FL75L07

Filter Module

0~75Vdc input, 7A Current Rating

The FL75L07 filter module, from a world leader in power systems technology and manufacturing – Delta Electronics, Inc., is designed to reduce the conducted common-mode and differential-mode noise on input or output lines of high-frequency switching power supplies and has a maximum current rating of 7A. It has the industry standard footprint and pin-out. With creative design technology and optimization of component placement, Delta FL75L07 filter module possesses outstanding electrical and thermal performance, as well as extremely high reliability under highly stressful operating conditions.

FEATURES

Electrical

- RoHS Compliant
- Optimized for use with high frequency board mounted DC/DC converters
- Printed-circuit board mountable

Mechanical

Size:

- Small size:
- SMD: 25.4mm x 25.4mm x 12.5mm (1.0” x 1.0” x 0.49”)
- Through hole: 25.4mm x 25.4mm x 12.7mm (1.0” x 1.0” x 0.50”)
- Industry standard footprint and pin-out

Safety & Reliability

- ISO 9001, TL 9000, ISO 14001, QS 9000, OHSAS 18001 certified manufacturing facility
- UL/cUL 60950 (US & Canada) Recognized, VDE 0805 (IEC60950) Licensed

OPTIONS

- Surface mount or through hole pins

APPLICATIONS

- Common-mode and differential-mode filtering of power supply dc input and output line
- Computer application
- Communications equipment

Specifications

GENERAL SPECIFICATIONS			OUTPUT SPECIFICATIONS		
Input voltage, operation	Typical	0~75V	Common-mode Insertion Loss	50Ω circuit, 500 kHz (Typ)	40dB
Input voltage, continuous	Typical	0~100V	Differential-mode Insertion Loss	50Ω circuit, 500 kHz (Typ)	70dB
Operating temperature	Typical	-40℃ ~ 85℃			
Storage temperature	Typical	-55℃ ~ 125℃			
I/O to Ground Isolation	Maximum	1500Vrms			
Size(SMD)	(1.0". x 1.0"x 0.49").	25.4 x 25.4 x 12.5 mm			
Size(Through hole)	(1.0". x 1.0"x 0.50")	25.4 x 25.4 x 12.7 mm			

