

Surface Mount EMI Suppression Ferrite Chips Signal and Power Filtering

- Features:**
- Small footprint permits use in densely populated surface mount designs
 - Filtering of low frequency input/output signals entering/exiting shielded enclosures
 - Economical component for applications requiring discrete signal filtering
 - High frequency filtering of medium speed clocks and video signals
 - Preventing oscillations in high frequency amplifiers
 - Filtering of power input pins of oscillators and logic devices using high speed clocks

Fig.	Size Code	Dimensions - mm			Current Rating (mA)	Typical Impedance @ 100 MHz	Digi-Key Part No.	Cut Tape Pricing 50 100			Digi-Key Part No.	Tape & Reel Pricing			Steward Part No.
		Length	Width	Height				10							
1	0402	1.01	0.50	0.50	200	300 Ω	240-1136-1-ND	81	3.51	6.48	240-1136-2-ND	302.28/8,000	1105.48/32,000		LI0402B301R-00
					400	120 Ω	240-1135-1-ND	81	3.51	6.48	240-1135-2-ND	302.28/8,000	1105.48/32,000		LI0402D121R-00
					500	30 Ω	240-1133-1-ND	81	3.51	6.48	240-1133-2-ND	302.28/8,000	1105.48/32,000		LI0402E300R-00
					500	60 Ω	240-1134-1-ND	81	3.51	6.48	240-1134-2-ND	302.28/8,000	1105.48/32,000		LI0402E600R-00
					100	600 Ω	240-1142-1-ND	88	3.81	7.02	240-1142-2-ND	327.73/8,000	1198.54/32,000		HZ0402A601R-00
1	0603	1.60	0.80	0.80	400	300 Ω	240-1141-1-ND	52	2.26	4.16	240-1141-2-ND	97.16/4,000	266.50/12,000		LI0603D301R-00
					500	150 Ω	240-1139-1-ND	57	2.48	4.58	240-1139-2-ND	106.80/4,000	292.94/12,000		LI0603I151R-00
					700	120 Ω	240-1138-1-ND	34	1.49	2.74	240-1138-2-ND	64.00/4,000	175.55/12,000		LI0603G121R-00
					700	220 Ω	240-1140-1-ND	52	2.26	4.16	240-1140-2-ND	97.16/4,000	266.50/12,000		LI0603G221R-00
					700	80 Ω	240-1137-1-ND	52	2.26	4.16	240-1137-2-ND	97.16/4,000	266.50/12,000		LI0603G800R-00
		1.60	0.80	0.80	1,000	60 Ω	240-1131-1-ND	52	2.24	4.13	240-1131-2-ND	96.39/4,000	264.38/12,000		MI0603J600R-00
					1,000	600 Ω	240-2198-1-ND	78	3.35	6.20	240-2198-2-ND	144.59/4,000	396.58/12,000		MI0603J601R-00
					1,000	68 Ω	240-1132-1-ND	52	2.24	4.13	240-1132-2-ND	96.39/4,000	264.38/12,000		MI0603J680R-00
					1,500	30 Ω	240-1130-1-ND	53	2.30	4.25	240-1130-2-ND	99.09/4,000	271.79/12,000		MI0603K300R-00
					2,000	300 Ω	240-2239-1-ND	78	3.35	6.20	240-2239-2-ND	144.59/4,000	396.58/12,000		MI0603L301R-00
					2,500	120 Ω	240-2238-1-ND	78	3.35	6.20	240-2238-2-ND	144.59/4,000	396.58/12,000		MI0603M121R-00
		1.60	0.80	0.80	4,000	60 Ω	240-2193-1-ND	75	3.26	6.01	240-2193-2-ND	140.34/4,000	384.94/12,000		HI0603P600R-00
					100	2,200 Ω	240-2208-1-ND	57	2.46	4.54	240-2208-2-ND	106.03/4,000	290.82/12,000		HZ0603A222R-00
					200	1,000 Ω	240-1145-1-ND	29	1.26	2.33	240-1145-2-ND	54.36/4,000	149.11/12,000		HZ0603B102R-00
					200	1,100 Ω	240-2209-1-ND	57	2.46	4.54	240-2209-2-ND	140.34/4,000	384.94/12,000		HZ0603B112R-00
					300	600 Ω	240-1143-1-ND	32	1.40	2.59	240-1143-2-ND	60.53/4,000	166.03/12,000		HZ0603C601R-00
1	0805	2.00	1.25	0.90	700	300 Ω	240-2218-1-ND	52	2.26	4.16	240-2218-2-ND	97.16/4,000	266.50/12,000		LI0805G301R-00
					800	120 Ω	240-1041-1-ND	52	2.26	4.16	240-1041-2-ND	97.16/4,000	266.50/12,000		LI0805H121R-00
					800	150 Ω	240-1021-1-ND	52	2.26	4.16	240-1021-2-ND	97.16/4,000	266.50/12,000		LI0805H151R-00
					800	75 Ω	240-2219-1-ND	52	2.26	4.16	240-2219-2-ND	97.16/4,000	266.50/12,000		LI0805H750R-00
					1,000	7 Ω	240-2200-1-ND	57	2.46	4.54	240-2200-2-ND	106.03/4,000	290.82/12,000		MI0805J070R-00
		2.00	1.25	0.90	1,500	11 Ω	240-1034-1-ND	57	2.46	4.54	240-1034-2-ND	106.03/4,000	290.82/12,000		MI0805K110R-00
					1,500	26 Ω	240-2201-1-ND	57	2.46	4.54	240-2201-2-ND	106.03/4,000	290.82/12,000		MI0805K260R-00
					1,500	40 Ω	240-1035-1-ND	57	2.46	4.54	240-1035-2-ND	106.03/4,000	290.82/12,000		MI0805K400R-00
					1,500	600 Ω	240-2202-1-ND	67	2.91	5.37	240-2202-2-ND	125.31/4,000	343.70/12,000		MI0805K601R-00
					2,000	300 Ω	240-2203-1-ND	67	2.91	5.37	240-2203-2-ND	125.31/4,000	343.70/12,000		MI0805L301R-00
		2.00	1.25	0.90	2,500	220 Ω	240-2204-1-ND	72	3.13	5.78	240-2204-2-ND	134.95/4,000	370.14/12,000		MI0805M221R-00
					3,500	120 Ω	240-2194-1-ND	75	3.25	6.00	240-2194-2-ND	139.96/4,000	383.89/12,000		HI0805O121R-00
					4,500	31 Ω	240-1007-1-ND	64	2.76	5.09	240-1007-2-ND	118.75/4,000	325.72/12,000		HI0805Q310R-00
					5,000	80 Ω	240-2195-1-ND	69	3.01	5.55	240-2195-2-ND	129.55/4,000	355.33/12,000		HI0805R800R-01
		2.00	1.25	0.90	300	2,000 Ω	240-2211-1-ND	62	2.69	4.96	240-2211-2-ND	115.67/4,000	317.26/12,000		HZ0805C202R-00
					400	1,000 Ω	240-2212-1-ND	62	2.69	4.96	240-2212-2-ND	115.67/4,000	317.26/12,000		HZ0805D102R-00
					400	1,500 Ω	240-2213-1-ND	62	2.69	4.96	240-2213-2-ND	115.67/4,000	317.26/12,000		HZ0805D152R-00
					500	600 Ω	240-1018-1-ND	32	1.40	2.59	240-1018-2-ND	60.53/4,000	166.03/12,000		HZ0805E601R-00
					700	470 Ω	240-2214-1-ND	52	2.24	4.13	240-2214-2-ND	96.39/4,000	264.38/12,000		HZ0805G471R-00
1	1206	3.20	1.60	1.10	800	120 Ω	240-2222-1-ND	52	2.26	4.16	240-2222-2-ND	72.87/3,000	137.41/6,000		LI1206H121R-00
					800	150 Ω	240-2223-1-ND	52	2.26	4.16	240-2223-2-ND	72.87/3,000	137.41/6,000		LI1206H151R-00
					1,500	26 Ω	240-1027-1-ND	57	2.46	4.54	240-1027-2-ND	79.52/3,000	149.96/6,000		MI1206K260R-00
					1,500	31 Ω	240-1036-1-ND	67	2.91	5.37	240-1036-2-ND	93.98/3,000	177.22/6,000		MI1206K310R-00
					2,000	600 Ω	240-2206-1-ND	78	3.35	6.20	240-2206-2-ND	108.44/3,000	204.48/6,000		MI1206K601R-00
		3.20	1.60	1.10	1,500	90 Ω	240-1037-1-ND	67	2.91	5.37	240-1037-2-ND	93.98/3,000	177.22/6,000		MI1206K900R-00
					2,000	500 Ω	240-2207-1-ND	67	2.91	5.37	240-2207-2-ND	93.98/3,000	177.22/6,000		MI1206L501R-00
					3,000	100 Ω	240-1008-1-ND	75	3.26	6.01	240-1008-2-ND	105.26/3,000	198.49/6,000		HI1206N101R-00
					3,000	80 Ω	240-1010-1-ND	75	3.26	6.01	240-1010-2-ND	105.26/3,000	198.49/6,000		HI1206N800R-00
					4,000	120 Ω	240-2235-1-ND	69	3.01	5.55	240-2235-2-ND	97.16/3,000	183.22/6,000		HI1206P121R-00
		3.20	1.60	1.10	6,000	160 Ω	240-2196-1-ND	75	3.26	6.01	240-2196-2-ND	105.26/3,000	198.49/6,000		HI1206T161R-00
					6,000	50 Ω	240-1009-1-ND	75	3.26	6.01	240-1009-2-ND	105.26/3,000	198.49/6,000		HI1206T500R-00
		3.20	1.60	1.10	300	2,000 Ω	240-2215-1-ND	62	2.69	4.96	240-2215-2-ND	86.75/3,000	163.59/6,000		HZ1206C202R-00
					400	1,000 Ω	240-2216-1-ND	62	2.69	4.96	240-2216-2-ND	86.75/3,000	163.59/6,000		HZ1206D102R-00
					500	600 Ω	240-1019-1-ND	46	1.98	3.65	240-1019-2-ND	63.91/3,000	120.51/6,000		HZ1206E601R-00
1	1210	3.20	2.50	1.40	1,500	60 Ω	240-1038-1-ND	1.04	4.48	8.26	240-1038-2-ND	144.59/3,000	272.65/6,000		MI1210K600R-00
1	1612	4.06	3.05	2.28	10,000	56 Ω	240-1128-1-ND	3.98	17.24	31.83	240-1128-2-ND	464.12/2,500	875.19/5,000		DM1612X560R-00
1	1806	4.50	1.60	1.60	300	150 Ω	240-1030-1-ND	1.33	5.77	10.64	240-1030-2-ND	124.15/2,000	351.17/6,000		LI1806C151R-00
					500	100 Ω	240-1031-1-ND	1.33	5.77	10.64	240-1031-2-ND	124.15/2,000	351.17/6,000		LI1806E101R-00
					500	80 Ω	240-1032-1-ND	1.33	5.77	10.64	240-1032-2-ND	124.15/2,000	351.17/6,000		LI1806E800R-00
		4.50	1.60	1.60	1,000	80 Ω	240-1039-1-ND	1.12	4.84	8.92	240-1039-2-ND	10			

SMD Common Mode Arrays Power and Signal Filtering

An advanced family of common mode choke arrays provides filtering for both power and data lines all in one part. Can be used as a multi-turn device to multiply impedance.

