DSF & FSO Series

XP Power

30W-500W

DC-DC CONVERTER

Developed specifically for the defense and avionics market, the DSF100 & DSF200LV are single module EMC filter & surge protectors, whereas the DSF500 surge protector & FSO461 EMC filter must be used in combination to provide the same level of protection. These products offer a high end specification while offering the short lead times and cost benefits of COTS components.

Designed to provide active surge protection and EMC filtering for the conducted emissions of DC-DC converters, they also protect against the conducted susceptibility specified in MIL-STD-461G and for surges and spikes as specified in MIL-STD-1275A-E and MIL-STD-704A-F.

Features

- Up to 500W baseplate cooled
- Up to 28A output current
- Active surge protection & EMC filter (DSF100 & DSF200LV)
- Active surge protection (DSF500) & EMC filter (FSO461)
- Output voltage tracks input voltage & clamps <36VDC
- Input range 10V to 33VDC (DSF), 0 to 100VDC (FSO)
- Input transient ±250V for 70µs 2J
- Overtemperature protection
- Remote inhibit
- -40°C to +100°C operating temperature (baseplate)
- 3 Year Warranty

Applications

Healthcare

Home Healthcare

Medical Diagnostics

Dimensions

0.96 x 0.58 x 0.43" (24.4 x 14.7 x 10.8mm)

Models & Ratings

Model Number	Input Voltage	Output Voltage	Output Current (Max)	Efficiency
DSF100	10-33VDC	<36VDC	3.7 A	98%
DSF200 LV	10-18VDC	<36VDC	3.0 A	92%
	18-33VDC	<36VDC	7.0 A	93%
DSF500(3)	10-33VDC	<36VDC	28.0 A(1)	98%
FSO461(2)	0-100VDC	Vin - Iin x 0.013	28.0 A	99%

Notes:

1. For input voltages above 18V, maximum load is 500W.
2. FSO461 has filter circuitry only. To be used with DSF500 for conducted immunity compliance.
3. DSF500 has surge protection only. To meet stated EMC performance it must be used with FSO461.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	See models and ratings				
Input Transient		±250		V	For 70µS 2 J per MIL-STD-1275A-E
		100		V	For 50ms 0.5Ω per MIL-STD-1275A-E
Input Reverse Voltage Protection	Continuous				
Fuse Protection	None				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	Tracks input voltage & clamps <36VDC				
Output Power	See models and ratings table				
Output Module Inhibit (INH)	Open collector transistor rated 70VDC with 5mA sink current referenced to -Vin/-Vout. When the output current is: >4A: DSF100, >7.77A : DSF200LV, >28A: DSF500 then the INH pin is pulled logic low. This can be used to inhibit downstream DC-DC converters and reduce the load on the filter. When the output current is lower than above the INH pin is logic high.				
Overtemperature Protection	Shuts down output by pulling disable pin low when baseplate >100°C, typical hysteresis 5°C auto recovery				

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency	See efficiency table				
Isolation Voltage		500		VDC	Input & output to case
Series Resistance		0.07		Ω	DSF100
		0.26			DSF200LV
		0.018			DSF500
		0.013			FS0461
Disabled Input Current		25		mA	
Disable (DIS)	On = open circuit or up to 40V				
	Off = short circuit or <1V				
No Load Current		75		mA	
Package Style	Photo-etched nickel-silver case & aluminium cooling baseplate				
Power Density			37.08	Wcm^3	
Mean Time Between Failure		2496		khrs	MIL-HDBK-217F, 40°C GB
		2218			
		573			
		8737			

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+100	°C	Baseplate
Storage Temperature	-55		+100	°C	
Salt Atmosphere	MIL-STD-810G method 509.4				
Humidity	MIL-STD-810G 507.4				
Altitude	MIL-STD-810G 500.4				
Shock	MIL-STD-810G 516.5 function test for ground equipment 40g in 3 axes				
Vibration	MIL-STD-810G method 514.5C-17. Minimum integrity test for military equipment (1 Hr/axis, 3 axes). Vibration 5-33 Hz, 0.5mm displacement				

