CUI INC
a bel group

SERIES: VFM-XX | DESCRIPTION: DC EMI FILTER

FEATURES

- compact size
- suitable for use with wide range of dc-dc converters
- reduces common and differential mode noise

RoHS

MODEL

MODEL	input voltage range (Vdc)	input surge voltage[1] nominal (Vdc)	input current max (A)	isolation voltage[2] min (Vdc)
VFM-10A	0 ~ 75	100	10	1,500
VFM-15C	0 ~ 75	100	15	1,500
VFM-20A	0 ~ 75	100	20	1,500
VFM-25C	0 ~ 36	50	25	1,500

Note: 1. For 100 ms.
2. Input to ground, output to ground.

PART NUMBER KEY

VFM - **XX** **X**

Input Current

Mounting Style:
A = board mount
C = chassis mount

SPECIFICATIONS

parameter	conditions/description	min	nom	max	units
isolation voltage	input to ground, output to ground	1,500			Vdc
isolation resistance	input to ground, output to ground	10^7			Ω
dc resistance	total for two legs		16		mΩ

ENVIRONMENTAL

parameter	conditions/description	min	nom	max	units
operating temperature		-40		100	°C
case temperature				100	°C
storage temperature		-40		100	°C
cooling	natural convection				

MECHANICAL

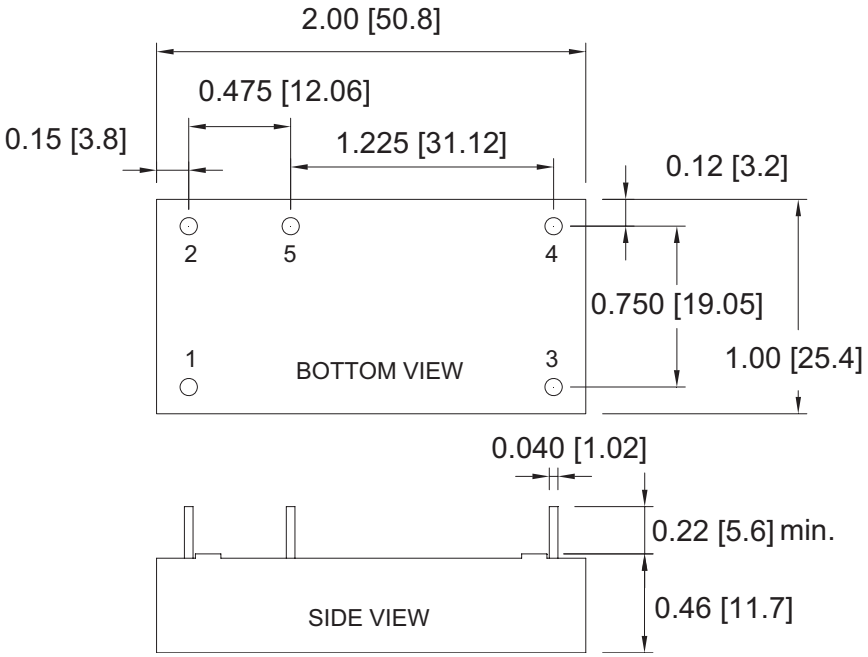
parameter	conditions/description	min	typ	max	units
dimensions	VFM-10A: 2.00 x 1.00 x 0.46 [50.8 x 25.4 x 11.7 mm] VFM-15C: 4.06 x 3.11 x 0.89 [103.2 x 79 x 22.7 mm] VFM-20A: 2.00 x 1.60 x 0.50 [50.8 x 40.6 x 12.7 mm] VFM-25C: 4.06 x 3.11 x 0.89 [103.2 x 79 x 22.7 mm]				inch inch inch inch
case material	VFM-10A & VFM-20A: black plastic VFM-15C & VFM-25C: black coated steel				

MECHANICAL DRAWING

VFM-10A

units: inch [mm]
tolerance: inches: x.xx = ±0.02, x.xxx = ±0.010
mm: x.x = ±0.5, x.xx = ±0.25
pin size: 0.04 [1.02]

