

**AFH461 SERIES**

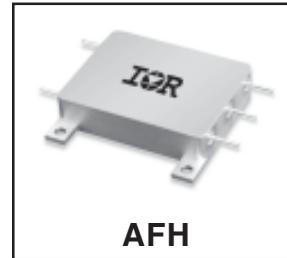
**EMI FILTER  
 HYBRID - HIGH RELIABILITY**

**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.

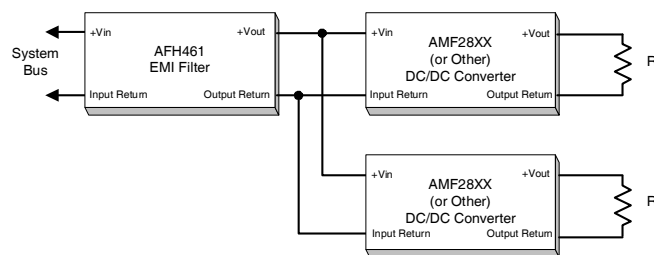


**Features**

- 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 internal 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 <i>Note 1</i>	
Input Voltage	-80V to +80V <i>Note 2</i>
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

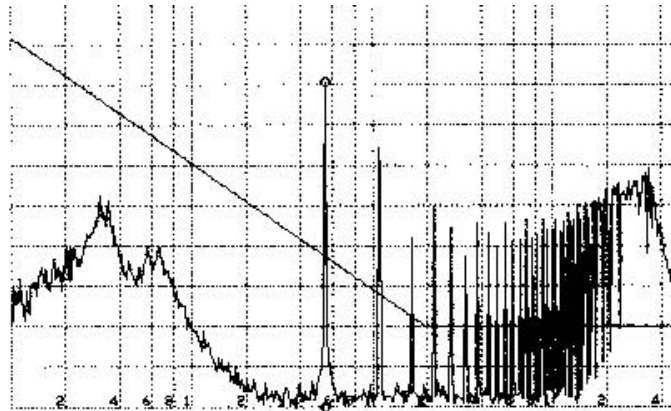
Electrical Characteristics  $-55^{\circ}\text{C} \leq T_{\text{CASE}} \leq +125^{\circ}\text{C}$ ,  $0 \leq V_{\text{IN}} \leq +50$  unless otherwise specified

Parameter	Group A Subgroups	Test Conditions	Min	Nom	Max	Unit
INPUT VOLTAGE	1, 2, 3	$I_{\text{IN}} \leq 500\mu\text{A}$	0		+40	$V_{\text{DC}}$
		Transient <i>Note 2</i>	-50		+50	
OUTPUT CURRENT <i>Note 3</i>					2.0	$A_{\text{DC}}$
DC RESISTANCE <i>Note 4</i>	1	$T_{\text{C}} = 25^{\circ}\text{C}$		150	250	$\text{m}\Omega$
POWER DISSIPATION		Maximum Current $T_{\text{C}} = 25^{\circ}\text{C}$			1.0	W
NOISE REDUCTION	4, 5, 6	$T_{\text{C}} = 25^{\circ}\text{C}$ 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			$\text{M}\Omega$
CAPACITANCE	1, 2, 3	Measured Between Any Pin and Case	32	44	48	nF
DEVICE WEIGHT		Slight Variations with Case Style		30		g

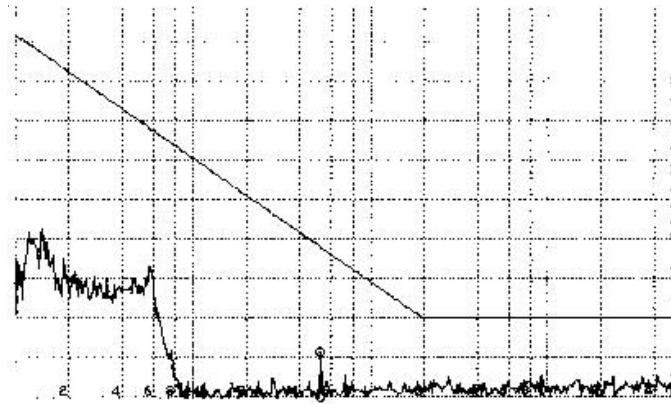
## Notes to Specifications

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  $\pm 100$  Volt transient whose duration is  $\leq 100$  ms when  $R_{\theta} \geq 0.5 \Omega$ .
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**

