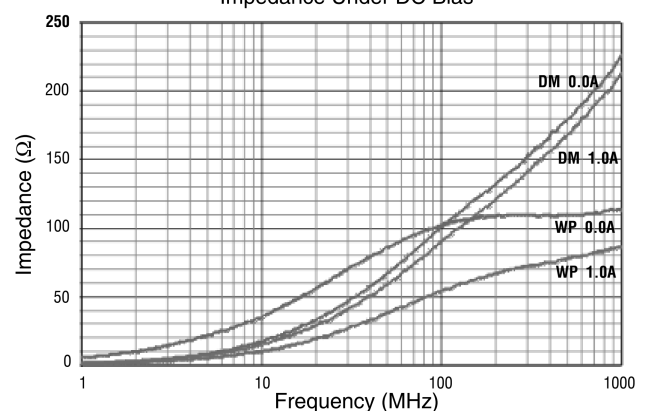
DM1612 (DM) vs. Conventional Wound Part (WP)

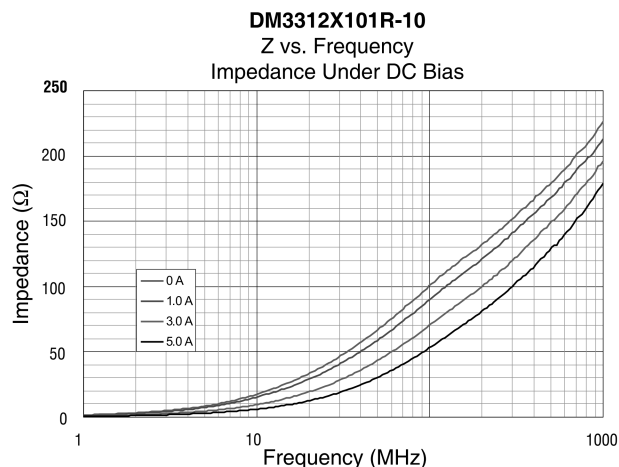
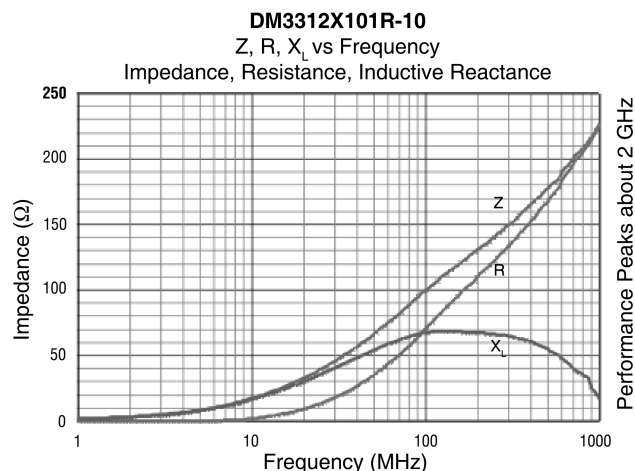
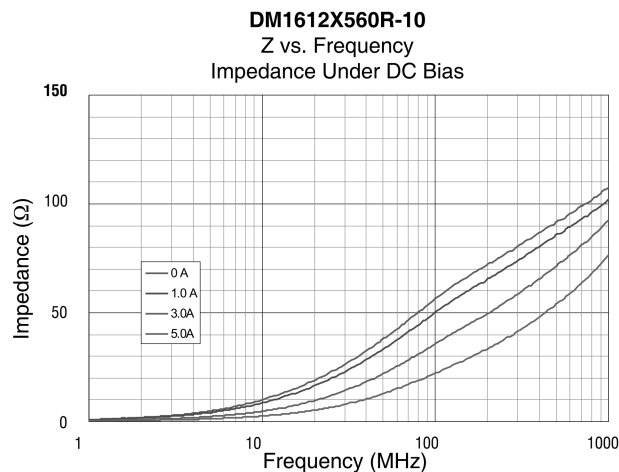
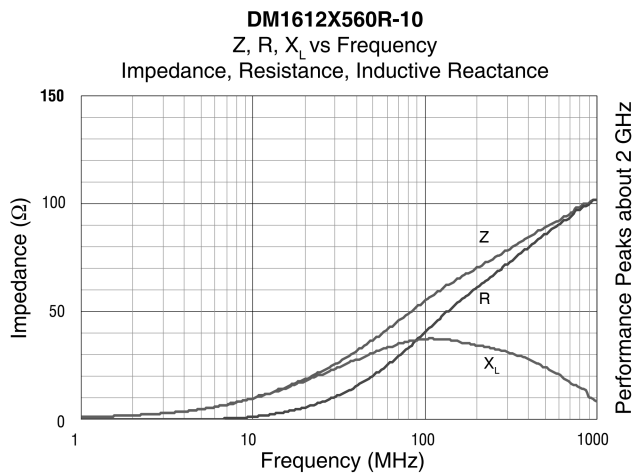
Z vs. Frequency
Impedance Under DC Bias