Electrical Characteristics Curves

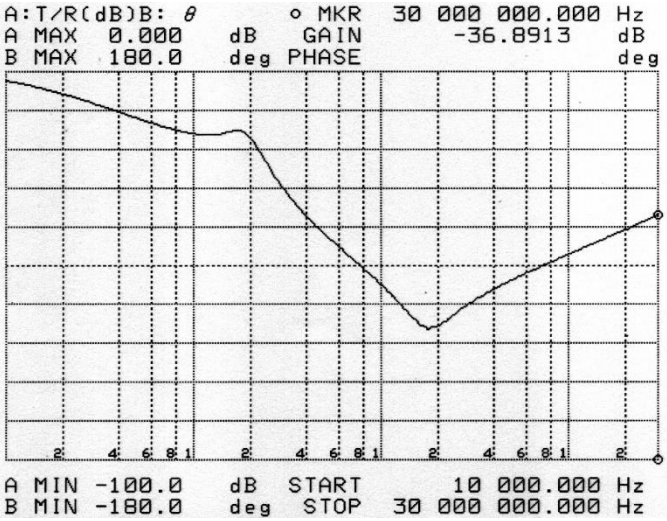


Figure 1: *Typical common-mode insertion loss in a 50Ω circuit*

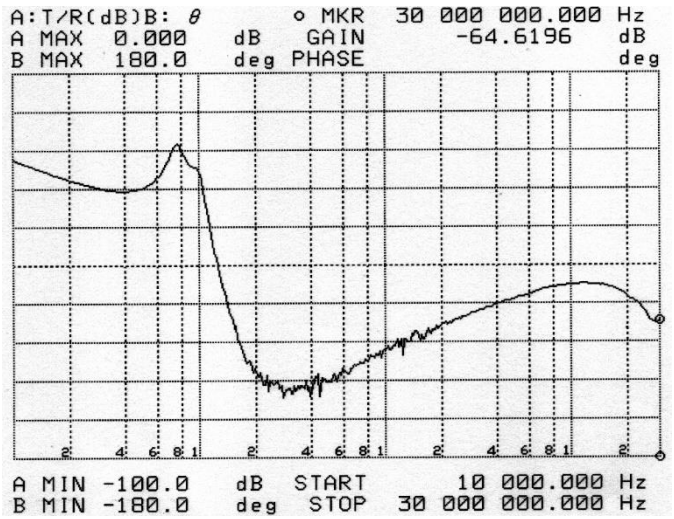


Figure 2: *Typical differential-mode insertion loss in a 50Ω circuit*

Internal Schematics

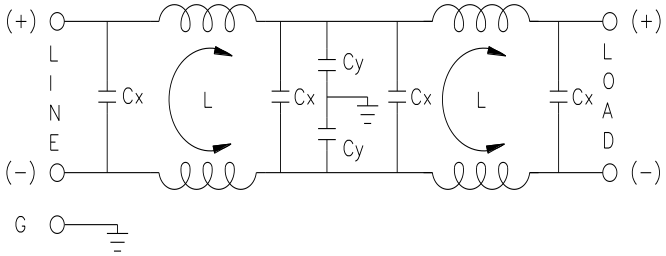


Figure 3: *Internal schematics*

THERMAL CONSIDERATIONS

Thermal management is an important part of the system design. To ensure proper, reliable operation, sufficient cooling of the power module is needed over the entire temperature range of the module. Convection cooling is usually the dominant mode of heat transfer.

Hence, the choice of equipment to characterize the thermal performance of the power module is a wind tunnel.

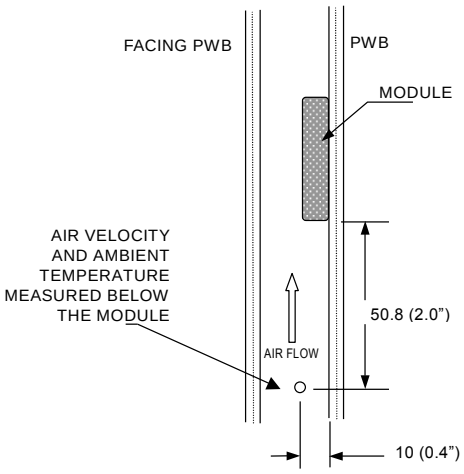
Thermal Testing Setup

Delta's filter modules are characterized in heated vertical wind tunnels that simulate the thermal environments encountered in most electronics equipment. This type of equipment commonly uses vertically mounted circuit cards in cabinet racks in which the power modules are mounted.

The following figure shows the wind tunnel characterization setup. The filter module is mounted on a test PWB and is vertically positioned within the wind tunnel. The space between the neighboring PWB and the top of the power module is 6.35mm (0.25").

Thermal Derating

Heat can be removed by increasing airflow over the module. Figure 4 shows maximum output is a function of ambient temperature and airflow rate. To enhance system reliability, the power module should always be operated below the maximum operating temperature. If the temperature exceeds the maximum module temperature, reliability of the unit may be affected.



Note: Wind Tunnel Test Setup Figure Dimensions are in millimeters and (Inches)

