

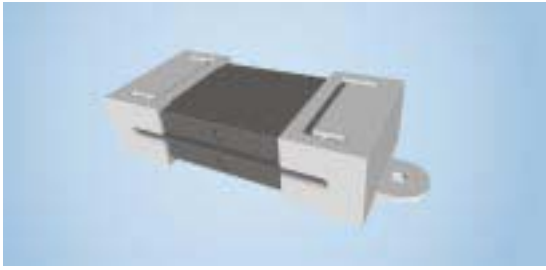
# EMI Suppression

## Ferrites for Cables and Connectors

### SPLIT FERRITES FOR FLAT CABLES

Part No.	Package Size	Impedance (Z) Typical Ohms @		C <sub>1</sub>	Length (mm)	Width (mm)	Height (mm)
		100 MHz	300 MHz				
<a href="#">28S0651-000</a>	0651	51			16.50	12.50	10.50
<a href="#">28S0651-100</a>	0651	93			16.50	12.50	15.00
<a href="#">28S0670-000</a>	0670	93		8.81	17.02	12.50	15.00
<a href="#">25S1517-000</a>	1517		172	5.86	43.59	35.00	28.00
<a href="#">28S1517-000</a>	1517	153		5.86	43.59	35.00	28.00
<a href="#">25S2001-000</a>	2001		312	3.20	63.50	52.07	28.58
<a href="#">28S2001-000</a>	2001	250		3.20	63.50	52.07	28.58
<a href="#">25S2001-2A2</a>	2001		255		63.50	52.07	24.38
<a href="#">28S2001-2A2</a>	2001	213			63.50	52.07	24.38
<a href="#">25S2011-000</a>	2011		295	3.31	76.20	65.28	28.58
<a href="#">28S2011-000</a>	2011	232		3.31	76.20	65.28	28.58
<a href="#">25S2011-100</a>	2011		179	6.30	76.20	65.28	15.01
<a href="#">28S2011-100</a>	2011	122		6.30	76.20	65.28	15.01
<a href="#">25S2022-000</a>	2022		262	3.54	45.09	34.42	28.58
<a href="#">28S2022-000</a>	2022	226		3.54	45.09	34.42	28.58
<a href="#">25S2023-000</a>	2023		275	3.47	38.10	26.67	25.40
<a href="#">28S2023-000</a>	2023	217		3.47	38.10	26.67	25.40

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# Split Ferrite Cores For Ribbon Cables

**Steward** offers a selection of "split" components 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 provide secure closure of the ferrite onto the cable.

### Features:

- Inside core slot lengths from 12.5mm (0.429") to 65mm (2.56") and slot widths from 0.5mm (0.040") to .95mm (.074")
- Precision formed smooth surfaces prevent damage to wire insulation
- Available in quality Steward broad band (28) or high frequency (25) materials
- Custom designs available
- Plastic cases are UL 94V-0 flame retardant rated
- Saves valuable PC board space
- Plastic (P) or Metal (M) end clips available for most cores

### Applications:

- Internal data cables
- Floppy disk and hard disk ribbon cables
- Cables between PC boards and data connectors
- Ribbon cables with 8, 16, 32, or 64 bit digital signal busses
- Products with limited PC board space available for surface mount EMI components
- Printer cables
- Retrofit, auxiliary EMI attenuation

### Test Specifications:

- HP4396A Network/Spectrum Analyzer
- HP43961A Impedance Test Kit
- HP16192A Test Fixture
- HP16200A DC Bias Adapter
- Philips PM2811 DC Power Supply
- Ambient Temperature 23.5°C
- Bandwidth 3 kHz
- Sweep Time 423 ms

PART NUMBERING SYSTEM					
28	S	0651	-	0	0
MATERIAL TYPE	PRODUCT CODE	PART SIZE CODE	SELECTED DIMENSION CODE (Usually Height)	ADDITIONAL DESCRIPTION (Clip Type)	PACKAGING OR FINISH CODE