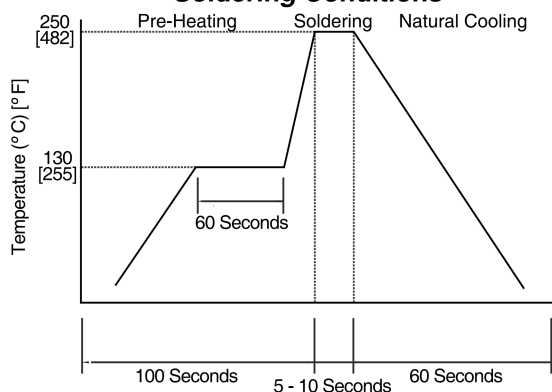
DM3312 (DM) vs. Conventional Wound Part (WP)

Z vs. Frequency
Impedance Under DC Bias

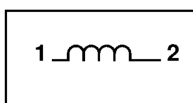




Recommended Lead Free Soldering Conditions



Equivalent Circuit



Land Patterns for Reflow Soldering

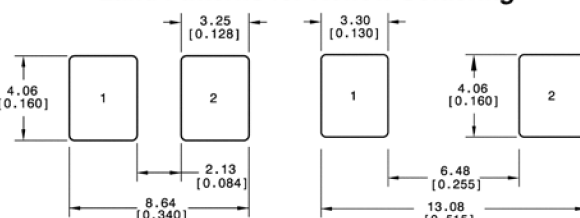


Figure 1
DM1612

Figure 2
DM3312

Steward Ultra High Current
EMI Ferrite Chip Beads
Brochure 008 Rev 4.01 01/2006

Steward produces an extensive line of ferrite products for Inductive and EMI Filtering Applications. Products include ferrite EMI cable cores, connector plates, unique common mode chokes, can-bus chokes, high current thru hole and surface mount components, impedance chip beads, surface mount inductors, toroid inductor cores and ferrite powders. Please consult our web site, Steward's EMI and Inductive Components full catalog, or contact your nearest Steward office or representative for additional information.

Steward North America

1200 East 36th Street
P.O. Box 510
Chattanooga, Tennessee 37401-0510
U.S.A.
Phone: +1-423-308-1690
Fax: +1-423-308-1622
e-mail: americas@steward.com

Steward Mexico

Ave. Obrero Mundial # 9
Parque Industrial Dynatech
Hermosillo, Sonora 83170
Mexico
Phone: +52 662 260-4832
Fax: +52 662 216 1202
e-mail: mexico@steward.com

Steward Europe

5 Cochrane Square
Brucefield Industry Park
Livingston EH54 9DR
Scotland, UK
Phone: +44-(0)-1506-414200
Fax: +44-(0)-1506-410694
e-mail: europe@steward.com

