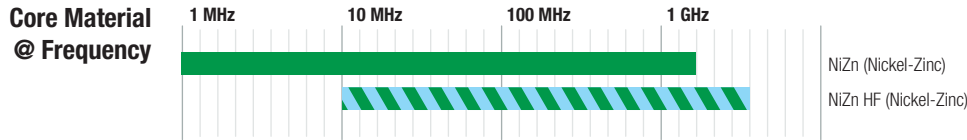


# Filter Applications: EMI Suppression

## Ferrites for PCB Assembly



## Multilayer SMT Ferrites

80 V <sub>AC</sub>	SMT	Core Material	I <sub>R</sub> 10 mA				Size:	R <sub>DC</sub> :	Frequency Range:	
			Z @ 100 MHz 1 Ω	100 mA 10 Ω	1 A 100 Ω	10 A 1000 Ω				
80 V <sub>AC</sub>	SMT	NiZn	WE-CBF	5 – 2700 Ω	450 – 9600 mA		0402, 0603, 0805, 1206, 1210, 1806, 1812	0.005 – 1.5 Ω	6 MHz – 2 GHz	
			WE-MPSB	8 – 600 Ω	2100 – 10500 mA		0603, 0805, 1206, 1612, 1812, 2220, 3312	24 – 253 Ω	0.001 – 0.043 Ω	1 MHz – 3 GHz
		NiZn HF	WE-TMSB	10 – 1800 Ω	210 – 7500 mA		0201, 0402, 0603	12 – 1500 Ω	0.00295 – 1.91 Ω	6 MHz – 3 GHz
			WE-CBF HF		180 – 1000 Ω	250 – 1300 mA		0402, 0603	180 – 1100 Ω	0.13 – 1.2 Ω

## Wired SMT Ferrites

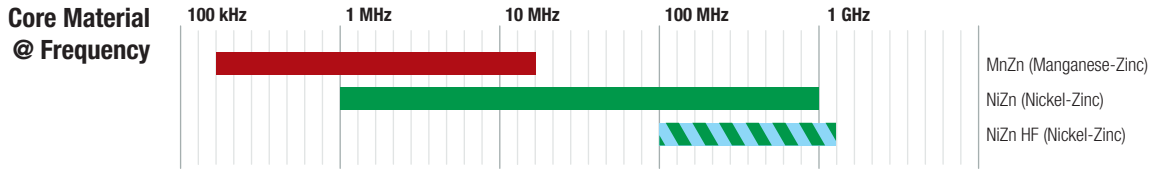
80 V <sub>AC</sub>	SMT	Core Material	I <sub>R</sub> 10 mA				L x W x H Min:	L x W x H Max:	Z @ 100 MHz:	R <sub>DC</sub> :	Frequency Range:	
			Z @ 25 MHz 1 Ω	100 mA 10 Ω	1 A 100 Ω	10 A 1000 Ω						
80 V <sub>AC</sub>	SMT	NiZn	WE-PBF	23 – 65 Ω		14 – 18 A	3.1 x 2.9 x 2.41 mm	8.5 x 3 x 2.55 mm	39 – 98 Ω	0.0006 – 0.0009 Ω	6 MHz – 2 GHz	
			WE-CMS	20 – 54 Ω		17 – 21 A	5.6 x 4.8 x 3.2 mm	9.3 x 8.5 x 4.8 mm	30 – 83 Ω	0.003 Ω	1 MHz – 3 GHz	
			WE-SUKW			5 A	272 – 425 Ω	8 x 5 x 4.5 mm	11 x 4.65 x 5 mm	416 – 580 Ω	0.011 – 0.012 Ω	100 kHz – 800 MHz
			WE-PF			4.5 – 10 A		12 x 12 x 8 mm	12 x 12 x 8 mm	2900 – 15000 Ω	9 – 30 mΩ	1 – 100 MHz