Figure 4: *Wind tunnel test setup*

Thermal Curves

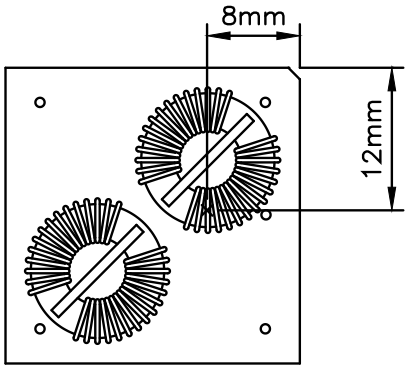


Figure 5: *Temperature measurement location*

The allowed maximum hot spot temperature is defined at 115℃

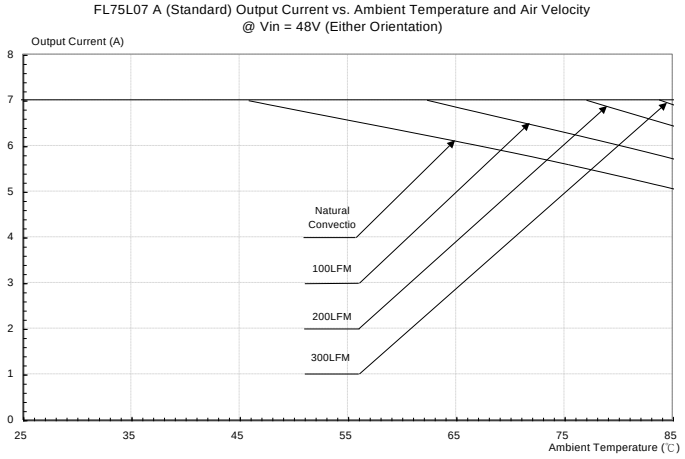
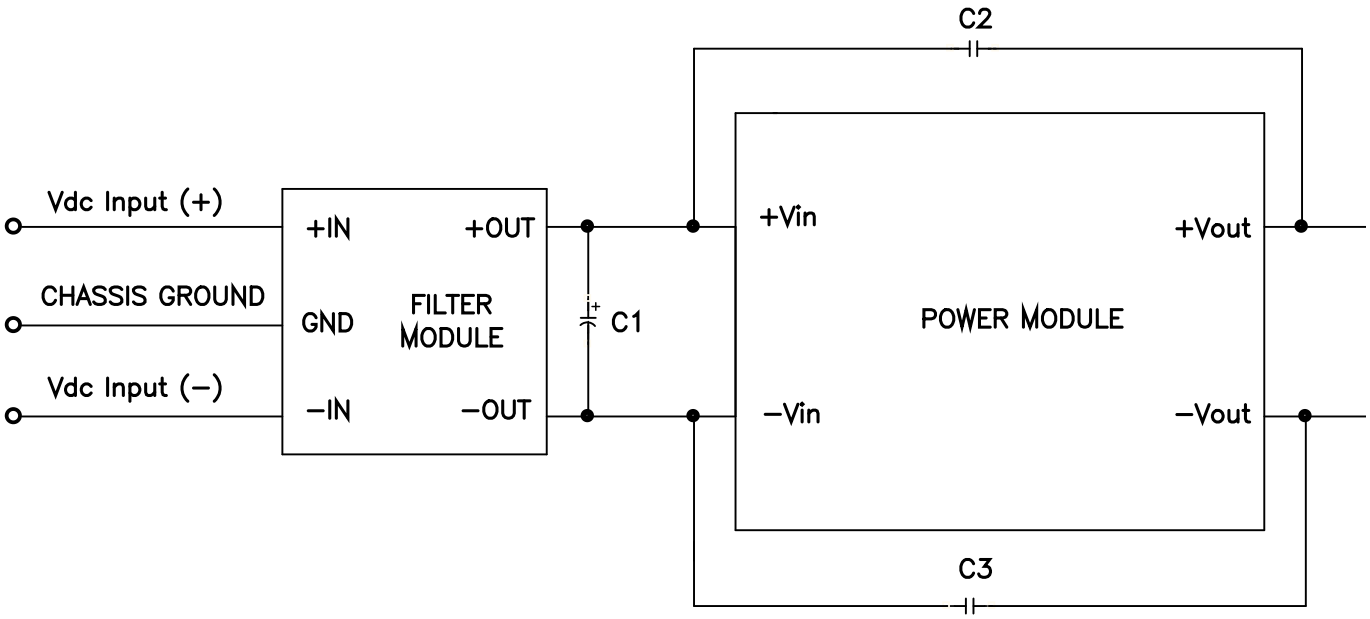
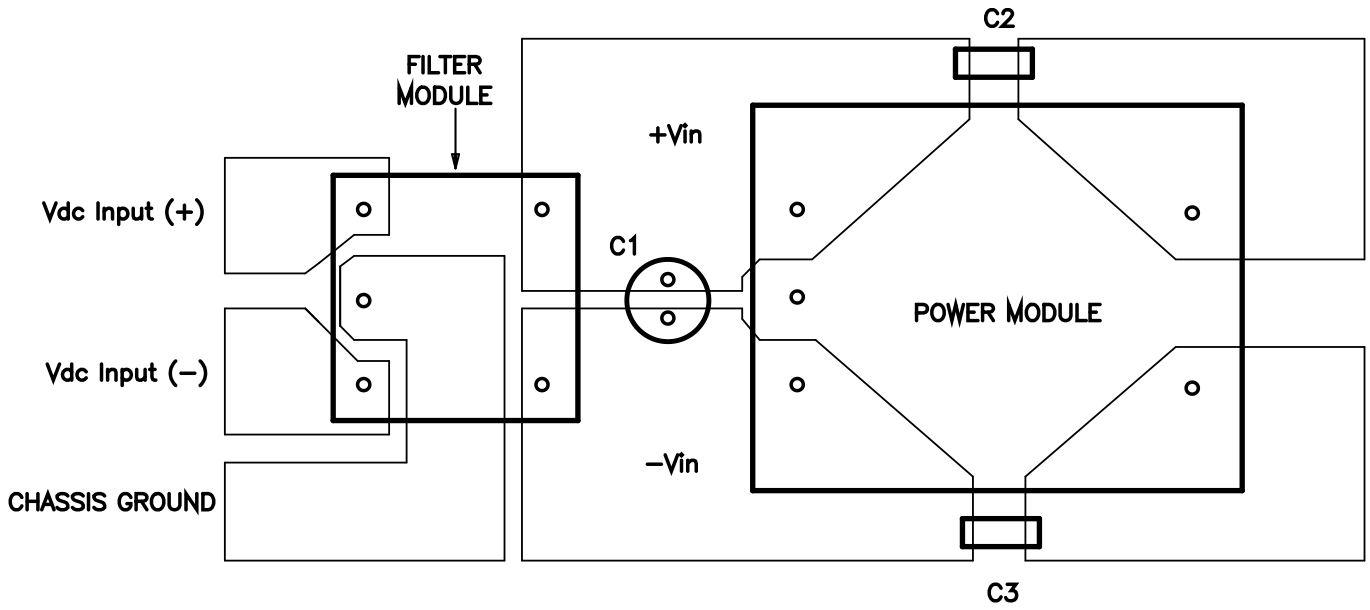