Steward Asia / Pacific

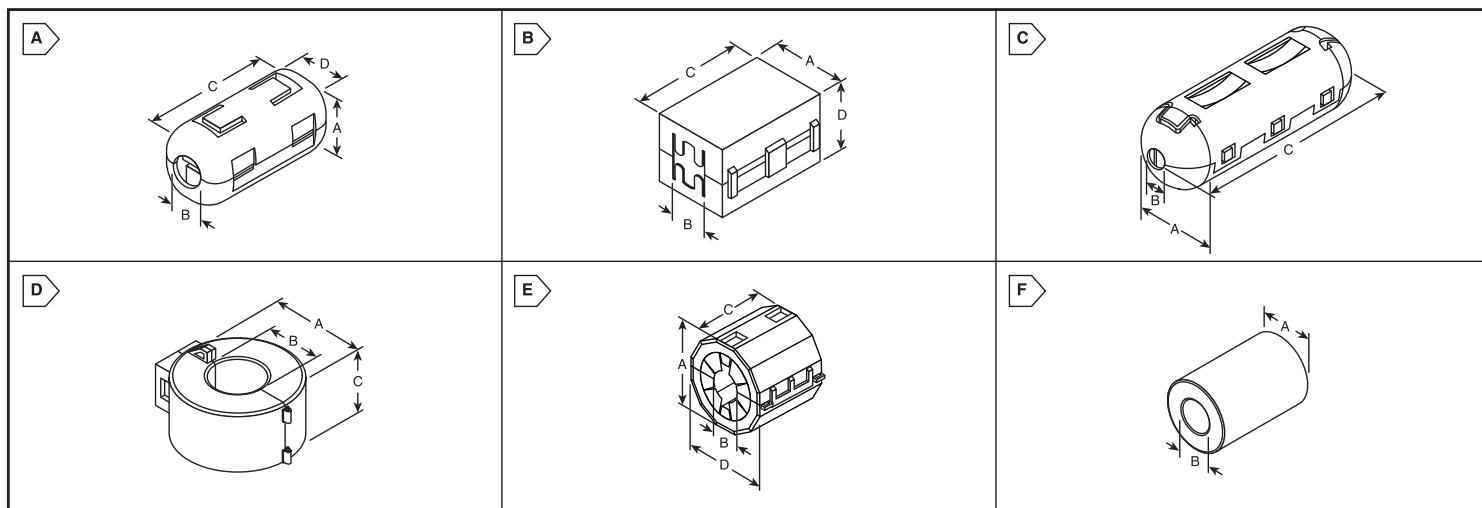
3791 Jalan Bukit Merah
#10-14, E-Centre @ Redhill
159471
Singapore
Phone: +65 6272 2646
Fax: +65 6272 6165
email: asia@steward.com

Steward China

Fuan Industrial Zone, Leliu Town
Shunde District, Foshan City,
Guangdong Province
P.R. China 528322
Phone: +86-757-2563 8860
Fax: +86-757-2563-8862
email: china@steward.com



This product is RoHS compliant.



EMI Suppression

Steward

SNAP-ON EMI FERRITE CLAMP FILTERS IN PLASTIC CASES

Features:

- For retrofit and post assembly usages
- Excellent common and differential mode EMI suppression
- Black or white plastic snap-on cases provide secure closure
- For round cables and wire bundles



RoHS Compliant

For quantities of 500 and up, call for quote.