PIN CONNECTIONS	
PIN	Function
1	+Vin
2	-Vin
3	+Vout
4	-Vout
5	GND

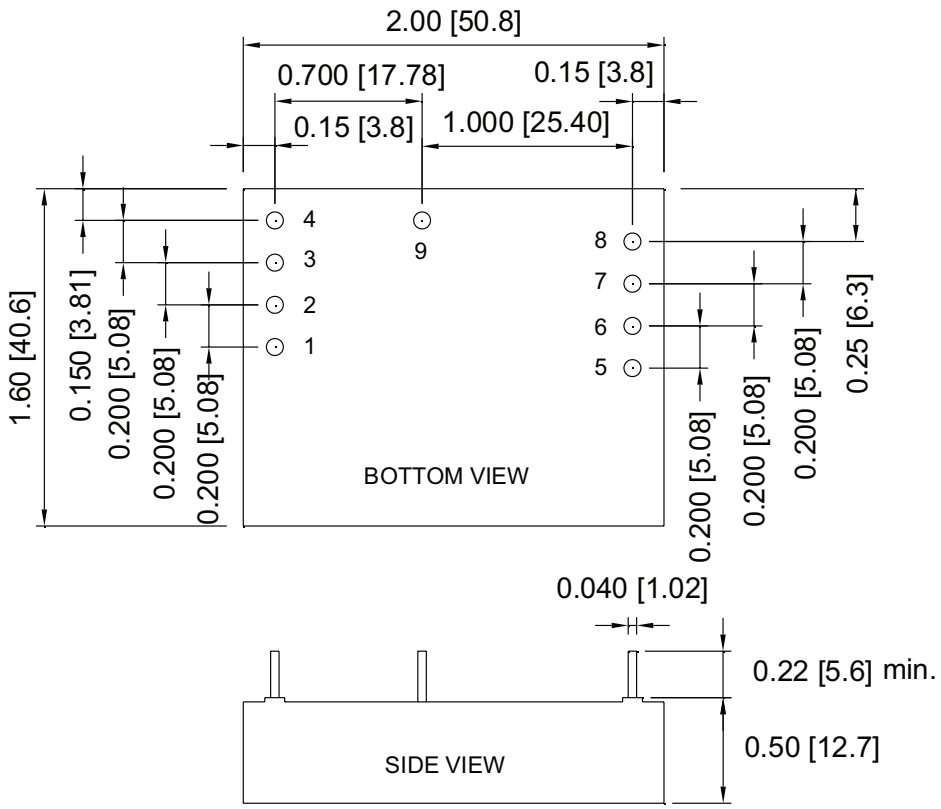


MECHANICAL DRAWING (CONTINUED)

