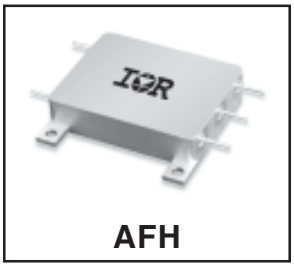
International
IOR Rectifier

AFH461 SERIES

EMI FILTER
HYBRID - HIGH RELIABILITY



Description

The AFH Series EMI filter has been designed to provide full compliance with the input line reflected ripple current requirement specified by CE03 of MIL-STD-461C over the extended military temperature range while operating in conjunction with the corresponding AMA, AMF and AMR series of DC/DC converters. These filters are offered as part of a family of high reliability conversion products providing single, dual and triple output voltages while operating from nominal +28 volt input line. Other converters operating with a similar switching frequency will also benefit by use of this device.

These EMI filters are hermetically packaged in a seam welded enclosure utilizing axially oriented copper-core pins which minimize resistive DC losses. This package has been configured to complement the AMA, AMF and AMR packages as a convenience in system installation and is fabricated with International Rectifier's rugged ceramic lead-to-package seal assuring long term hermetic seal integrity in harsh environments.

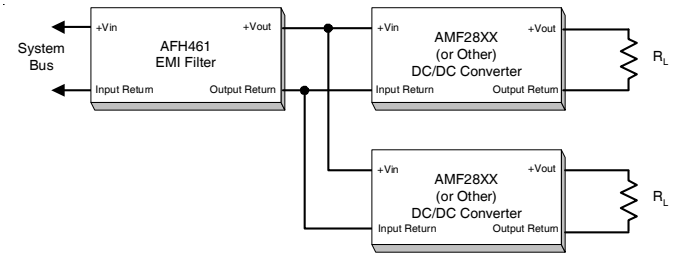
Designed to meet the stringent requirements of military and aerospace use, these devices are manufactured in a facility fully qualified to MIL-PRF-38534, and are available in two screening grades. The flight grade is designed with the requirements of MIL-PRF-38534 for class K.

Features

- Up to 2.0 A Output Current
- Attenuation > 60dB@500 KHz
- Low Profile Seam Welded Package
- Ceramic Insulated Copper Core Pins
- Operation Over Full Military Temp. Range
- No Derating for -55°C to +125°C

The EM grade is processed and screened to a lower grade requirement. Flight grade are tested to meet the complete group "A" test specifications over the full military temperature range with no derating. The design does not meet MIL-STD-975 voltage derating requirements for some ineternal components. Variations in electrical, mechanical and screening requirements can be accommodated. Contact IR Santa Clara for special requirements.

Typical Connection Diagram



Specifications

ABSOLUTE MAXIMUM RATINGS *Note 1*	
Input Voltage	-80V to +80V *Note 2*
Input Current	3.0 A
Lead Soldering Temperature	300°C for 10 seconds
Case Temperature - Operating	-55°C to +125°C
Case Temperature - Storage	-65°C to +135°C

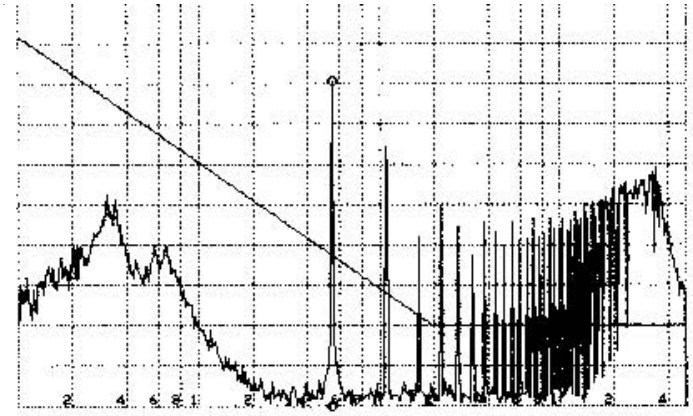
Electrical Characteristics $-55°C \le T_{CASE} \le +125°C$, $0 \le V_{IN} \le +50$ unless otherwise specified

Parameter	Group A Subgroups	Test Conditions	Min	Nom	Max	Unit
INPUT VOLTAGE	1, 2, 3	$I_{IN} \le 500\mu A$	0		+40	V_{DC}
		Transient *Note 2*	-50		+50	
OUTPUT CURRENT *Note 3*					2.0	A_{DC}
DC RESISTANCE *Note 4*	1	$T_C = 25°C$		150	250	mΩ
POWER DISSIPATION		Maximum Current $T_C = 25°C$			1.0	W
NOISE REDUCTION	4, 5, 6	TC = 25°C 1KHz 200 KHz - 500 KHz 500 KHz - 10 MHz	-1.0		+1.0 -40 -60	dB
ISOLATION	1	Any Pin to Case Tested @ 500VDC	100			MΩ
CAPACITANCE	1, 2, 3	Measured Between Any Pin and Case	32	44	48	nF
DEVICE WEIGHT		Slight Variations with Case Style		30		g

