

AMH461

Hybrid - High Reliability
EMI Filter

DESCRIPTION

The AMH 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 AHF 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 from use of this device.

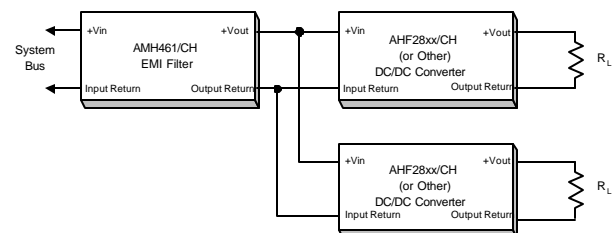
These EMI filters are hermetically packaged in a seam welded enclosure utilizing axially oriented copper-core pins which minimize resistive DC losses. This package has been configured to complement the AHF package as a convenience in system installation and is fabricated with Advanced Analog / M-3's rugged ceramic lead-to-package seal assuring long term hermetic seal integrity in harsh environments.

Designed to meet the 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 CH grade intended for flight use is fully compliant to the requirements of MIL-PRF-38534 for class H. The HB grade is processed and screened to the class H requirement, but does not include element evaluation. The ES grade is processed and screened to a lower level requirement. Class CH grade and class HB grade are tested to meet the complete group "A" test specification over the full military temperature range with no derating. Variations in electrical, mechanical and screen requirements can be accommodated. Contact Advanced Analog / M-3 for special requirements.

FEATURES

- Up to 2.0 Ampere Output Current
- Attenuation > 60dB at 500KHz
- Low Profile Seam Welded Package
- Ceramic Insulated Copper Core Pins
- Operation Over Full Military Temp Range
- No Derating for -55°C to $+125^{\circ}\text{C}$

Typical Connection Diagram



SPECIFICATIONS

AMH461

ABSOLUTE MAXIMUM RATINGS *Note 1*

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
	Storage	-65°C to +135°C

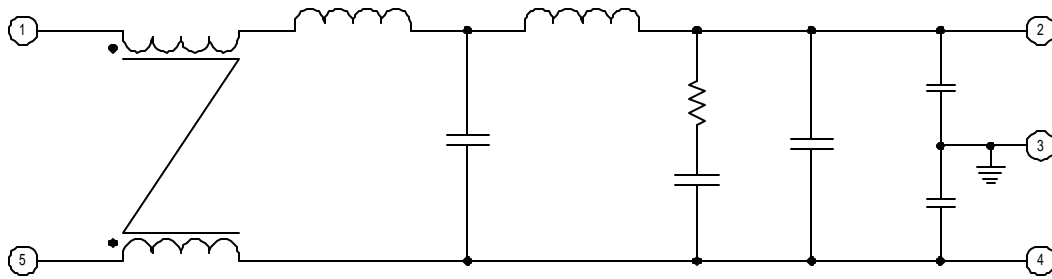
Electrical Characteristics $-55^{\circ}\text{C} \leq T_{\text{CASE}} \leq +125^{\circ}\text{C}$, $-50 \leq V_{\text{IN}} \leq +50$ unless otherwise specified.

Parameter	Group A Subgroups	Test Conditions	Min	Nom	Max	Unit
INPUT VOLTAGE		Steady State	-40	—	+40	V_{DC}
		Transient <i>Note 2</i>	-50		+50	
OUTPUT VOLTAGE	1, 2, 3	$V_{\text{OUT}} = V_{\text{IN}} - I_{\text{IN}}(R_{\text{DC}})$				V_{DC}
OUTPUT CURRENT <i>Note 3</i>					2.0	A_{DC}
DC RESISTANCE <i>Note 4</i>	1	$T_{\text{C}} = 25^{\circ}\text{C}$		150	250	$m\Omega$
POWER DISSIPATION		Maximum Current $T_{\text{C}} = 25^{\circ}\text{C}$			1.0	W
NOISE REDUCTION		$T_{\text{C}} = 25^{\circ}\text{C}$ 1KHz	-1	+1		dB
		200 KHz - 500 KHz	40	50		
		500 KHz – 10 MHz	70	80		
		10 MHz – 50 MHz	60	70		
ISOLATION	1	Any Pin to Case Tested @ 500VDC	100			$M\Omega$
CAPACITANCE		Measured Between Any Pin and Case		44		nF
DEVICE WEIGHT		Slight Variations with Case Style		30		gms

Notes to Specifications:

- Operation above maximum ratings may cause permanent damage to the device. Operation at maximum ratings may degrade performance and affect reliability.
- Device can tolerate ± 100 Volt transient whose duration is ≤ 100 ms when $R_s \geq 0.5 \Omega$
- Derate Output Current linearly from 100% at 125°C to 0 at 135°C .
- 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.

