

## AFC461 SERIES

### EMI FILTER HYBRID - HIGH RELIABILITY

#### Description

The AFC461 EMI filter will reduce the input line reflected ripple current of the AHV, ATO, ATW, ATR, and AHF line of DC/DC converters to levels below the CEO3 limits of MIL-STD-461.

These EMI filters are manufactured in a facility certified to MIL-PRF-38534. All purposes used to manufacture these filters have been qualified to enable International Rectifier to deliver compliant devices. Three standard temperature grades are offered with screening options. Manufactured in a facility fully qualified to MIL-PRF-38534, these EMI filters are fabricated utilizing DSCC qualified processes. For available screening options, refer to device screening table in the data sheet.

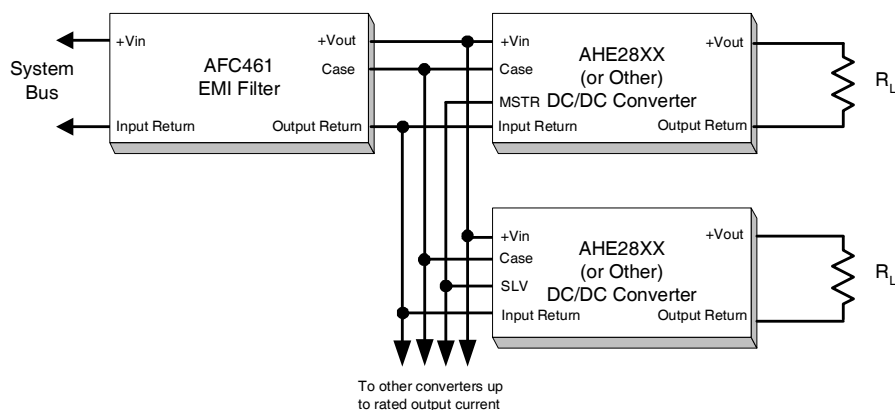


AFC

#### Features

- 4.0 A Input Current - max.
- 40 dB Noise Reduction min. @100 KHz
- -55°C to +125°C Operation
- Military Screening
- Compatible with ATW, AHE, ATO, ATR and AHF Series DC/DC Converters
- No Derating for -55°C to +125°C Operation
- No Tantalum Capacitors for High Reliability
- Standard Microcircuit Drawings Available

#### Typical Application



## Specifications

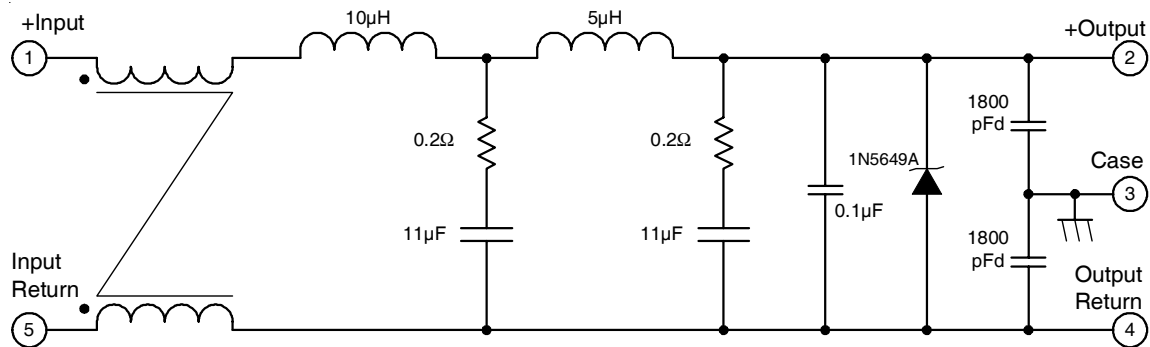
Parameter	Condition	Min	Typ	Max	Unit
Input Voltage	Steady State	0	28	40	VDC
Input Current	DC Ripple			4.0 1.0	A A RMS
Input Clamping Voltage	-55°C +25°C +125°C	38.9 42.3 44.9	43.2 47.0 49.9	47.5 51.7 54.8	VDC VDC VDC
Output Voltage <sup>1</sup>	Steady State	$V_{OUT} = V_{IN} - I_{IN} (R_{DC})$			VDC
Output Current	Steady State			4.0	A
DC Resistance ( $R_{DC}$ )	Steady State	0.07	0.10	0.15	$\Omega$
Power Dissipation	Max. DC Current			1.6	W
Noise Reduction	100 KHz to 50 MHz	40			dB
Capacitance	Any pin to case			4200	pF
Isolation	Any pin to case 500VDC	100			M $\Omega$
Operating Temperature	Case	-55		+125	°C
Storage Temperature	Case	-65		+150	°C
Weight				55	g