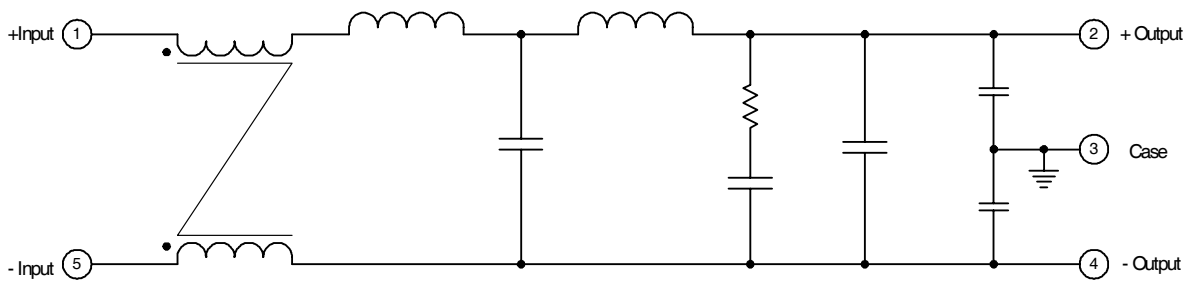


**AHF2805S CE03 Performance with AFH461 Filter**

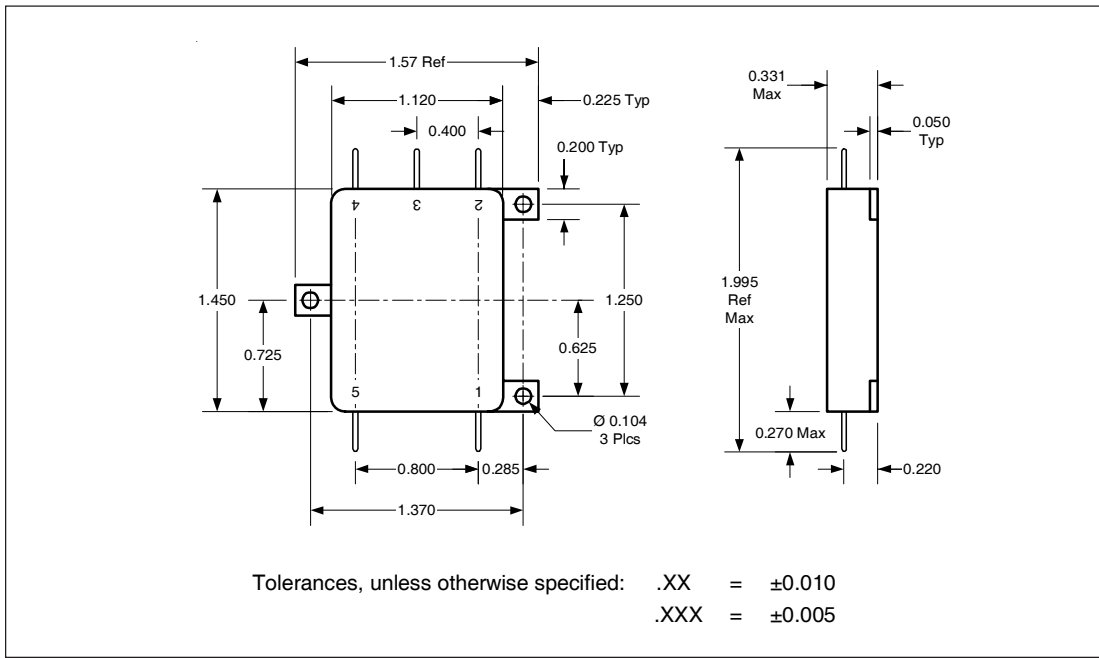
**Available Screening Levels and Process Variations for AFH461 Series**

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**



**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**