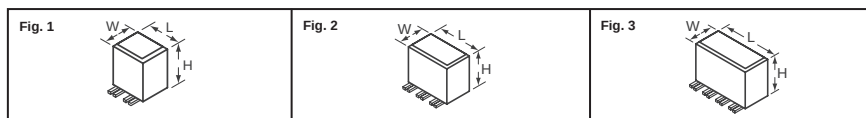


Fig.	Size Code	Dimensions (mm)			Current Rating iMax (A)	Typical Impedance @ 100 MHz	Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape & Reel Pricing			Steward Part No.
		Length	Width	Height				10	50	100		10	50	100	
1	2722	6.99	5.72	7.62	5	150 Ω	240-2175-1-ND	.55	.48	.44	240-2175-2-ND	151.93/600	716.24/3,000	1389.07/6,000	CM2722R151R-00
	2722	6.99	5.72	9.53	5	200 Ω	240-2176-1-ND	.69	.60	.55	240-2176-2-ND	159.43/500	751.59/2,500	1457.64/5,000	CM2722R201R-00
	2722	6.99	5.72	4.32	5	80 Ω	240-2178-1-ND	.53	.46	.42	240-2178-2-ND	243.87/1,000	1149.66/5,000	2229.64/10,000	CM2722R800R-00
2	3822	9.78	5.72	7.62	5	150 Ω	240-2179-1-ND	.59	.51	.47	240-2179-2-ND	164.42/600	775.14/3,000	1503.29/6,000	CM3822R151R-00
	3822	9.78	5.72	4.32	5	80 Ω	240-2180-1-ND	.56	.49	.45	240-2180-2-ND	260.45/1,000	1227.82/5,000	2381.22/10,000	CM3822R800R-00
	3822	9.78	5.72	9.53	5	200 Ω	240-2181-1-ND	.79	.69	.64	240-2181-2-ND	184.10/500	867.92/2,500	1683.24/5,000	CM3822R201R-00
3	5022	12.57	5.72	7.62	5	150 Ω	240-2182-1-ND	.73	.63	.58	240-2182-2-ND	201.90/600	951.81/3,000	1845.93/6,000	CM5022R151R-00
	5022	12.57	5.72	9.53	5	200 Ω	240-2183-1-ND	.93	.81	.75	240-2183-2-ND	162.77/375	767.33/1,875	1488.15/3,750	CM5022R201R-00
	5022	12.57	5.72	4.32	5	80 Ω	240-2184-1-ND	.67	.58	.54	240-2184-2-ND	310.95/1,000	1465.93/5,000	2843.01/10,000	CM5022R800R-00

Common Mode Chokes Ultra High Current Power Filtering

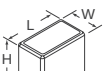
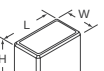
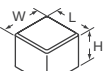
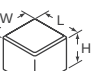
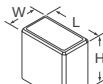
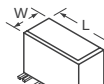
Fig. 4	Fig. 5	Fig. 6	Fig. 7	Fig. 8	Fig. 9
					
Features: • High current capability (10A continuous operation) • Compact size • Up to 170 Ω impedance @ 100MHz or 300 Ω @ 1GHz • Parts available in both thru-hole (B) and surface mount (R) versions		Features: • High current carrying capability (10A continuous operation) • Can be used as multi-turn device to multiply impedance • With two turns, up to 800 ohms impedance at 300MHz • Available in both thru-hole (B) and surface mount (R) versions		Features: • UL 1950 compliant for creepage up to 250 volts • Very high current continuous operation capability • Small footprint • Low clearance height • Low cost • Parts available in broad band and low frequency materials • Lighter smaller and less susceptible to vibration than older wire-wound chokes	
Features: • Surface mount design • Filters groups of signals. • Can be used as a multi-turn device to multiply impedance • Will fit behind RJ45 Jack • High continuous operating current carrying capability					

Fig.	Size Code	Dimensions (mm)			Current Rating iMax (A)	Impedance @ 100 MHz	Digi-Key Part No.	Cut Tape Price Each				Digi-Key Part No.	Tape & Reel Pricing				Steward Part No.
		Length	Width	Height				1	10	50	100		10	50	100		
High Power Surface Mount																	
5	2545	11.38	6.30	9.32	10	170 Ω	240-1106-1-ND	—	.58	.50	.46	240-1106-2-ND	107.11/400	504.94/2,000	979.28/4,000	CM2545X171R-00	
1	3032	7.62	8.13	9.45	8	200 Ω	240-1116-1-ND	—	.73	.63	.59	240-1116-2-ND	84.80/250	399.77/1,250	775.31/2,500	CM3032V201R-00	
1	3032	7.62	8.13	14.48	8	300 Ω	240-1118-1-ND	—	.88	.76	—	240-1118-2-ND	40.76/100	192.17/500	372.69/1,000	CM3032V301R-00	
5	3440	10.03	8.51	9.32	20	170 Ω	240-2186-1-ND	—	.65	.56	.52	240-2186-2-ND	112.24/375	529.10/1,875	1026.14/3,750	CM3440Z171R-00	
7	4545	11.38	11.38	9.32	10	130 Ω	240-1108-1-ND	—	.76	.66	.61	240-1108-2-ND	141.89/400	668.89/2,000	1297.24/4,000	CM4545Z131R-00	
2	4732	11.94	8.13	9.45	8	200 Ω	240-1117-1-ND	—	.90	.78	.72	240-1117-2-ND	167.18/400	788.13/2,000	1528.49/4,000	CM4732V201R-00	
2	4732	11.94	8.13	14.48	8	300 Ω	240-1119-1-ND	—	1.06	.92	—	240-1119-2-ND	74.00/150	348.85/750	676.56/1,500	CM4732V301R-00	
7	5740	14.48	10.03	9.32	20	170 Ω	240-2189-1-ND	—	.74	.64	.59	240-2189-2-ND	128.03/375	603.57/1,875	1170.56/3,750	CM5740Z171R-00	
3	6032	15.24	8.13	9.45	8	200 Ω	240-2191-1-ND	—	.92	.80	.74	240-2191-2-ND	107.31/250	505.87/1,250	981.08/2,500	CM6032V201R-00	
3	6032	15.24	8.13	14.48	8	300 Ω	240-2192-1-ND	—	1.10	.95	—	240-2192-2-ND	51.15/100	241.16/500	467.70/1,000	CM6032V301R-00	
High Current Thru Hole																	
4	2545	11.38	6.30	9.32	10	170 Ω	240-1105-ND†	.45	.37	.32	.29	—	—	—	—	CM2545X171B-00	
6	4545	11.38	11.38	9.32	10	130 Ω	240-1107-ND†	.52	.44	.38	.34	—	—	—	—	CM4545Z131B-00	
Ultra High Current Thru Hole																	
4	3440	10.03	8.51	9.32	20	170 Ω	240-2185-ND†	.50	.41	.36	.32	—	—	—	—	CM3440Z171B-00	
8	5441	13.72	10.41	15.24	75	160 Ω	240-1109-ND†	.93	.78	.67	.60	—	—	—	—	CM5441Z161B-00	
8	5441	13.72	10.41	10.52	75	100 Ω	240-1110-ND†	.89	.74	.64	.58	—	—	—	—	CM5441Z101B-00	
6	5740	10.03	14.48	9.32	20	170 Ω	240-2188-ND†	.58	.49	.42	.38	—	—	—	—	CM5740Z171B-00	

† Bulk Packaging

Common Mode Chokes Low Frequency PCB Power Filters

A low frequency material is used to provide effective CM filtering in the kHz – 30MHz range.
Part construction allows for high operating current.

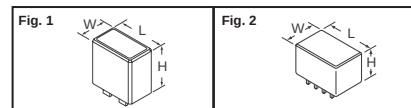
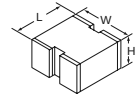


Fig.	Size Code	Dimensions (mm)			Current Rating iMax (A)	Typical Impedance @ 4 MHz	Digi-Key Part No.	Price Each				Steward Part No.
		Length	Width	Height				1	10	50	100	
1	5441	13.72	10.41	15.24	75	99 Ω	240-2187-ND	1.38	1.14	.99	.89	CM5441Z990B-00
2	5740	14.48	10.03	9.32	20	240 Ω	240-2234-ND	.81	.68	.58	.53	CM5740Z241B-00

(Continued)

All prices are in British Pound Sterling and include duties.



- Features:**
- Monolithic
 - Compact size
 - High current carrying capability

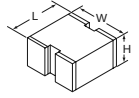
- Excellent high frequency performance beyond 3GHz
- Very low DCR to minimize signal distortion
- Smaller, lighter, and less susceptible to vibration than old style wire-wound chokes

Size Code	Dimensions (mm)			Current Rating iMax (A)	Typical Impedance @ 100 MHz	Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape & Reel Pricing			Steward Part No.
	Length	Width	Height				10	50	100		2,500	5,000	10,000	
Low Profile Surface Mount - Monolithic														
3322	8.50	5.60	2.10	4	40 Ω	240-1101-1-ND	.50	.44	.40	240-1101-2-ND	232.78/M	219.48/M	212.83/M	CM3322P400R-00

Common Mode Chip Beads Power Signal Filtering



Call Digi-Key for Lead Free Versions of these Parts!



- Features:**
- Monolithic
 - Compact size
 - High current carrying capability

- Very low DCR to minimize signal distortion
- Smaller, lighter, and less susceptible to vibration than old style wire-wound chokes

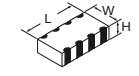
Size Code	Dimensions (mm)			Current Rating iMax (A)	Typical Impedance @ 100 MHz	Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape & Reel Pricing			Steward Part No.
	Length	Width	Height				10	50	100		2,500	5,000	10,000	
Low Profile Surface Mount - Monolithic														
3322	8.50	5.60	2.10	7	61 Ω	240-1102-1-ND	.50	.44	.40	240-1102-2-ND	232.78/M	219.48/M	212.83/M	CM3322U610R-00
3322	8.50	5.60	2.84	10	63 Ω	240-1103-1-ND	.50	.44	.40	240-1103-2-ND	232.78/M	219.48/M	212.83/M	CM3322X630R-00
1922	4.70	5.60	2.84	10	33 Ω	240-1104-1-ND	.38	.33	.31	240-1104-2-ND	177.36/M	167.23/M	162.16/M	CM1922X330R-00

Surface Mount Multi-Line Chip Arrays - Signal Filtering

- Features:**
- Small footprint
 - Rugged construction
 - Broad range of impedance values
 - Good high frequency performance (peaks well above 100MHz)
 - Lower installation cost (one pick and place motion instead of four discrete installations)



Call Digi-Key for Lead Free Versions of these Parts!