Figure 6: *Output Current vs. Ambient Temperature and Air Velocity @ Vin = 48V (Either Orientation)*



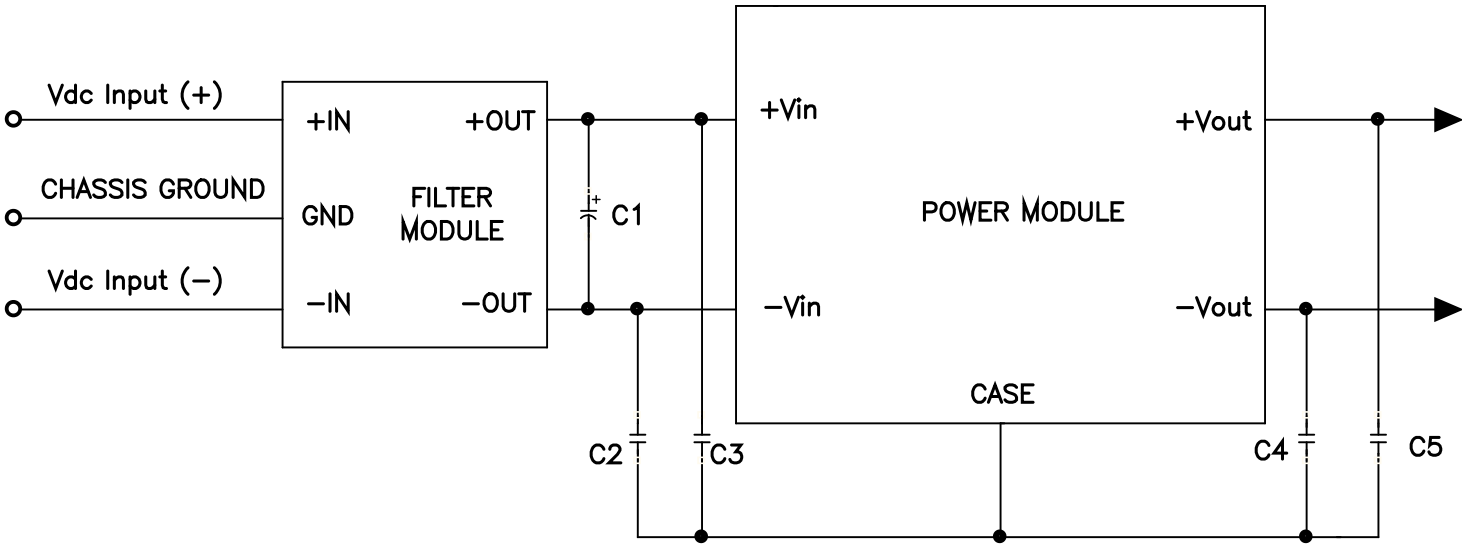
Note: C2 & C3 can be 0.01μF to 0.1μF. Select the voltage rating to meet input-to-output isolation requirements. C1 should be the recommended value suggested in the power module data sheet.

Figure 7. *Recommended schematic when used as the input filter to a high-frequency with open-frame dc-to-dc converter*



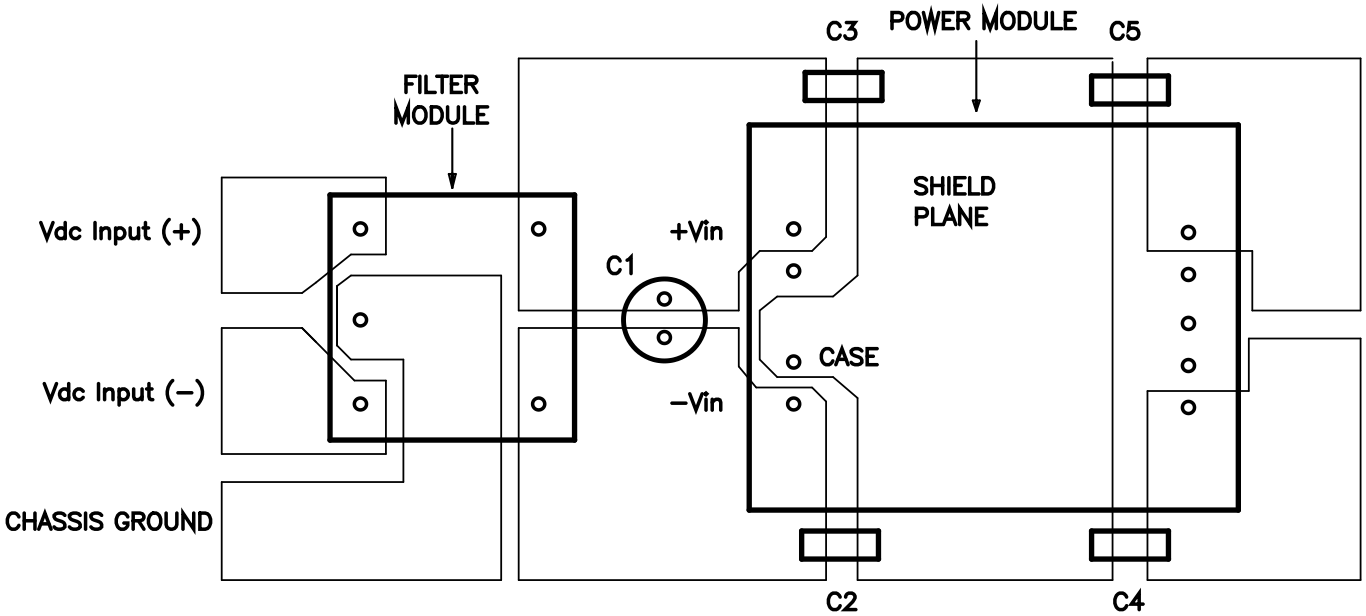
Note: Avoid routing signals or planes under the power module or the filter module. Please ensure all connections are low impedance.