Broad band material is 28  
High frequency material is 25

M designates Metal Clip, P designates Plastic Clip

PART NUMBER	Fig #	End Clip Type	A mm (inches)	B mm (inches)	C mm (inches)	D mm (inches)	E mm (inches)	Typical Impedance (Ohms)	
								25 Material @ 300 MHz	28 Material @ 100 MHz
__S0651-000	2	NA	16.50 ± 0.25 (0.650 ± 0.010)	12.50 ± 0.20 (0.492 ± 0.008)	10.50 ± 0.18 (0.404 ± 0.007)	2.00 ± 0.08 (0.079 ± 0.003)	0.51 ± 0.20 (0.020 ± 0.008)		51
__S0651-100	2	NA	16.50 ± 0.25 (0.650 ± 0.010)	12.50 ± 0.20 (0.492 ± 0.008)	15.00 ± 0.18 (0.590 ± 0.007)	2.00 ± 0.08 (0.079 ± 0.003)	0.51 ± 0.20 (0.020 ± 0.008)		93
__S0670-000	3	NA	17.02 ± 0.25 (0.670 ± 0.010)	12.50 ± 0.20 (0.492 ± 0.008)	15.00 ± 0.230 (0.590 ± 0.008)	3.40 ± 0.20 (0.134 ± 0.008)	0.51 ± 0.20 (0.020 ± 0.008)		93
__S1517-000	2	NA	43.59 ± 0.76 (1.176 ± 0.030)	35.00 ± 0.70 (1.380 ± 0.028)	28.0 ± 0.58 (1.10 ± 0.023)	5.26 ± 0.23 (0.207 ± 0.009)	0.95 ± 0.25 (0.037 ± 0.010)	172	153
__S2001-000	1	M or P	63.50 ± 1.27 (2.500 ± 0.050)	52.07 ± 1.02 (2.050 ± 0.040)	28.58 ± 0.64 (1.125 ± 0.025)	6.35 ± 0.25 (0.250 ± 0.010)	0.84 ± 0.25 (0.033 ± 0.010)	312	250
__S2001-2A2	4	NA	63.50 ± 1.27 (2.500 ± 0.050)	52.07 ± 1.02 (2.050 ± 0.040)	24.38 ± 0.50 (0.960 ± 0.020)	6.35 ± 0.25 (0.250 ± 0.010)		255	213
__S2011-000	1	M or P	76.20 ± 1.52 (3.000 ± 0.060)	65.28 ± 1.27 (2.570 ± 0.050)	28.58 ± 0.64 (1.125 ± 0.025)	6.68 ± 0.25 (0.263 ± 0.010)	0.84 ± 0.25 (0.033 ± 0.010)	301	232
__S2011-100	1	M or P	76.20 ± 1.52 (3.000 ± 0.060)	65.28 ± 1.27 (2.570 ± 0.050)	15.01 ± 0.64 (0.591 ± 0.025)	6.35 ± 0.25 (0.250 ± 0.010)	0.84 ± 0.25 (0.033 ± 0.010)	179	122
__S2022-000	1	M or P	45.09 ± 0.89 (1.775 ± 0.035)	34.42 ± 0.64 (1.355 ± 0.025)	28.58 ± 0.64 (1.125 ± 0.025)	6.35 ± 0.25 (0.250 ± 0.010)	0.84 ± 0.25 (0.033 ± 0.010)	262	226
__S2023-000	1	M or P	38.10 ± 0.76 (1.500 ± 0.030)	26.67 ± 0.76 (1.050 ± 0.030)	25.40 ± 0.51 (1.00 ± 0.020)	6.35 ± 0.25 (0.250 ± 0.010)	0.84 ± 0.25 (0.033 ± 0.010)	275	217

All impedance values are NET; they are based on the ferrite cores only.

**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 \_\_ S2001 - 2A2 (Figure 4) which is sold assembled)**

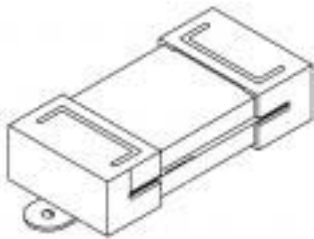
To specify one core side and one black plastic clip together, replace the second ferrite core part number character after the dash with the letter "P" (example: 28S2022-0P0). One complete assembly of two ferrite cores (28 material) with two plastic clips would be specified as follows: 2 of part # 28S2022-0P0