VFM-20A

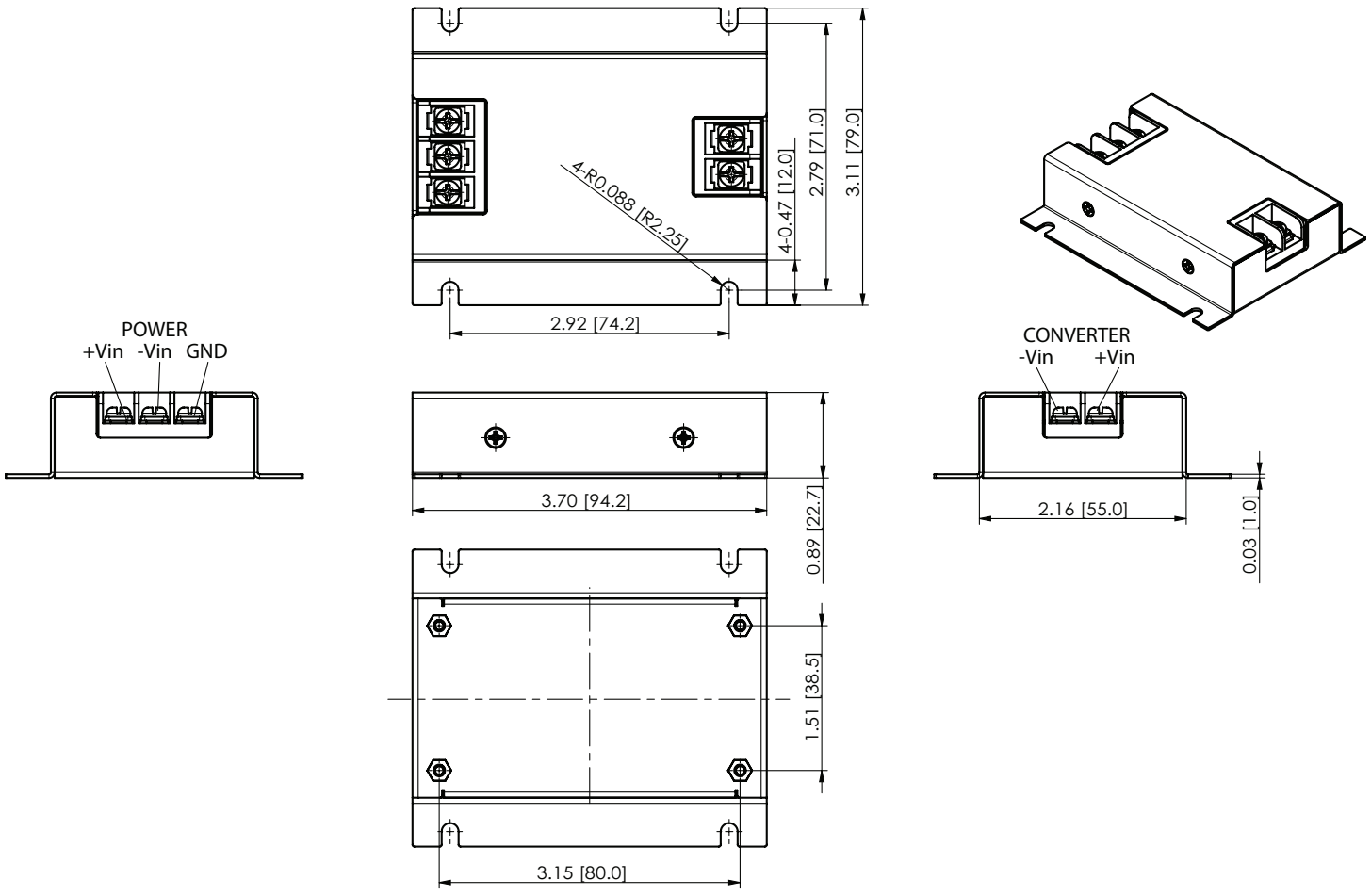
units: inch [mm]
tolerance: inches: x.xx = ±0.02, x.xxx = ±0.010
mm: x.x = ±0.5, x.xx = ±0.25
pin size: 0.04 [1.02]

PIN CONNECTIONS	
PIN	Function
1	+Vin
2	+Vin
3	-Vin
4	-Vin
5	+Vout
6	+Vout
7	-Vout
8	-Vout
9	GND



MECHANICAL DRAWING (CONTINUED)

