Design your EMC Filter - 744998

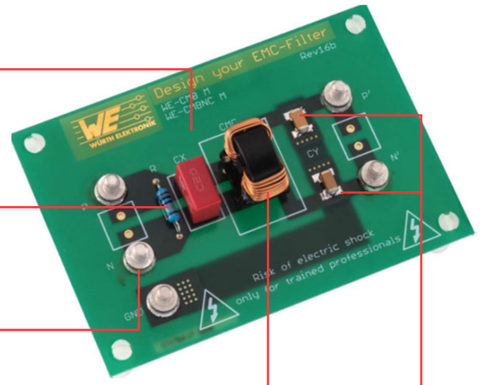
An easier way to investigate, experiment and solve your daily EMC challenges

What are our EMC filters made of?

X-Capacitor
- Increases the differential mode attenuation

Discharge Resistor
- Discharge of X-Capacitor
- Important for safety

SMD Power Elements
- High current connection in SMD assembling



Common Mode Choke
- High common mode and partly differential mode attenuation

Y-Capacitors
- Strongly increases common mode and partly differential mode attenutation, driving some leakage current to ground

Effect of the single components to the filter behaviour

Additionally available –
Different kind of filter boards – to evaluate which is the best filter for your application

Line Filter 250 V
Order Code. : 7449981

Differential Filter 250 V;
Order Code. : 7449982

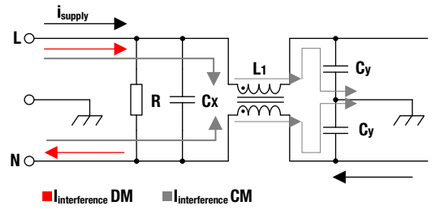
DC Filter 80 V, for SMD parts
Order Code. : 7449983

Multiple Line Filter 250 V, with overvoltage protection
Order Code. : 7449984

How does an EMC Filter work?

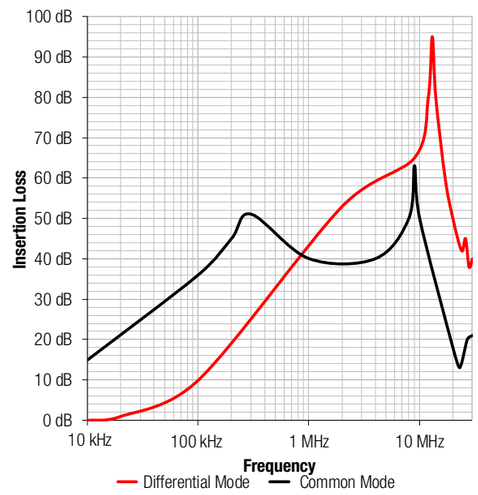
Low-pass filter for differential mode noise (diff)

At differential signal noise current flows in through line L and returns through line N. Basically, in this situation the inductance of the common mode choke (L_{diff}) and the X-Capacitor (C_x) build a low pass filter for this current. The loop of this low pass filter is closed via X-Capacitor. The high frequency interference current ($i_{interference}$) is filtered. Meanwhile the supply current (i_{supply}), which has typically a much lower frequency, will pass the filter.



Low-pass filter for common mode noise

At common mode noise the inductance of the common mode choke is very high. This inductance (L_{comm}) and the Y-Capacitors build a low-pass for high frequency common mode noise. The Y-Capacitors create a conductor for high frequency noise to internal ground, so common mode noise can be diverted. Because of the high common mode impedance of the common mode choke at high frequencies, the interference current will be attenuated and leakage currents will be reduced. Cut-off frequency depends only on inductance (L_{comm}) and parasitic winding capacitance (C_w) of the common mode choke.



Measured example with
C_X: WCAP-FTX2 150 nF

CMC: WE-CMB S 10mH
C_Y: WCAP-CSSA MLCC 2.2 nF

Everything you need in one kit

Order Code	Article	Value	Quantity
Common Mode Power Line Choke			
744 824 101	WE-CMB L	1 mH	2
744 824 622	WE-CMB L	2.2 mH	2
744 824 433	WE-CMB L	3.3 mH	2
744 824 310	WE-CMB L	10 mH	2
744 824 220	WE-CMB L	20 mH	2
744 823 601	WE-CMB M	1 mH	2
744 823 422	WE-CMB M	2.2 mH	2
744 823 305	WE-CMB M	5 mH	2
744 823 210	WE-CMB M	10 mH	2
744 823 220	WE-CMB M	20 mH	2
744 822 301	WE-CMB S	1 mH	2
744 822 222	WE-CMB S	2.2 mH	2
744 822 233	WE-CMB S	3.3 mH	2
744 822 110	WE-CMB S	10 mH	2
744 822 120	WE-CMB S	20 mH	2
744 803 050 9	WE-CMBNC M	9 mH	1
744 804 070 7	WE-CMBNC L	7 mH	1
744 662 400 07	WE-LF SH	0.7 mH	1
744 662 200 2	WE-LF SH	2.2 mH	1
744 662 100 7	WE-LF SH	6.8 mH	1
744 662 002 7	WE-LF SH	27 mH	1
Film Capacitors			
890 324 023 025	WCAP-FTX2	150 nF	5
890 324 022 007	WCAP-FTX2	15 nF	5
890 324 023 006	WCAP-FTX2	10 nF	5
Ceramic Capacitors (SMD)			
885 352 211 002	WCAP-CSSA MLCCs	680 pF	10
885 352 211 003	WCAP-CSSA MLCCs	1 nF	10
885 352 213 011	WCAP-CSSA MLCCs	1 nF	10
885 352 213 015	WCAP-CSSA MLCCs	2.2 nF	10
5.00 mm Horizontal Cable Entry with Pressure Clamp			
691 134 710 002	WR-TBL Serie 1347		10
Self-Retaining Space			
702 936 000	WA-SNSR		20
SMD External thread with Pins			
746 611 3	WP-SMSH	M3	10
746 611 4	WP-SMSH	M4	10
	Resistor THT	1 MΩ	10

With these included PCBS you can set up several filters

Order Code	PCB for	Quantity
L-744998-4	WE-CMB L, WE-CMBNC L, WE-ExB	3
L-744998-3	WE-CMB M, WE-CMBNC M	3
L-744998-2	WE-CMB S, WE-CMB NC S, WE-CMB NiZn S	2
L-744998-1	WE-LF SH	2

Order your Design Kit today!