## THT Ferrites

80 V <sub>AC</sub>	THT	Core Material	I <sub>R</sub> 10 mA				L x W x H Min:	L x W x H Max:	Z @ 25 MHz:	R <sub>DC</sub> :	Frequency Range:
			Z @ 100 MHz 1 Ω	100 mA 10 Ω	1 A 100 Ω	10 A 1000 Ω					
80 V <sub>AC</sub>	THT	NiZn	WE-UKW			3 A	3.5 x 5 x 10 mm	40 x 6 x 10 mm	145 – 920 Ω	0.020 Ω	100 kHz – 500 MHz
			WE-MLS			4 A	7.62 x 5.08 x 10 mm	11.2 x 11.2 x 11 mm	115 – 292 Ω	0.002 Ω	10 MHz – 100 MHz
			WE-WAFB			3 – 6 A	70 – 130 Ω	58.4 x 3.5 x 5 mm	63 x 3.5 x 9 mm	20 – 65 Ω	0.005 Ω

# Filter Applications: EMI Suppression

## Ferrites for Cable Assembly



## Round Cable – Medium and High Frequency

		Cable Diameter	0 mm	10 mm	20 mm	30 mm	40 mm	
		Z @ 100 MHz	0 Ω	10 Ω	100 Ω	1000 Ω	10000 Ω	
Snap Ferrite	NiZn	WE-STAR-TEC	3.5 – 25 mm		182 – 525 Ω			Z @ 25 MHz 1 turn: 98 – 306 Ω Frequency Range: 1 – 1000 MHz
		WE-STAR-RING	8 mm – 27 mm		110 – 165 Ω			Z @ 25 MHz 1 turn: 55 – 83 Ω Frequency Range: 1 – 1000 MHz
	NiZn HF	WE-STAR-BUENO	2.5 – 8.5 mm		200 – 350 Ω			Z @ 25 MHz 1 turn: 120 – 180 Ω Frequency Range: 1 – 1000 MHz
		WE-STAR-GAP	4.5 – 12.5 mm		345 – 400 Ω			Z @ 25 MHz 1 turn: 28 – 35 Ω Frequency Range: 100 – 2000 MHz
Split Core		WE-NCF	7.8 ≤ 26.5 mm		93 – 200 Ω			Z @ 25 MHz 1 turn: 48 – 100 Ω Frequency Range: 1 – 1000 MHz
Solid Core	NiZn	WE-TOF	3 – 33.4 mm		37 – 200 Ω			Z @ 25 MHz 1 turn: 25 – 110 Ω Frequency Range: 1 – 1000 MHz
		WE-AFB	4.55 – 12.5 mm		45 – 451 Ω			Z @ 25 MHz 1 turn: 30 – 300 Ω Frequency Range: 1 – 1000 MHz
		WE-SAFB	0.55 – 4 mm		40 – 278 Ω			Z @ 25 MHz 1 turn: 20 – 114 Ω Frequency Range: 1 – 1000 MHz
		WE-RIB	0.8 – 3.5 mm		91 – 260 Ω			Z @ 25 MHz 1 turn: 35 – 126 Ω Frequency Range: 1 – 1000 MHz
Split Core		WE-SPLITRING	7.8 – 26.5 mm		93 – 200 Ω			Z @ 25 MHz 1 turn: 48 – 100 Ω Frequency Range: 1 – 1000 MHz

## Round Cable – Low Frequency

		Cable Diameter	0 mm	10 mm	20 mm	30 mm	40 mm	
		Z @ 1 MHz	0 Ω	10 Ω	100 Ω	1000 Ω	10000 Ω	
Snap Ferrite	MnZn	WE-STAR-TEC LFS		3.5 – 25 mm	20 – 94 Ω			Z @ 10 MHz 1 turn: 32 – 65 Ω Frequency Range: 300 kHz – 30 MHz
		WE-AFB LFS		4.5 – 12.5 mm	30 – 130 Ω			Z @ 10 MHz 1 turn: 40 – 100 Ω Frequency Range: 300 kHz – 30 MHz

## Flat Cable

		Cable Width	0 mm	10 mm	20 mm	30 mm	40 mm	
		Z @ 100 MHz	0 Ω	10 Ω	100 Ω	1000 Ω	10000 Ω	
Snap Ferrite		WE-STAR-FLAT			100 – 194 Ω		34 – 64.5 mm >	Z @ 25 MHz 1 turn: 42 – 97 Ω No. of Poles: 26 – 50 Frequency Range: 1 – 1000 MHz
Solid Core	NiZn	WE-FLAT Ferrite Core			42 – 166 Ω		14 – 64.5 mm >	Z @ 25 MHz 1 turn: 17 – 90 Ω No. of Poles: 10 – 40 Frequency Range: 1 – 1000 MHz
		WE-FLAT Ferrite for Flexible Printed Circuit Boards			19 – 130 Ω		5 – 52 mm >	Z @ 25 MHz 1 turn: 7 – 71 Ω Frequency Range: 1 – 1000 MHz
Split Core		WE-SFA			57 – 267 Ω		13 – 83.4 mm >	Z @ 25 MHz 1 turn: 27 – 148 Ω Frequency Range: 1 – 1000 MHz

