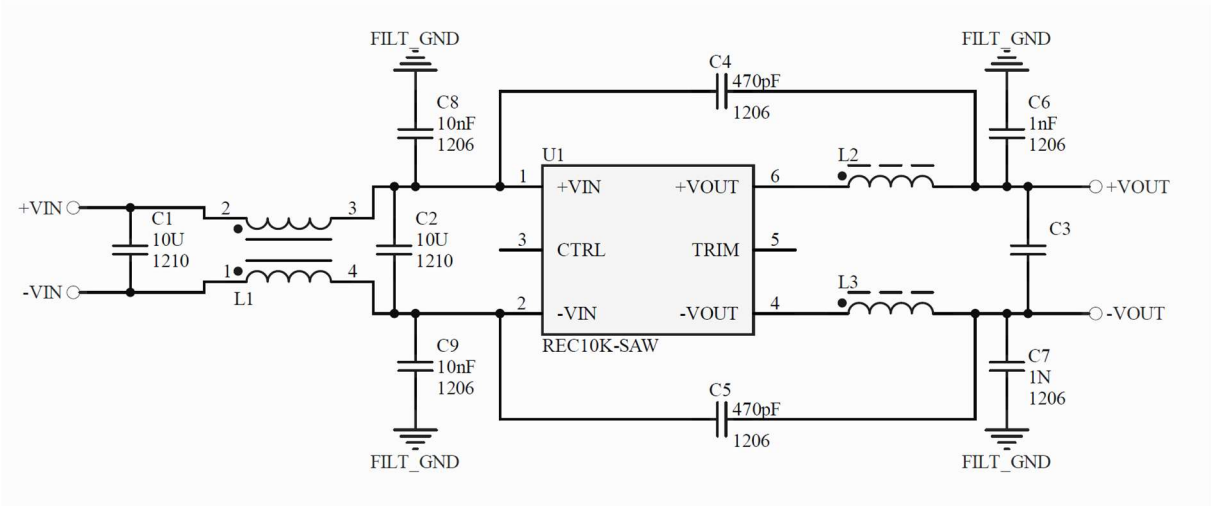
Application note – EMI filtering & PB Layout

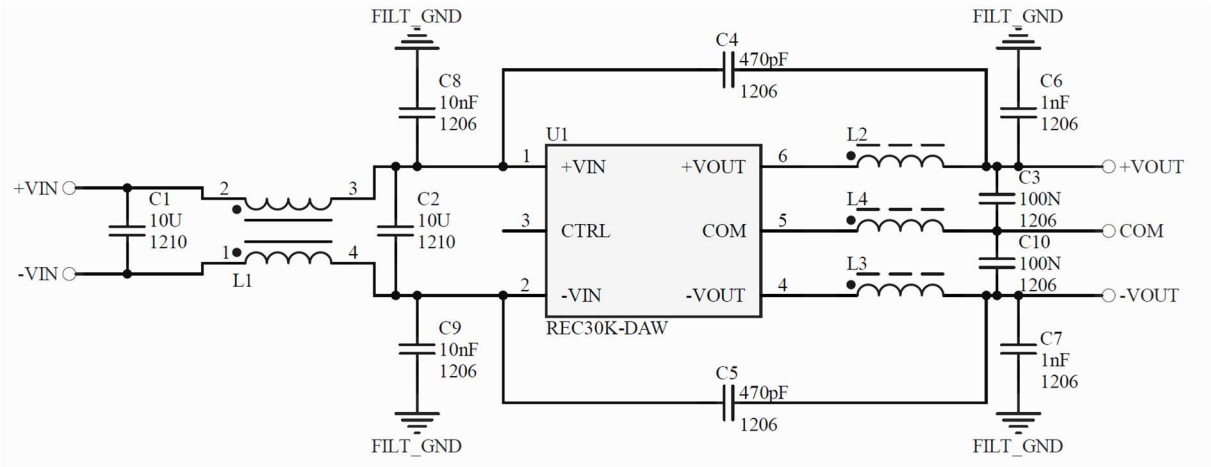
Successful filtering of the REC10K-xxxxxAW/H2 modules requires selecting suitable components for the filter and ensuring proper PCB layout:

- An efficient PCB layout, especially with careful input capacitor placement, is critical for stable operation. Position the ceramic input capacitor as close as possible to both +VIN and -VIN.
- Connect a filtering isolated plane under the area of placed power module. This plane helps to mitigate H-fields emitted from the magnetic transformer core. Optimal results are achieved when a solid plane is used under the entire module area.
- Use capacitors with an appropriate power rating for the desired isolation voltage. Ensure sufficient clearance and creepage distances to the FILT_GND plane.
- Ensure that main power have short, direct, and wide traces. Optionally use planes.
- Displayed Layout is for the reference, some footprints can be different according to the used parts.

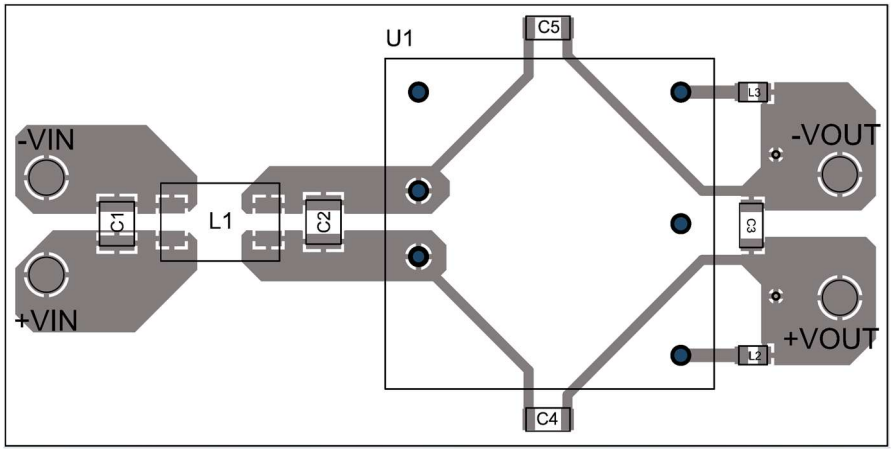
The design for application with supply 24/48VIN with single output – full load.



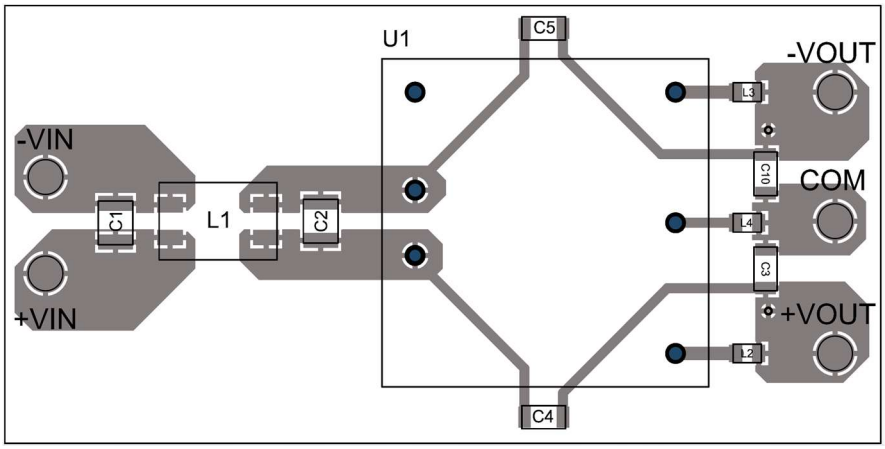
The design for application with supply 24/48VIN with dual output – full load.