Figure 8. *Recommended layout when used as the input filter to a high-frequency with open-frame dc-to-dc converter*



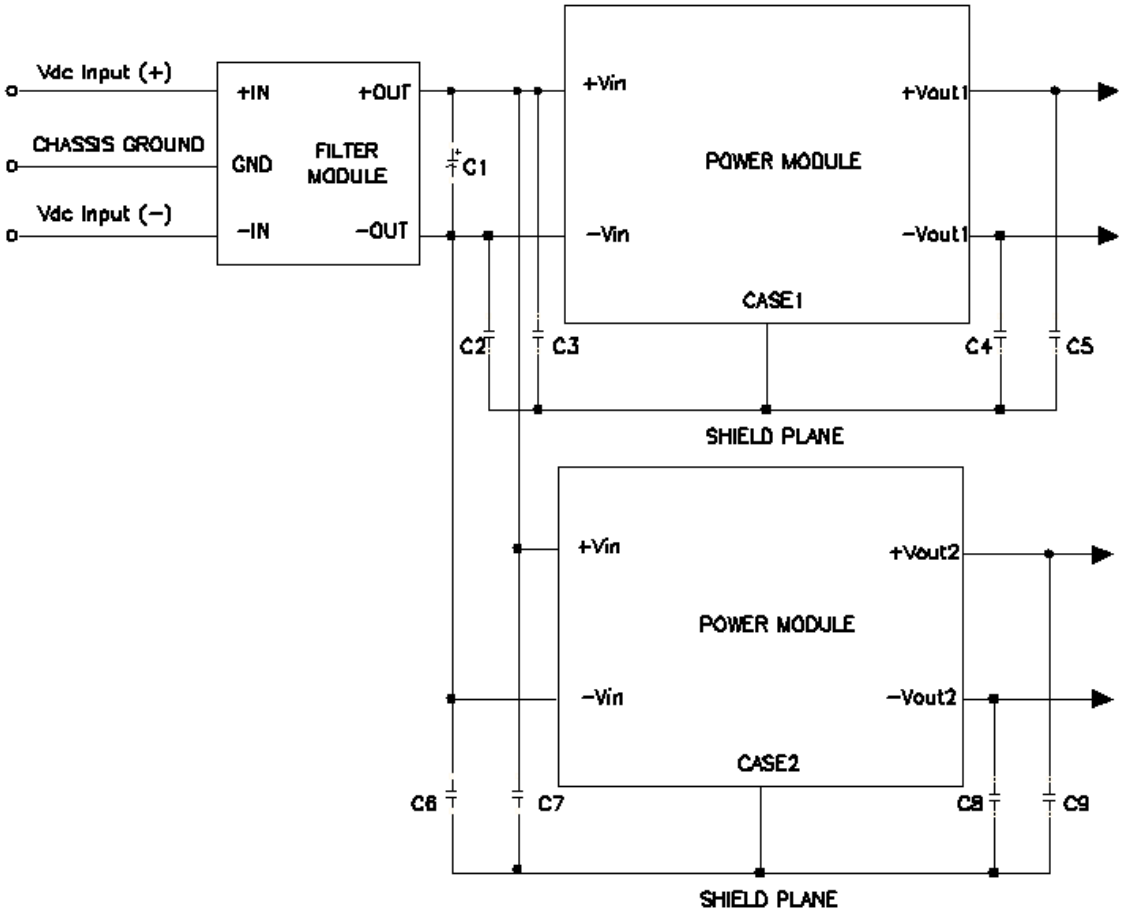
Note: C2 through C5 can be 0.01μF to 0.1μF. Select the voltage rating to meet input-to-output isolation requirements. C1 should be the recommended value suggested in the power module data sheet.