## Accessories



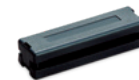
### WE-STAR-CLIP

For the fixation of Snap Ferrite STAR-TEC (LFS), STARD-FIX (LFS) and STAR-GAP



### WE-STAR-KEY

Equipment to open Snap Ferrites of WE-STAR Series

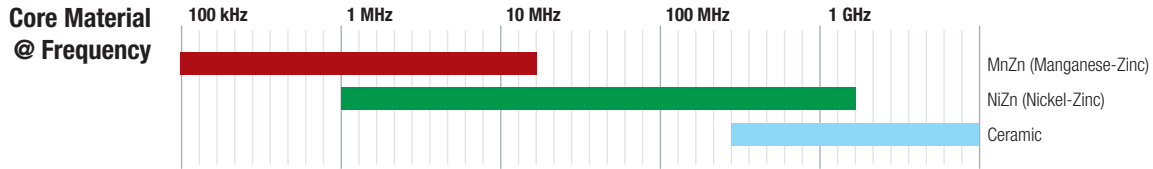


### WE-FCAC

Easy fixation for flat cores on ribbon cables

# Filter Applications: EMI Suppression

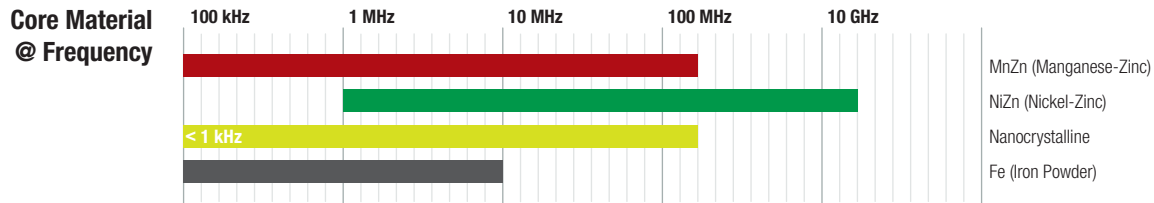
## Common Mode Chokes for Low Voltage and Data Lines



SMT	Core Material	Part Number	Current (mA)				Impedance (Ω)				L x W x H	R <sub>DC</sub>	Number of windings	Winding Style				
			10	100	1000	10000	100	1000	10000	100000								
MnZn	MnZn	WE-SL5	350 - 2500				460 - 13000						10 x 8.7 x 6.5 mm	0.025 - 0.72 Ω	2	Bifilar & Sectional		
		WE-UCF	150 - 10000				100 - 40000						16.6 x 12.5 x 9.3 mm	0.0027 - 8.5 Ω	2, 4	Sectional		
		WE-CNSW	90 - 2000				22 - 10000						0603 - 1812	0.05 - 5.5 Ω	2	Bifilar		
		WE-CNSW HF		280 - 600			60 - 120						0504, 0805	0.22 - 0.30 Ω	2	Bifilar		
		WE-SLM		300 - 400			800 - 4000						6 x 3.3 x 3.3 mm	0.18 - 0.58 Ω	2	Bifilar		
		NiZn	NiZn	WE-SCC	150 - 4750				1600 - 160000						7345, 1260, 1210	0.01 - 4.3 Ω	2	Bifilar
				WE-SL1		300			300 - 2000						6.3 x 3.6 x 1.65 mm	0.16 - 0.30 Ω	2	Sectional
				WE-SL5 HC			1400 - 5000		500 - 2200						9.3 x 8.3 x 5.3 mm	0.0055 - 0.06 Ω	2	Sectional
				WE-SL3		450 - 700			1250 - 5000						9.2 x 6.6 x 2.5 mm	0.14 - 0.45 Ω	2 - 3	Bifilar & Trifilar
				NiZn/MnZn	NiZn/MnZn	WE-SL2	200 - 1600				920 - 50000						9.2 x 6 x 5 mm	0.08 - 2.6 Ω
WE-SL	200 - 2700						900 - 14000						12.7 x 11 x 5.75 mm	0.035 - 0.85 Ω	2 - 4	Bifilar		
Ceramic	Ceramic	WE-CCMF				300			1600 - 11000						0504	2.5 Ω	2	Multilayer
															8 - 12 GHz			