Safety Approvals

Safety Agency	Standard	Notes & Conditions
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

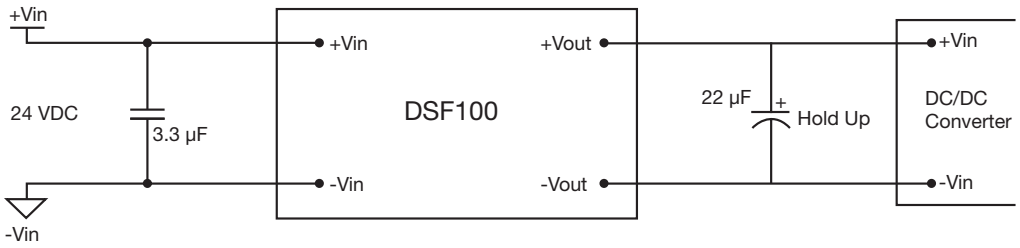
EMC

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Immunity	MIL-STD-1275A-E, MIL-STD-461E/F/G (CS101, CS114, CS115 & CS116) MIL-STD-704A, DEF-STAN 61-5 part 6 issue 5 Contact Sales when DEF-STAN-61-5 part 6 issue 6 is required			
EMC Performance	DSF100 & DSF200LV: MIL-STD 461E/F CE102 & DEF STAN 59-411 DCE01/DCE02 is achieved with external components. DSF500: Compliance to MIL-STD 461E/F/G CE102 & DEF STAN 59-411 DCE01/DCE02 is achieved when used in conjuction with FS0461.			

