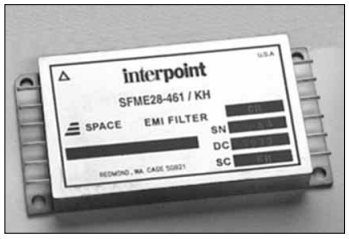
SFME28-461
EMI FILTER
10 AMP

EMI INPUT FILTER
28 VOLT INPUT

FEATURES

- **Fully qualified to Class H or K**
- **Passive components for maximum tolerance in space environments**
- **–55° to +125°C operation**
- Up to 10 amps of throughput current
- Up to 50 dB attenuation at 500 kHz.
- Compliant to MIL-STD-461C, CE03
- Compatible with MIL-STD-704E DC power bus



INPUT VOLTAGE AND CURRENT	
Input (V)	Current (A)
28	10

Size (max.): 3.005 x 1.505 x 0.400 inches (76.33 x 38.23 x 10.16mm)
See Section B8, case U1, for dimensions.
Weight: 110 grams maximum
Screening: Standard, Class H, or Class K (MIL-PRF-38534)
See Section C2 for screening options, see Section A5 for ordering information.

DESCRIPTION

The SFME28-461™ Series EMI filter modules are specifically designed to reduce the reflected input ripple current of high frequency DC/DC converters. SFME28-461 filters minimize electromagnetic interference (EMI) for Interpoint's space applications converters. These filters are intended for use in 28 volt applications which must meet MIL-STD-461 levels of conducted emissions. One filter can be used with multiple converters up to the rated throughput current of the filter.

SCREENING AND REPORTS

The SFME28-461 filter offers three screening options – Standard, Class H, or Class K. See Section C2, Quality Assurance, pages C2-7 through C2-9, for descriptions. Detailed reports on product performance are also available and are listed on page C2-9.

INPUT RIPPLE AND EMI

Switching DC/DC converters naturally generate two noise components on the power input line: differential noise and common mode noise. Input ripple current refers to both of these components.

Differential noise occurs between the positive input and input common. Most Interpoint converters have an input filter that reduces differential noise which is sufficient for most applications.

Common mode noise occurs across stray capacitances between the converter's power train components and the baseplate (bottom of the package) of the converter.

Where low noise currents are required to meet CE03 of MIL-STD-461, a power line filter is needed. The SFME28-461 Series of EMI power line filters reduces the common mode and differential noise generated by the converters. SFME28-461 filters reduce input ripple current by as much as 60 dB at 500 kHz and 55 dB at 1 MHz when used in conjunction with Interpoint's DC/DC converters.
The filter must be placed as close as possible to the converter for optimum performance. The baseplates of the filter and the converter should be connected with the shortest and widest possible conductors. For the best connection, mount the filter's and converter's baseplates on or above a small ground plane.

OPERATION OVER TEMPERATURE

All SFME28-461 Series filters are rated for full power operation from –55°C to +125°C case temperature. Current is derated linearly to zero at +135°C case temperature.

INSERTION LOSS

The maximum dc insertion loss at full load and nominal input voltage represents a power loss of less than 4%.

PACKAGING

SFME28-461filters are sealed in metal hermetic side-leaded packages.

For more information, contact your Interpoint representative listed in Section A5.

CRANE

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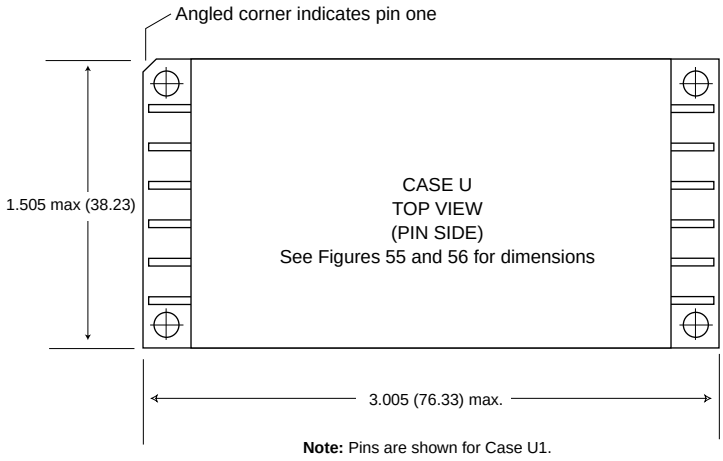

Note: Pins are shown for Case U1.

Materials

Header	Cold Rolled Steel/Nickel/Gold
Cover	Kovar/Nickel
Pins	#52 alloy/Gold compression glass seal

Case dimensions in inches (mm)

Tolerance ±0.005 (0.13) for three decimal places
±0.01 (0.2) for two decimal places
unless otherwise specified

CAUTION

Heat from reflow or wave soldering may damage the device. Solder pins individually with heat application not exceeding 300°C for 10 seconds per pin.