VFM-15C & VFM-25C



INTERNAL SCHEMATICS

Figure 1
VFM-10A

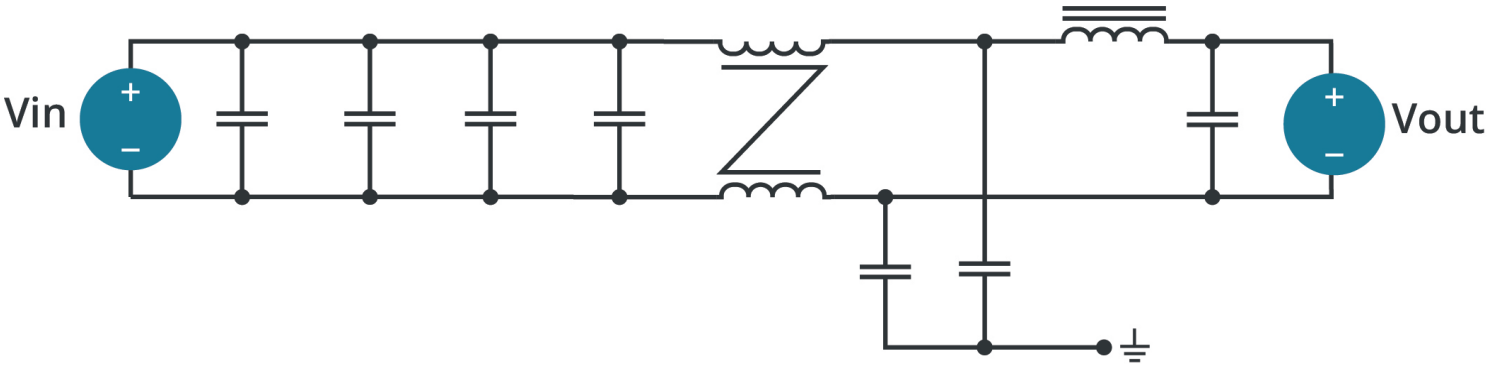


Figure 2
VFM-20A

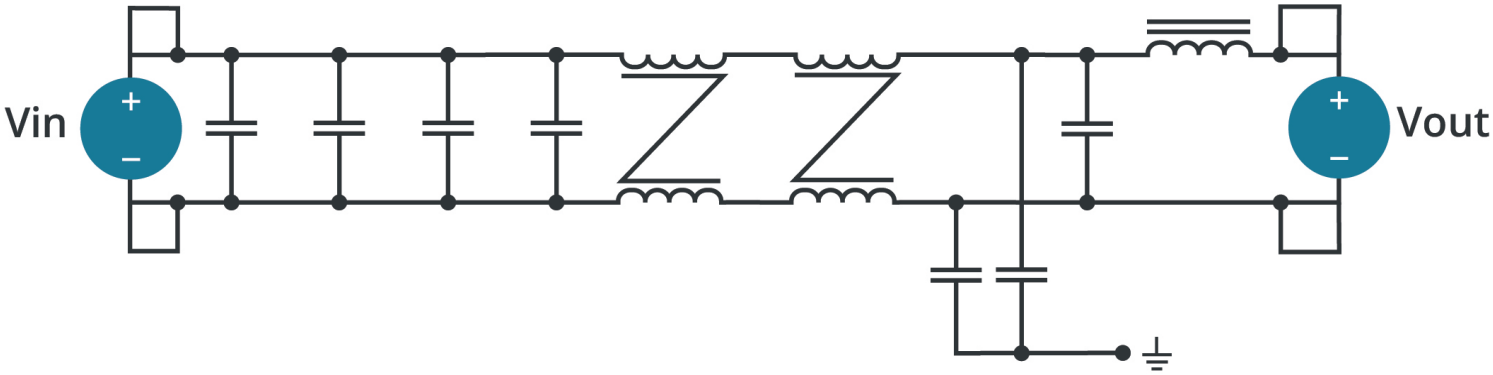
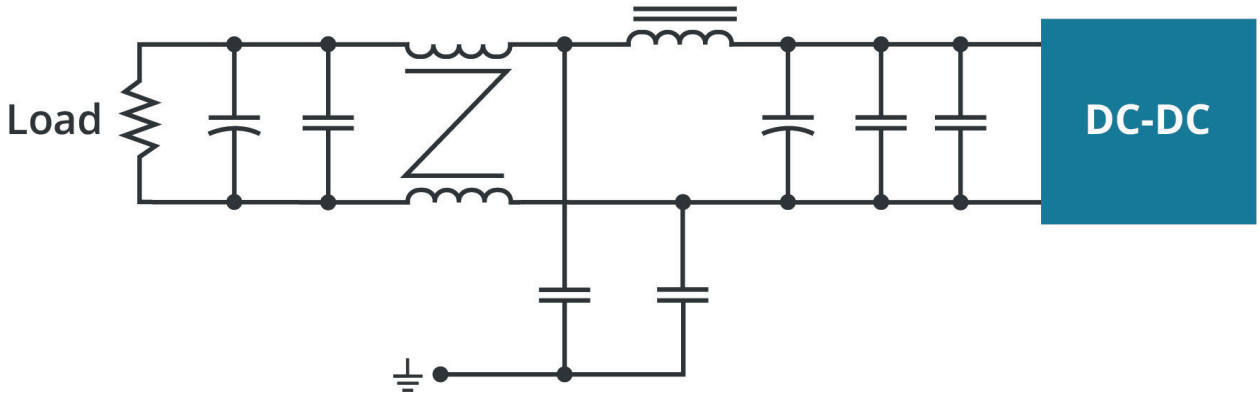
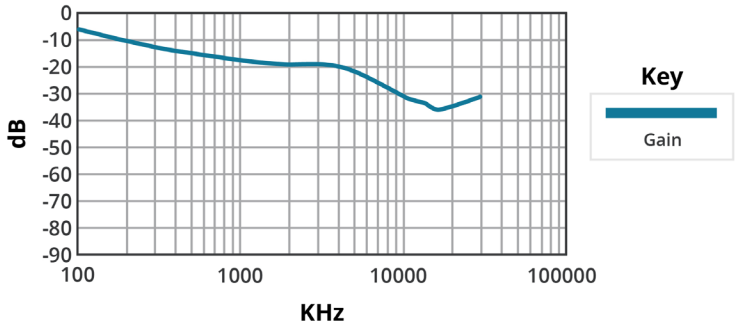