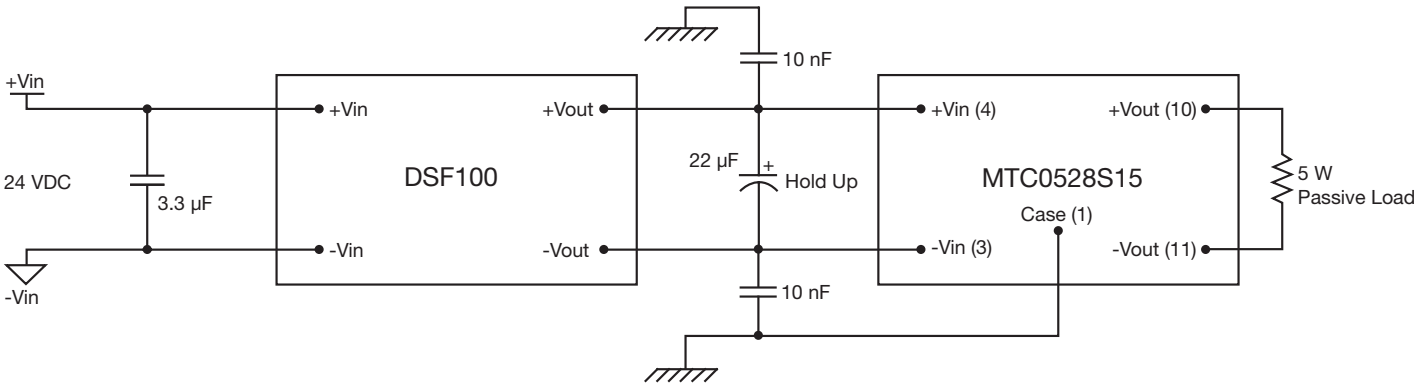
Application Notes

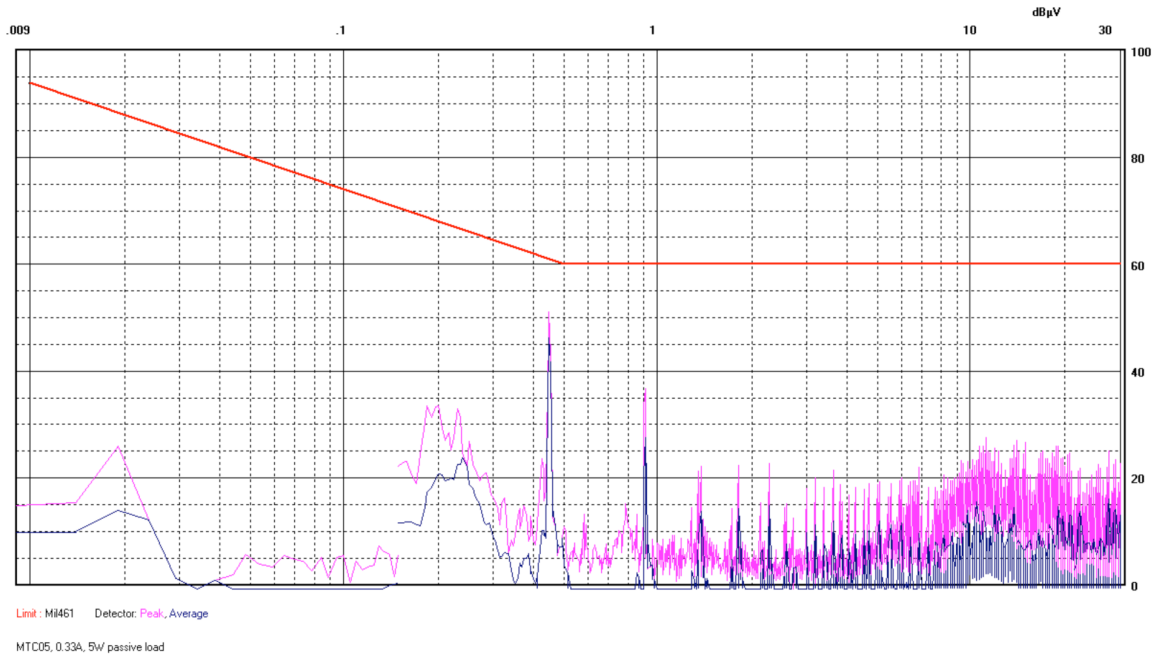
MIL-STD-461 CE102

DSF100 Connection Diagram



DSF100 & MTC0528S15

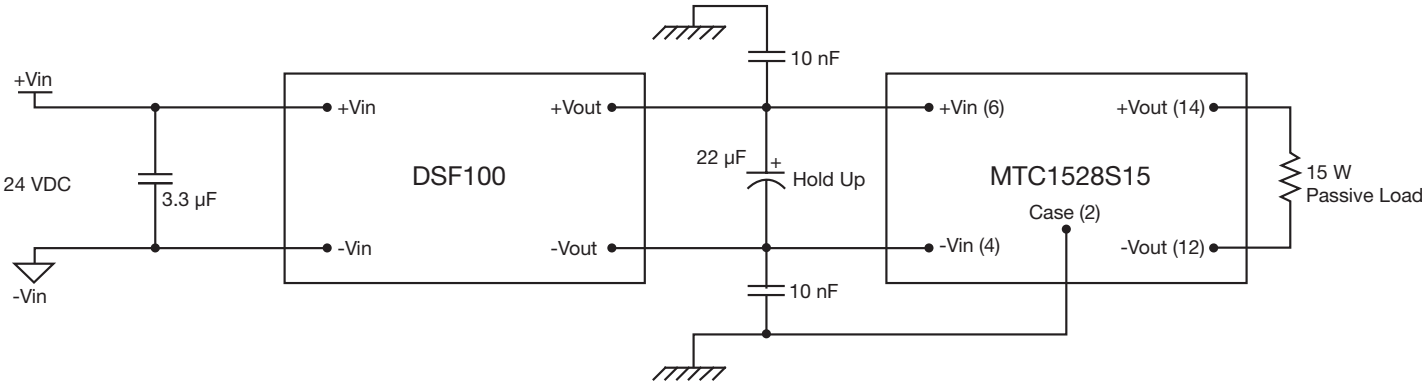


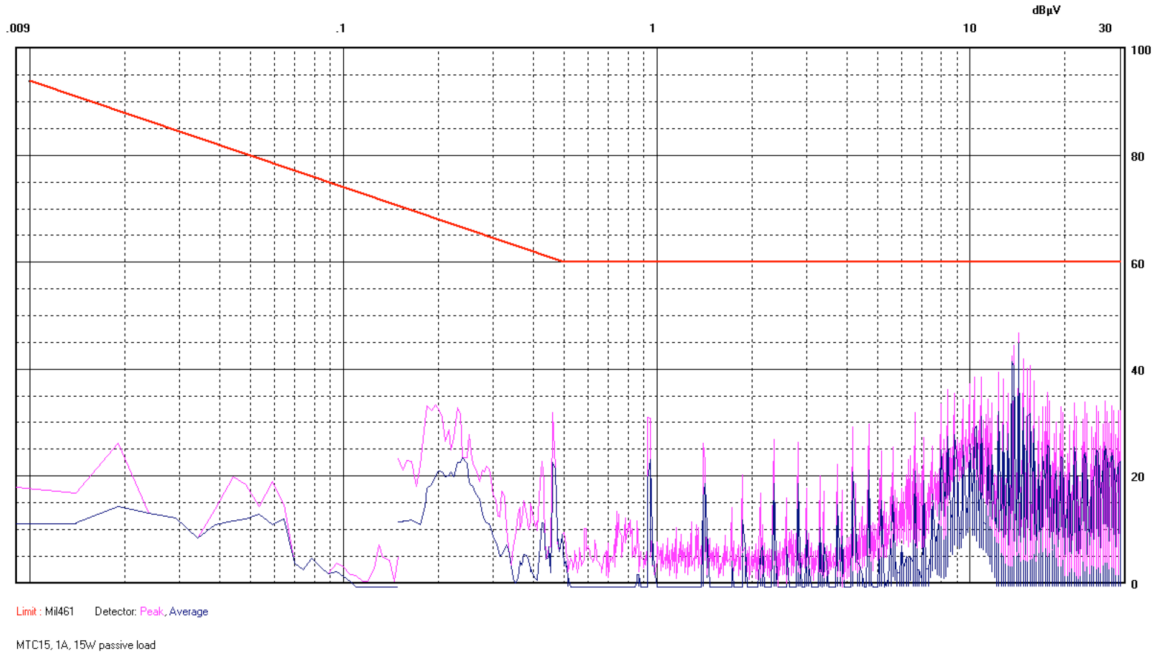


Application Notes

