WF WE-CLFS Line Filters Passive Components Owner's Manual

Contents

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WF WE-CLFS Line Filters Passive Components.webp

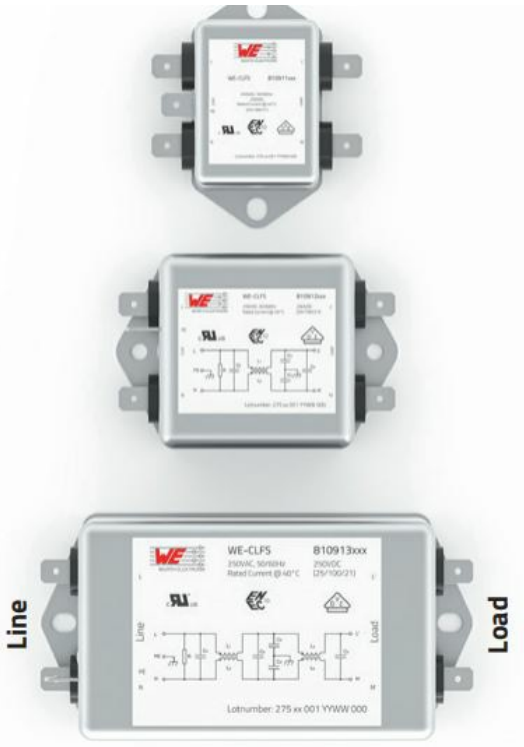
1. Single Phase Line Filter

Single-Stage:
Very compact design

Single-Stage Advanced:
Improved differential mode noise attenuation

Two-Stage:
Extreme differential and common mode noise attenuation

Low Leakage Version available for each of them

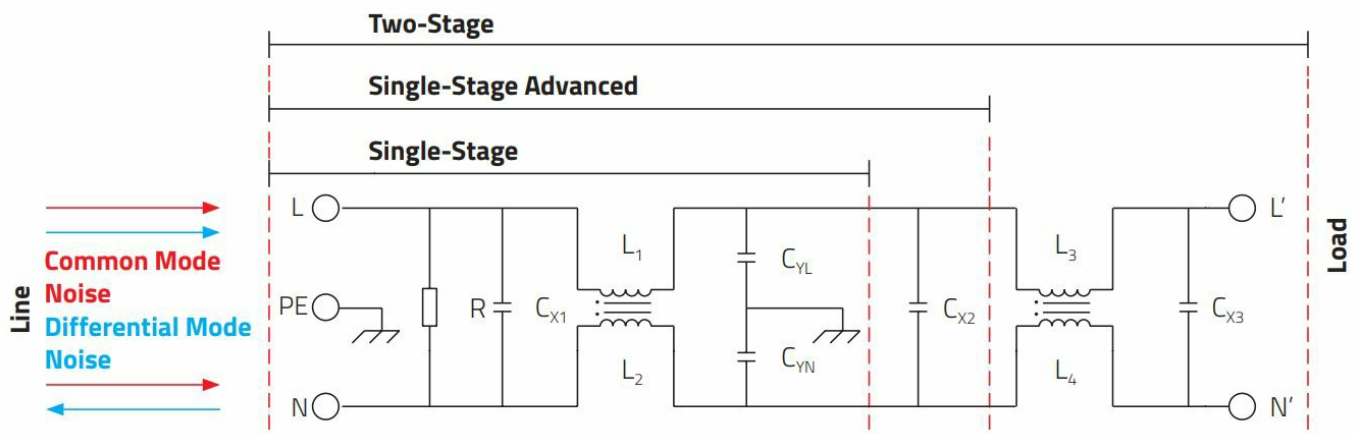


Size	L (mm)	W (mm)	H (mm)
Single-Stage	64	35	29
Single-Stage Advanced	75	51.8	29
Two-Stage	114.9	58.5	45

LTspice Simulation Models, Application Scenarios and more technical Information available.