Size Code	Dimensions - mm			Filtered Circuits	Current Rating iMax (mA)	Typical Impedance @ 100 MHz	Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape & Reel Pricing			Steward Part No.
	Length	Width	Height					10	50	100		3,000	6,000	9,000	
1206	3.20	1.60	0.80	4	500	30 Ω	240-1146-1-ND	.34	.29	.27	240-1146-2-ND	154.71/M	145.87/M	141.45/M	DA1206E300R-00
					300	120 Ω	240-1147-1-ND	.34	.29	.27	240-1147-2-ND	154.71/M	145.87/M	141.45/M	DA1206C121R-00
					400	300 Ω	240-1148-1-ND	.34	.29	.27	240-1148-2-ND	154.71/M	145.87/M	141.45/M	DA1206D301R-00
					200	600 Ω	240-1149-1-ND	.34	.29	.27	240-1149-2-ND	154.71/M	145.87/M	141.45/M	DA1206B601R-00
					200	1000 Ω	240-1150-1-ND	.38	.33	.31	240-1150-2-ND	175.34/M	165.32/M	160.31/M	DA1206B102R-00
					200	1000 Ω	240-1150-1-ND	.38	.33	.31	240-1150-2-ND	175.34/M	165.32/M	160.31/M	DA1206B102R-00

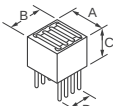
Differential Mode Multi-Line Arrays - Power Filtering

These multi-line ferrite products provide economical EMI filtering of differential mode noise in surface mount and through-hole PCB applications. They are designed to provide high frequency suppression of both common and differential mode EMI noise on groups of data/power lines.

Fig. 1 - Surface Mount



Fig. 2 - Through Hole



Dimensions - mm				Current Rating iMax (A)	Lines	Typ. Imped. @ 100 MHz	Digi-Key Part No.	Cut Tape Pricing			Digi-Key Part No.	Tape & Reel Pricing			Steward Part No.
Fig.	Length	Width	Height					10	50	100		1	10	100	
1	4.83	4.50	2.92	6	3	83 Ω	240-1003-1-ND	4.82	20.88	38.55	240-1003-2-ND	202.39/900	954.12/4,500	1850.42/9,000	29F0318-0SR
	8.33	10.87	6.35	9	3	200 Ω	240-1004-1-ND	4.99	21.61	39.91	240-1004-2-ND	104.75/450	493.83/2,250	957.73/4,500	29F0330-2SR
	6.10	4.50	4.19	6	4	119 Ω	240-1005-1-ND	5.16	22.35	41.26	240-1005-2-ND	216.62/900	1021.19/4,500	1980.50/9,000	29F0418-1SR
	10.87	10.87	6.35	9	4	200 Ω	240-1006-1-ND	5.56	24.11	44.52	240-1006-2-ND	116.85/450	550.88/2,250	1068.38/4,500	29F0430-2SR
	11.43	4.50	4.19	6	8	119 Ω	240-2167-1-ND	7.19	31.18	57.55	240-2167-2-ND	302.15/900	1424.44/4,500	2762.55/9,000	29F0818-1SR

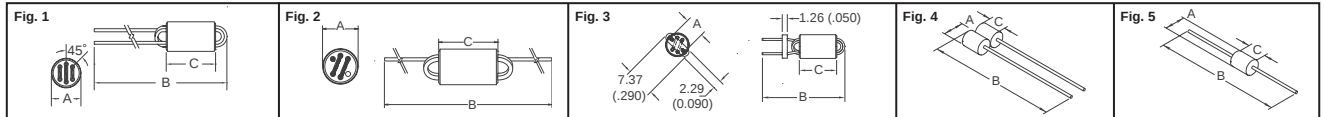
Fig.	No. of Lines	Dimensions (mm)				Current Rating iMax (A)	Typical Impedance	Digi-Key Part No.	Price Each		Steward Part No.
		A	B	C	D				1	10	
2	4	10.87	10.87	10.57	7.62	10	342 Ω	240-2001-ND	.40	.33	29F0428-0TO
	4	10.87	5.49	10.44	2.54	8	285 Ω	240-2002-ND	.30	.25	29F0429-0TO
	5	13.41	10.87	10.57	7.62	10	342 Ω	240-2003-ND	.47	.40	29F0528-0TO

Axial Lead Beads Power Filtering

Offers a number of uniquely configured multi-aperture, multiple turn devices. For the most demanding applications, three turn configurations provide lossy impedance over one thousand Ω. These parts offer excellent broadband frequency performance and also can be made using high frequency material. Current rating is up to 7 amps.



Call Digi-Key for Lead Free Versions of these Parts!



Dimensions - mm				Current Rating iMax (A)	Typical Impedance @ 100 MHz	Digi-Key Part No.	Cut Tape Pricing			Digi-Key Part No.	Tape & Reel Pricing	Steward Part No.	
Fig.	A	B	C				10	50	100				
Broad Band Power Filtering													
1	5.99	50.53	10.00	7	998 Ω	240-2169-ND	.85	3.69	6.64	—	—	—	28C0236-0EW
2	5.99	86.46	10.00	7	835 Ω	240-2168-ND	.73	3.13	5.63	—	—	—	28C0236-0BW
3	6.00	20.96	10.01	7	998 Ω	240-2170-ND	.91	3.92	7.05	—	—	—	28C0236-0JW
Power Filtering													
4	3.51	25.4	4.45	5	143 Ω	240-2171-1-ND	.55	2.35	4.35	240-2171-2-ND	101.40/4,000	191.22/8,000	28J0138-11R
5	3.51	59.00	4.45	5	75 Ω	240-2172-1-ND	.29	1.27	2.35	240-2172-2-ND	61.60/4,500	116.15/9,000	28L0138-10R
5	3.51	59.00	8.89	5	135 Ω	240-2173-1-ND	.40	1.71	3.16	240-2173-2-ND	82.85/4,500	156.23/9,000	28L0138-40R
5	3.51	59.00	13.97	5	220 Ω	240-2174-1-ND	.50	2.16	3.98	240-2174-2-ND	104.54/4,500	197.13/9,000	28L0138-70R

All prices are in British Pound Sterling and include duties.

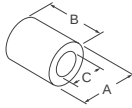
uk.digikey.com — FREEPHONE: 0-800-587-0991 • 0-800-904-7786 — FREEFAX: 0-800-587-0992 • 0-800-904-7783

Steward Ferrite EMI Cores for Cables and Wiring Harnesses

240-2225-ND	High Frequency Ferrite Clamp-On and Solid Cylinder Core Kit for Round Cables (18 different sizes)	16.52
240-2226-ND	Broadband Ribbon, Flex, and Solid Cylinder Ferrite EMI Cable Core Kit (37 different sizes)	33.05

Cylindrical Bead Cores for Round Cable

One-piece ferrite tubular bead cores for effectively attenuating a broad range of conducted and radiated electromagnetic interference (EMI). Install over round cables or wire bundles. Ferrite beads can be overmolded or covered with heat shrink coating if desired. Additional wire turns will multiply impedance.



Broad Band (30MHz – 800MHz) EMI Bead Cores

Dimensions (mm)			Typical Impedance @ 100 MHz	Typical Impedance @ 300 MHz	Digi-Key Part No.	Price Each			Steward Part No.
A	B	C				1	10	50	
6.78	14.22	3.99	138 Ω	260 Ω	240-2112-ND	.08	.07	.06	28B0268-000
9.53	14.48	5.08	154 Ω	282 Ω	240-2067-ND	.12	.10	.09	28B0375-100
9.53	19.05	5.08	194 Ω	310 Ω	240-2113-ND	.13	.11	.09	28B0375-300
12.00	10.00	3.55	195 Ω	320 Ω	240-2240-ND	.15	.13	.11	28B0473-000
12.00	25.00	3.55	424 Ω	558 Ω	240-2241-ND	.29	.25	.21	28B0473-200
12.32	25.40	4.88	320 Ω	450 Ω	240-2114-ND	.31	.27	.23	28B0485-000
14.27	28.57	6.35	317 Ω	470 Ω	240-2078-ND	.24	.20	.17	28B0562-200
15.00	35.00	5.90	450 Ω	580 Ω	240-2242-ND	.51	.42	.37	28B0591-200
15.88	28.58	7.87	280 Ω	400 Ω	240-2115-ND	.41	.34	.30	28B0625-100
17.42	28.57	9.52	242 Ω	390 Ω	240-2079-ND	.36	.30	.26	28B0686-200
22.10	12.70	13.72	122 Ω	236 Ω	240-2116-ND	.35	.29	.25	28B0870-100
25.40	12.70	12.70	171 Ω	278 Ω	240-2117-ND	.43	.36	.31	28B1000-000
25.91	28.58	12.83	276 Ω	412 Ω	240-2081-ND	.93	.77	.67	28B1020-100
28.50	28.58	13.77	307 Ω	440 Ω	240-2243-ND	1.32	1.10	.95	28B1122-100
29.01	7.49	19.00	82 Ω	200 Ω	240-2118-ND	.32	.27	.23	28B1142-000
31.75	22.22	19.05	186 Ω	292 Ω	240-2119-ND	.91	.76	.66	28B1250-000
50.80	28.70	25.40	305 Ω	442 Ω	240-2244-ND	4.16	3.45	2.98	28B2000-100
60.96	12.70	35.56	129 Ω	268 Ω	240-2120-ND	1.85	1.54	1.33	28B2400-000

High Frequency (300MHz – 2GHz) Cores for Round Cables

Dimensions (mm)			Net Impedance @ 800 MHz	Digi-Key Part No.	Price Each			Steward Part No.
A	B	C			1	10	50	
7.52	10.00	2.39	138 Ω	240-2146-ND	.09	.08	.07	HFB075024-000
9.52	10.00	5.08	85 Ω	240-2145-ND	.11	.10	.08	HFB095051-100
9.52	19.00	5.08	183 Ω	240-2140-ND	.15	.13	.11	HFB095051-200
12.32	10.00	4.88	127 Ω	240-2149-ND	.15	.13	.12	HFB123049-100
14.27	10.00	6.35	113 Ω	240-2147-ND	.20	.17	.14	HFB143064-100
14.27	28.58	6.35	306 Ω	240-2148-ND	.46	.39	.34	HFB143064-300
15.00	28.58	6.99	279 Ω	240-2150-ND	.50	.42	.36	HFB150070-200
15.24	10.00	3.38	189 Ω	240-2151-ND	.27	.23	.20	HFB152034-000
15.88	28.58	7.87	302 Ω	240-2142-ND	.55	.46	.39	HFB159079-100
16.00	27.99	9.25	261 Ω	240-2152-ND	.47	.39	.34	HFB160093-300
16.99	10.00	7.01	127 Ω	240-2153-ND	.28	.23	.20	HFB170070-000
18.67	30.00	10.16	276 Ω	240-2154-ND	.67	.56	.49	HFB187102-100
25.91	20.00	12.83	242 Ω	240-2144-ND	.93	.77	.66	HFB259128-000
25.91	28.58	12.83	268 Ω	240-2154-ND	1.28	1.06	.92	HFB259128-100

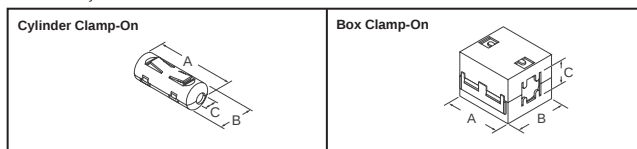
Low Frequency (300KHz – 30MHz) Cores for Round Cables

Additional wire turns will multiply impedance.