MIL-STD-461 CE102

DSF100 & MTC1528S15

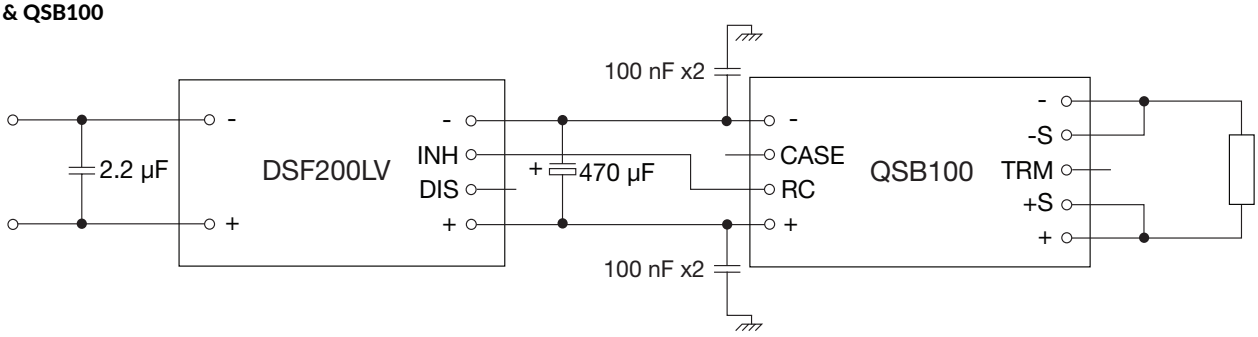


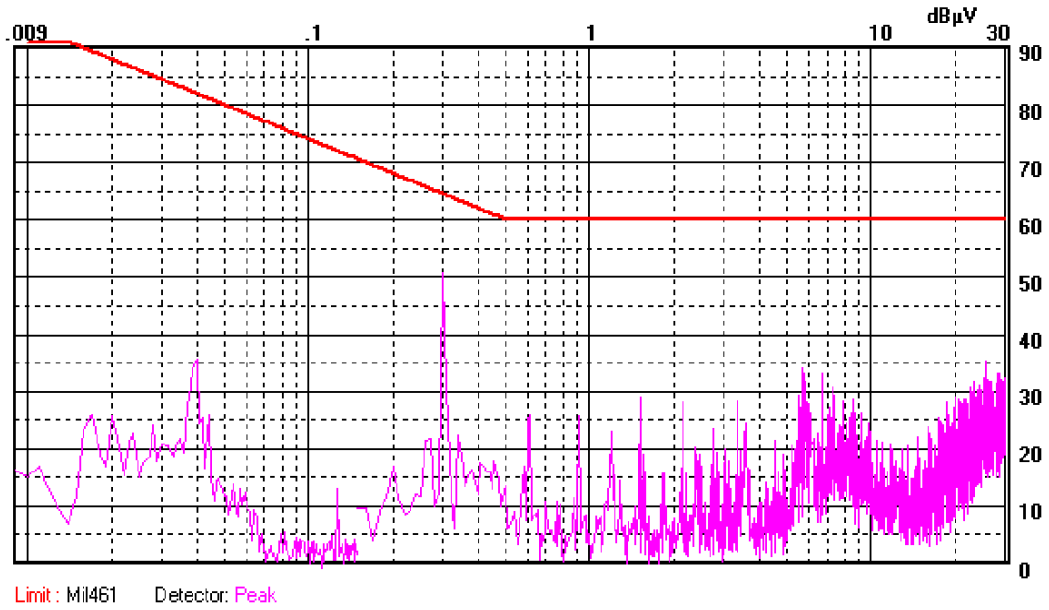


Application Notes

MIL-STD-461 CE102

DSF200 & QSB100



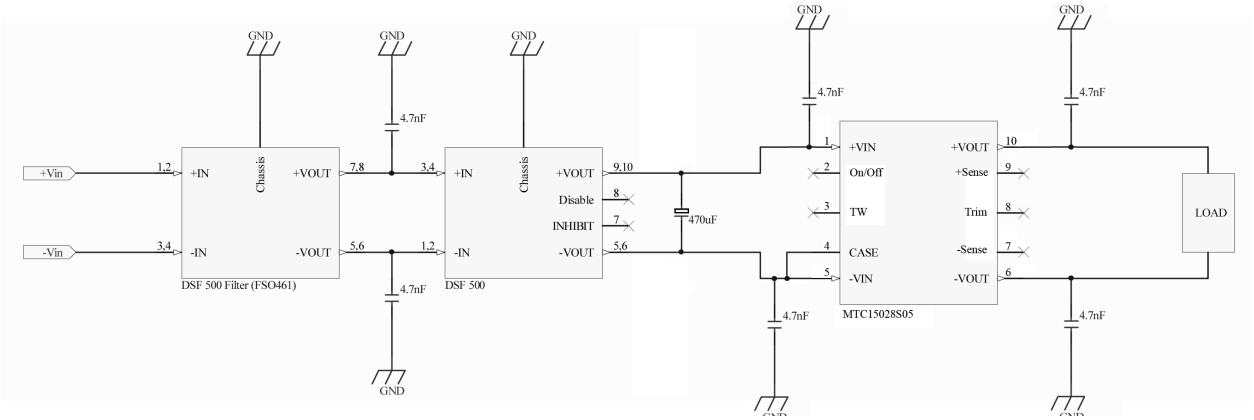


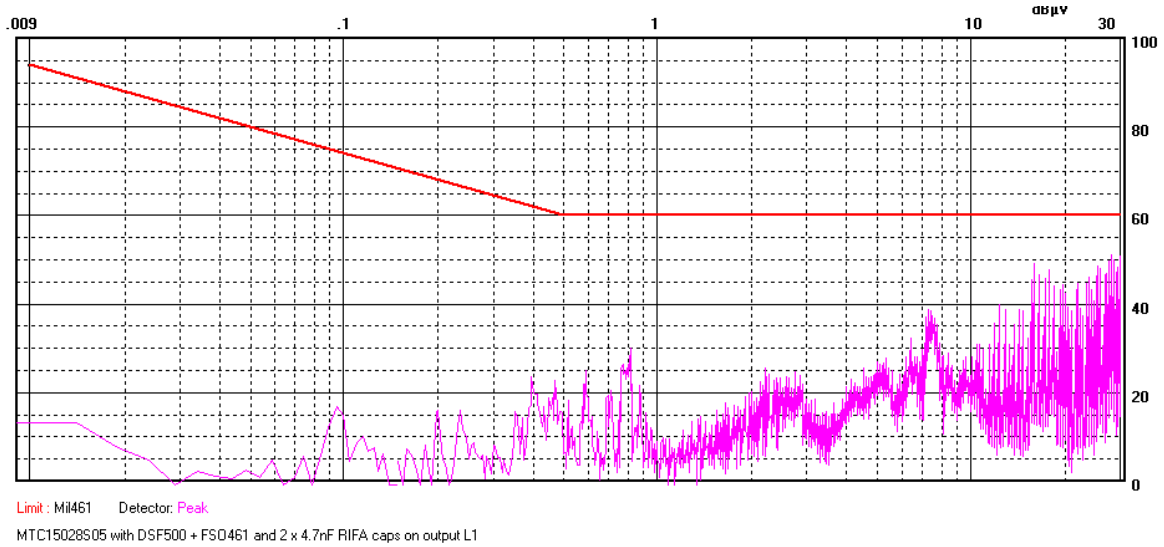
DSF 200 with 12v codelmodule

