



The FMC-461™ EMI filter module has been specifically designed to reduce the input line reflected ripple current of Interpoint's MHF, MTR, MTO, MHV, MHF+, MHD, MTW, MHE, and MLP series of dc-dc converters. It is intended for use in applications of high frequency switch-mode dc-dc converters which must meet MIL-STD-461B levels of conducted and radiated noise.

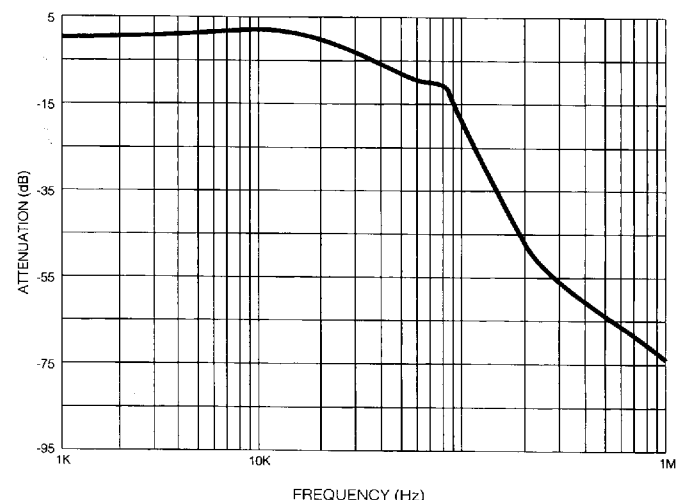
When used in conjunction with Interpoint converters, the FMC-461 reduces input ripple current by 40 dB within the frequency band of 200 kHz to 50 MHz. This gives the filter/converter combination a performance which exceeds the CEO3 test of MIL-STD-461B. Typical FMC-461 output impedance behavior and frequency response is shown in Figures 1 and 2. CEO3 performance of a typical converter with the FMC-461 attached is shown in Figure 3.

The FMC-461 also features a fast-reacting (1 pico second) transient suppressor which begins clamping the input voltage at approximately 47 Vdc, protecting the dc-dc converter from damage from induced line transients.

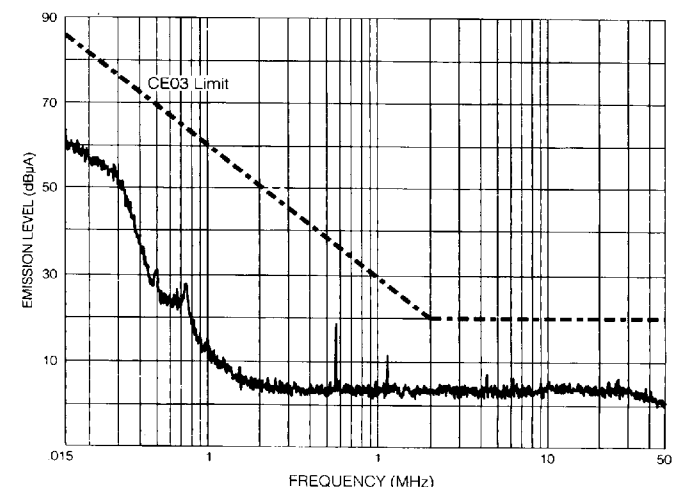
The filter is rated to operate with no degradation of performance over the temperature range of -55°C to +125°C (as measured at the baseplate). Above +125°C, current must be derated as specified on the reverse. The maximum dc insertion loss for the FMC-461 (at a load of 22 watts) represents a power loss of less than 2% at typical input voltage.

This unit is built using thick-film hybrid technology and is hermetically sealed in metal packages for military, aerospace, and other high-reliability applications. The filter uses only ceramic capacitors for reliable high temperature operation.

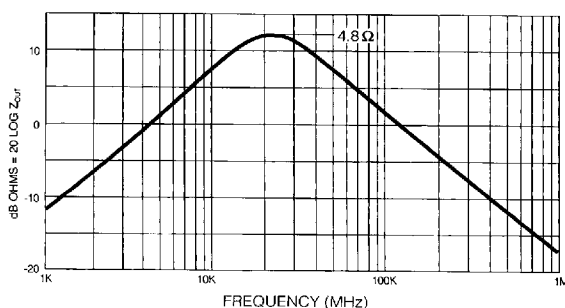
- Less than 2.4 sq. in. of board area
- -55°C to +125°C operation
- 40 dB min differential mode rejection at 200 kHz
- 50 dB min differential mode rejection from 400 kHz to 50 MHz
- Optional environmental screening
- Meets MIL-STD-461B CEO3 standards for MHF, MHE, MLP, MTO, MHV, MHF+, MHD, MTR, and MTW dc-dc converters
- MIL-STD-704D DC power bus compatibility



