MTF50

- MIL-STD 810 Environmental Performance
- 15 to 40 VDC Steady State Input Range
- 10 to 50 VDC Transient Input Range
- 50 W Max Output Power
- -55 °C to 100 °C Operation
- Cooling Plates and Mounting Holes for easy integration
- MIL-STD 461E EMI Performance
- MIL-STD 1275A-D & MIL-STD704A-F Immunity Performance
- Designed as a COTS component for Defense and Avionics applications

The MTF50 is a COTS EMC filter which has been developed specifically for the defense and avionics market. This product offers a high end specification while offering the short lead times and cost benefits of COTS components. The MTF50 is designed to filter the conducted emissions of the MTC series DC-DC Converters and protect against conducted susceptibility specified in MIL-STD-461E and surges and spikes specified in MIL-STD-1275A-D and MIL-STD-704A-F.

Input Characteristics

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage	15.5	28	40	VDC	Continuous operation
Transient Input Voltage Range	10.0		50	VDC	10 secs max
Inrush Current	13.3	24.7	39.4	A	Peak value

Output Characteristics

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Maximum Output Voltage	44		47.5	VDC	Clamped <50 V
Nominal Output Voltage				VDC	Non regulated, output proportional to input: Vout = Vin - Iout x Rseries
Output Power			50.0	W	15.5-40.0 VDC input 10.0-15.5 VDC 10 secs max 40.0-50.0 VDC 10 secs max
Inhibit	Off = TTL low or short curcuit, On = TTL high or open circuit				

General Specifications

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		97.00		%	
Resistance		0.25		Ω	Input to output, case to case pin @ 10 A
Power Disspation Inhibited		0.10		W	
Rth Case-Ambient		8.00		°C/W	
Fusing	External fusing required				
Reverse Voltage Protection	Needs to be provided externally, see safe operating area				
MTBF	See MTBF Calculations				

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Case Temperature	-40		+100	ºC	Baseplate temperature
Extended Temperature Range	-55		+100	ºC	Baseplate temperature[1]
Storage Temperature	-55		+100	ºC	Ambient temperature
Humidity		88		%	Relative humidity
Altitude			70000	Ft	MIL-STD 810D Method 500.2
Shock		100		G	MIL-STD 810D Method 516.3 crash hazard for ground equipment
Vibration	5		500	Hz	MIL-STD 810D Method 514.3 3 g basic transportation
Bump		40		G	2000 bumps in each axes MIL-STD 810D Method 516.3 crash hazard

1. For -55 ºC extended operating range, add suffix '-LT' to the part number. e.g. MTF50-LT.

Electromagnetic Compatibility

	Standard	Test Level	Criteria	Notes & Conditions
Conducted Emissions	MIL-STD-461E	CE101/CE102		
Immunity	MIL-STD-1275A-D	Spikes Surges Ripple	±250 V for 100 µs 100 V for 50 ms at 0.5 Ω 14 VAC pk-pk	
	MIL-STD-704A/B-F	600 V input transient	10 µs 50 Ω source impedance	
Conducted Susceptibility	MIL-STD-461E	CS101, CS114, CS115, CS116		

Safety Approvals

Standard	Category
CE	LVD

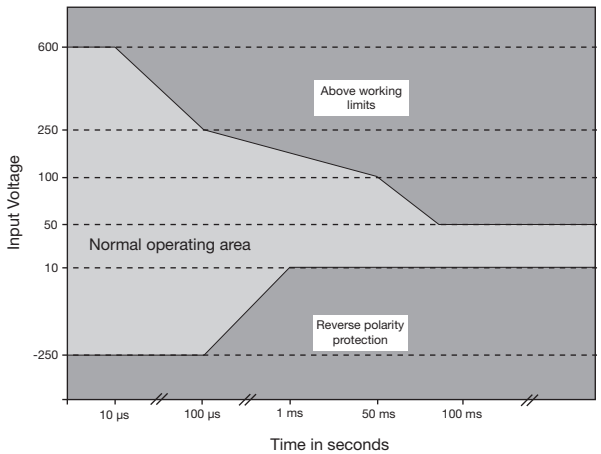
Models & Ratings

Output Voltage	Input Voltage	Efficiency	Model Number
50 VDC max	15.5-40.0 VDC	97%	MTF50