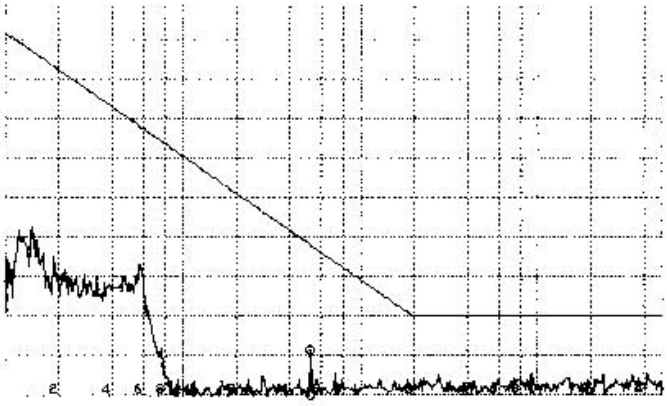
Notes to Specifications

1. Operation above maximum ratings may cause permanent damage to the device. Operation at maximum ratings may degrade performance and affect reliability.
2. Device can tolerate ± 100 Volt transient whose duration is ≤ 100 ms when $R_s \ge 0.5\ \Omega$.
3. Derate Output Current linearly from 100% at 125°C to 0 at 135°C.
4. DC resistance is the total resistance of the device and includes the sum of the *input* to *output* resistance and the *return in* to *return out* resistance paths.

Typical Filter CE03 Performance



AHF2805S CE03 Performance without AFH461 Filter

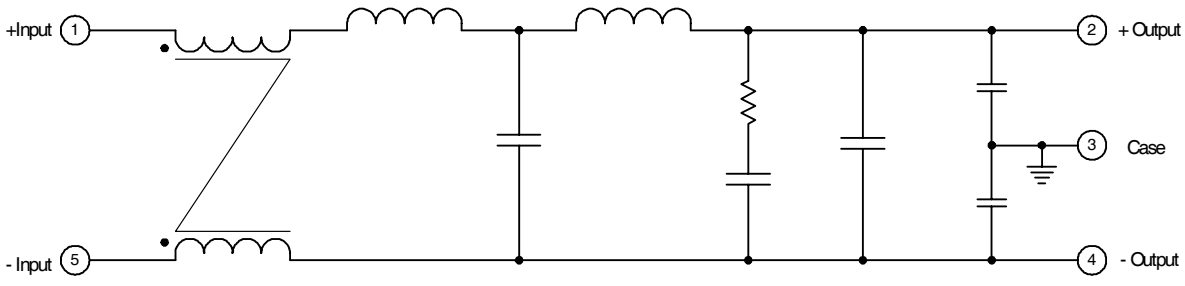


AHF2805S CE03 Performance with AFH461 Filter

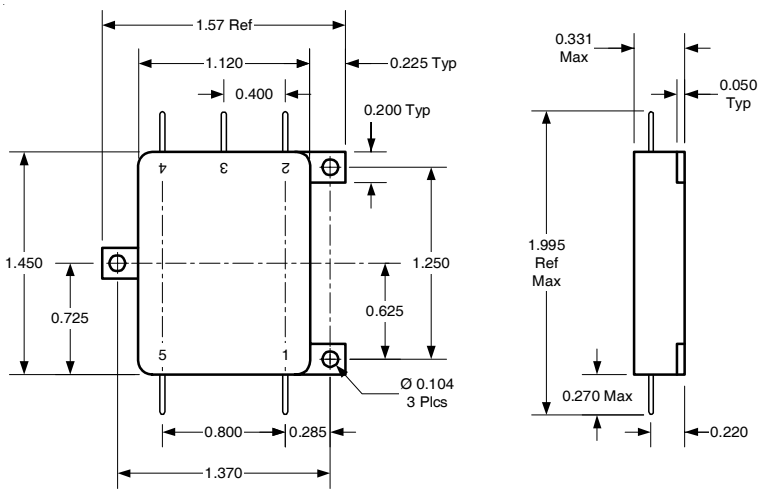
Available Screening Levels and Process Variations for AFH461 Series

Requirement	MIL-STD-883 Method	Flight No Suffix	/EM Suffix
Temperature Range		-55°C to +125°C	-55°C to +125°C
Element Evaluation		MIL-PRF-38534, Class K	—
Internal Visual	2017	Yes	Yes
Temperature Cycle	1010	Cond C	—
Constant Acceleration	2001	Cond A	—
Burn-in Interim Electrical @ 160 hrs	1015	320 hrs @ 125°C	48 hrs @ 125°C
Final Electrical (Group A) Read & Record Data	MIL-PRF-38534 & Specification	-55°C, +25°C, +125°C	+25°C
PDA (25°C, interim to final)		2%	—
Seal, Fine & Gross	1014	Cond A, C	Cond A, C
Radiographic	2012	Yes	—
External Visual	2009	Yes	Yes

AFH461 Block Diagram



AFH461 Case Style Outline



Tolerances, unless otherwise specified: .XX = ±0.010
.XXX = ±0.005

Pin Designation

Pin No.	Designation
1	Positive Input
2	Positive Output
3	Case Ground
4	Output Common
5	Input Common

Part Numbering

AFH 461 / EM

- AFH: Model
- 461: Applicable Military Test Standard
- /EM: Screening Suffix
  - None = Flight
  - /EM = Engineering Model

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