FMC-461 — TYPICAL AMPLITUDE RESPONSE VS. FREQUENCY
Figure 2



DC-DC CONVERTER TYPICAL WORST CASE EMI WITH FMC-461 FILTERING
Figure 3



FMC-461 — MAGNITUDE OF TYPICAL OUTPUT Z WITH INPUT SHORTED
Figure 1

CHARACTERISTICS

PARAMETER	CONDITION	MIN	TYP	MAX	UNITS	PARAMETER	CONDITION	MIN	TYP	MAX	UNITS
INPUT VOLTAGE	STEADY STATE	0	28	40	Vdc	POWER DISSIPATION	MAX. CURRENT	—	—	1.6	Watts
INPUT 1/ CURRENT	DC	—	—	2.70 ³	Amps	DIFFERENTIAL MODE REJECTIONS	200kHz	40	—	—	dB
INPUT CLAMPING VOLTAGE	-55°C	40.8	45.1	49.4	Vdc		400kHz-50 MHz	50	—	—	
	+25°C	44.7	47.0	49.4		COMMON MODE REJECTION	2 MHz-50 MHz	40	—	—	dB
	+125°C	44.7	49.5	54.2		CAPACITANCE	ANY PIN TO CASE	—	—	0.038	µF
OUTPUT 2/ VOLTAGE	STEADY STATE	V _{OUT} = V _{IN} - I _{IN} (Rdc)			Vdc	ISOLATION	ANY PIN TO CASE, 500 Vdc	100	—	—	MOhm
OUTPUT 1/ CURRENT	RIPPLE	—	—	1.0	Amps RMS	OPERATING 1/ TEMP.	CASE BASEPLATE	-55	—	+125	°C
	STEADY STATE	—	—	2.7	Amps	STORAGE TEMP.	CASE BASEPLATE	-65	—	+150	°C
DC RESISTANCE (Rdc)	T = 25°C	—	—	.20	Ohms	WEIGHT		—	46	48	Grams

1/ Above 125°C case temperature, derate current as follows:

- Output Ripple Current: Derate linearly to zero at +135°C case temp.
- DC Input & Output Current: Derate linearly to zero at +135°C case temp.

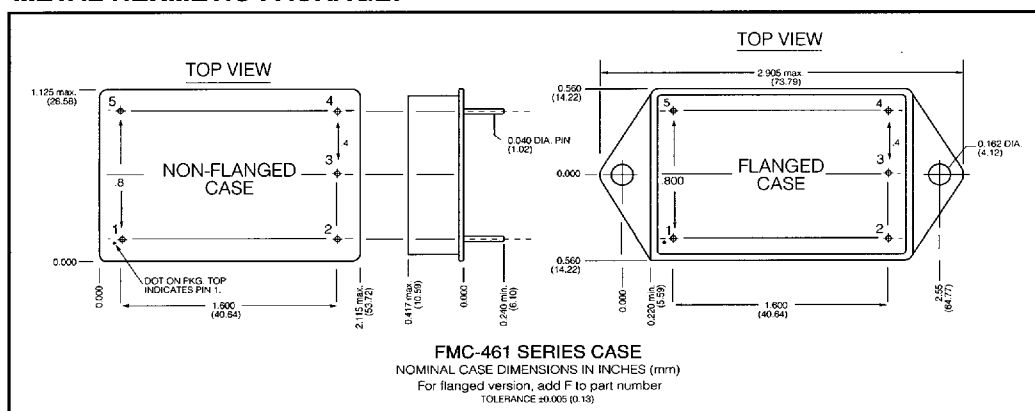
2/ Typical applications result in V_{OUT} within 2% of V_{IN}.

OPTIONAL ENVIRONMENTAL SCREENING

Environmental screening, referenced to MIL-STD-883 per Interpoint's in-house screening procedure, consists of the following:

- Pre-cap internal visual inspection: Per method 2017
- Temp. cycle: 10 times, -55°C to +125°C per method 1010
- Constant acceleration: 500 g per method 2001
- Fine leak: Per method 1014, cond. A
- Gross leak: Per method 1014, cond. C
- Burn-in: 96 hr. at 125°C case (typ)
- Final electrical test (25°C)
- Final external visual inspection: Per method 2009
- To order optional screening, add suffix -ES to model number. Example: FMC-461/ES. On unscreened parts, the screening code block is marked with "00" or "01." On screened parts, the block is marked "ES" or "02." Contact your Interpoint representative for information about additional Hi-Rel screening options.

METAL HERMETIC PACKAGE:



DESIGNATION	PIN
+ V _{IN}	1
+ V _{OUT}	2
Case Ground	3
Out Common	4
In Common	5

CAUTION: Heat from reflow or wave soldering may damage this part. Solder pins individually with heat application NOT exceeding 300°C for 10 seconds per pin.

STANDARD MILITARY DRAWING AVAILABLE

STANDARD MILITARY CATEGORY	STANDARD MILITARY DRAWING NUMBER	FMC SIMILAR PART NUMBER
5915 5915	9401001HXC 9401001HZC	FMC-461/883 FMC-461F/883
5915 5915	9401002 HXC 9401002HZC	FMC-461NT/883* FMC-461NTF/883*

*OPTIONAL: WITHOUT TRANSORB