



3

YEARS
WARRANTY

ROHS
COMPLIANT

REACH
COMPLIANT



Railway



Defense



Industry



Automation



Datacom



Measurement



Telecom



Automobile



Boat



Charger



Medical



PV

NON
isolation

4 : 1
Wide
Input
Range

MIL-STD
1275D
Compliant

MIL-STD
461G

INRUSH
CURRENT
LIMIT

REVERSE
POLARITY
PROTECTION

REMOTE
ON
OFF

OCP

OTP

OVP

SCP

UVP

TECHNICAL SPECIFICATION All specifications are typical at nominal input, full load and 25°C unless otherwise noted

INPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating input voltage range		9	28	36	VDC
Inrush current	With 1000μF connected to the output		5		A
Start up voltage				9	VDC
Remote ON/OFF	Referred to -Vin pin DC-DC ON DC-DC OFF	Open or Short or 0 ~ 1.2VDC 4 ~ 12VDC			
Transient voltage	1 second, max.			50	VDC
	50 ms, max.			100	VDC
Spikes	70μs , 15mJ	-250		250	VDC
Reverse polarity protection	Internal series MOSFET is held in an off state to avoid reverse current flow	-36		0	VDC

OUTPUT SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Output voltage			Vin-1	Vin	VDC
Clamping voltage	Input transient voltage mode		40		VDC
Efficiency			97		%
Output current				5	A
Output power range				45	W
Over load protection	Hiccup mode		12.5		A
Short circuit protection		Continuous, automatics recovery			

GENERAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Standard meets	Compliance with standards voltage transient immunity				RIA12 Surge Susceptibility NF F 01-510 Surge Susceptibility MIL-STD-1275D Surge Susceptibility
Case material					Non-conductive black plastic
Base material					Non-conductive black plastic
Potting material					Silicone (UL94 V-0)
Weight					19.7g (0.69oz)
MTBF	MIL-HDBK-217F, Full load				2.718 x 10 ⁶ hrs

ENVIRONMENTAL SPECIFICATIONS

Parameter	Conditions	Min.	Typ.	Max.	Unit
Operating ambient temperature	With derating	-40		+100	°C
Maximum case temperature				100	°C
Over temperature protection			115		°C
Storage temperature range		-55		+125	°C
Thermal shock					MIL-STD-810F
Vibration					MIL-STD-810F
Relative humidity					5% to 95% RH

EMC SPECIFICATIONS

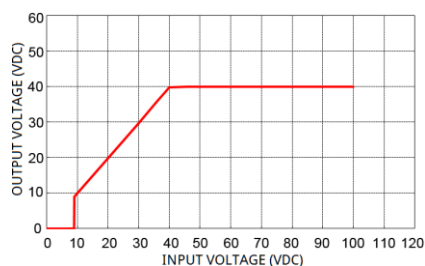
Parameter	Conditions	Level
EMI	CE101-4 Curve #2 CE102-1 Basic curve RE101-2 Navy RE102-3 Fixed Wing internal, ≥ 25 Meters Nose to Tail With external components	MIL-STD-461G
EMS	CS101-1 Curve #2 CS114-1 Curve #5 CS115-1 Basic waveform CS116-2 I _{max} =10A With external components	MIL-STD-461G

Note:

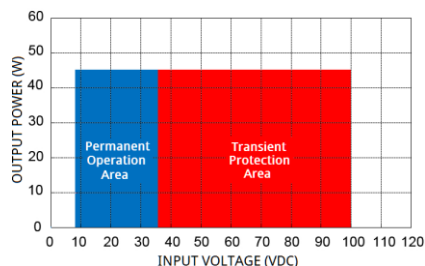
- The MCF-028005-001 is a DC front-end module that provides EMI filtering and transient protection. The module enables designers using **P-DUKE'S** 24V DC/DC converters to meet conducted emission and conducted susceptibility per MIL-STD-461G.

CAUTION: This power module is not internally fused. An input line fuse must always be used.