Dimensions (mm)			Net Imped. @ 5 MHz (2 Turn)	Digi-Key Part No.	Price Each			Steward Part No.
A	B	C			1	10	50	
9.00	7.00	5.00	140 Ω	240-2135-ND	.06	.05	.04	LFB090050-000
14.27	13.46	6.35	215 Ω	240-2136-ND	.32	.27	.24	LFB143064-100
22.00	12.70	14.00	110 Ω	240-2137-ND	.29	.24	.21	LFB220140-000
25.91	28.58	12.83	240 Ω	240-2138-ND	1.61	1.34	1.16	LFB259128-000
31.00	13.00	19.00	88 Ω	240-2139-ND	.61	.50	.44	LFB310190-000

Clamp-On, Split Ferrite Cores for Round Cables and Wires

Split ferrite bead cores in clamp-on (or snap-on) plastic cases can be easily used for EMI attenuation where one-piece cores cannot be installed. Clamp-on cores are also convenient for use during EMI testing. Cylinder or Round shaped clamp-on ferrite in plastic case assembly. Box shaped clamp-on ferrite in plastic case assembly.



Broad Band (30MHz – 800MHz) Clamp-On Cores

Case Color	Dimensions (mm)			Typical Impedance @ 100 MHz	Digi-Key Part No.	Price Each			Steward Part No.
A	B	C				1	10	50	
Round and Cylinder Clamp-On Ferrite									
Black	25.20	13.00	3.50	240 Ω	240-2233-ND	.61	.51	.44	28A0350-0B2
White	29.3	12.8	5.02	170 Ω	240-2068-ND	.59	.49	.42	28A0392-0A0
Black	29.3	12.8	5.02	170 Ω	240-2070-ND	.59	.49	.42	28A0392-0A2
Black	53.39	18.75	4.50	572 Ω	240-2245-ND	.94	.79	.68	28A0592-0A2
Black	53.39	18.75	6.60	417 Ω	240-2246-ND	.89	.74	.64	28A0593-0A2
White	40.38	19.10	9.02	240 Ω	240-2065-ND	1.09	.90	.78	28A0640-0A0
Black	40.38	19.10	9.02	240 Ω	240-2066-ND	1.09	.90	.78	28A0640-0A2
Black	41.68	21.03	8.13	270 Ω	240-2122-ND	1.16	.96	.83	28A2026-0A2
Black	19.90	19.20	8.20	160 Ω	240-2123-ND	.71	.59	.51	28A2432-0A2
Black	35.10	18.00	9.00	220 Ω	240-2124-ND	.85	.71	.61	28A2736-0A2
Black	13.60	24.55	10.20	130 Ω	240-2125-ND	.74	.62	.54	28A3039-0A2
Black	17.63	27.80	11.40	160 Ω	240-2126-ND	1.00	.83	.72	28A3344-0A2
Black	33.70	30.00	13.00	260 Ω	240-2127-ND	1.75	1.45	1.25	28A3851-0A2
Black	42.00	28.80	19.30	120 Ω	240-2128-ND	.85	.71	.61	28A4155-0A2
Box Clamp-On Ferrite									
White	32.5	29.0	13.0	280 Ω	240-2072-ND	2.08	1.73	1.49	28A2024-0A0
Black	32.5	29.0	13.0	280 Ω	240-2073-ND	2.08	1.73	1.49	28A2024-0A2
White	32.5	17.9	7.0	320 Ω	240-2074-ND	1.05	.87	.75	28A2025-0A0
Black	32.5	17.9	7.0	320 Ω	240-2075-ND	1.05	.87	.75	28A2025-0A2
White	32.5	21.5	10.0	250 Ω	240-2076-ND	1.30	1.08	.94	28A2029-0A0
Black	32.5	21.5	10.0	250 Ω	240-2077-ND	1.30	1.08	.94	28A2029-0A2
Black	42.00	29.20	19.30	210 Ω	240-2121-ND	2.90	2.40	2.07	28A5776-0A2

240-2224-ND Split Clamp-On EMI Ferrite Cores Kit for Round Cables (14 different sizes) 16.52

High Frequency (300MHz – 2GHz) Clamp-On Ferrite Cores

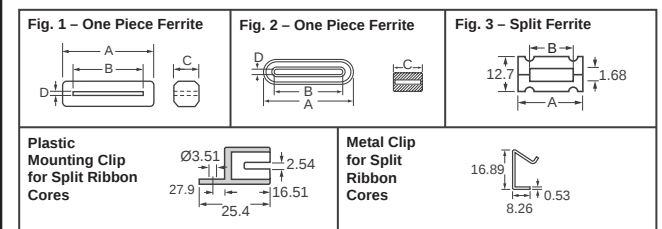
Dimensions (mm)			Net Impedance @ 800 MHz	Digi-Key Part No.	Price Each			Steward Part No.
A	B	C			1	10	50	
Cylinder Clamp-On Ferrite								
29.30	12.80	5.30	193 Ω	240-2129-ND	.64	.54	.46	HFA100049-0A2
41.68	20.96	6.76	309 Ω	240-2132-ND	1.15	.96	.82	HFA150068-0A2
40.36	19.10	9.09	277 Ω	240-2130-ND	1.23	1.02	.88	HFA163090-0A2
Box Clamp-On Ferrite								
32.50	18.40	7.00	339 Ω	240-2131-ND	1.00	.83	.72	HFA150066-0A2
32.84	21.84	10.00	292 Ω	240-2133-ND	1.37	1.13	.98	HFA187102-0A2
32.51	29.72	13.00	286 Ω	240-2134-ND	2.17	1.81	1.56	HFA259131-0A2

Broad Band (30MHz – 900MHz) Ribbon and Flex Cable Ferrite Cores

One Piece Ferrite EMI Cores for Flat Cables: Cable must be inserted into the ferrite core before cable ends are connected.

Split Ribbon Cable Cores with Plastic End Clips: Easy to use where assembled cable connectors prevent the use of one piece ferrite cores. White end clips provide secure closure of ferrite parts onto the flat cable. Tabs with screw holes for mounting the assembly including. Order two parts for each assembly.

Split Ribbon Cable Cores with Metal Clips: Split ferrite cores for flat ribbon cables clamp together with small metal clips that provide secure closure. Order two parts for each assembly.



Dimensions (mm)				Typ. Imped. @ 100 MHz	Digi-Key Part No.	Price Each			Steward Part No.
A	B	C	D			1	2	10	50
Fig. 1 One Piece Ferrite Cores for Flat Cables									
11.50	8.00	12.00	0.70	104 Ω	240-2155-ND	.15	—	.13	.11
12.20	8.00	18.00	1.00	190 Ω	240-2156-ND	.14	—	.12	.10
15.01	10.00	22.86	1.50	227 Ω	240-2229-ND	.25	—	.22	.19
15.60	13.60	16.00	0.70	116 Ω	240-2158-ND	.18	—	.15	.13
17.00	13.00	12.00	0.75	110 Ω	240-2157-ND	.18	—	.15	.13
22.35	14.00	19.05	1.5	187 Ω	240-2082-ND	.33	—	.28	.24
22.80	18.70	16.00	0.70	127 Ω	240-2161-ND	.20	—	.17	.15
28.00	23.00	20.00	0.80	192 Ω	240-2162-ND	.28	—	.24	.21
38.10	26.67	25.00	1.91	230 Ω	240-2084-ND	.85	—	.71	.61
45.08	34.42	28.58	1.52	260 Ω	240-2086-ND	1.18	—	.98	.85
63.50	52.07	28.58	1.68	298 Ω	240-2088-ND	1.68	—	1.39	1.20
55.12	43.69	25.40	1.27	280 Ω	240-2090-ND	1.33	—	1.11	.96

Fig. 2 One Piece Ferrite Cores for Flat Cables									
19.20	15.00	16.00	1.15	147 Ω	240-2159-ND	.17	—	.14	.12
25.00	18.00	24.00	0.90	232 Ω	240-2160-ND	.39	—	.32	.28
28.58	23.50	31.00	1.70	220 Ω	240-2230-ND	.47	—	.39	.34
28.58	23.50	17.00	1.70	150 Ω	240-2231-ND	.32	—	.27	.24
37.00	27.00	18.25	1.50	168 Ω	240-2163-ND	.41	—	.35	.30
36.83	29.58	10.00	0.75	143 Ω	240-2164-ND	.28	—	.24	.21
37.00	31.08	25.00	1.50	212 Ω	240-2232-ND	.51	—	.43	.37
49.61	44.00	12.00	1.45	127 Ω	240-2165-ND	.36	—	.31	.27
56.90	52.32	9.00	1.02	110 Ω	240-2166-ND	.32	—	.27	.23

Fig. 3 Split Ribbon Cable Cores with Plastic End Clips									
63.50	52.07	—	—	280 Ω	240-2097-ND*	—	2.37	.99	.85
76.20	65.28	—	—	280 Ω	240-2099-ND*	—	2.52	1.05	.90
45.09	34.42	—	—	250 Ω	240-2103-ND*	—	1.91	.79	.68

Fig. 3 Split Ribbon Cable Cores with Metal Clips									
63.50	52.07	—	—	280 Ω	240-2096-ND*	—	2.16	.90	.78
76.20	65.28	—	—	280 Ω	240-2098-ND*	—	2.30	.96	.83
45.09	34.42	—	—	250 Ω	240-2102-ND*	—	1.69	.70	.61
38.10	26.67	—	—	250 Ω	240-2104-ND*	—	1.33	.56	.48

* Note: Split ferrite ribbon cable cores require two ferrite pieces per one complete assembly.

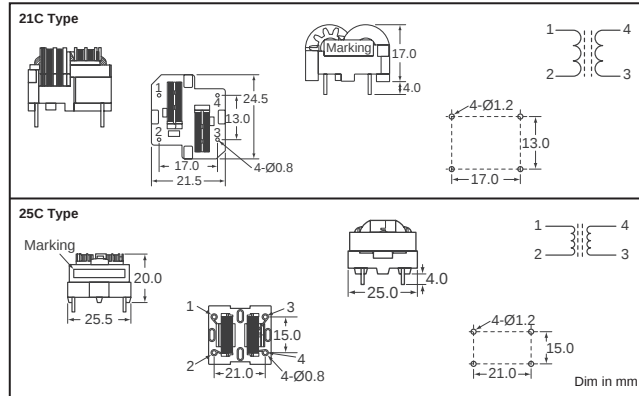
Combination Line Filters

Series C, types 21C and 25C

Combination line filters applicable for attenuation of both the common mode and normal mode.