More information about WE-CLFS:
www.we-online.com/we-clfs

2. Internal Schematic



Discharge Resistor R:
Discharge of capacitors. Important to fulfill safety standards.

X-Capacitor C_X:
Increases the differential mode attenuation.

Common Mode Choke L:
High common and partly differential mode attenuation, without deriving any leakage current to ground.

Y-Capacitor C_Y:
Strongly increases common and partly differential mode attenuation, driving some leakage current to ground.

3. General Information

Rated current of the mains filter :
Must be equal to or greater than the current requirements of the connected devices.
For ambient temperatures above 40 °C, the following derating curve applies.

Operating Voltage:
250 V_{AC} 50/60 Hz
250 V_{DC}

Operating Temperature:
-25 °C – +100 °C

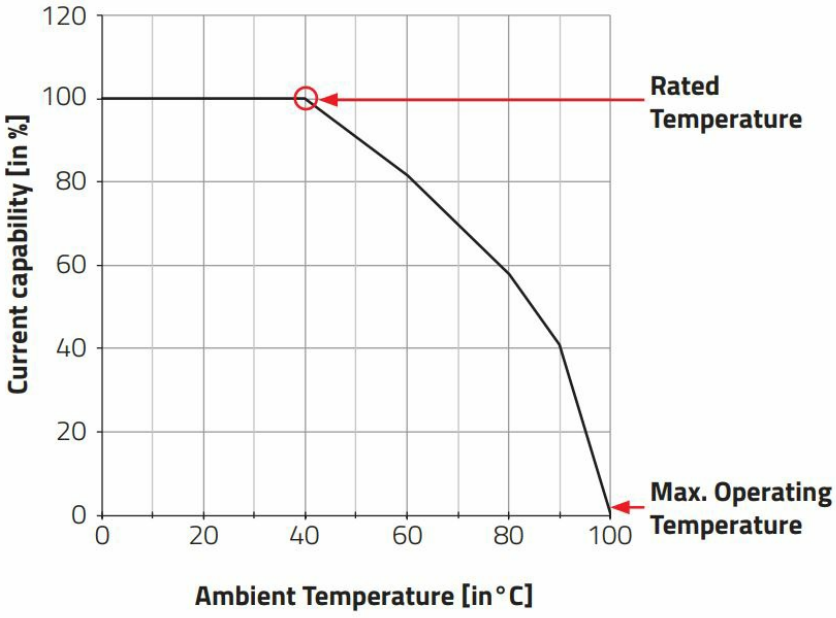
Climatic Category:
25/100/21

Rated Current:
Up to 20 A

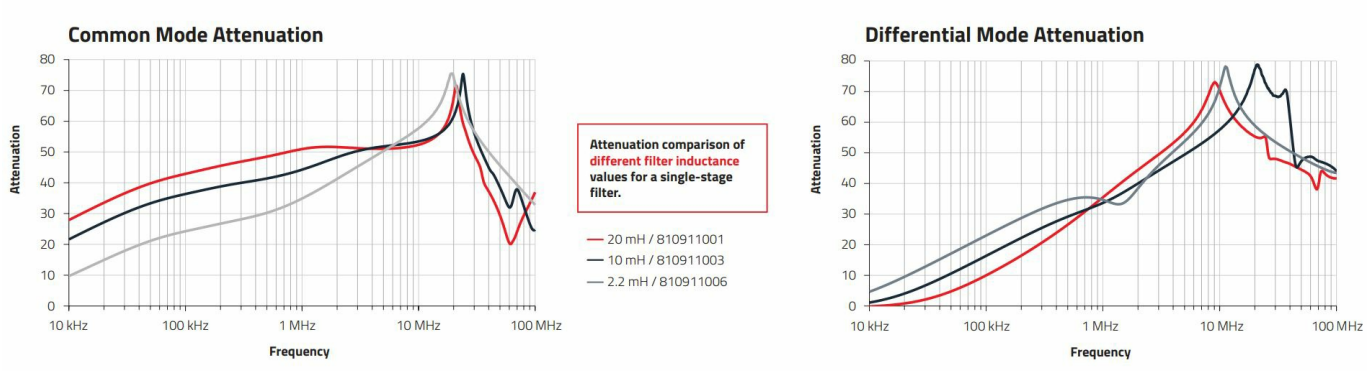
Certifications:

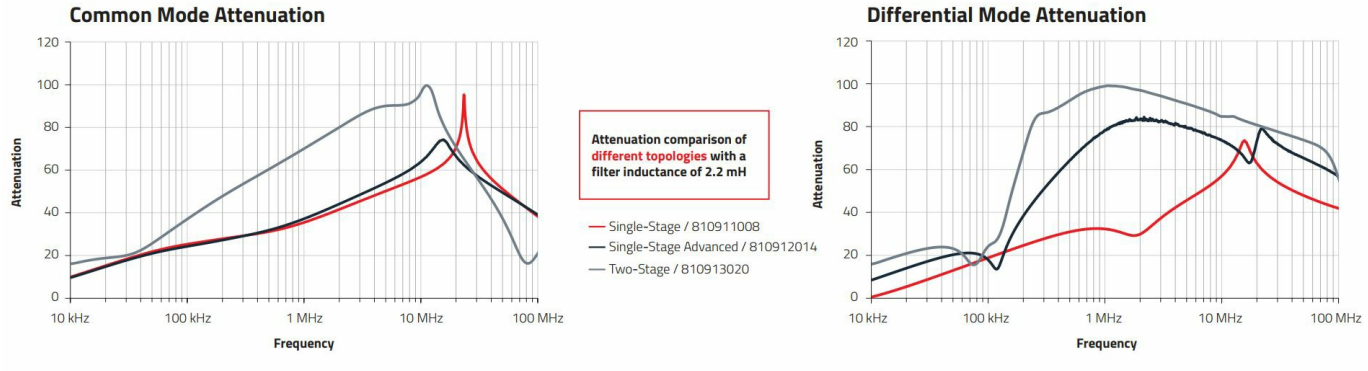
RoHS COMPLIANT REACh COMPLIANT

Derating Curve:



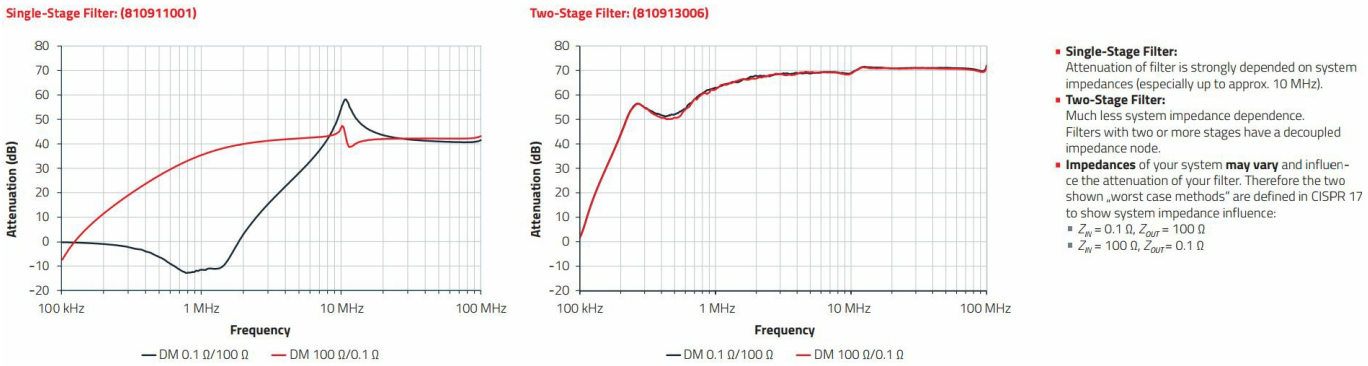
4. ATTENUATION FOR DIFFERENT INDUCTANCE VALUES AND TOPOLOGIES:





Attenuation plots for the examined filters with system impedances of 50 Ω and 50 Ω. You can simulate these plots and many more with our REDEXPERT online tool.