Application Notes

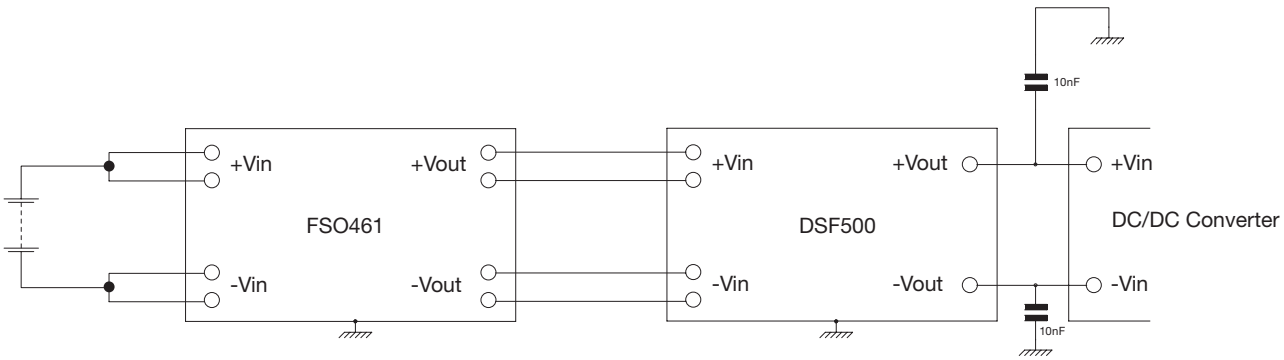
MIL-STD-461 CE102 filter circuits

DSF500 + FSO461 & MTC150



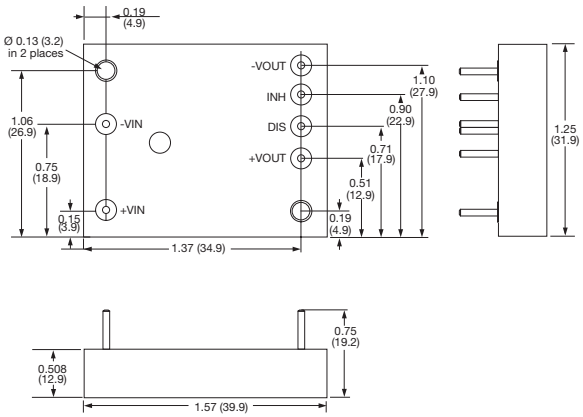


FSO461 & DSF500 Connection Diagram

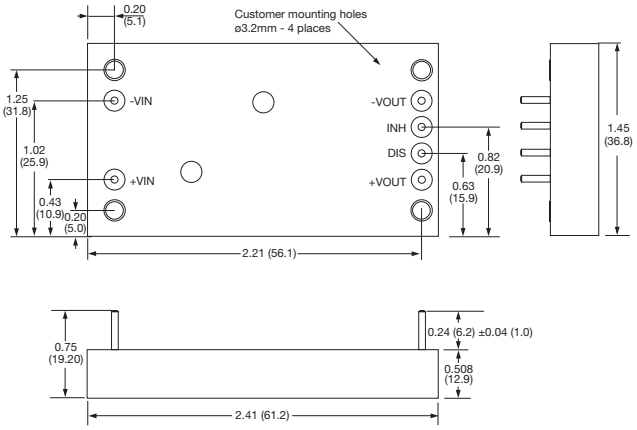


Mechanical Details