Next Generation for High Frequencies

## Common Mode Chokes for Mains Power Lines



### Single Phase Common Mode Chokes (2 Windings)

		$I_r$ 100 mA	1 A	10 A	100 A		
		L 100 $\mu$ H	1 mH	10 mH	100 mH		
THT	MnZn	WE-CMB	0.3 – 35 A			0.5 – 39 mH	L x W x H Min: 15 x 7.5 x 18 mm L x W x H Max: 47 x 23.5 x 43 mm $R_{DC}$ : 0.0023 – 3 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
		WE-CMBH	2 – 10 A			1 – 20 mH	L x W x H: 32.5 x 28 x 22 mm $R_{DC}$ : 0.0125 – 0.230 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
		WE-CMB HC	5 – 10 A			0.175 – 0.7 mH	L x W x H: 18.5 x 14.5 x 22 mm $R_{DC}$ : 0.004 – 0.044 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
		WE-CMB HV	6.8 – 21.5 A			0.7 – 4.7 mH	L x W x H Min: 39.5 x 23 x 39.5 mm L x W x H Max: 46.5 x 28 x 44.5 mm $R_{DC}$ : 0.0038 – 0.044 $\Omega$ $V_{FV}$ : 760 V <sub>AC</sub>
		WE-FC	0.4 – 2.65 A			1.1 – 43 mH	L x W x H Min: 21.3 x 16.6 x 22.5 mm L x W x H Max: 21.3 x 21.3 x 17.8 mm $R_{DC}$ : 0.08 – 2.88 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
		WE-FCL	1.25 – 5.0 A			3.9 – 100 mH	L x W x H: 37 x 26 x 45 mm $R_{DC}$ : 0.050 – 0.9 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
		WE-TFC	0.25 – 1.0 A			1.8 – 25 mH	L x W x H Min: 17 x 15.5 x 12.5 mm L x W x H Max: 17 x 11.5 x 17 mm $R_{DC}$ : 0.31 – 3.6 $\Omega$ $V_{FV}$ : 300 V <sub>AC</sub>
		WE-LPCC	120 – 450 $\mu$ H			9.5 – 23.5 A	L x W x H Min: 25 x 27.5 x 9.7 mm L x W x H Max: 25 x 27.5 x 11.7 mm $R_{DC}$ : 0.0014 – 0.0096 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
		WE-LF	0.3 – 6 A			0.4 – 50 mH	L x W x H Min: 18 x 18 x 13 mm L x W x H Max: 33.5 x 33.5 x 20 mm $R_{DC}$ : 0.02 – 2.6 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
		WE-LF SMD	0.4 – 5.25 A			0.7 – 47 mH	L x W x H: 23.3 x 18.5 x 11.5 mm $R_{DC}$ : 0.03 – 2.6 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
THT	Nanocrystalline	WE-CMBNC	0.9 – 38 A			0.4 – 190 mH	L x W x H Min: 14 x 7.5 x 16 mm L x W x H Max: 48 x 27 x 46 mm $R_{DC}$ : 0.0011 – 1 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
	NiZn	WE-CMB NiZn	1.5 – 10 A			14 – 110 $\mu$ H	L x W x H Min: 16 x 7.5 x 17.5 mm L x W x H Max: 18.5 x 14.5 x 22 mm $R_{DC}$ : 0.0027 – 0.08 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>
	Mn/NiZn	WE-ExB	4.5 – 15 A			< 47 – 1000 $\mu$ H	L x W x H: 28 x 18.5 x 33 mm $R_{DC}$ : 0.0046 – 0.042 $\Omega$ $V_{FV}$ : 250 V <sub>AC</sub>