FEATURES: • Addition of superior normal mode attenuation characteristics • Compact and high inductance • Low profile and suitable for high density mounting

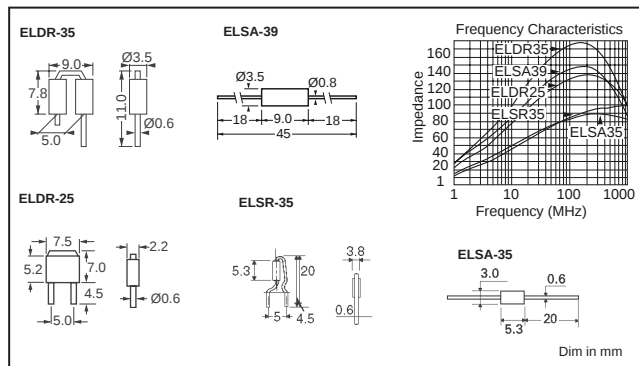
RECOMMENDED APPLICATIONS: • Lighting equipment • AV Equipment • Communication equipment • Power supply
SPECIFICATIONS: • Operating Temperature: -20°C ~ 115°C • Voltage: AC 250 Vrms maximum • Dielectric withstanding voltage: AC 2kV 1 min. • Temperature rise: 45 K maximum



Inductance (mH min)		DCR (at 20°C) (Ω) $\pm 20\%$ Tol.		Rated Current (A rms) max		Digi-Key Part No.		Price Each		Panasonic Part No.
Common	Normal							1	10	100
21C Type										
43.0	1.70	3.07	0.3	PLK1294-ND	2.03	1.74	1.45	ELF-21C003A		
25.0	.960	1.75	0.4	PLK1295-ND	2.03	1.74	1.45	ELF-21C004A		
11.0	.440	.790	0.6	PLK1296-ND	2.03	1.74	1.45	ELF-21C006A		
6.40	.250	.450	0.9	PLK1297-ND	2.03	1.74	1.45	ELF-21C009A		
3.90	.150	.300	1.1	PLK1298-ND	2.03	1.74	1.45	ELF-21C011A		
2.30	.090	.170	1.5	PLK1299-ND	2.03	1.74	1.45	ELF-21C015A		
1.70	.065	.120	1.8	PLK1300-ND	2.03	1.74	1.45	ELF-21C018A		
1.00	.040	.080	2.3	PLK1301-ND	2.03	1.74	1.45	ELF-21C023A		
25C Type										
184.0	5.30	5.031	0.3	PLK1302-ND	2.47	2.12	1.77	ELF-25C003A		
72.0	2.10	1.891	0.5	PLK1303-ND	2.47	2.12	1.77	ELF-25C005A		
34.0	0.90	.916	0.7	PLK1304-ND	2.47	2.12	1.77	ELF-25C007A		
20.0	0.52	.510	0.9	PLK1305-ND	2.47	2.12	1.77	ELF-25C009A		
11.0	0.31	.310	1.2	PLK1306-ND	2.47	2.12	1.77	ELF-25C012A		
6.70	.180	.180	1.6	PLK1307-ND	2.47	2.12	1.77	ELF-25C016A		
4.40	.110	.113	2.0	PLK1308-ND	2.47	2.12	1.77	ELF-25C020A		
3.00	.080	.080	2.5	PLK1309-ND	2.47	2.12	1.77	ELF-25C025A		
1.80	.050	.053	3.2	PLK1310-ND	2.47	2.12	1.77	ELF-25C032A		
1.20	.03	.037	3.8	PLK1311-ND	2.47	2.12	1.77	ELF-25C038A		

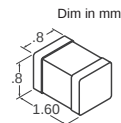
EMI Bead Cores (For Electromagnetic Interference)

SPECIFICATIONS: • DC Resistance: 10m Ω maximum • Insulation Resistance: 10M Ω min.



Description	Imp. (Ω) 100 MHz	Digi-Key Part No.	10	100	Pricing 1,000	2,000	Panasonic Part No.
Radial Dual Type (Tape & Box)	140 min.	P9817TB-ND	—	—	48.47	—	EXC-ELDR35V
Radial Dual Type (Bulk)	140 min.	P9817BK-ND	.99	8.03	—	—	EXC-ELDR35C
Axial Single Type (Tape & Box)	110 min.	P9818TB-ND	—	—	31.95	—	EXC-ELSA39V
Axial Single Type (Bulk)	110 min.	P9818BK-ND	.70	5.70	—	—	EXC-ELSA39C
Radial Dual Type (Tape & Box)	100 min.	P9819TB-ND	—	—	45.17M	—	EXC-ELDR25V
Radial Dual Type (Bulk)	100 min.	P9819BK-ND	.95	7.76	62.79	—	EXC-ELDR25C
Axial Single Type (Tape & Box)	60 min.	P9820TB-ND	—	—	31.95	—	EXC-ELSA35V
Axial Lead Type (Bulk)	60 min.	P9820BK-ND	.70	4.84	—	—	EXC-ELSA35C
Radial Single Type (Tape & Box)	60 min.	P9821TB-ND	—	—	31.95	—	EXC-ELSR35T
Radial Form Type (Bulk)	60 min.	P9821BK-ND	.70	4.84	—	—	EXC-ELSR35S

Surface Mount Bead Cores 0603



FEATURES: **EXC-38B Series:** • High impedance for high speed signal line • Increase the A characteristics sharply above 40MHz and is applicable for radiated noise in the 100MHz ~ 300MHz range **EXC-38P Series:** • Reduced DC resistance for EMI suppression • High current rating • Effective noise suppression at high frequency, up to 2GHz

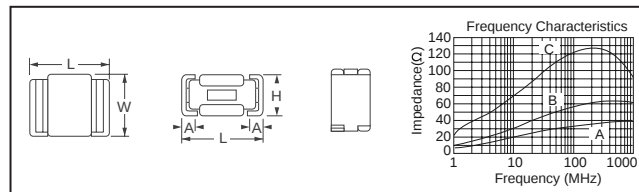
APPLICATIONS: Clock line, signal line, I/O interface circuit

Imp. 100 MHz (Ω) $\pm 25\%$	I (mA)	Rdc (Ω)	Digi-Key Part No.	Cut Tape Pricing 100	500	Digi-Key Part No.	T & R Pricing 4,000	Panasonic Part No.
220	200	0.3	P10188CT-ND	.84	5.63	19.09	P10188TR-ND	24.79/M
220	100	0.8	P10189CT-ND	.84	5.63	19.09	P10189TR-ND	24.79/M
1000	50	1	P10190CT-ND	.84	5.63	19.09	P10190TR-ND	24.79/M
60	1000	0.07	P10749CT-ND	.95	6.66	23.02	P10749TR-ND	36.36/M
120	500	0.1	P10750CT-ND	.95	6.66	23.02	P10750TR-ND	36.36/M

Surface Mount Bead Cores

SPECIFICATIONS:

• Tolerance: $\pm 25\%$ • Test Frequency: 100MHz • Rated Current: 2 (A) • Flow Reflow Soldering



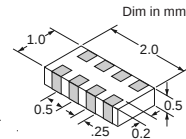
Dia.	Imp. (Ω)	Dimensions (mm) L W H A	Digi-Key Part No.	Cut Tape Price Each 10 100	Digi-Key Part No.	Tape & Reel Pricing 2,000 10,000	Panasonic Part No.
A	25	3.2 1.6 1.6 0.5	P9810CT-ND	.23 .17	P9810TR-ND	95.29/M 88.13/M	EXC-CL3216U1
B	45	3.2 2.5 1.6 0.5	P9811CT-ND	.29 .22	P9811TR-ND	121.73/M 112.92/M	EXC-CL3225U1
C	115	4.5 3.2 1.8 0.5	P9812CT-ND	.34 .25	P9812TR-ND	— 132.20/M	EXC-CL4532U1

Surface Mount Bead Cores 0804 (0402x4)

FEATURES: • .02 inch (0.51mm) height, lightweight (typically only 5mg), narrow pitch, compatible with SSOP pitch

EXC-28BB Series: • Suitable for high speed signals (over 50MHz), excellent cross talk characteristics (100MHz: <25dB) **APPLICATIONS:** • PC, LCD, DSC, Printer, PDA, MD, CD, NAVI

EXC-28BA Series: • Suitable for ring suppression while maintaining wave form, excellent cross talk characteristics (100MHz: <30dB) **APPLICATIONS:** • HDD, E-IDE (Ultra DMA 33), DVD, CD-ROM, C-DR, CDR-RW



Imp. 100 MHz (Ω) $\pm 25\%$	I (mA)	Rdc (Ω)	Digi-Key Part No.	Cut Tape Price Each 10 100 500	Digi-Key Part No.	Tape & Reel Pricing 5,000	Panasonic Part No.
120	100	0.5	P10751CT-ND	.39 .29 .21	P10751TR-ND	164.14/M	EXC-28BB121U
220	100	0.7	P10752CT-ND	.39 .29 .21	P10752TR-ND	164.14/M	EXC-28BB221U
120	100	0.5	P10753CT-ND	.39 .29 .21	P10753TR-ND	164.14/M	EXC-28BA121U
200	100	0.7	P10754CT-ND	.39 .29 .21	P10754TR-ND	164.14/M	EXC-28BA221U

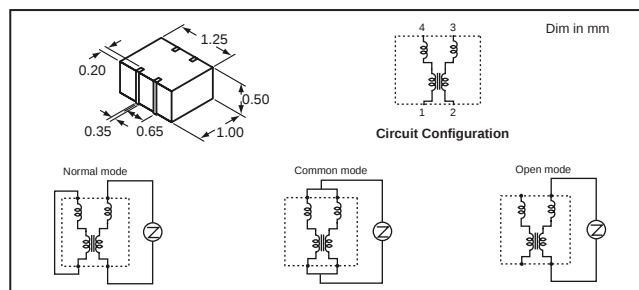
Surface Mount 2 Mode Noise Filters

EXC-24CB and EXC-24CP Series

FEATURES: • Acoustic quality improvement of mobile phone and portable audio equipment • Effectively suppresses both common mode noise and normal mode noise • Small size and light weight

APPLICATIONS: • Receiver line, microphone line and headset of mobile phone (GSM, TDMA, PDC, etc.) • Small digital equipment such as personal computers, printer, HDD, DVD-ROM, CD-ROM and LCD • Digital audio and video equipment such as PDA, DSC, DVC, CD Player, DVD Player and MD Player

SPECIFICATIONS: • Tolerance: $\pm 25\%$ • Rated Voltage: 5 VDC



Open Mode Impedance @100MHz (Ω)	Rated Current (mA DC)	DC Resist. Max. (Ω)	Digi-Key Part No.	Cut Tape Price Each 1 100	Tape & Reel* Pricing 5,000	Panasonic Part No.
1000	50	1.5	P11169CT-ND	.37 .28 .21	118.43/M	EXC-24CB102U
220	100	0.7	P11170CT-ND	.37 .28 .21	118.43/M	EXC-24CB221U
220	350	0.4	P11598CT-ND	.39 .30 .22	122.83/M	EXC-24CP221U
120	500	0.3	P11597CT-ND	.39 .30 .22	122.83/M	EXC-24CP121U

* For Tape and Reel part number, change CT-ND to TR-ND

All prices are in British Pound Sterling and include duties.

uk.digikey.com — FREEPHONE: 0-800-587-0991 • 0-800-904-7786 — FREEFAX: 0-800-587-0992 • 0-800-904-7783

Panasonic® Line Filters

V Series (290, 450, 650, 850, 21V, 24V Types)

H Series (200, 270, 400, 600 Types)

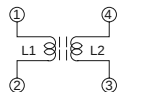
F Series (23F, 25F Types)

M Series (11M, 14M, 16M Types)

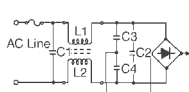
N Series (15N, 18N, 20N Types)

High N Series (17N, 19N, 21N Types)

Standard Circuit Diag.