Figure 3
VFM-15C & VFM-25C

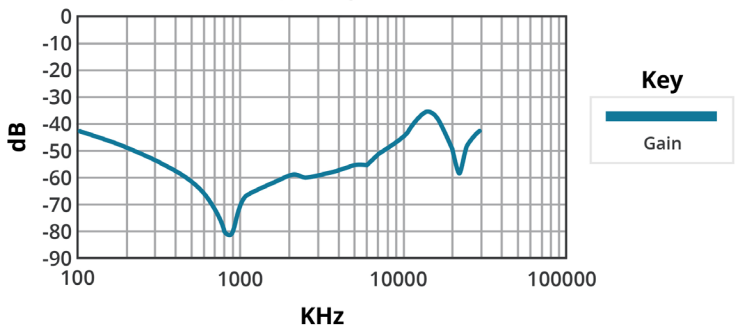


INSERTION LOSS GRAPHS

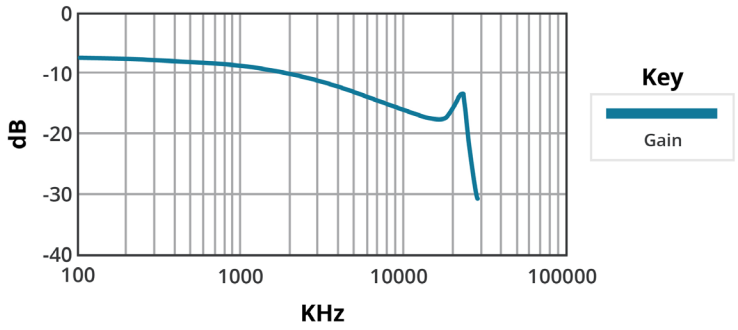
COMMON MODE VFM-10A



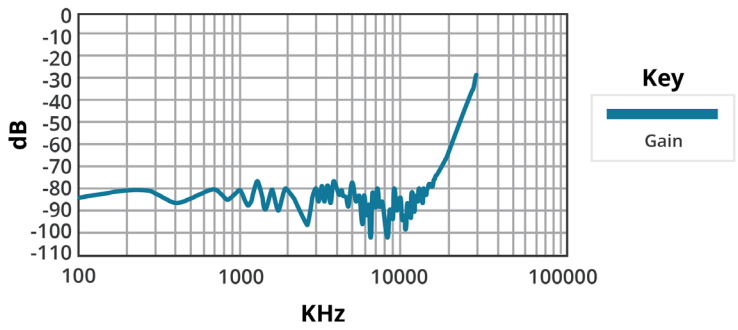
DIFFERENTIAL MODE VFM-10A



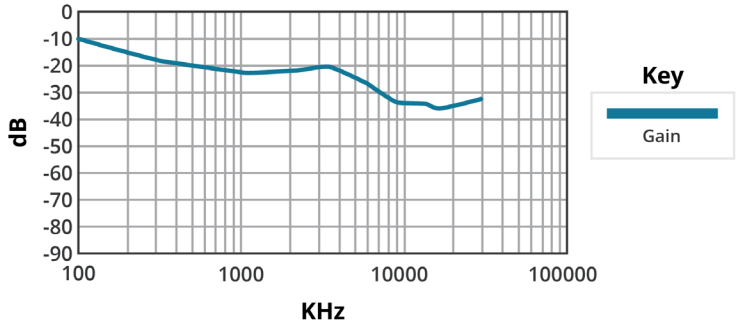
COMMON MODE VFM-15C



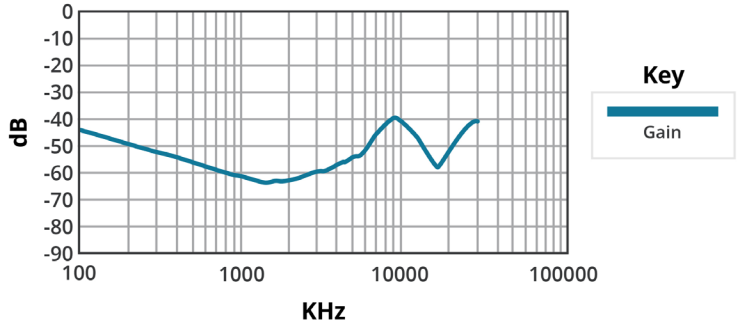
DIFFERENTIAL MODE VFM-15C



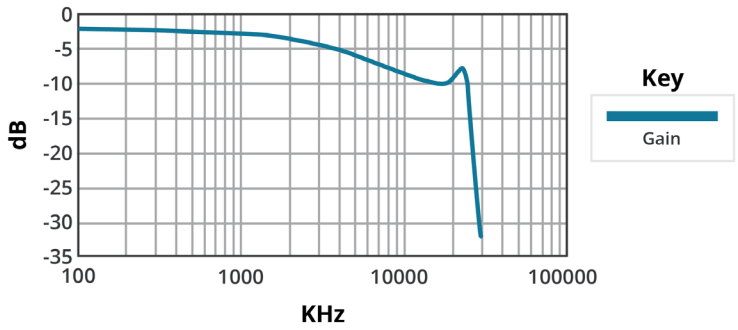
COMMON MODE VFM-20A



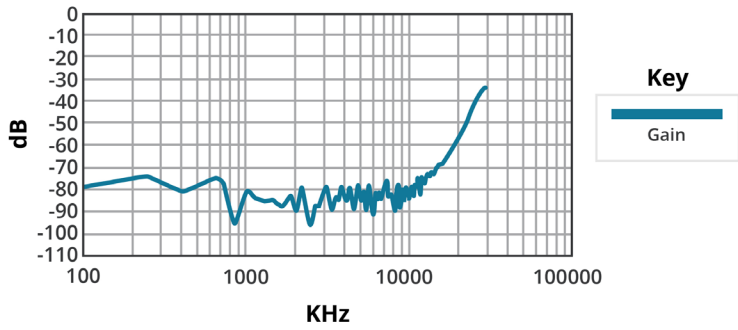