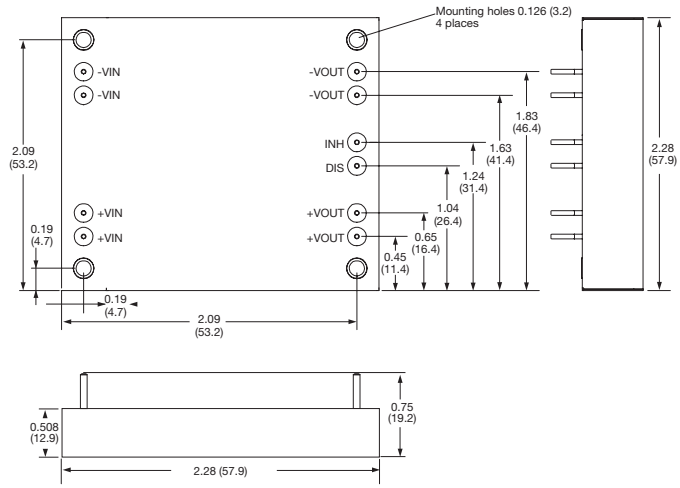
DSF100 - Surge protection and filter



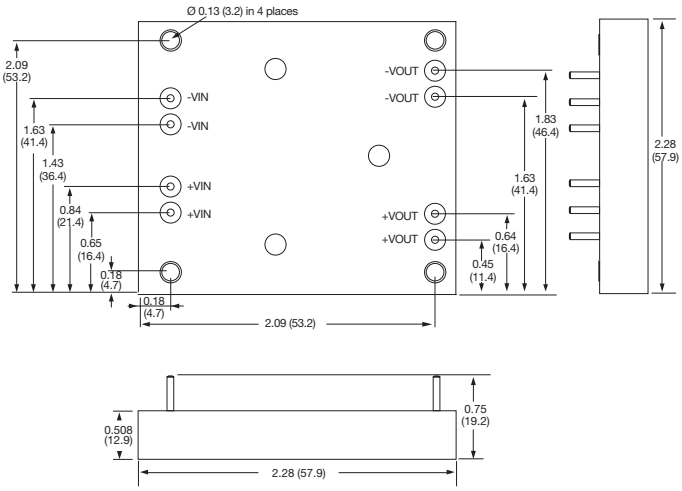
DSF200LV - Surface protection and filter



DSF500 - Surge protection



FSO461 - Filter



Notes:

1. All dimensions in mm (inches).
2. Weights: DSF100: 50g (0.11lbs)
   DSF200LV: 80g (0.18lbs)
   DSF500: 160g (0.36lbs)
   FSO461: 160g (0.36lbs)
3. Tolerance: ±0.3 (±0.011). If using multiple modules, please consider variations in module tolerances.
4. Pin diameter: 1.0 (0.04)
5. Pin Material: Copper - tin alloy
   Finish: 2.5µ copper and 2.5µ Sn (tin)