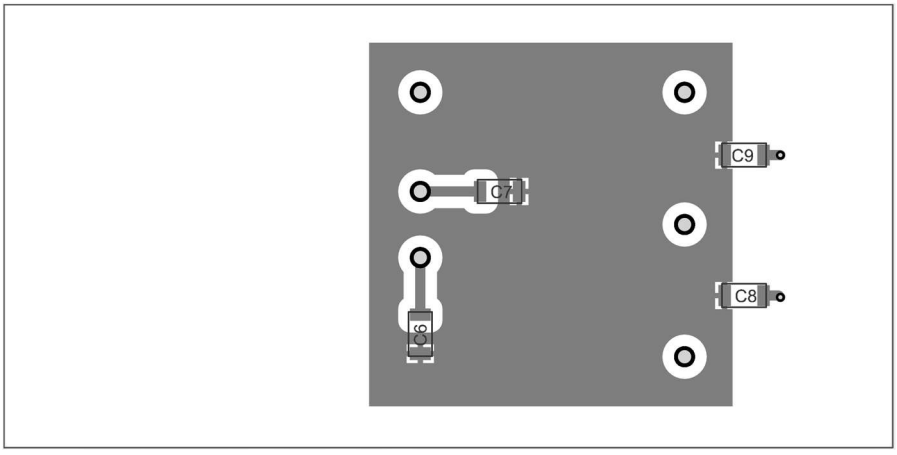
Top layer – Single output



Top layer – double output



Bottom layer



BOM

Description	Designator
CAP,CER,X7R,10uF,100VDC,-10%,+10%,1210	C1, C2
CAP,CER,C0G NPO,470pF,2kVDC,-5%,+5%,1206	C4, C5
CAP,CER,X7R, 1nF,1kVDC,-10%,+10%,1206	C6, C7
CAP,CER,X7R,10nF,1kVDC,-10%,+10%,1206	C8, C9

REC10K-2405SAW/H2 & REC10K-2409SAW/H2:

Common Mode Choke, 470uH, 1.6A	L1
Ferrite bead, 600Ω @ 100MHz, 2A	L2, L3

REC10K-2415DAW/H2:

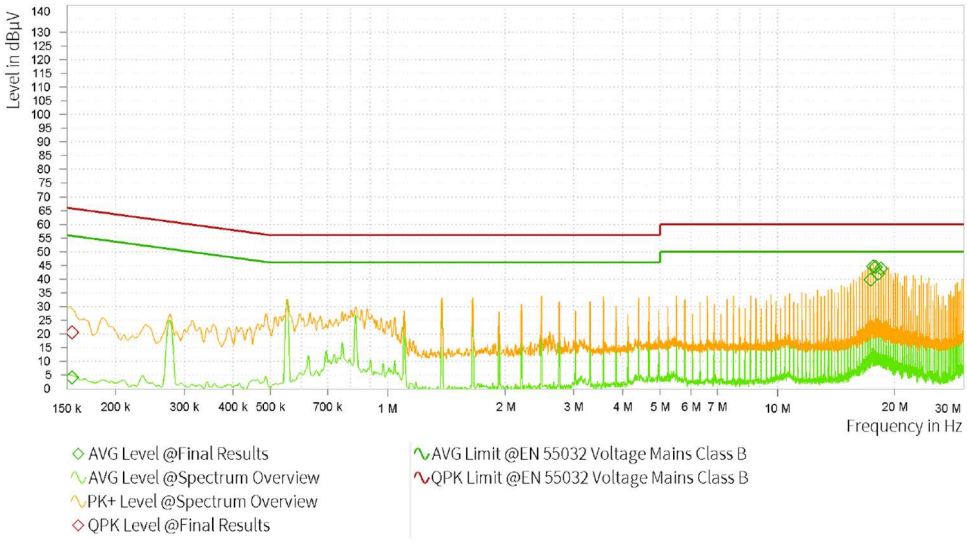
CAP,CER,X7R,100nF,50VDC,-10%,+10%,1206	C3, C10
Common Mode Choke, 470uH, 1.6A	L1
Ferrite bead, 220Ω @ 100MHz, 0.5A	L2, L3, L4*

*L4 improves cca 5dB at field in range 200MHz-300MHz, if not necessary it can be shorted