DIFFERENTIAL MODE VFM-20A



COMMON MODE VFM-25C



DIFFERENTIAL MODE VFM-25C



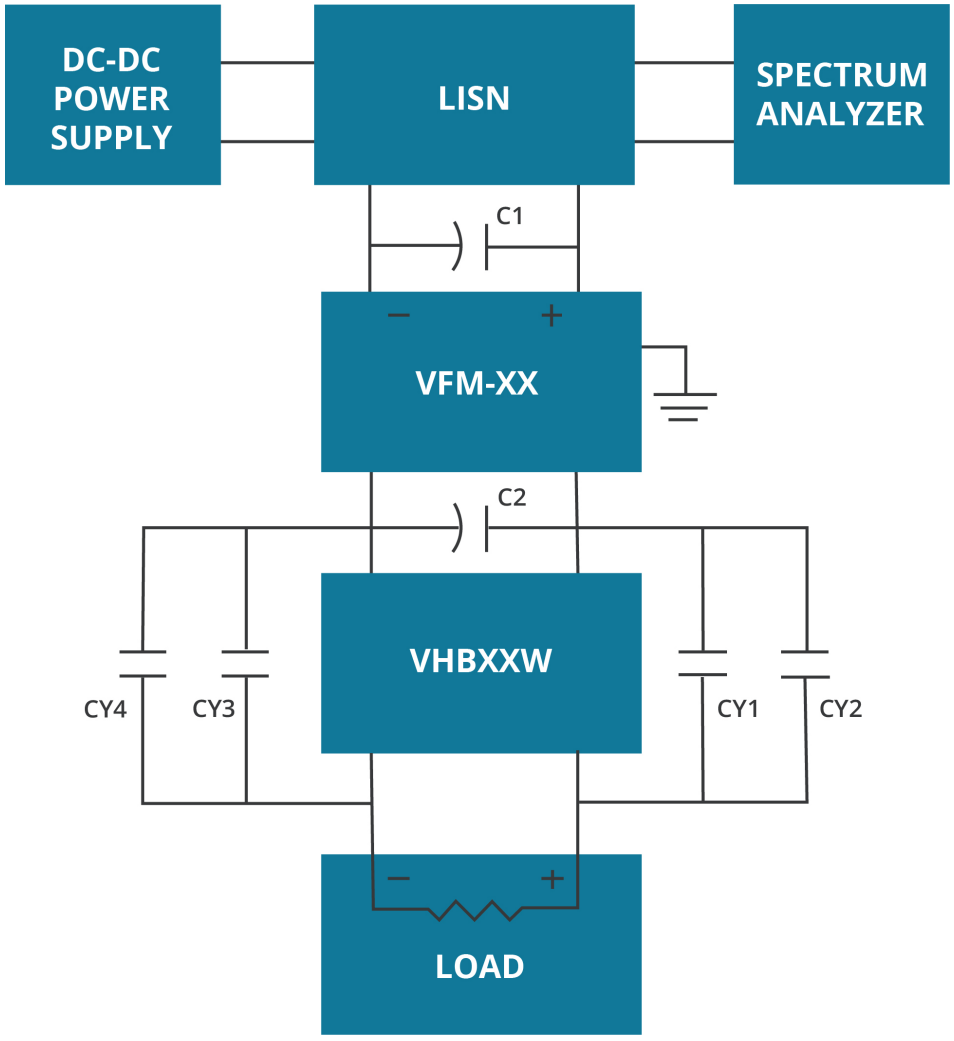
APPLICATION CIRCUIT

The following application note shows EN 55022 class B conducted emissions tests for the VFM-XX series EMI filters in series with a VHK or VHB series DC/DC converter and a purely resistive load. This information is for example only. Actual results may vary.

1) EMI Filtering - Connection Diagram

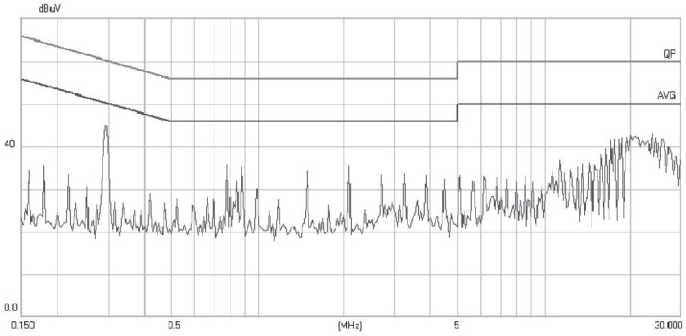
Filter Model (VFM-XX)	DC-DC Converter Model (VHXXXW)	C1	C2	CY1	CY2	CY3	CY4
VFM-10A	VHB50W-Q24-S5	47 µF/100 V KY	•••	•••	•••	•••	•••
	VHB50W-Q48-S5	47 µF/100 V KY	•••	•••	•••	•••	•••
VFM-15C	VHK200W	•••	•••	•••	•••	•••	•••
VFM-20A	VHB150W-Q24-S5	47 µF/100 V KY	220 µF/100 V KY	1000 pF / 2 KV	•••	1000 pF / 2 KV	560 pF/2 KV
	VHB150W-Q48-S5	•••	220 µF/100 V KY	1000 pF / 2 KV	•••	1000 pF / 2 KV	560 pF/2 KV
VFM-25C	VHK200W	•••	•••	•••	•••	•••	•••