Figure 9. *Recommended schematic when used as the input filter to a high-frequency with metal-cased dc-to-dc converter*



Note: Avoid routing signals or planes under the power module or the filter module. Please ensure all connections are low impedance.

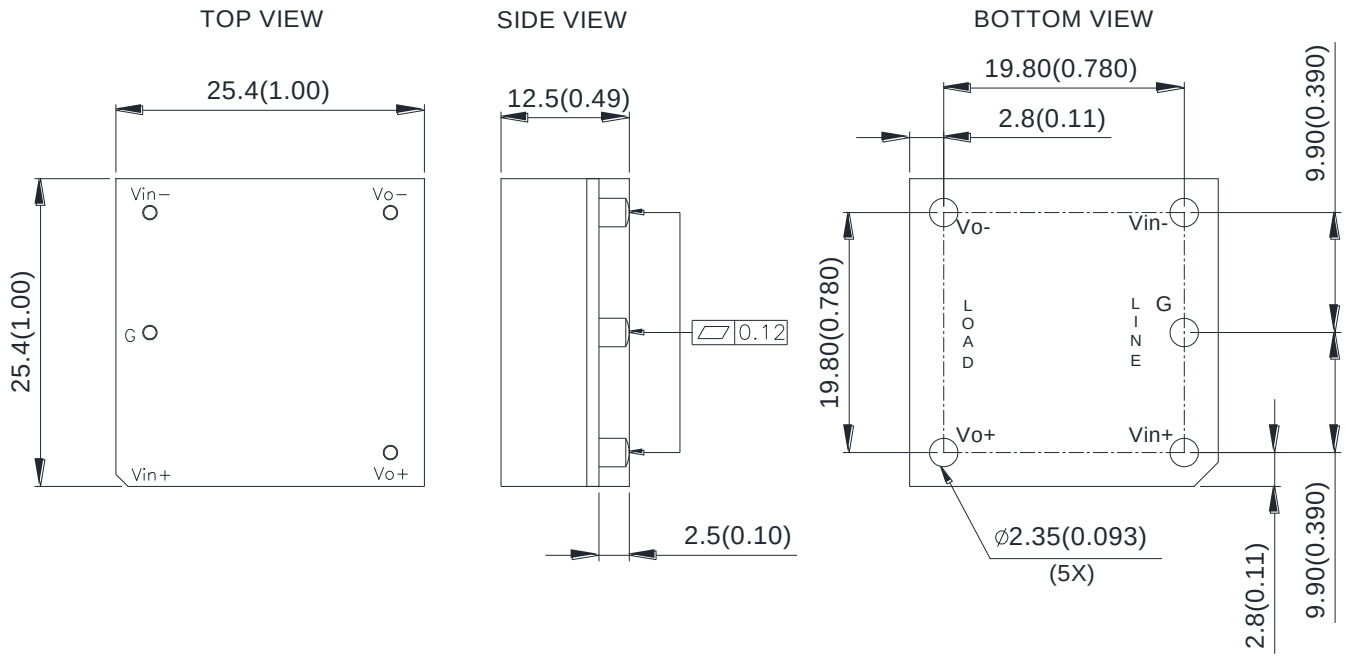
Figure10. *Recommended layout when used as the input filter to a high-frequency with metal-cased dc-to-dc converter*



Note: : C2 through C5 and C6 through C9 can be 0.01μF to o.1μF. Select the voltage rating to meet input-to-output isolation requirements. C1 should be the recommended value suggested in the power module datasheet.