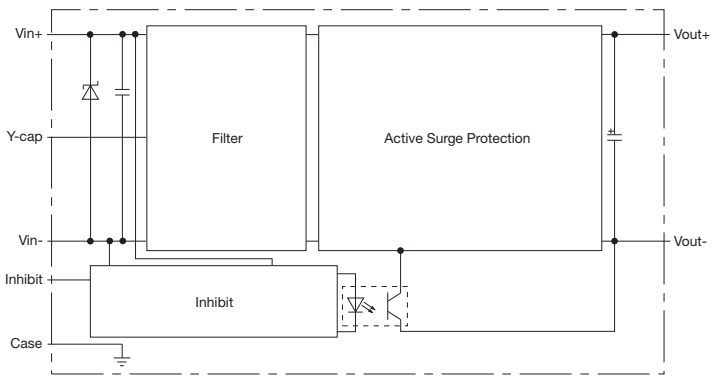
MTBF Calculations

Temperature / Environment	Ground Mobile - GM	Airbourne Inhabited Cargo - AIC	Airbourne Inhabited Fighter - AIF
20 ºC	693264 Hrs	600672 Hrs	301882 Hrs
40 ºC	471398 Hrs	410083 Hrs	203684 Hrs
60 ºC	320466 Hrs	284139 Hrs	141178 Hrs
80 ºC	218610 Hrs	199505 Hrs	100179 Hrs
100 ºC	148081 Hrs	140201 Hrs	72052 Hrs