5. Influence of the System Impedances



6. Filter Selection with REDEXPERT

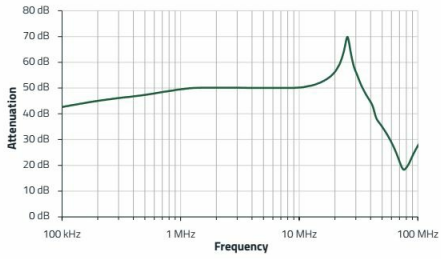
Selection Guide:

- Choose rated current
- Check frequency range of the noise
- Check attenuation in this frequency range

- Choose maximal allowed leakage current

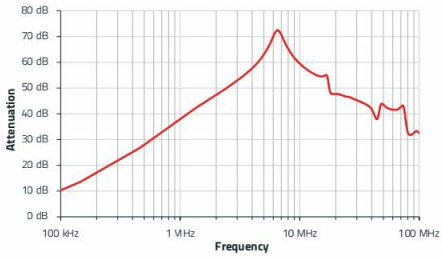
Take the different system impedances in consideration.

Common Mode Insertion Loss



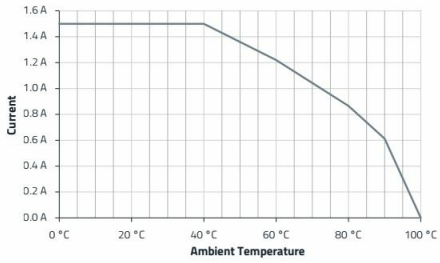
Single-Stage Filter
20 mH / 810911001

Differential Mode Insertion Loss



Single-Stage Filter
20 mH / 810911001

Temperature Derating



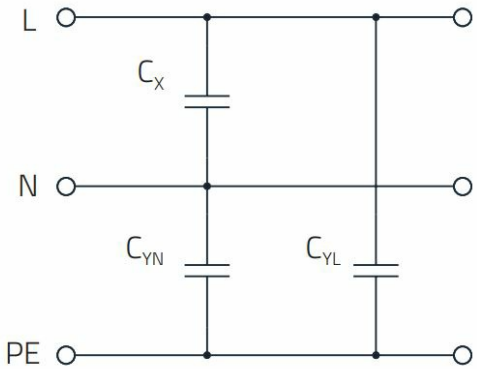
Single-Stage Filter
20 mH / 810911001

REDEXPERT is for simulation and selection

www.we-online.com/redexpert-emc-filters

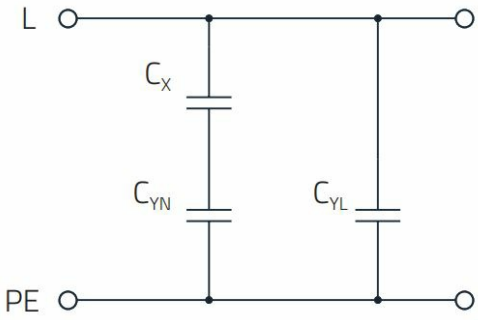
7. Interesting: Leakage Current

Leakage current calculation during regular operation:



$I_{LK} = 2\pi \cdot f \cdot U \cdot C_{YL}$ **see also IEC 60939-1:2010**

Worst case operation: Neutral line interruption

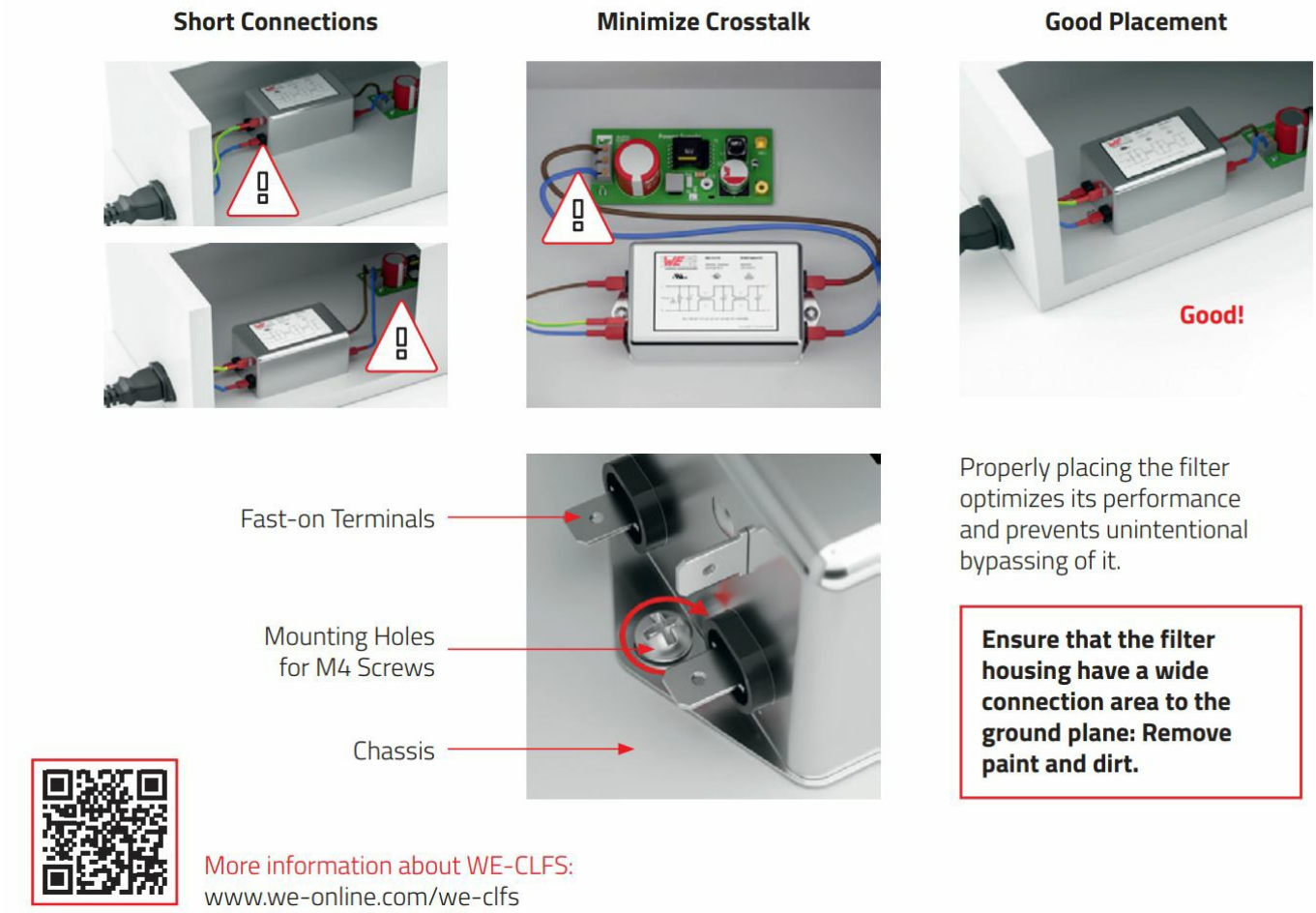


$$I_{LK} = 2\pi \cdot f \cdot U \cdot C_{eq}$$

$$C_{eq} = C_{YL} + \frac{C_{YN} \cdot C_X}{C_{YN} + C_X}$$

For low leakage requesting applications, we offer a low leakage version without Y capacitors.

8. Placement and Grounding



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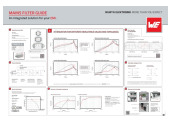	WF WE-CLFS Line Filters Passive Components [pdf] Owner's Manual WE-CLFS Line Filters Passive Components, WE-CLFS, Line Filters Passive Components, Filters Passive Components, Passive Components, Components

References

- Würth Elektronik
- User Manual