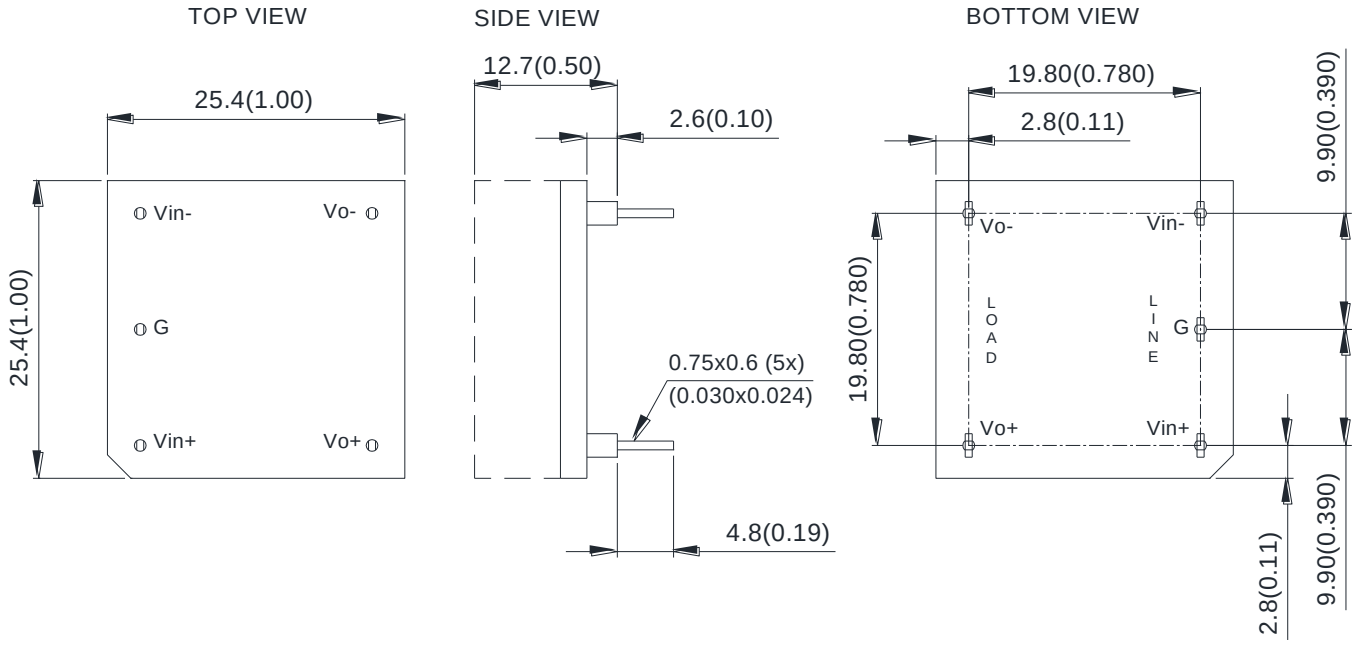
Figure 11. *Recommended schematic of filter module with two power modules (metal -cased)*

MECHANICAL DRAWING (SMD)



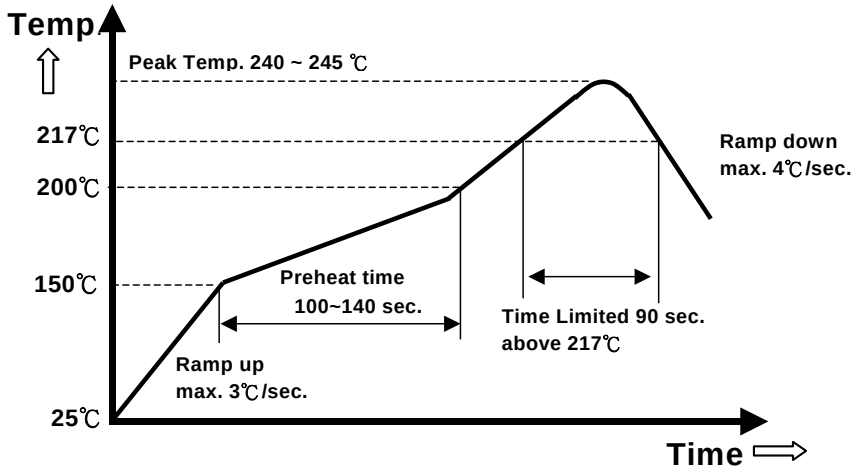
Dimensions are in millimeter
Tolerances : x.x ± 0.5 mm (0.02 in), x.xx ± 0.25 mm (0.010 in)

MECHANICAL DRAWING (Through hole)



Dimensions are in millimeter
Tolerances : x.x ± 0.5 mm (0.02 in), x.xx ± 0.25 mm (0.010 in)

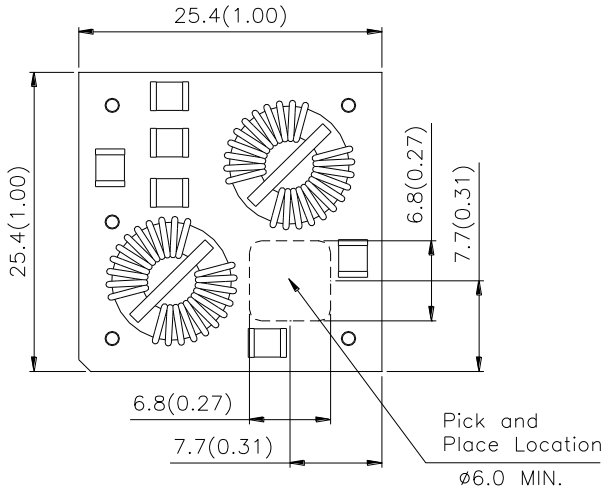
Lead Free (SAC) Process recommend Temp. Profile