Circuit Example



Line filters for suppressing conductive noise ranging from low to high frequencies generated from power supply circuits of various equipment

V Series (Vertical Structure): Excellent attenuation in high frequency characteristics

H Series (Horizontal Structure): Greatly decreases leakage flux

F Series (Thin Structure): 15 mm height max.

M Series (Small Structure): Small size and lightweight

N Series (Vertical Structure): Suitable for high-density automatic insertion

High N Series (High L Structure): High inductance (same size with N Series)

290 Type	200, 400, 600 Type <table><tr><th>Type</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th></tr><tr><td>200</td><td>20.00</td><td>21.00</td><td>20.00</td><td>13.00</td><td>10.00</td><td>13.00</td><td>10.00</td></tr><tr><td>400</td><td>24.00</td><td>24.50</td><td>19.50</td><td>21.00</td><td>15.00</td><td>21.00</td><td>15.00</td></tr><tr><td>600</td><td>28.50</td><td>29.00</td><td>22.50</td><td>24.00</td><td>20.00</td><td>24.00</td><td>20.00</td></tr></table> 23F, 25F Types <table><tr><th>Type</th><th>A</th><th>B</th><th>C</th><th>D</th><th>E</th><th>F</th><th>G</th></tr><tr><td>23F</td><td>24</td><td>23</td><td>14</td><td>16±0.5</td><td>10±0.5</td><td>16±0.1</td><td>10±0.1</td></tr><tr><td>25F</td><td>28</td><td>25</td><td>15</td><td>21±0.5</td><td>11±0.5</td><td>21±0.1</td><td>11±0.1</td></tr></table>	Type	A	B	C	D	E	F	G	200	20.00	21.00	20.00	13.00	10.00	13.00	10.00	400	24.00	24.50	19.50	21.00	15.00	21.00	15.00	600	28.50	29.00	22.50	24.00	20.00	24.00	20.00	Type	A	B	C	D	E	F	G	23F	24	23	14	16±0.5	10±0.5	16±0.1	10±0.1	25F	28	25	15	21±0.5	11±0.5	21±0.1	11±0.1	17N Type 19N Type 21N Type 11M Type 14M Type 16M Type
Type	A	B	C	D	E	F	G																																																			
200	20.00	21.00	20.00	13.00	10.00	13.00	10.00																																																			
400	24.00	24.50	19.50	21.00	15.00	21.00	15.00																																																			
600	28.50	29.00	22.50	24.00	20.00	24.00	20.00																																																			
Type	A	B	C	D	E	F	G																																																			
23F	24	23	14	16±0.5	10±0.5	16±0.1	10±0.1																																																			
25F	28	25	15	21±0.5	11±0.5	21±0.1	11±0.1																																																			
450, 650 Type Dim.: shown in [] are for 450 type.	850 Type	21V Type 24V Type	15N Type	18N Type	20N Type																																																					

Type	Inductance mH min.	Rated Current A rms	Digi-Key Part No.	1	10	100	1,000	Panasonic Part No.
V Series								
290	33.0	0.3	PLK1005-ND	1.85	15.86	132.19	789.30	ELF-18D290H
	22.0	0.4	PLK1004-ND	1.85	15.86	132.19	789.30	ELF-18D290C
	10.0	0.6	PLK1003-ND	1.85	15.86	132.19	789.30	ELF-18D290G
	3.3	1.1	PLK1002-ND	1.85	15.86	132.19	789.30	ELF-18D290S
	2.2	1.3	PLK1001-ND	1.85	15.86	132.19	789.30	ELF-18D290T
	0.82	2.0	PLK1000-ND	1.85	15.86	132.19	789.30	ELF-18D290B
450	56.0	0.45	PLK1206-ND	3.13	26.82	223.49	1334.04	ELF-18D450Q
	39.0	0.50	PLK1207-ND	3.13	26.82	223.49	1334.04	ELF-18D450H
	18.0	0.8	PLK1208-ND	3.13	26.82	223.49	1334.04	ELF-18D450B
	10.0	1.0	PLK1209-ND	3.13	26.82	223.49	1334.04	ELF-18D450J
	8.2	1.1	PLK1209-ND	3.13	26.82	223.49	1334.04	ELF-18D450G
	6.8	1.2	PLK1210-ND	3.13	26.82	223.49	1334.04	ELF-18D450L
	5.6	1.4	PLK1211-ND	3.13	26.82	223.49	1334.04	ELF-18D450D
650	3.9	1.8	PLK1212-ND	3.13	26.82	223.49	1334.04	ELF-18D450K
	2.7	2.0	PLK1006-ND	3.13	26.82	223.49	1334.04	ELF-18D450A
	2.2	2.2	PLK1213-ND	3.13	26.82	223.49	1334.04	ELF-18D450C
	1.2	3.0	PLK1214-ND	3.13	26.82	223.49	1334.04	ELF-18D450M
	68.0	0.6	PLK1223-ND	3.42	29.33	244.42	1459.07	ELF-18D650S
	47.0	0.7	PLK1210-ND	3.42	29.33	244.42	1459.07	ELF-18D650U
	39.0	0.7	PLK1215-ND	3.42	29.33	244.42	1459.07	ELF-18D650P
850	33.0	0.8	PLK1216-ND	3.42	29.33	244.42	1459.07	ELF-18D650H
	27.0	1.0	PLK1224-ND	3.42	29.33	244.42	1459.07	ELF-18D650V
	22.0	1.0	PLK1011-ND	3.42	29.33	244.42	1459.07	ELF-18D650L
	18.0	1.2	PLK1225-ND	3.42	29.33	244.42	1459.07	ELF-18D650Q
	15.0	1.3	PLK1226-ND	3.42	29.33	244.42	1459.07	ELF-18D650E
	12.0	1.3	PLK1218-ND	3.42	29.33	244.42	1459.07	ELF-18D650J
	12.0	1.6	PLK1038-ND	3.42	29.33	244.42	1459.07	ELF-18D650G
21V	10.0	1.4	PLK1219-ND	3.42	29.33	244.42	1459.07	ELF-18D650W
	8.2	1.7	PLK1010-ND	3.42	29.33	244.42	1459.07	ELF-18D650C
	6.8	1.8	PLK1220-ND	3.42	29.33	244.42	1459.07	ELF-18D650K
	6.8	2.0	PLK1221-ND	3.42	29.33	244.42	1459.07	ELF-18D650X
	5.6	2.2	PLK1222-ND	3.42	29.33	244.42	1459.07	ELF-18D650Y
	4.7	2.0	PLK1009-ND	3.42	29.33	244.42	1459.07	ELF-18D650B
	1.8	2.8	PLK1222-ND	3.42	29.33	244.42	1459.07	ELF-18D650G
24V	5.3	3.1	PLK1008-ND	3.42	29.33	244.42	1459.07	ELF-18D650M
	4.7	2.5	PLK1229-ND	3.42	29.33	244.42	1459.07	ELF-18D656Y
	2.7	2.7	PLK1230-ND	3.42	29.33	244.42	1459.07	ELF-18D656Z
	2.2	2.8	PLK1037-ND	3.42	29.33	244.42	1459.07	ELF-18D666A

Type	Inductance mH min.	Rated Current A rms	Digi-Key Part No.	1	10	100	1,000	Panasonic Part No.
290	82.0	0.8	PLK1231-ND	5.41	46.37	386.39	2306.75	ELF-18D850R
	56.0	1.1	PLK1017-ND	5.41	46.37	386.39	2306.75	ELF-18D850T
	47.0	1.2	PLK1232-ND	5.41	46.37	386.39	2306.75	ELF-18D850U
	33.0	1.4	PLK1233-ND	5.41	46.37	386.39	2306.75	ELF-18D850H
	27.0	1.5	PLK1234-ND	5.41	46.37	386.39	2306.75	ELF-18D850Z
	22.0	1.8	PLK1018-ND	5.41	46.37	386.39	2306.75	ELF-18D860C
	18.0	1.9	PLK1235-ND	5.41	46.37	386.39	2306.75	ELF-18D850Q
850	15.0	2.0	PLK1236-ND	5.41	46.37	386.39	2306.75	ELF-18D850D
	10.0	2.5	PLK1016-ND	5.41	46.37	386.39	2306.75	ELF-18D850W
	8.2	3.0	PLK1237-ND	5.41	46.37	386.39	2306.75	ELF-18D850C
	5.6	3.4	PLK1238-ND	5.41	46.37	386.39	2306.75	ELF-18D850X
	4.7	3.5	PLK1015-ND	5.41	46.37	386.39	2306.75	ELF-18D850Y
	3.9	3.7	PLK1239-ND	5.41	46.37	386.39	2306.75	ELF-18D850P
	3.3	4.2	PLK1014-ND	5.41	46.37	386.39	2306.75	ELF-18D850B
21V	2.7	4.5	PLK1240-ND	5.41	46.37	386.39	2306.75	ELF-18D860B
	1.5	5.0	PLK1013-ND	5.41	46.37	386.39	2306.75	ELF-18D850M
	68.0	0.6	PLK1102-ND	2.57	21.99	183.28	1094.44	ELF-21V006A
	56.0	0.7	PLK1103-ND	2.57	21.99	183.28	1094.44	ELF-21V007A
	33.0	0.8	PLK1104-ND	3.18	27.26	227.21	1356.62	ELF-21V008A
	27.0	1.0	PLK1105-ND	3.18	27.26	227.21	1356.62	ELF-21V010A
	18.0	1.2	PLK1106-ND	3.18	27.26	227.21	1356.62	ELF-21V012A
24V	15.0	1.3	PLK1107-ND	3.18	27.26	227.21	1356.62	ELF-21V013A
	12.0	1.6	PLK1108-ND	3.18	27.26	227.21	1356.62	ELF-21V016A
	8.2	1.8	PLK1109-ND	3.18	27.26	227.21	1356.62	ELF-21V018A
	6.8	2.0	PLK1110-ND	3.18	27.26	227.21	1356.62	ELF-21V020A
	5.6	2.2	PLK1111-ND	3.18	27.26	227.21	1356.62	ELF-21V022A
	4.5	2.5	PLK1112-ND	3.18	27.26	227.21	1356.62	ELF-21V025A
	2.7	2.7	PLK1113-ND	3.18	27.26	227.21	1356.62	ELF-21V027A
290	2.2	3.0	PLK1114-ND	3.18	27.26	227.21	1356.62	ELF-21V030A
	82.0	0.8	PLK1115-ND	3.18	27.26	227.21	1356.62	ELF-24V008A
	56.0	1.0	PLK1116-ND	3.18	27.26	227.21	1356.62	ELF-24V010A
	47.0	1.2	PLK1117-ND	3.18	27.26	227.21	1356.62	ELF-24V012A
	33.0	1.4	PLK1118-ND	3.18	27.26	227.21	1356.62	ELF-24V014A
	27.0	1.5	PLK1119-ND	3.18	27.26	227.21	1356.62	ELF-24V015A
	22.0	1.8	PLK1120-ND	3.18	27.26	227.21	1356.62	ELF-24V018A
450	18.0	1.9	PLK1121-ND	3.18	27.26	227.21	1356.62	ELF-24V019A
	15.0	2.0	PLK1122-ND	3.18	27.26	227.21	1356.62	ELF-24V020A
	10.0	2.5	PLK1123-ND	3.18	27.26	227.21	1356.62	ELF-24V025A
	9.0	2.8	PLK1124-ND	3.18	27.26	227.21	1356.62	ELF-24V028A
	8.2	3.0	PLK1125-ND	3.18	27.26	227.21	1356.62	ELF-24V030A

(Continued)

All prices are in British Pound Sterling and include duties.

