

AFH461 SERIES

EMI FILTER HYBRID - HIGH RELIABILITY

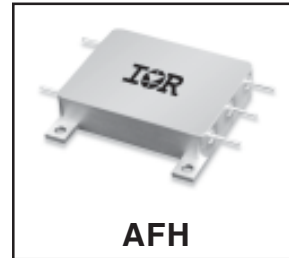
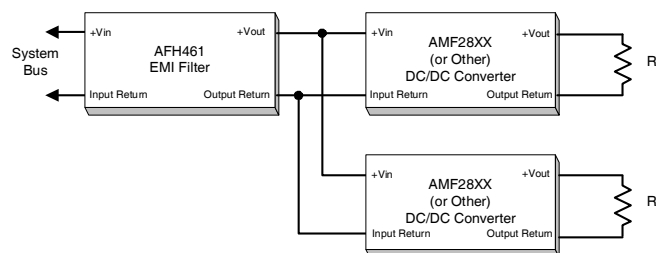
Description

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.

Typical Connection Diagram



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 San Jose for special requirements.

Specifications

Absolute Maximum Ratings, Note 1	
Input Voltage	-80V to +80V, Note 2
Input Current	3.0A
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 ≤ T_{CASE} ≤ +125°C, 0 ≤ V_{IN} ≤ +50 unless otherwise specified

Parameter	Group A Subgroup	Conditions	Min.	Nom.	Max.	Unit
Input Voltage	1, 2, 3	I _{IN} < 500 μA	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	T _C = 25°C	-1.0		+1.0	dB
		1.0 kHz			-40	
		200 kHz - 500 kHz			-60	
		500 kHz - 10 MHz			-60	
Isolation	1	Any Pin to Case, Tested @ 500V _{DC}	100			MΩ
Capacitance	1, 2, 3	Measured between any Pin and Case	32	44	48	nF
Device Weight		Slight variation 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 ≥ 0.5 Ω.
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

Fig 1. AHF2805S CE03 Performance without AFH461 Filter

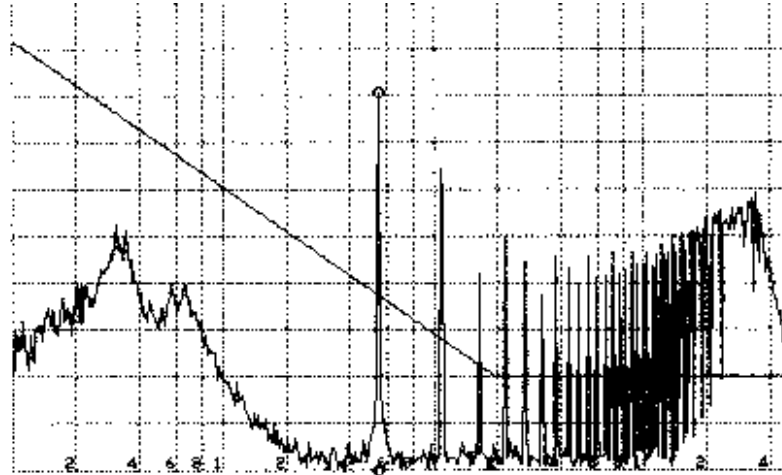
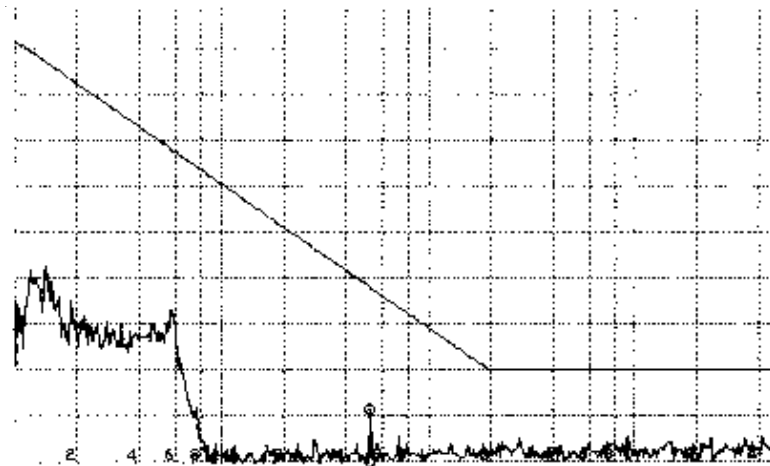