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

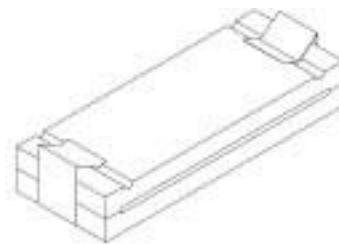
To order black plastic end clips separately in bulk, specify part number ASSE001-2

To order metal end clips separately in bulk, specify part number ASSE017-2

**Split Core with Plastic Clip**



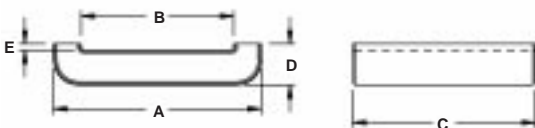
**Split Core with Metal Clip**



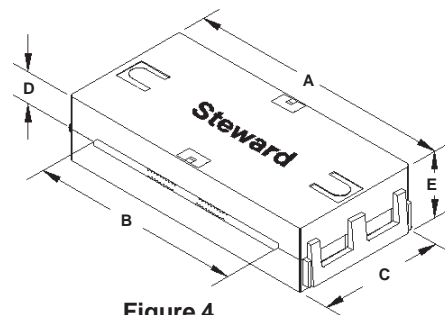
**Figure 1**



**Figure 2**



**Figure 3**



**Figure 4**

## EMI Suppression

### Ferrites for Cables and Connectors

#### SOLID FERRITE CORES FOR RIBBON CABLES

Part No.	Package Size	Impedance (Z) Typical Ohms @		C <sub>1</sub>	Length (mm)	Width (mm)	Height (mm)
		100 MHz	300 MHz				
<a href="#">28R0393-000</a>	0393	50		14.50	10.00	7.01	10.00
<a href="#">28R0393-100</a>	0393	100		7.23	10.00	7.01	20.02
<a href="#">28R0880-000</a>	0880	145		4.97	22.35	14.00	19.05
<a href="#">25R1101-000</a>	1101		185		27.97	22.94	14.66
<a href="#">28R1101-000</a>	1101	95		8.00	27.97	22.94	14.66
<a href="#">28R1127-000</a>	1127	208		4.14	28.58	23.51	31.00
<a href="#">28R1127-100</a>	1127	135			28.60	23.50	20.00
<a href="#">28R1127-200</a>	1127	165			28.60	23.50	25.00
<a href="#">28R1127-400</a>	1127	115			28.60	23.50	17.00
<a href="#">28R1227-000</a>	1227	46		17.40	31.12	24.76	6.35
<a href="#">28R1236-000</a>	1236	120			31.40	23.00	19.00
<a href="#">28R1259-200</a>	1259	164			32.00	27.80	25.00
<a href="#">28R1300-000</a>	1300	23			33.02	28.50	3.00
<a href="#">28R1339-000</a>	1339	17			34.00	29.58	25.00
<a href="#">25R1517-000</a>	1517		277	3.62	38.53	26.77	25.40
<a href="#">28R1517-000</a>	1517	206		3.62	38.53	26.77	25.40
<a href="#">28R1550-000</a>	1550	38		25.30	15.50	13.50	10.00
<a href="#">28R1654-010</a>	1654	34			42.00	37.50	5.00
<a href="#">25R1775-000</a>	1775		352	3.04	45.08	34.42	28.58
<a href="#">28R1775-000</a>	1775	249		3.04	45.08	34.42	28.58
<a href="#">25R1779-000</a>	1779		354	3.03	63.50	52.07	28.58
<a href="#">28R1779-000</a>	1779	264		3.03	63.50	52.07	28.58
<a href="#">25R1779-100</a>	1779		161	6.67	63.50	52.07	12.98
<a href="#">28R1779-100</a>	1779	120		6.67	63.50	52.07	12.98
<a href="#">28R1860-310</a>	1860	228			40.74	40.74	31.75
<a href="#">28R1953-000</a>	1953	73			49.61	44.00	11.99
<a href="#">25R2170-000</a>	2170		371	2.84	55.12	43.69	25.40
<a href="#">28R2170-000</a>	2170	262		2.84	55.12	43.69	25.40
<a href="#">25R2170-100</a>	2170		218	5.68	55.12	43.69	12.70