SLIM SERIES
50 - 250 WATT

LINE INTERFACE MODULE
40 TO 80 VDC INPUT
50 OR 250 WATT OUTPUT

FEATURES

- **Fully qualified to Class H or K**
- **Radiation hardened**
- **-55°C to +125°C operating temp**
- **40 to 80 VDC input**
- Fixed frequency, 550 kHz typical
- Topology – Non-isolated buck
- 35 VDC input with lowered efficiency
- Up to 90 V for up to 120 ms transient protection
- 35 VDC output
- Inhibit function
- Power readiness function
- Load fault/short circuit protection
- Up to 94% efficiency, 90 W/in^3

SLIM5050

Size (max.):	Non flanged 1.460 x 1.130 x 0.330 (37.08 x 28.70 x 8.38 mm) Flanged 2.005 x 1.130 x 0.330 (50.93 x 28.70 x 8.38 mm) See Section B8, cases E1 and G1, for dimensions.
Weight:	30 grams typical
Screening:	Standard, Class H, or Class K (MIL-PRF-38534) Radiation hardness levels O, L, and R Section C2 for screening and radiation hardness options, see Section A5 for ordering information.

MODEL
THROUGHPUT POWER

MODEL	WATTS
SLIM5050™	50
SLIM50250™	250

DESCRIPTION

The SLIM50™ Series of line interface modules for space provide a nominal output voltage of 35 VDC from input voltages of 45 to 75 VDC with efficiencies of 94% or higher. Sustained operation at voltages as high at 80 or as low as 35 are possible with reduced efficiency. The SLIM5050 module delivers 50 watts of output power over the full military temperature range of –55°C to +125°C and fits in a package of 1.460 x 1.130 x 0.330 inches (37.08 x 28.70 x 8.38 mm) maximum, resulting in a power density of over 91 watts/in^3.

SCREENING AND REPORTS

The SLIM5050 module offers three screening options – Standard, Class H, or Class K – and three levels of radiation hardness. 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.

CONVERTER DESIGN

The SLIM5050 modules are non-isolated converters operating at a frequency between 500 kHz and 600 kHz. The control circuitry uses average current mode control to achieve a wide bandwidth with little or no overshoot over a wide range of loads. These converters are specifically designed to accommodate loads with a negative impedance such as those presented by Interpoint DC/DC converters with a constant power consumption.

PARALLEL OPERATION: UP TO 10 MODULES

Up to 10 SLIM Series™ modules can be paralleled for increased power. Current sharing is typically within 2%.

OVERLOAD AND CURRENT LIMIT

Current overload protection is accomplished by monitoring the output current resulting in a constant current mode when the load exceeds approximately 125% of rated load at full output voltage. When the overload condition forces the output voltage to drop the maximum current delivered falls from approximately 1.9 amps to less than 1.5 amps. This feature keeps the short circuit dissipation low and forces the output voltage to collapse rapidly thereby preventing operation in an abnormal condition. Combined with the "Power Ready" signal (see below), this foldback of the output current prevents power cycling of the downstream converters.

POWER READY SIGNAL

To avoid high current surges during power up, the interface module has a signal intended to connect to the inhibit lines of Interpoint converters to keep these converters turned off until the interface module's output exceeds approximately 13 volts thereby assuring that, in an overload condition, the converters powered by the interface module will shut off before the power ready signal turns them off. This feature prevents repeated limit cycling in an overload condition.

INHIBIT

The SLIM Series modules have an open collector TTL compatible inhibit terminal that can be used to disable power conversion, resulting in a very low quiescent input current and no generation of switching noise.

Future offerings are planned for the SLIM Series of modules. Please contact your Interpoint representative listed in Section A5, for more details.

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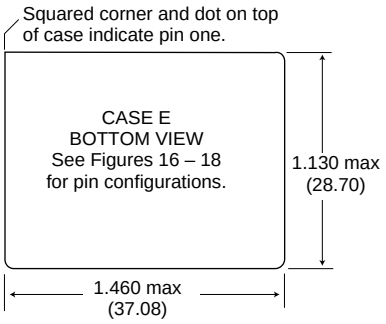
CASES



Materials

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

Case dimensions in inches (mm)

Tolerance ±0.005 (0.13) for three decimal places
±0.01 (0.3) 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 15: CASE E MAXIMUM DIMENSIONS

BOTTOM VIEW CASE E1

MHF+ Series Single and Dual: Screening – Standard, ES, or 883
MHF Series and LIM5050 Module: Screening – Standard or ES
SMHF Series Single and Dual and SLIM5050 Module:
Screening – Space Standard, H, or K
HR120 Series: No screening options

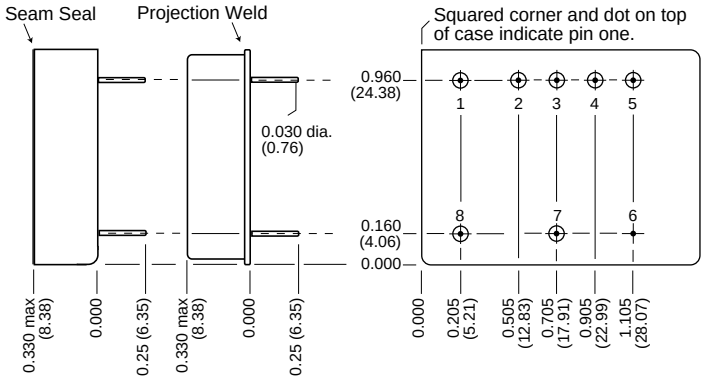


FIGURE 16: CASE E1

Note: Although every effort has been made to render the case drawings at actual size, variations in the printing process may cause some distortion. Please refer to the numerical dimensions for accuracy.