FIGURE 54: CASE U MAXIMUM DIMENSIONS

TOP VIEW CASE U1

MFL Series and MHP Series: Screening – Standard, ES or 883
MFLHP Series, FMD270 EMI Filter, and FMD28-461SL EMI Filters:
Screening – Standard or ES
SMFL, SMFLHP, SMHP, and SSP Series; SFCS, and SFME EMI Filters:
Screening – Standard, Class H or K
HUM70 Module and LCM Module: Screening – Standard or ES

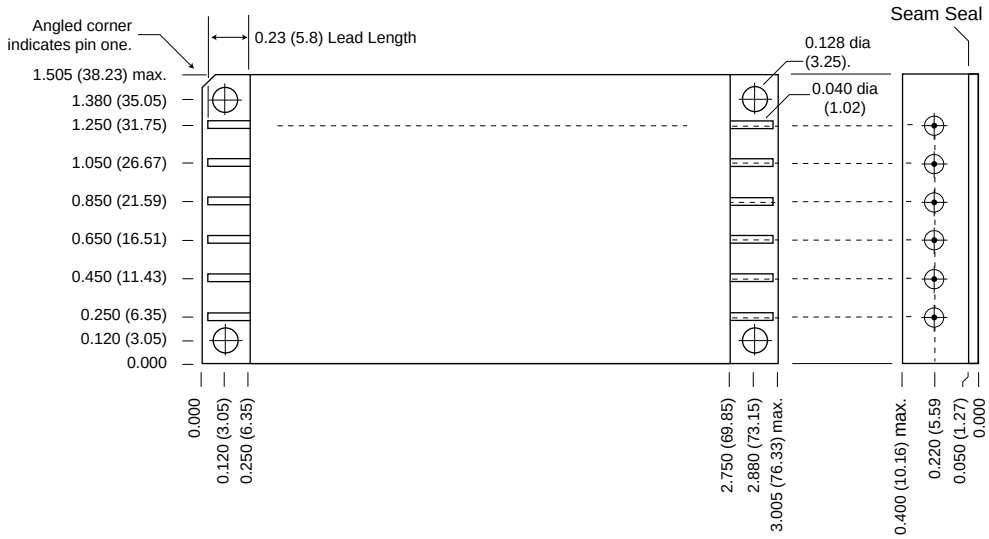

FIGURE 55: CASE U1

SPACE PRODUCTS

ELEMENT EVALUATION TEST PERFORMED (COMPONENT LEVEL)	STANDARD (O)		CLASS H		CLASS K	
	M/S	P	M/S	P	M/S	P
Element Electrical	yes	no	yes	yes	yes	yes
Element Visual	no	no	yes	yes	yes	yes
Internal Visual	no	no	yes	no	yes	no
Temperature Cycling	no	no	no	no	yes	yes
Constant Acceleration	no	no	no	no	yes	yes
Interim Electrical	no	no	no	no	yes	no
Burn-in	no	no	no	no	yes	no
Post Burn-in Electrical	no	no	no	no	yes	no
Steady State Life	no	no	no	no	yes	no
Voltage Conditioning /Aging	no	no	no	no	no	yes
Visual Inspection	no	no	no	no	no	yes
Final Electrical	no	no	yes	yes	yes	yes
Wire Bond Evaluation*	no	no	yes	yes	yes	yes
SEM	no	no	no	no	yes	no
SLAM™/C-SAM: Input capacitors only (Add'l test, not req. by H or K)	no	no	no	yes	no	yes

Notes

M/S	Active components (Microcircuit and Semiconductor Die)
P	Passive components
*	Not applicable to EMI filters that have no wirebonds

Definitions
Element Evaluation: Component testing/screening per MIL-STD-883 as determined by MIL-PRF-38534
SEM: Scanning Electron Microscopy
SLAM™: Scanning Laser Acoustic Microscopy
C-SAM: C - Mode Scanning Acoustic Microscopy

Applies to the following products:

SMFLHP Series
SMFL Series
SMHP Series (O&H only)
SMTR Series
SSP Series
SMHF Series
SMSA Series
SLH Series
SLIM Module
SFME120 EMI Filter
SFME28 EMI Filter
SFCS EMI Filter
SFMC EMI Filter
STF EMI Filter

QA SCREENING
SPACE PRODUCTS

ENVIRONMENTAL SCREENING TEST PERFORMED (END ITEM LEVEL)	STANDARD (O)	CLASS H	CLASS K
Non-destruct bond pull*			
Method 2023	no	no	yes
Pre-cap inspection			
Method 2017, 2032	yes	yes	yes
Temperature cycle			
Method 1010, Cond. C	yes	yes	yes
Constant acceleration			
Method 2001, 3000 g	yes	yes	yes
PIND Test			
Method 2020, Cond. B	no	no	yes
Radiography			
Method 2012	no	no	yes
Pre burn-in test	yes	yes	yes
Burn-in, Method 1015, 125°C			
96 hours	yes	no	no
160 hours	no	yes	no
2 x 160 hour (includes mid BI test)	no	no	yes
Final electrical test			
MIL-PRF-38534, Group A	yes	yes	yes
Hermeticity test			
Fine Leak,			
Method 1014, Cond. A	yes	yes	yes
Gross Leak,			
Method 1014, Cond. C	yes	yes	yes
Final visual inspection			
Method 2009	yes	yes	yes

Test methods are referenced to MIL-STD-883 as determined by MIL-PRF-38534.

Note
* Not applicable to EMI filters that have no wirebonds.

Applies to the following products:

SMFLHP Series
SMFL Series
SMHP Series (O&H only)
SMTR Series
SSP Series
SMHF Series
SMSA Series
SLH Series
SLIM Module
SFME120 EMI Filter
SFME28 EMI Filter
SFCS EMI Filter
SFMC EMI Filter
STF EMI Filter