# Filter Applications: EMI Suppression

## Three Phases Common Mode Chokes (3 Windings)

		$I_R$ 100 mA	1 A	10 A	100 A	
		L 100 $\mu$ H	1 mH	10 mH	100 mH	
THT	MnZn WE-TPB		0.52 – 12 mH	6 – 24 A		L x W x H: 47 x 47 x 39 mm $R_{DC}$ : 0.003 – 0.065 $\Omega$ $V_R$ : 500 $V_{AC}$
	Nano-crystalline WE-TPB HV		0.2 – 208 mH	7.2 – 46 A		L x W x H: 70 x 70 x 39 mm $R_{DC}$ : 0.0016 – 0.085 $\Omega$ $V_R$ : 760 $V_{AC}$

## Differential Mode Chokes (1 Winding)

		$I_R$ 100 mA	1 A	10 A	100 A	
		L 100 nH	1 $\mu$ H	10 $\mu$ H	100 $\mu$ H	
THT	NiZn WE-SD		2 – 10 $\mu$ H	2.5 – 15 A		L x W x H Min: 12.3 x 3.2 x 3.2 mm L x W x H Max: 30.8 x 16 x 16 mm $R_{DC}$ : 0.0017 – 0.033 $\Omega$
	Fe WE-FI		8.2 – 860 $\mu$ H	0.9 – 9 A		L x W x H Min: 9.5 x 6 x 15 mm L x W x H Max: 28.5 x 15 x 28.5 mm $R_{DC}$ : 0.01 – 0.45 $\Omega$
SMT	NiZn WE-MI	< <	0.047 – 33 $\mu$ H	3 – 300 mA		Size: 0603 – 1206 $R_{DC}$ : 0.15 – 2.1 $\Omega$

## Line Filter

		$I_R$ 100 mA	1 A	10 A	100 A	
		L 100 $\mu$ H	1 mH	10 mH	100 mH	
Chassis mount	WE-CLFS Line Filter		1 – 20 mH	1.5 – 20 A		L x W x H Min: 64 x 35 x 29 mm L x W x H Max: 114.9 x 58.5 x 45 mm $R_{DC}$ : 0.01 – 0.300 $\Omega$ $V_R$ : 250 $V_{AC}$

## ESD and Surge Protection

### Surge Protection

		Operating Voltage	10 V	100 V	1000 V	
		$I_{Peak}$	10 A	100 A	1000 A	
THT	WE-VD	1 V 1 A		18 – 1465 V <sub>RMS</sub>	100 – 10.000 A (8/20 μs)	Diameters: 5 – 20 mm W <sub>max</sub> : 0.7 – 620 J V <sub>Clamp</sub> : 43 – 2970 V V <sub>BR</sub> : 22 – 1800 V
	WE-VS		3.3 – 85 V <sub>DC</sub>	10 – 200 A (8/20 μs)		Size: 0402 – 1206 W <sub>max</sub> : 0.02 – 1.1 J V <sub>Clamp</sub> : 13 – 165 V V <sub>BR</sub> : 5.5 – 100 V
SMT	WE-TVSP		5 – 440 V <sub>DC</sub>	0.6 – 326 A (10/1000 μs)		Size: DO-214AC: SMAJ DO-214AA: SMBJ DO-214AB: SMCJ, SMDJ P <sub>class</sub> : 400 – 3000 W V <sub>Clamp</sub> : 9.2 – 162 V

### ESD Protection

		Operating Voltage	10 V	100 V	1000 V	
		$C_{typ}$	0.1 pF	1 pF	10 pF	
SMT	WE-TVSS Standard High Speed Super Speed	1 V 0.01 pF	1.2 – 20 V <sub>DC</sub>	0.2 – 1650 pF		Size: DFN3810 / 1210 / 1610 / 2020, MSOP, SC70, SOT23/563/143 Channel: 1 – 8 / uni or bidirectional V <sub>ESD (contact/air)</sub> : up to ±30 kV / ±30 kV
	WE-VE ESD Suppressor, ULC ESD Suppressor, femtoF		5 – 26 V <sub>DC</sub>	0.05 – 120 pF		Size: 0402, 0603, 0805 Channel: 1 / bidirectional V <sub>ESD (contact/air)</sub> : ±8 kV / ±15 kV
	WE-VEA		5 – 18 V <sub>DC</sub>	0.2 – 120 pF		Size: 0508, 0612 Channel: 1 / bidirectional V <sub>ESD (contact/air)</sub> : ±8 kV / ±15 kV