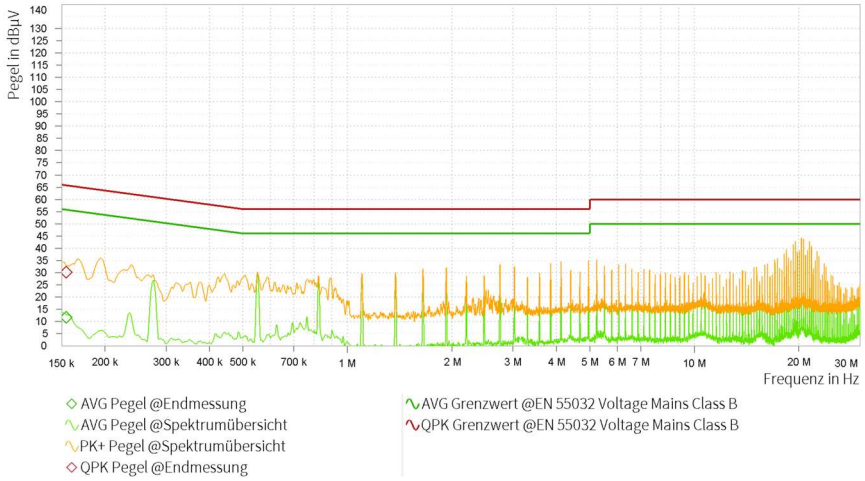
REC10K-4805SAW/H2 & REC10K-4812SAW/H2:

Common Mode Choke, 1000uH, 0.95A	L1
Ferrite bead, 600Ω @ 100MHz, 2A	L2, L3

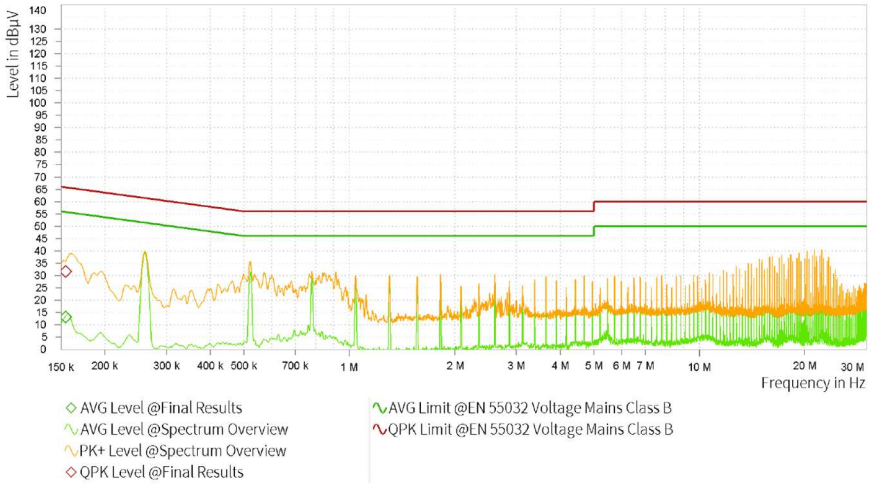
Spectrum overview – LISN, Full Load



REC10K-2405SAW/H2, 24VIN – EN55032 Class B Emission test

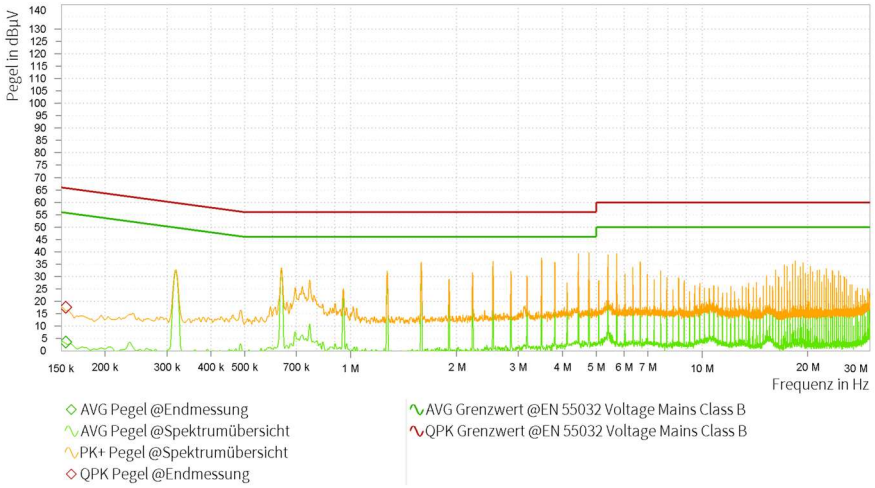


REC10K-2409SAW/H2, 24VIN – EN55032 Class B Emission test



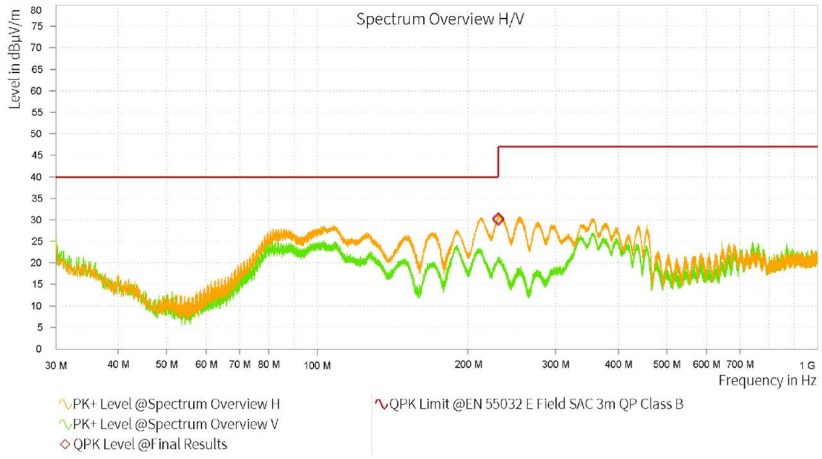
REC10K-2415DAW/H2, 24VIN – EN55032 Class B Emission test