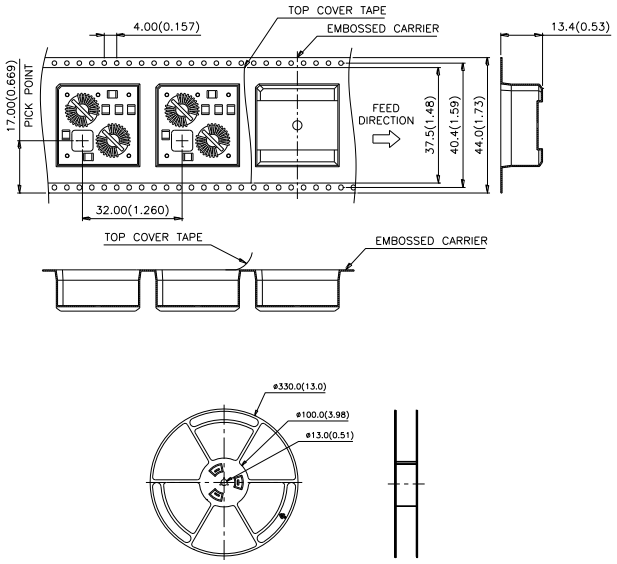
Note: The temperature refers to the pin of filter 7A, measured on the pin 1 (+Vout) joint.

MANUFACTURE CONSIDERATION

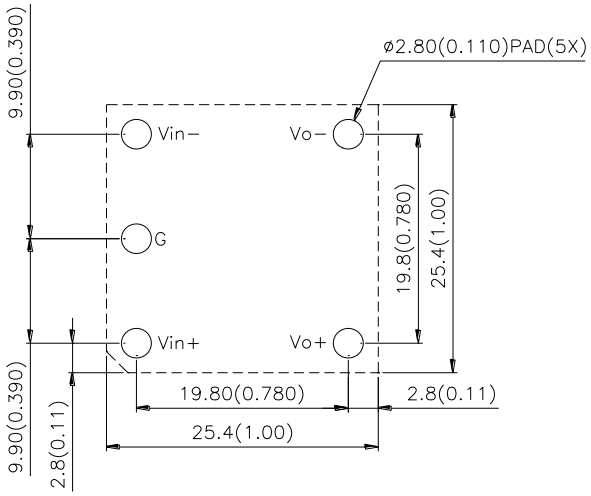
PICK AND PLACE LOCATION (SMD)



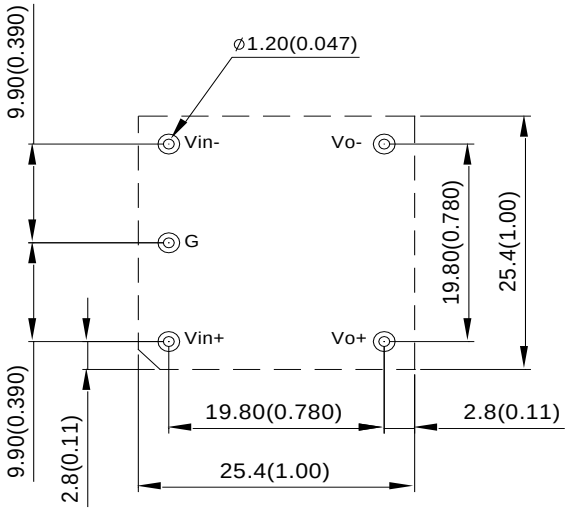
SURFACE-MOUNT TAPE & REEL



RECOMMENDED PAD PATTERN (SMD)



RECOMMENDED PAD PATTERN (Through Hole)



Note: Inside this filter module, the components have no voltage polarity. Hence, the input positive (Vin+) and input negative (Vin-) labels could be swapped for the convenience of layout and matching with power module input connected to the filter module, just remember to swap the output labels accordingly as well. Please refer to Figures 8 and 10 for how it is applied.

PART NUMBERING SYSTEM

FL	75	L	07		A
Product Family	**Input Voltage**	**Product Series**	**Output Current**		**Option Code**
FL - Filter	0 ~ 75V	L - standard	7A		A - Standard, SMD pins (7A only) B - Standard, through hole pins

MODEL LIST

Module Name	Input Voltage (max.)	Current Rating (max.)	Size (metric)	Size (English unit)
FL75L05 A	75V	5A	25.4 x 25.4 x 10.2 mm	1.0 in. x 1.0 in. x 0.4 in.
FL75L07 A	75V	7A	25.4 x 25.4 x 12.5 mm	1.0 in. x 1.0 in. x 0.49 in
FL75L10 A	75V	10A	50.8 x 27.9 x 12.5 mm	2.0 in. x 1.1 in. x 0.5 in.
FL75L20 A	75V	20A	50.8 x 40.6 x 12.7 mm	2.0 in. x 1.6 in. x 0.5 in.

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