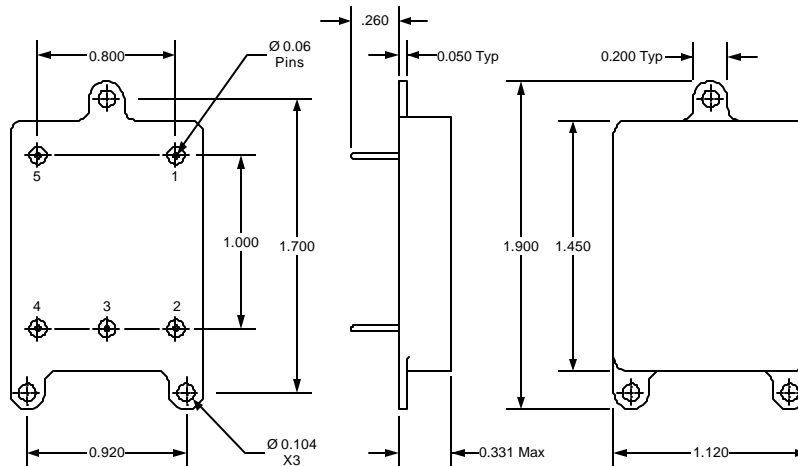
AMH461 Block Diagram



AMH461 PIN DESIGNATION

Pin Number	Designation
1	Positive Input
2	Positive Output
3	Case Ground
4	Output Common
5	Input Common

AMH461 Case Outline



Note: Flanged case shown. Non-flange case identical size but without three mounting ears.

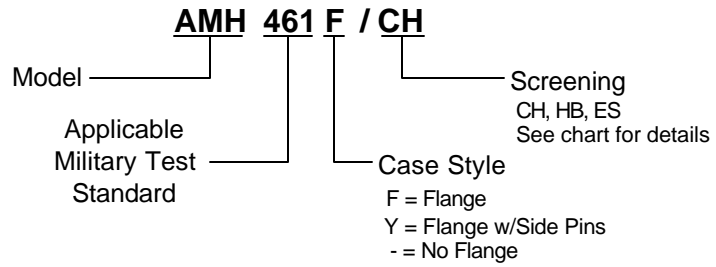
Tolerances, unless otherwise .XX = ±0.010
specified:

.XXX = ±0.005

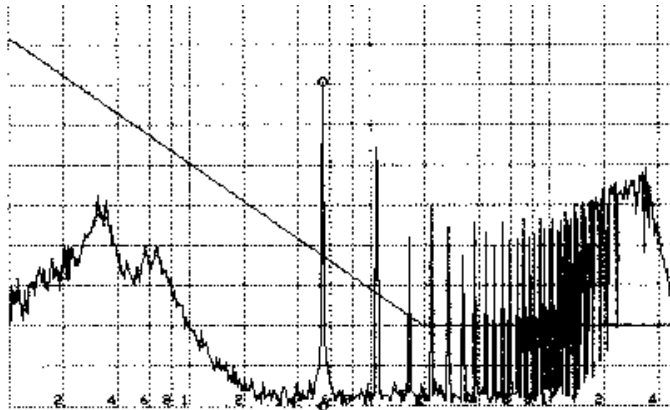
Available Screening Levels and Process Variations for AMH461 EMI Filters.

Requirement	MIL-STD-883 Method	/CH Suffix	/HB Suffix	/ES Suffix
Temperature Range		-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Element Evaluation		MIL-PRF-38534	—	—
Internal Visual	2017	Yes	Yes	Yes
Temperature Cycle	1010	Cond C	Cond C	Cond B
Constant Acceleration	2001,	Cond A	Cond A	500g
Burn-in Interim Electrical @ 0 hrs	1015	160 hrs @ 125°C	160 hrs @ 125°C	96 hrs @ 125°C
Final Electrical (Group A) Read & Record Data	MIL-PRF-38534 & Specification	-55, +25, +125°C	-55, +25, +125°C	+25°C
PDA (25°C, interim to final)		10%	10%	—
Seal, Fine & Gross	1014	Cond A, C	Cond A, C	Cond A, C
External Visual	2009	Yes	Yes	Yes

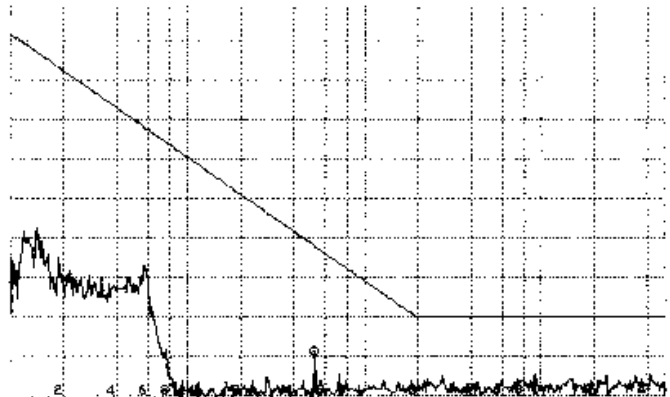
Part Numbering/Ordering Information



Typical Filter CE03 Performance



AHF2805S CE03 Performance Without AMH461 filter



AHF2805S CE03 Performance With AMH461 filter