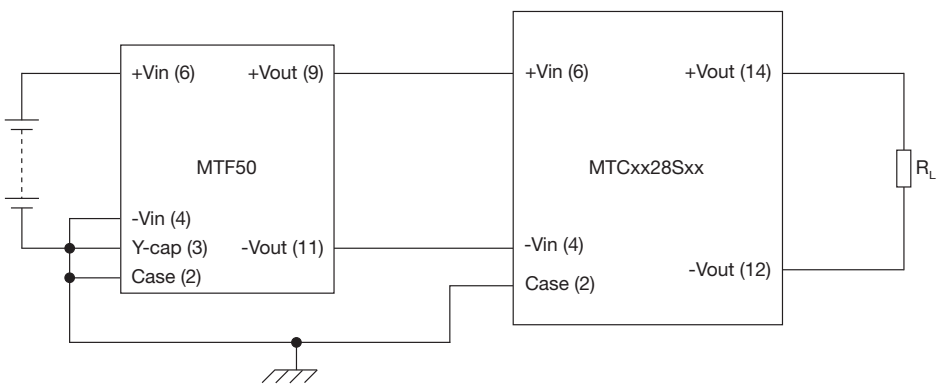
Safe Operating Area



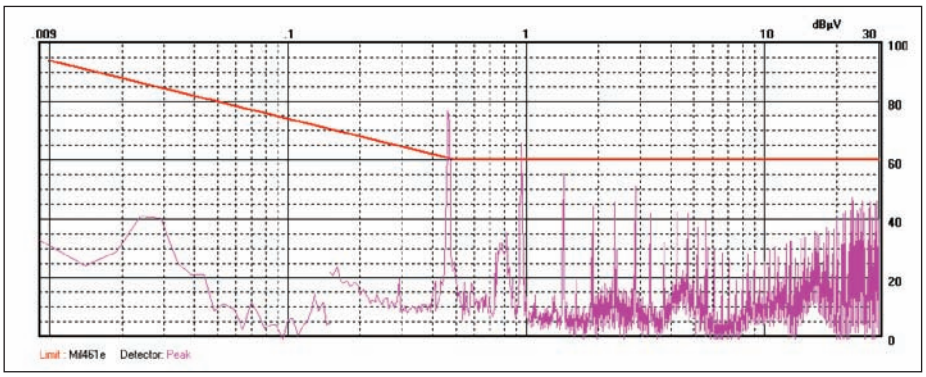
Block Diagram



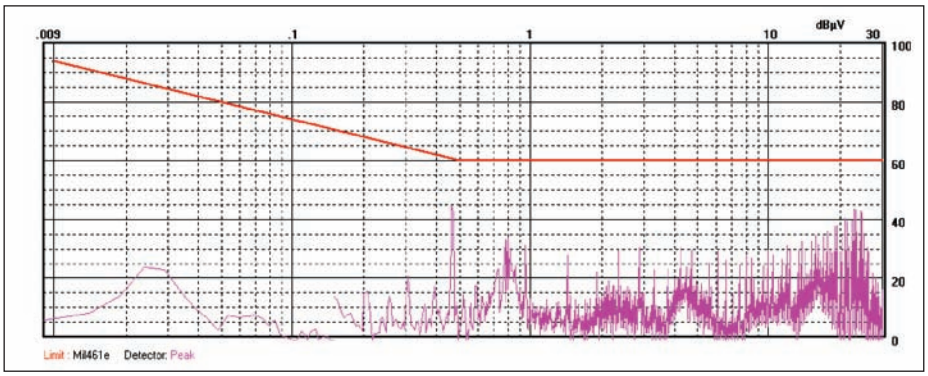
EMC Connection Diagram



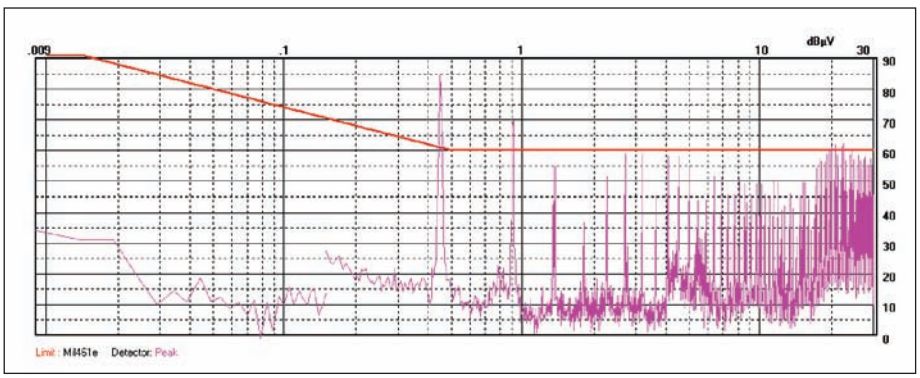
Conducted Emissions



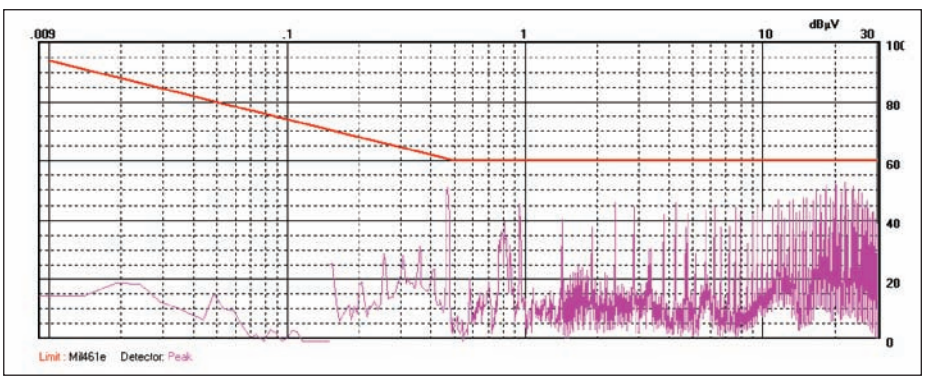
MTC0528S12 without MTF50 filter



MTC0528S12 with MTF50 filter

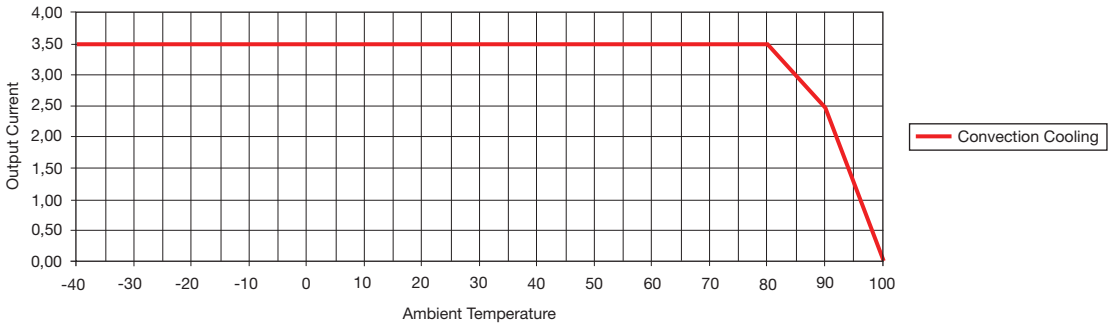


MTC1528S12 without MTF50 filter

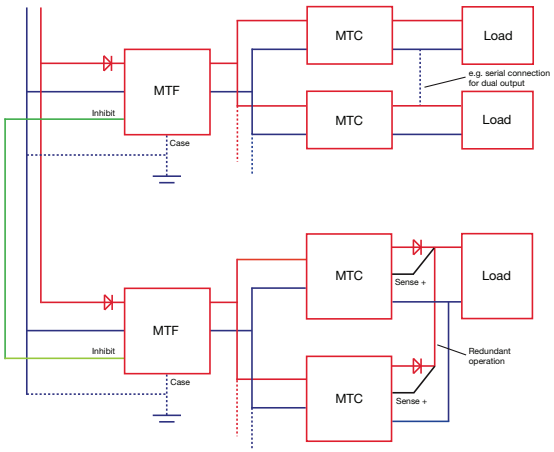


MTC1528S12 with MTF50 filter

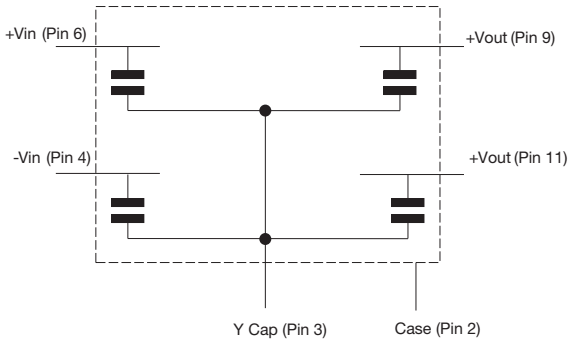
Temperature Derating



MTF50 Filter Typical Application

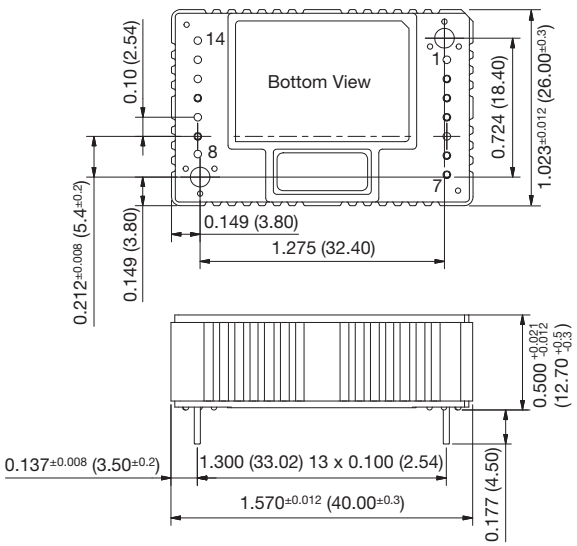


MTF50 - Y Cap Note



The MTF50 has four ” Y„ capacitors for EMI filtering connected to Pin 3. Dependant on the application and system configuration this pin can be connected to Case and/or -Vin. Alternatively it can be left not connected if not required.

Mechanical Details



Pin	Function
1	No Pin
2	Case
3	Y-cap
4	-Vin
5	No Pin
6	+Vin
7	INH
8	No Pin
9	+Vout
10	No Pin
11	-Vout
12	No Pin
13	No Pin
14	No Pin

Materials & Finish:

Pin - Material: Cu Zn30 2.5Ìm Ni
Finish: 0.2-0.5Ìm AU (HV 170-200)
Case - Material: Aluminium (Al Mg Si 0.5)
Finish: Chromated
Nameplate - Non-conductive plastic

Notes.
1. Dimensions are in inches (mm).
2. Tolerance ±0.02 inches (±0.5mm).
3. Weight 25 g.

Soldering.
Wave soldering: 260 °C max for 10 s
Soldering gun: 450 ° C max for 5 s

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