1. Typical Applications result in Vout within 2 % of Vin

## Standard Microcircuit Drawing Equivalence Table

Standard Microcircuit Drawing Number	Vendor Cage Code	IR Standard Part Number
91020-01HXA	52467	AFC461/CH
91020-01HZA	52467	AFC461F/CH

### Block Diagram



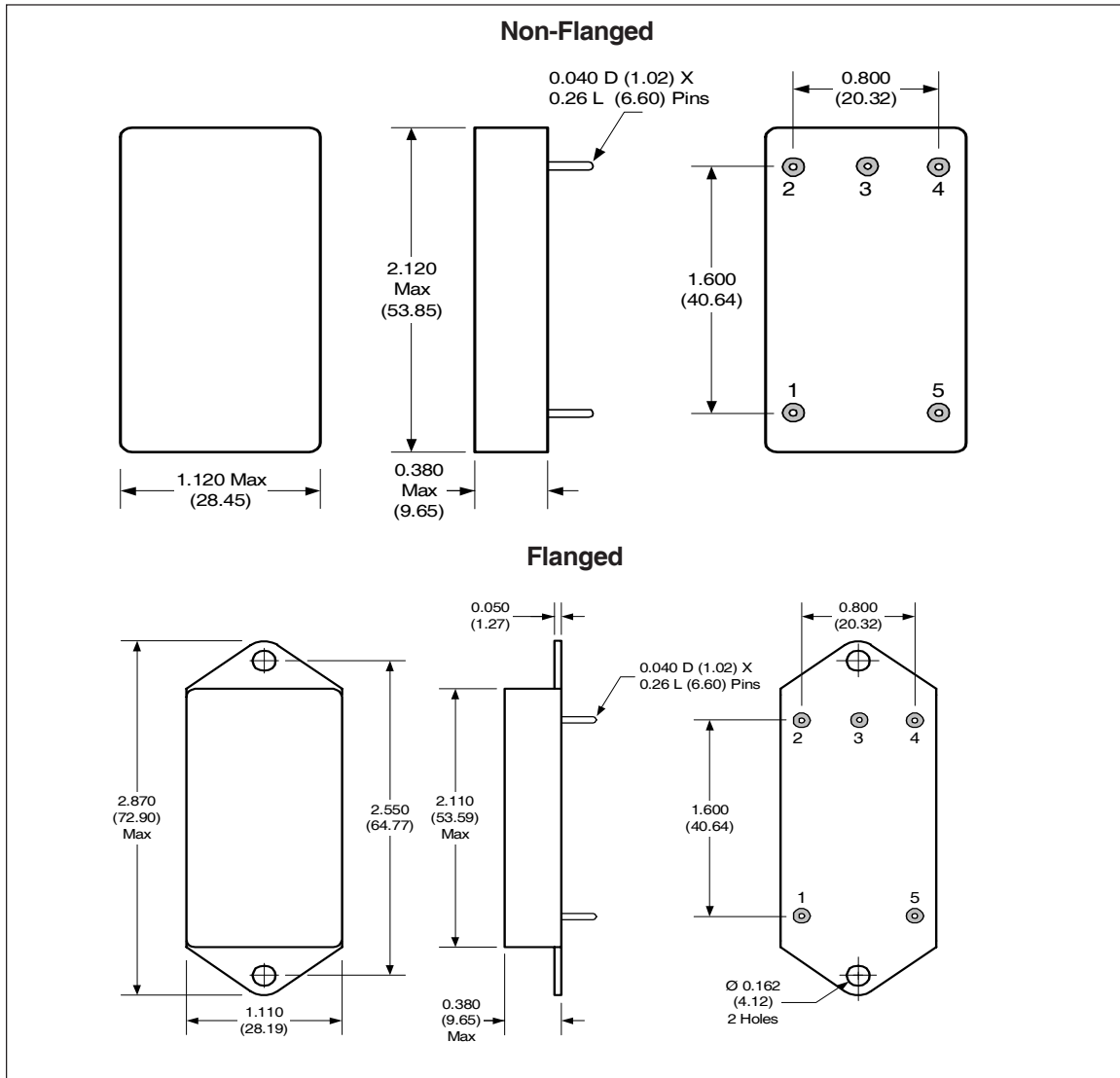
Refer to page 4 for Pin Designation Table