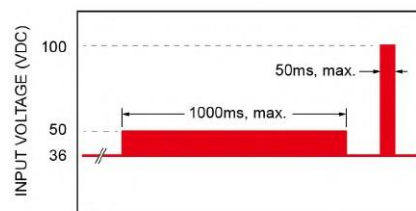
CHARACTERISTIC CURVE



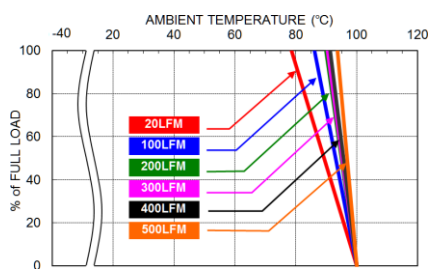
Transfer Function



Pout vs. Input Voltage



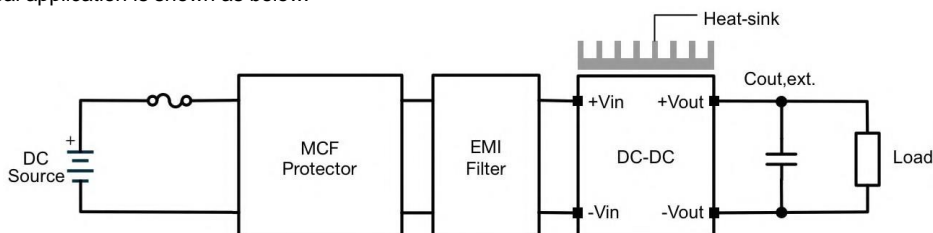
Transient Limitation



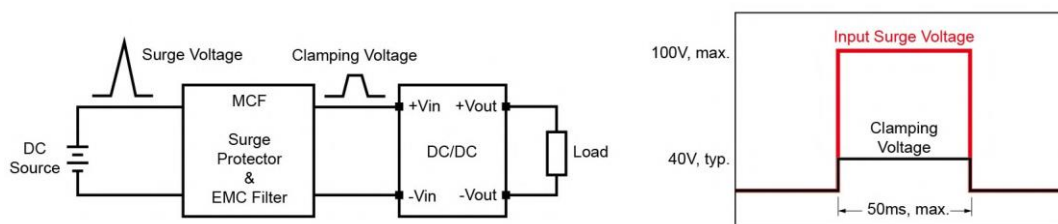
Derating Curve

TYPICAL APPLICATION

1. The schematic for typical application is shown as below.



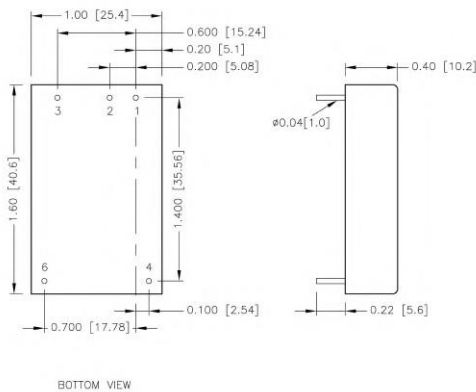
2. Surge protector clamps over-voltage to a safe value in order to protect the power module from damaging. According to MIL-STD-1275D, the module should keep working during input surge occurs.



3. This surge protector can be used for 28V battery system of MIL-STD-1275D application. Input range of DC-DC converter also has to meet 24V system input range.

Standard	Un (VDC)	Permanent Operating Input Range (VDC)	Brownout	Transient	Spike
MIL-STD-1275D	28	23 – 33	n/a	40V / 500ms 100V / 50ms	±250V / 70μs
EN 50155	24	16.6 – 30	14.4V / 100ms	33.6V / 1000ms	n/a
RIA12	24	16.6 – 30	14.4V / 100ms	36V / 1000ms 84V / 20ms	n/a
NF F 01-510	24	18 – 34	12V / 100ms	40V / 100ms	n/a

MECHANICAL DRAWING

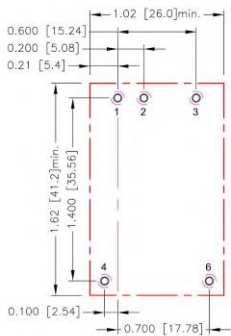


PIN CONNECTION

PIN	PIN CONNECTION
1	+Vin
2	Ctrl
3	-Vin
4	+Vout
6	-Vout

- 1. All dimensions in inch [mm]
- 2. Tolerance :x.xx±0.02 [x.x±0.5]
x.xxx±0.010 [x.xx±0.25]
- 3. Pin dimension tolerance ±0.004[0.10]

RECOMMENDED PAD LAYOUT



- All dimensions in inch[mm]
- Pad size(lead free recommended)
- Through hole 1.2.3.4.6: "0.051[1.30]
- Top view pad 1.2.3.4.6: "0.064[1.63]
- Bottom view pad 1.2.3.4.6: "0.102[2.60]

THERMAL CONSIDERATIONS

The power module operates in a variety of thermal environments. However, sufficient cooling should be provided to help ensure reliable operation of the unit. Heat is removed by conduction, convection, and radiation to the surrounding environment. Proper cooling can be verified by measuring the point as the figure below. The temperature at this location should not exceed "Maximum case temperature". When operating, adequate cooling must be provided to maintain the test point temperature at or below "Maximum case temperature". You can limit this temperature to a lower value for extremely high reliability.

- Thermal test condition with vertical direction by natural convection (20LFM).