Figure 4

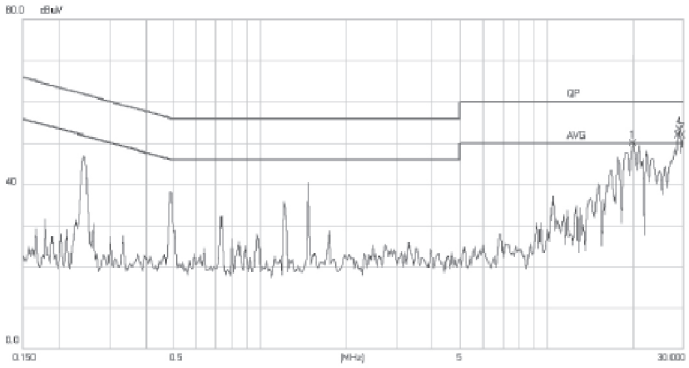


2) Conducted Emission Measurement

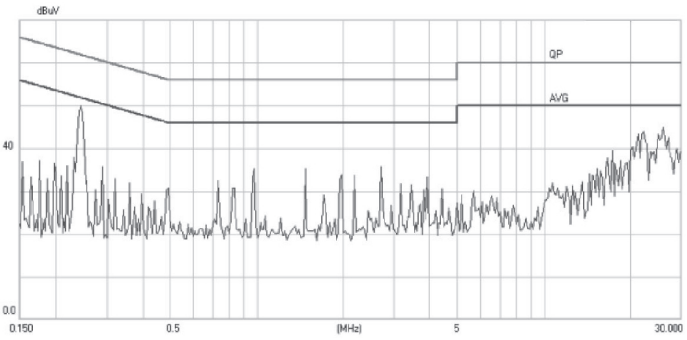
FILTER MODEL (VFM-10A)
DC-DC CONVERTER MODEL: VHB50W-Q24-S5
Vin = 12 Vdc



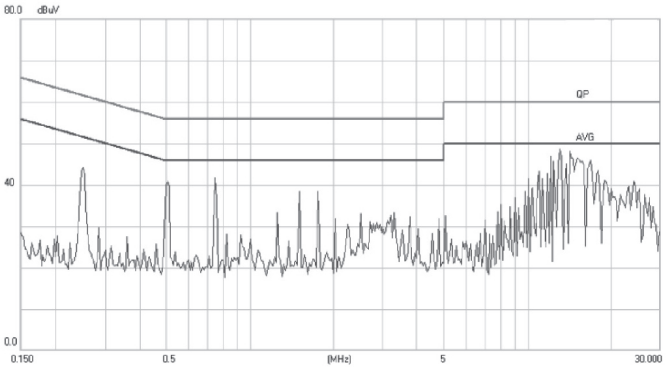
FILTER MODEL (VFM-15C)
DC-DC CONVERTER MODEL: VHK200W-Q48-S12
Vin = 48 Vdc



FILTER MODEL (VFM-20A)
DC-DC CONVERTER MODEL: VHB150W-Q24-S5
Vin = 12 Vdc



FILTER MODEL (VFM-25C)
DC-DC CONVERTER MODEL: VHK200W-Q24-S12
Vin = 24 Vdc



REVISION HISTORY

rev.	description	date
1.0	initial release	01/01/2017
1.01	specification updated to a new CUI template	01/17/2022
1.02	pin connection table updated	05/11/2022
1.03	pin size updated in the pin connection table	06/14/2022
1.04	header updated on page 6	04/26/2023

The revision history provided is for informational purposes only and is believed to be accurate.

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