REC10K-4805SAW/H2, 48VIN – EN55032 Class B Emission test

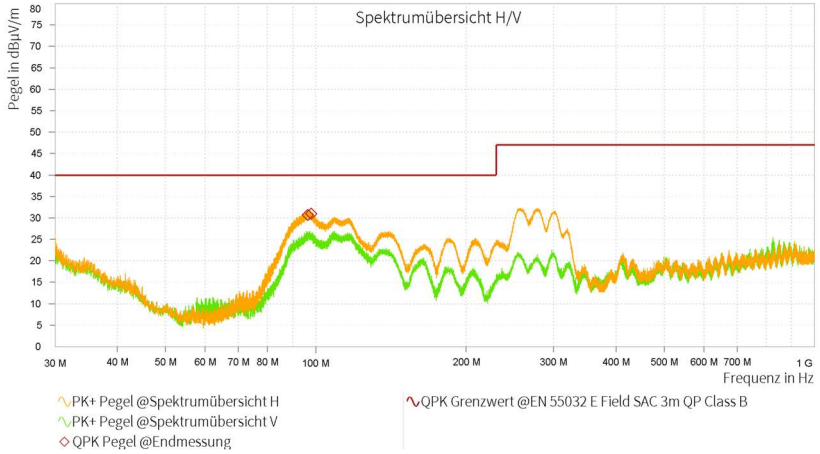


REC10K-4812SAW/H2, 48VIN – EN55032 Class B Emission test

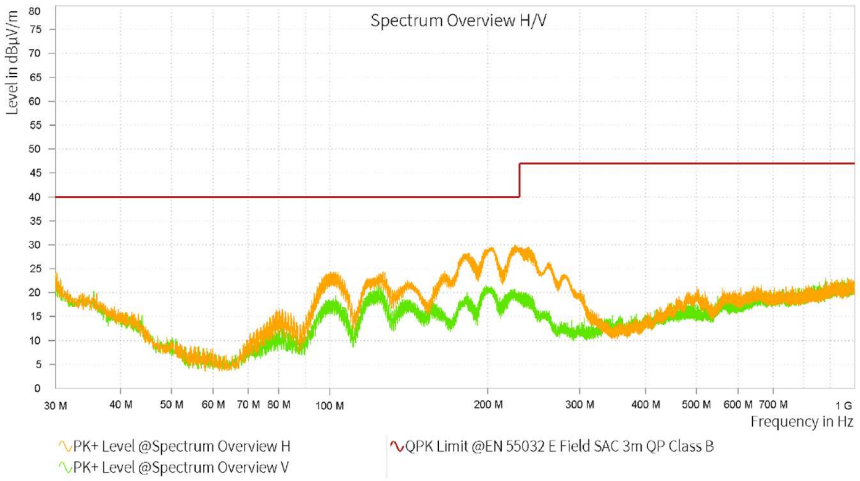
Radiated field emissions Full Load



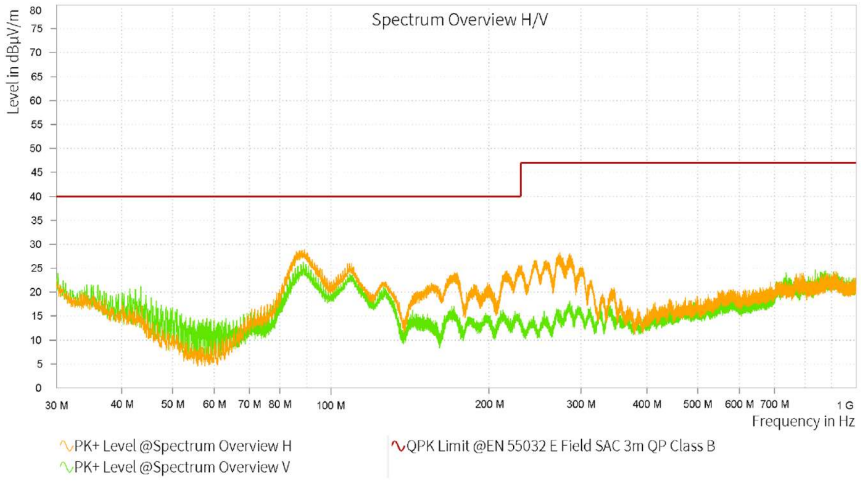
REC10K-2405SAW/H2, 24VIN – EN55032 Class B Radiated emission test



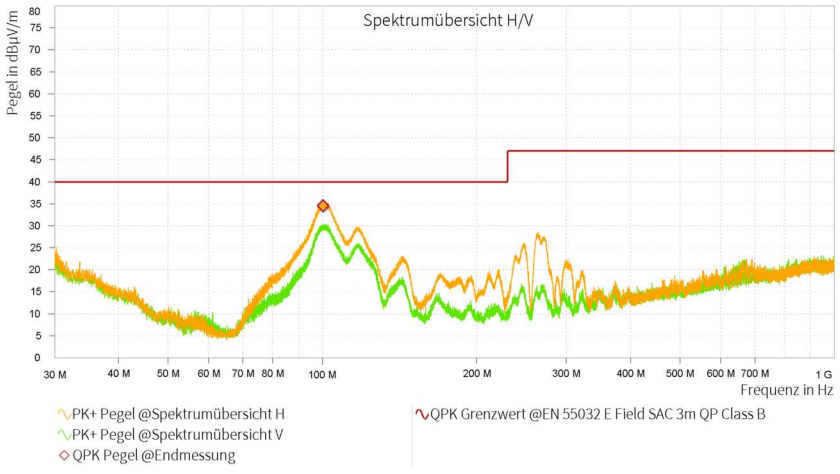
REC10K-2409SAW/H2, 24VIN – EN55032 Class B Radiated emission test



REC10K-2415DAW/H2, 24VIN – EN55032 Class B Radiated emission test



REC10K-4805SAW/H2, 48VIN – EN55032 Class B Radiated emission test



REC10K-4812SAW/H2, 48VIN – EN55032 Class B Radiated emission test