	Steward Part No.	Fig.	Impedance @ 100MHz (Ω)	Impedance @ 300MHz (Ω)	Maximum Cable Diameter	Dimensions: mm				Case Color	Price Each			
						A	B	C	D		1	10	50	100
	28A0392-0A0	A	170	320	4.65	12.80	5.44	29.08	12.32	White	.94	.78	.68	.61
	28A0640-0A0	A	240	390	8.95	19.10	9.09	40.36	20.80	White	1.30	1.07	.93	.84
	28A2025-0A0	B	320	510	6.35	17.90	7.00	32.50	18.40	White	1.28	1.05	.92	.82
	28A2029-0A0	B	250	420	9.91	21.77	10.00	32.84	21.84	White	1.67	1.38	1.19	1.07
	28A2024-0A0	B	280	440	12.70	29.00	13.00	32.50	29.60	White	2.92	2.42	2.08	1.87
	28A0392-0A2	A	170	320	4.65	12.80	5.44	29.08	12.32	Black	.94	.78	.68	.61
	28A0350-0B2	A	240	400	3.50	13.00	3.50	25.20	11.50	Black	1.37	1.13	.98	.88
	28A2736-0A2	A	220	360	9.00	18.00	9.00	35.10	19.70	Black	1.16	.96	.83	.75
	28A0640-0A2	A	240	690	8.95	19.10	9.09	40.36	20.80	Black	1.30	1.07	.93	.84
	28A2026-0A2	A	270	460	6.35	21.03	8.13	41.68	21.03	Black	1.36	1.13	.98	.88
	28A3851-0A2	A	260	410	12.85	30.00	13.00	33.70	30.00	Black	6.08	5.03	4.34	3.90
	28A0593-0A2	C	471	575	6.55	18.75	6.60	53.39	-	Black	1.80	1.46	1.26	1.02
	28A2432-0A2	D	160	300	8.13	19.20	8.20	19.90	-	Black	1.86	1.54	1.33	1.19
	28A3039-0A2	D	130	250	10.19	24.55	10.20	13.60	-	Black	1.96	1.62	1.40	1.26
	28A4155-0A2	D	120	230	13.55	28.80	13.60	15.40	-	Black	2.25	1.86	1.61	1.44
	28A0434-0A2	C	227	449	5.10	42.55	14.30	5.35	-	Black	1.17	.97	.84	.75
	28A0592-0A2	C	572	688	4.50	53.39	18.75	4.80	-	Black	1.76	1.45	1.25	1.12
	28A2025-0A2	B	320	510	6.35	17.90	7.00	32.50	18.40	Black	1.28	1.05	.91	.82
	28A2029-0A2	B	250	420	9.91	21.77	10.00	32.84	21.84	Black	1.67	1.38	1.19	1.07
	28A5131-0A2	E	425	533	25.40	56.64	19.50	45.00	56.63	Black	9.87	8.17	7.04	6.34

ROUND AND CYLINDRICAL FERRITE EMI SUPPRESSION CORES

Features:

- Excellent common and differential mode EMI suppression
- For round cables and wire bundles
- Broadband performance
- Impedance value is NET impedance of the ferrite core only



RoHS Compliant

For quantities of 500 and up, call for quote.

	Steward Part No.	Fig.	Impedance @ 25MHz (Ω)	Impedance @ 100MHz (Ω)	Impedance @ 300MHz (Ω)	Dimensions: mm			Price Each			
						A	B	C	1	10	50	100
	28B0268-000	F	65	138	260	6.78	3.99	14.22	.14	.11	.10	.09
	28B0375-100	F	74	154	282	9.53	5.08	14.48	.19	.16	.14	.12
	28B0375-300	F	100	194	310	9.53	5.08	19.05	.22	.18	.16	.14
	28B0485-000	F	170	320	450	12.32	4.88	25.40	.43	.36	.31	.28
	28B0500-100	F	33	83	200	12.70	7.92	6.35	.16	.13	.12	.10
	28B0562-200	F	177	317	470	14.27	6.35	28.58	.58	.48	.42	.38
	28B0563-200	F	149	287	406	14.27	7.26	28.57	.55	.46	.39	.35
	28B0625-100	F	150	280	400	15.88	7.87	28.58	.66	.55	.48	.43
	28B0631-100	F	124	243	370	16.00	9.25	28.00	.60	.50	.43	.39
	28B0672-000	F	130	245	360	17.07	8.76	25.40	1.02	.79	.72	.65
	28B0686-000	F	61	91	214	17.42	9.52	6.35	.23	.20	.17	.15
	28B0686-100	F	66	139	265	17.42	9.52	12.70	.81	.63	.57	.52
	28B0686-200	F	124	242	390	17.42	9.52	28.58	.73	.61	.52	.47
	28B0734-000	F	116	229	370	18.67	11.18	28.58	1.39	1.08	.98	.89
	28B0735-000	F	135	250	400	18.67	10.16	28.58	.83	.69	.60	.54
	28B0870-100	F	56	122	236	22.10	13.72	12.70	.49	.41	.35	.32
	28B1000-000	F	73	151	278	25.40	12.70	12.70	.74	.61	.53	.48
	28B1020-100	F	147	276	412	25.91	12.83	28.58	1.62	1.34	1.15	1.04
	28B1122-100	F	160	307	440	28.50	13.77	28.58	1.96	1.62	1.39	1.25
	28B1142-000	F	34	85	200	29.01	19.00	7.49	.47	.39	.34	.30