### Device Synchronization

Whenever multiple DC/DC converters are utilized in a single system, significant low frequency noise may be generated due to slight difference in the switching frequencies of the converters (beat frequency noise). Because of the low frequency nature of this noise (typically less than 10KHz), it is difficult to filter out and may interfere with proper operation of sensitive systems (communications, radar or telemetry). International Rectifier offers an option, which provides synchronization of multiple AHE/ATW type converters, thus eliminating this type of noise. To take advantage of this capability, the system designer must assign one of the converters as the master. Then, by definition, the remaining converters become slaves and will operate at the masters' switching frequency. The user should be aware that the synchronization system is fail-safe; that is, the slaves

will continue operating should the master frequency be interrupted for any reason. The layout must be such that the synchronization output of the master device is connected to the synchronization input of each slave device. It is advisable to keep this run short to minimize the possibility of radiating the 250KHz switching frequency. A typical connection is illustrated on the cover sheet of this document.

The appropriate converters must be ordered to take advantage of this feature. After selecting the converters required for the system, a 'MSTR' suffix is added for the master converter part number and an 'SLV' suffix is added for slave part number. See Part Number section of the applicable converter data sheets.

**Pin Designation**

Pin #	Designation
1	+ Input
2	+ Output
3	Case Ground
4	Output Return
5	Input Return

**Device Screening**

Requirement	MIL-STD-883 Method	No Suffix	ES ②	HB	CH
Temperature Range	—	-20°C to +85°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Element Evaluation	MIL-PRF-38534		N/A	N/A	Class H
Non-Destructive Bond Pull	2023	N/A	N/A	N/A	N/A
Internal Visual	2017	①	Yes	Yes	Yes
Temperature Cycle	1010	N/A	Cond B	Cond C	Cond C
Constant Acceleration	2001, Y1 Axis	N/A	500 Gs	3000 Gs	3000 Gs
PIND	2020	N/A	N/A	N/A	N/A
Burn-In	1015	N/A	48 hrs@hi temp	160 hrs@125°C	160 hrs@125°C
Final Electrical ( Group A )	MIL-PRF-38534 & Specification	25°C	25°C ②	-55°C, +25°C, +125°C	-55°C, +25°C, +125°C
PDA	MIL-PRF-38534	N/A	N/A	N/A	10%
Seal, Fine and Gross	1014	Cond A	Cond A, C	Cond A, C	Cond A, C
Radiographic	2012	N/A	N/A	N/A	N/A
External Visual	2009	①	Yes	Yes	Yes

**Notes:**

- ① Best commercial practice
- ② Sample tests at low and high temperatures

**Part Numbering**