Type	Inductance mH min.	Rated Current A rms	Digi-Key Part No.	1	10	Pricing 100	1,000	Panasonic Part No.
24V	5.6	3.4	PLK1126-ND	3.18	27.26	227.21	1356.62	ELF-24V034A
	4.7	3.5	PLK1127-ND	4.73	40.48	337.37	2014.28	ELF-24V035A
	3.9	3.7	PLK1128-ND	4.73	40.48	337.37	2014.28	ELF-24V037A
	3.3	4.2	PLK1129-ND	4.73	40.48	337.37	2014.28	ELF-24V042A
	2.7	4.5	PLK1130-ND	4.73	40.48	337.37	2014.28	ELF-24V045A
	1.5	5.0	PLK1131-ND	4.73	40.48	337.37	2014.28	ELF-24V050A
	0.80	7.0	PLK1132-ND	4.73	40.48	337.37	2014.28	ELF-24V070A
	0.40	8.0	PLK1133-ND	4.73	40.48	337.37	2014.28	ELF-24V080A
	0.26	9.0	PLK1134-ND	4.73	40.48	337.37	2014.28	ELF-24V090A
	0.15	10.0	PLK1135-ND	4.73	40.48	337.37	2014.28	ELF-24V100A
H Series								
200	68.0	0.25	PLK1247-ND	2.12	18.11	150.92	901.11	ELF-18D222F
	47.0	0.3	PLK1248-ND	2.12	18.11	150.92	901.11	ELF-18D235F
	33.0	0.4	PLK1024-ND	2.12	18.11	150.92	901.11	ELF-18D221F
	22.0	0.4	PLK1021-ND	2.12	18.11	150.92	901.11	ELF-18D218
	18.0	0.5	PLK1241-ND	2.12	18.11	150.92	901.11	ELF-18D210
	15.0	0.5	PLK1242-ND	2.12	18.11	150.92	901.11	ELF-18D215
	8.2	0.7	PLK1243-ND	2.12	18.11	150.92	901.11	ELF-18D214
	6.8	0.8	PLK1244-ND	2.12	18.11	150.92	901.11	ELF-18D225
	4.7	1.0	PLK1249-ND	2.12	18.11	150.92	901.11	ELF-18D227F
	3.9	1.0	PLK1020-ND	2.12	18.11	150.92	901.11	ELF-18D216
100	33.0	0.3	PLK1251-ND	1.85	15.86	132.19	789.30	ELF-18D270J
	22.0	0.4	PLK1252-ND	1.85	15.86	132.19	789.30	ELF-18D270B
	18.0	0.5	PLK1253-ND	1.85	15.86	132.19	789.30	ELF-18D270H
	10.0	0.6	PLK1254-ND	1.85	15.86	132.19	789.30	ELF-18D270G
	6.8	0.7	PLK1025-ND	1.85	15.86	132.19	789.30	ELF-18D270A
	5.6	0.8	PLK1255-ND	1.85	15.86	132.19	789.30	ELF-18D270Q
	2.7	1.1	PLK1256-ND	1.85	15.86	132.19	789.30	ELF-18D270D
	1.8	1.5	PLK1257-ND	1.85	15.86	132.19	789.30	ELF-18D270C
	68.0	0.4	PLK1266-ND	2.51	21.50	179.15	1069.65	ELF-18D437F
	39.0	0.5	PLK1267-ND	2.51	21.50	179.15	1069.65	ELF-18D427F
400	33.0	0.5	PLK1029-ND	2.51	21.50	179.15	1069.65	ELF-18D428
	27.0	0.6	PLK1258-ND	2.51	21.50	179.15	1069.65	ELF-18D423
	22.0	0.6	PLK1259-ND	2.51	21.50	179.15	1069.65	ELF-18D427
	18.0	0.7	PLK1260-ND	2.51	21.50	179.15	1069.65	ELF-18D417
	18.0	0.8	PLK1268-ND	2.51	21.50	179.15	1069.65	ELF-18D417F
	12.0	0.9	PLK1028-ND	2.51	21.50	179.15	1069.65	ELF-18D430
	10.0	1.0	PLK1031-ND	2.51	21.50	179.15	1069.65	ELF-18D431F
	8.2	1.0	PLK1261-ND	2.51	21.50	179.15	1069.65	ELF-18D415
	6.8	1.2	PLK1262-ND	2.51	21.50	179.15	1069.65	ELF-18D412
	5.6	1.3	PLK1263-ND	2.51	21.50	179.15	1069.65	ELF-18D424
600	5.6	1.4	PLK1269-ND	2.51	21.50	179.15	1069.65	ELF-18D424F
	3.9	1.5	PLK1264-ND	2.51	21.50	179.15	1069.65	ELF-18D433
	3.3	1.8	PLK1265-ND	2.51	21.50	179.15	1069.65	ELF-18D414
	2.7	2.0	PLK1270-ND	2.51	21.50	179.15	1069.65	ELF-18D434F
	2.2	2.0	PLK1027-ND	2.51	21.50	179.15	1069.65	ELF-18D416
	1.5	2.4	PLK1030-ND	2.51	21.50	179.15	1069.65	ELF-18D435F
	1.2	3.0	PLK1026-ND	2.51	21.50	179.15	1069.65	ELF-18D419
	0.56	3.4	PLK1271-ND	2.51	21.50	179.15	1069.65	ELF-18D420F
	100.0	0.4	PLK1272-ND	2.51	21.50	179.15	1069.65	ELF-18D441F
	68.0	0.5	PLK1273-ND	3.17	27.15	226.24	1350.56	ELF-18D620
23F	47.0	0.7	PLK1274-ND	3.17	27.15	226.24	1350.56	ELF-18D607
	39.0	0.7	PLK1287-ND	3.17	27.15	226.24	1350.56	ELF-18D605F
	33.0	0.8	PLK1275-ND	3.17	27.15	226.24	1350.56	ELF-18D615
	30.0	0.8	PLK1036-ND	3.17	27.15	226.24	1350.56	ELF-18D624F
	27.0	0.8	PLK1276-ND	3.17	27.15	226.24	1350.56	ELF-18D618
	27.0	1.0	PLK1288-ND	3.17	27.15	226.24	1350.56	ELF-18D618F
	22.0	1.0	PLK1034-ND	3.17	27.15	226.24	1350.56	ELF-18D612
	18.0	1.2	PLK1277-ND	3.17	27.15	226.24	1350.56	ELF-18D606
	12.0	1.3	PLK1289-ND	3.17	27.15	226.24	1350.56	ELF-18D606F
	12.0	1.4	PLK1278-ND	3.17	27.15	226.24	1350.56	ELF-18D609
25F	12.0	1.6	PLK1290-ND	3.17	27.15	226.24	1350.56	ELF-18D609F
	10.0	1.6	PLK1291-ND	3.17	27.15	226.24	1350.56	ELF-18D616
	8.2	1.7	PLK1292-ND	3.17	27.15	226.24	1350.56	ELF-18D601F
	5.6	1.8	PLK1280-ND	3.17	27.15	226.24	1350.56	ELF-18D602
	5.6	2.1	PLK1281-ND	3.17	27.15	226.24	1350.56	ELF-18D603
	4.7	2.0	PLK1292-ND	3.17	27.15	226.24	1350.56	ELF-18D603F
	4.7	2.0	PLK1282-ND	3.17	27.15	226.24	1350.56	ELF-18D604
	4.7	2.5	PLK1293-ND	3.17	27.15	226.24	1350.56	ELF-18D604F
	3.9	2.2	PLK1283-ND	3.17	27.15	226.24	1350.56	ELF-18D613
	3.3	2.5	PLK1033-ND	3.17	27.15	226.24	1350.56	ELF-18D605
F Series								
23F	50.0	0.3	PLK1039-ND	5.43	46.48	387.35	2312.26	ELF-23F003A
	30.0	0.4	PLK1040-ND	5.43	46.48	387.35	2312.26	ELF-23F004A
	20.0	0.5	PLK1041-ND	5.43	46.48	387.35	2312.26	ELF-23F005A
	14.0	0.6	PLK1042-ND	5.43	46.48	387.35	2312.26	ELF-23F006A
	10.0	0.7	PLK1043-ND	5.43	46.48	387.35	2312.26	ELF-23F007A
	8.0	0.8	PLK1044-ND	5.43	46.48	387.35	2312.26	ELF-23F008A
	5.0	0.9	PLK1045-ND	5.43	46.48	387.35	2312.26	ELF-23F009A
	3.5	1.2	PLK1046-ND	5.43	46.48	387.35	2312.26	ELF-23F010A
	2.0	1.6	PLK1047-ND	5.43	46.48	387.35	2312.26	ELF-23F012A
	1.5	1.8	PLK1048-ND	5.43	46.48	387.35	2312.26	ELF-23F016A
25F	1.0	2.0	PLK1049-ND	5.43	46.48	387.35	2312.26	ELF-23F018A
	1.2	2.0	PLK1050-ND	5.43	46.48	387.35	2312.26	ELF-23F020A
	1.0	2.2	PLK1051-ND	5.43	46.48	387.35	2312.26	ELF-23F022A
	28.0	0.6	PLK1052-ND	6.33	54.23	451.93	2697.82	ELF-25F106A
	20.0	0.7	PLK1053-ND	6.33	54.23	451.93	2697.82	ELF-25F107A
	15.0	0.8	PLK1054-ND	6.33	54.23	451.93	2697.82	ELF-25F108A
	12.0	0.9	PLK1055-ND	6.33	54.23	451.93	2697.82	ELF-25F109A
	10.0	1.0	PLK1056-ND	6.33	54.23	451.93	2697.82	ELF-25F110A
	7.0	1.2	PLK1057-ND	6.33	54.23	451.93	2697.82	ELF-25F112A
	5.0	1.4	PLK1058-ND	6.33	54.23	451.93	2697.82	ELF-25F114A
25F	4.0	1.6	PLK1059-ND	6.33	54.23	451.93	2697.82	ELF-25F116A
	3.0	1.8	PLK1060-ND	6.33	54.23	451.93	2697.82	ELF-25F118A
	2.0	2.0	PLK1061-ND	6.33	54.23	451.93	2697.82	ELF-25F020A
	1.6	2.2	PLK1062-ND	6.33	54.23	451.93	2697.82	ELF-25F022A
	1.3	2.5	PLK1063-ND	6.33	54.23	451.93	2697.82	ELF-25F025A