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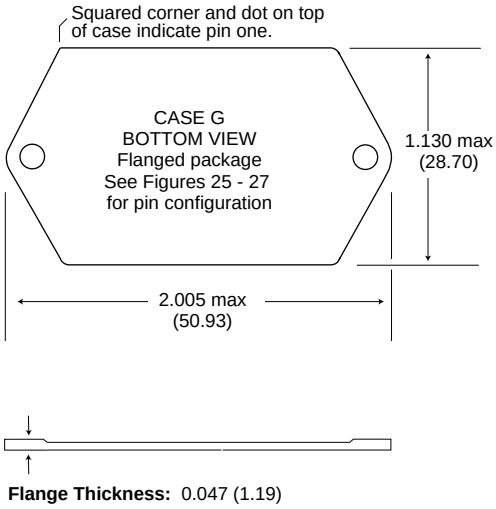

Flange Thickness: 0.047 (1.19)

Materials

Header Cold Rolled Steel/Nickel/Gold
Cover MHF+ Series and FMH Filter
Kovar/Nickel
SMHF
Cold Rolled Steel/Nickel
Pins #52 alloy (all cases)
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 24: CASE G MAXIMUM DIMENSIONS

BOTTOM VIEW CASE G1

Flanged cases: Designator required in Case Option position of model number
MHF+ Series Single and Dual, LIM5050 Module: Screening – Standard, ES, or 883
SMHF Series, SLIM5050 Module: Screening – Space Standard, H, or K

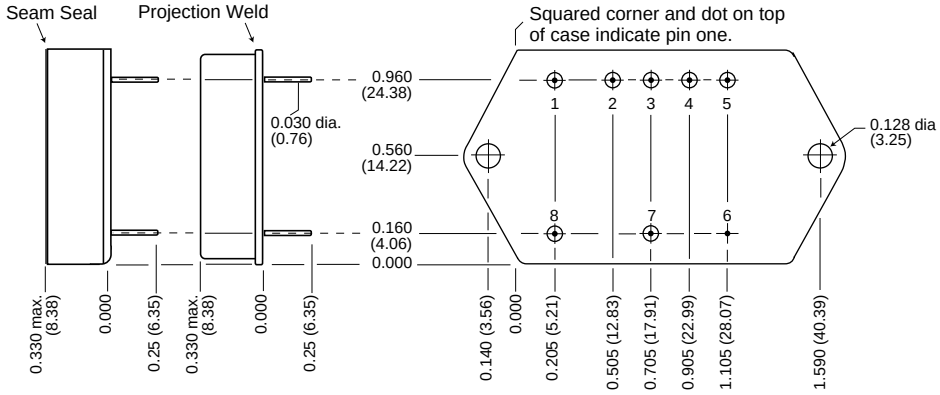

FIGURE 25: CASE G1

Note: Although every effort has been made to render the case drawings at actual size, variations in the printing process may cause some distortion. Please refer to the numerical dimensions for accuracy.

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

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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

RADIATION HARDNESS LEVELS
FOR DC/DC CONVERTERS AND LINE INPUT MODULES[1]

PRODUCT LEVEL AVAILABILITY	ENVIRONMENTAL SCREENING LEVELS		
RADIATION HARDNESS LEVELS	STANDARD (O)	CLASS H	CLASS K
O: Standard, no radiation guarantee For system evaluation, electrically and mechanically comparable to H and K level.	OO	HO	Not available
L: Radiation hardened – Tested lots Up to 50 k Rads (Si) total dose No SEU guarantee	Not available	HL	KL
R: Radiation hardened – Tested lots Up to 100 k Rads (Si) total dose SEU guarantee up to 40 MeV	Not available	HR	KR

L and R are referenced to MIL-PRF-38534, appendix G, Radiation Hardness Assurance (RHA) levels.

Note
1. Interpoint's **EMI filters** are designed exclusively with passive components providing maximum tolerance for space environment requirements.

Applies to the following products:

SMFLHP Series (levels O and L only)
SMFL Series (levels O and L only)
SMTR Series
SSP Series
SMHF Series
SMSA Series
SLH Series
SLIM Series Modules

REPORTS: INCLUDED WITH PURCHASE OF PRODUCT HL, KL, HR, or KR
1. Radiation Susceptibility Analysis
2. Electrical/Thermal Stress Analysis and Derating Report
3. MTBF Report
4. FMEA Report

OO option: Select reports available as separate purchases.