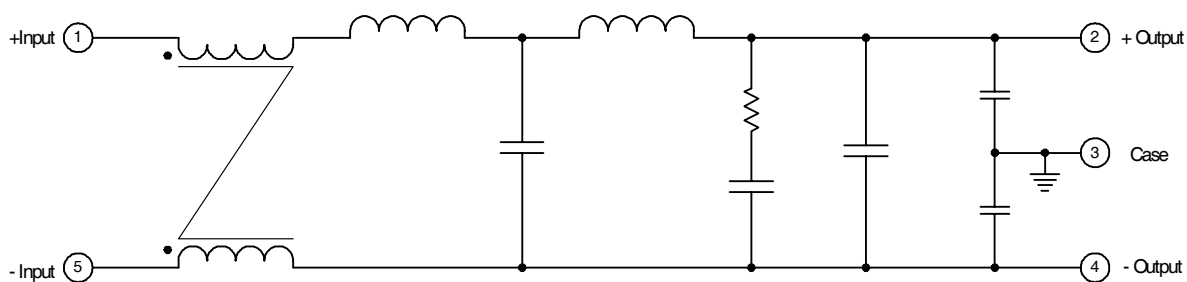
Fig 2. AHF2805S CE03 Performance with AFH461 Filter



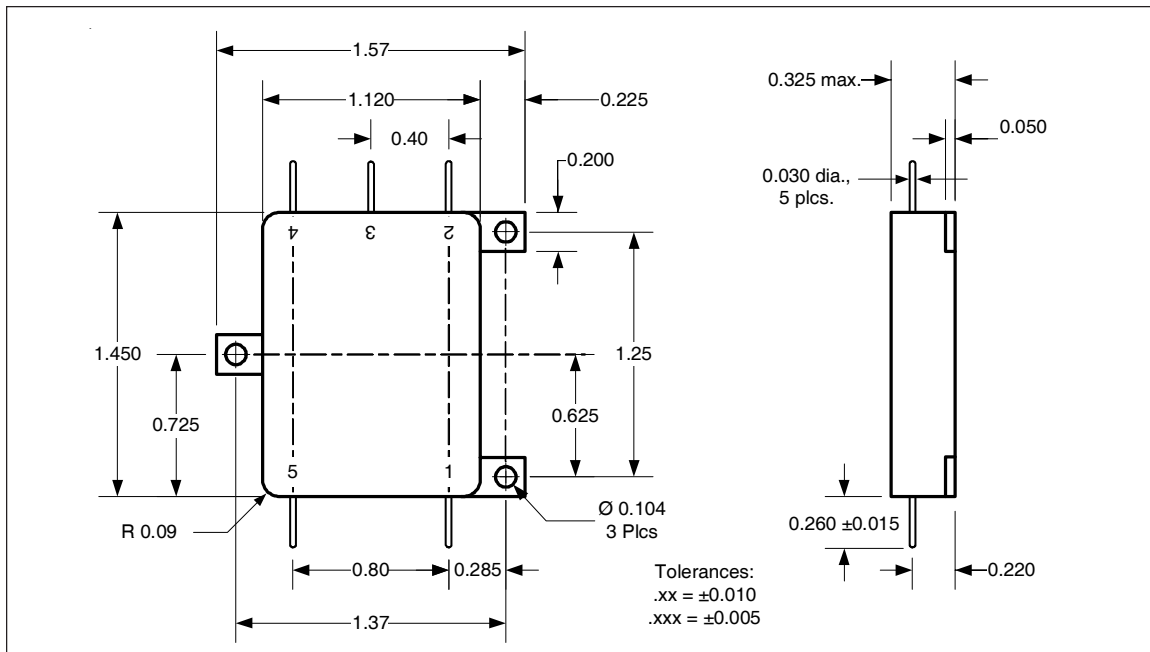
Available Screening Levels and Process Variations

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

Fig 3. Block Diagram



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

Model ————
Applicable
Military Test
Standard ————
Screening Suffix
None = Flight
/EM = Engineering Model