Type	Inductance mH min.	Rated Current A rms	Digi-Key Part No.	Pricing			Panasonic Part No.	
M Series								
11M	30.0	0.1	PLK1136-ND	1.61	13.80	114.98	686.30	ELF-11M010E
	12.0	0.2	PLK1137-ND	1.61	13.80	114.98	686.30	ELF-11M020E
	6.0	0.3	PLK1138-ND	1.61	13.80	114.98	686.30	ELF-11M030E
	3.5	0.4	PLK1139-ND	1.61	13.80	114.98	686.30	ELF-11M040E
	2.5	0.5	PLK1140-ND	1.61	13.80	114.98	686.30	ELF-11M050E
	1.5	0.6	PLK1141-ND	1.61	13.80	114.98	686.30	ELF-11M060E
	1.0	0.7	PLK1142-ND	1.61	13.80	114.98	686.30	ELF-11M070E
	0.8	0.8	PLK1143-ND	1.61	13.80	114.98	686.30	ELF-11M080E
	0.7	0.9	PLK1144-ND	1.61	13.80	114.98	686.30	ELF-11M090E
	0.5	1.0	PLK1145-ND	1.61	13.80	114.98	686.30	ELF-11M100E
14M	30.0	0.1	PLK1146-ND	1.76	15.12	126.00	752.39	ELF-14M010E
	12.0	0.2	PLK1147-ND	1.76	15.12	126.00	752.39	ELF-14M020E
	6.0	0.3	PLK1148-ND	1.76	15.12	126.00	752.39	ELF-14M030E
	3.5	0.4	PLK1149-ND	1.76	15.12	126.00	752.39	ELF-14M040E
	2.5	0.5	PLK1150-ND	1.76	15.12	126.00	752.39	ELF-14M050E
	1.5	0.6	PLK1151-ND	1.76	15.12	126.00	752.39	ELF-14M060E
	1.0	0.7	PLK1152-ND	1.76	15.12	126.00	752.39	ELF-14M070E
	0.8	0.8	PLK1153-ND	1.76	15.12	126.00	752.39	ELF-14M080E
	0.7	0.9	PLK1154-ND	1.76	15.12	126.00	752.39	ELF-14M090E
	0.5	1.0	PLK1155-ND	1.76	15.12	126.00	752.39	ELF-14M100E
16M	28.0	0.2	PLK1156-ND	.97	8.34	69.54	415.30	ELF-16M020A
	20.0	0.3	PLK1157-ND	.97	8.34	69.54	415.30	ELF-16M030A
	15.0	0.4	PLK1158-ND	.97	8.34	69.54	415.30	ELF-16M040A
	8.0	0.5	PLK1159-ND	.97	8.34	69.54	415.30	ELF-16M050A
	7.0	0.6	PLK1160-ND	.97	8.34	69.54	415.30	ELF-16M060A
	5.0	0.7	PLK1161-ND	.97	8.34	69.54	415.30	ELF-16M070A
	3.5	0.8	PLK1162-ND	.97	8.34	69.54	415.30	ELF-16M080A
	2.0	1.0	PLK1163-ND	.97	8.34	69.54	415.30	ELF-16M100A
	1.0	1.3	PLK1164-ND	.97	8.34	69.54	415.30	ELF-16M130A
	0.8	1.5	PLK1165-ND	.97	8.34	69.54	415.30	ELF-16M150A
	0.6	1.7	PLK1166-ND	.97	8.34	69.54	415.30	ELF-16M170A
	0.5	2.0	PLK1167-ND	.97	8.34	69.54	415.30	ELF-16M200A
N Series								
15N	104.0	0.2	PLK1064-ND	1.33	11.43	95.29	568.98	ELF-15N002A
	43.0	0.3	PLK1065-ND	1.33	11.43	95.29	568.98	ELF-15N003A
	26.0	0.4	PLK1066-ND	1.33	11.43	95.29	568.98	ELF-15N004A
	19.0	0.5	PLK1067-ND	1.33	11.43	95.29	568.98	ELF-15N005A
	12.0	0.6	PLK1068-ND	1.33	11.43	95.29	568.98	ELF-15N006A
	7.0	0.7	PLK1069-ND	1.33	11.43	95.29	568.98	ELF-15N007A
	6.8	0.8	PLK1070-ND	1.33	11.43	95.29	568.98	ELF-15N008A
	5.3	1.0	PLK1071-ND	1.33	11.43	95.29	568.98	ELF-15N010A
	4.0	1.1	PLK1072-ND	1.33	11.43	95.29	568.98	ELF-15N011A
	2.7	1.3	PLK1073-ND	1.33	11.43	95.29	568.98	ELF-15N013A
	2.1	1.5	PLK1074-ND	1.33	11.43	95.29	568.98	ELF-15N015A
	1.7	1.7	PLK1075-ND	1.33	11.43	95.29	568.98	ELF-15N017A
	1.0	2.2	PLK1076-ND	1.33	11.43	95.29	568.98	ELF-15N022A
	0.6	3.0	PLK1077-ND	1.33	11.43	95.29	568.98	ELF-15N030A
	18N	80.0	0.4	PLK1078-ND	2.57	22.06	183.83	1097.74
50.0		0.5	PLK1079-ND	2.57	22.06	183.83	1097.74	ELF-18N005A
35.0		0.6	PLK1080-ND	2.57	22.06	183.83	1097.74	ELF-18N006A
20.0		0.8	PLK1081-ND	2.57	22.06	183.83	1097.74	ELF-18N008A
15.0		1.0	PLK1082-ND	2.57	22.06	183.83	1097.74	ELF-18N010A
9.5		1.2	PLK1083-ND	2.57	22.06	183.83	1097.74	ELF-18N012A
6.0		1.6	PLK1084-ND	2.57	22.06	183.83	1097.74	ELF-18N016A
4.2		2.0	PLK1085-ND	2.57	22.06	183.83	1097.74	ELF-18N020A
2.4		2.5	PLK1086-ND	2.57	22.06	183.83	1097.74	ELF-18N025A
1.4		3.2	PLK1087-ND	2.57	22.06	183.83	1097.74	ELF-18N032A
20N	69.0	0.6	PLK1088-ND	2.81	24.11	200.90	1199.64	ELF-20N006A
	43.0	0.8	PLK1089-ND	2.81	24.11	200.90	1199.64	ELF-20N008A
	28.0	1.0	PLK1090-ND	2.81	24.11	200.90	1199.64	ELF-20N010A
	18.0	1.3	PLK1091-ND	2.81	24.11	200.90	1199.64	ELF-20N013A
	14.0	1.5	PLK1092-ND	2.81	24.11	200.90	1199.64	ELF-20N015A
	12.0	1.6	PLK1093-ND	2.81	24.11	200.90	1199.64	ELF-20N016A
	7.5	1.8	PLK1094-ND	2.81	24.11	200.90	1199.64	ELF-20N018A
	7.0	2.0	PLK1095-ND	2.81	24.11	200.90	1199.64	ELF-20N020A
	6.2	2.2	PLK1096-ND	2.81	24.11	200.90	1199.64	ELF-20N022A
	4.9	2.4	PLK1097-ND	2.81	24.11	200.90	1199.64	ELF-20N024A
	4.7	2.7	PLK1098-ND	2.81	24.11	200.90	1199.64	ELF-20N027A
	2.9	3.0	PLK1099-ND	2.81	24.11	200.90	1199.64	ELF-20N030A
	2.0	3.5	PLK1100-ND	2.81	24.11	200.90	1199.64	ELF-20N035A
	1.5	4.0	PLK1101-ND	2.81	24.11	200.90	1199.64	ELF-20N040A
	High N Series							
17N	142.0	0.2	PLK1168-ND	.78	6.73	56.04	334.34	ELF-17N002A
	60.0	0.3	PLK1169-ND	.78	6.73	56.04	334.34	ELF-17N003A
	35.0	0.4	PLK1170-ND	.78	6.73	56.04	334.34	ELF-17N004A
	26.0	0.5	PLK1171-ND	.78	6.73	56.04	334.34	ELF-17N005A
	16.0	0.6	PLK1172-ND	.78	6.73	56.04	334.34	ELF-17N006A
	14.0	0.7	PLK1173-ND	.78	6.73	56.04	334.34	ELF-17N007A
	9.2	0.8	PLK1174-ND	.78	6.73	56.04	334.34	ELF-17N008A
	7.2	1.0	PLK1175-ND	.78	6.73	56.04	334.34	ELF-17N010A
	5.4	1.1	PLK1176-ND	.78	6.73	56.04	334.34	ELF-17N011A
	3.7	1.3	PLK1177-ND	.78	6.73	56.04	334.34	ELF-17N013A
19N	2.9	1.5	PLK1178-ND	.78	6.73	56.04	334.34	ELF-17N015A
	2.3	1.7	PLK1179-ND	.78	6.73	56.04	334.34	ELF-17N017A
	1.3	2.2	PLK1180-ND	.78	6.73	56.04	334.34	ELF-17N022A
	0.8	3.0	PLK1181-ND	.78	6.73	56.04	334.34	ELF-17N030A
	99.0	0.4	PLK1182-ND	1.42	12.15	101.21	604.23	ELF-19N004A
	62.0	0.5	PLK1183-ND	1.42	12.15	101.21	604.23	ELF-19N005A
	36.0	0.6	PLK1184-ND	1.42	12.15	101.21	604.23	ELF-19N006A
	25.0	0.8	PLK1185-ND	1.42	12.15	101.21	604.23	ELF-19N008A
	19.0	1.0	PLK1186-ND	1.42	12.15	101.21	604.23	ELF-19N010A
	12.0	1.2	PLK1187-ND	1.42	12.15	101.21	604.23	ELF-19N012A
21N	7.4	1.6	PLK1188-ND	1.42	12.15	101.21	604.23	ELF-19N016A
	5.1	2.0	PLK1189-ND	1.42	12.15	101.21	604.23	ELF-19N020A
	3.0	3.5	PLK1190-ND	1.42	12.15	101.21	604.23	ELF-19N025A
	1.7	3.2	PLK1191-ND	1.42	12.15	101.21	604.23	ELF-19N032A
	89.0	0.6	PLK1192-ND	1.78	15.28	127.37	760.65	ELF-21N006A
	54.0	0.8	PLK1193-ND	1.78	15.28	127.37	760.65	ELF-21N008A
	36.0	1.0	PLK1194-ND	1.78	15.28	127.37	760.65	ELF-21N010A
	22.0	1.3	PLK1195-ND	1.78	15.28	127.37	760.65	ELF-21N013A
	18.0	1.5	PLK1196-ND	1.78	15.28	127.37	760.65	ELF-21N015A
	15.0	1.6	PLK1197-ND	1.78	15.28	127.37	760.65	ELF-21N016A
	9.4	1.8	PLK1198-ND	1.78	15.28	127.37	760.65	ELF-21N018A
	8.6	2.0	PLK1199-ND	1.78	15.28	127.37	760.65	ELF-21N019A
	7.8	2.2	PLK1200-ND	1.78	15.28	127.37	760.65	ELF-21N022A
	6.1	2.4	PLK1201-ND	1.78	15.28	127.37	760.65	ELF-21N024A
	5.8	2.7	PLK1202-ND	1.78	15.28	127.37	760.65	ELF-21N027A
	3.7	3.0	PLK1203-ND	1.78	15.28	127.37	760.65	ELF-21N030A
	2.5	3.5	PLK1204-ND	1.78	15.28	127.37	760.65	ELF-21N035A
	1.9	4.0	PLK1205-ND	1.78	15.28	127.37	760.65	ELF-21N040A