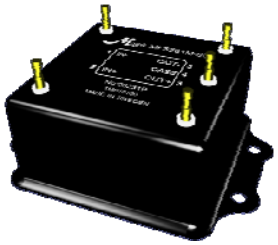
MFS281M (I)-6 Series Product Information



Description

Making sure products with excellent EMC characteristic and surge protection function is crucial for every power supply designer. In order to meet this requirement, an EMC filter and a surge protection module usually should be added to the input terminal of power supply. However, in some harsh environment, traditional method with two individual components would no longer meet the requirement because of their biggish volumes.

The MFS281M series of Magic, Integrated EMI filter technique into surge protection module, are suitable not only for electromagnetic noise suppression on output lines of system power supplies but also for surge protection of products. Because of its reduced size, simplified design and improved reliability, more and more worldwide aviation equipments suppliers are delight to make it for application.

Features

- **Wide Input Range, Without Additional Power Supply**
  MFS281M-6C：8~32V
  MFS281M-6C-H：8~36V
  MFS281M-6C-S：8~40V
- **62mm×47mm×22.5mm Small Volume, Low Power Consumption, High-Reliability and Case Assembly**
- **Providing Excellent differential and common mode attenuation, over a wide frequency range**
- **Support 80V/100ms or 100V/50ms Surge Strike Under The Rated Working Current of 6A**
- **Output Voltage Clamped When 80V Over-Voltage Surging Happens**
  MFS281M-6：< 35V
  MFS281M-6-H：< 38V
  MFS281M-6-S：< 42V
- **Outstanding Peak Surging Absorbing Ability**
- **Perfect Self-Protection Function. Automatically Turn Off Power Supply Output During Self-Damaged, Protecting System from Being Destroyed**
- **Excellent Single-Directional Power Passage. Only 40mV/A Forward Voltage Drop During Continuous Working**
- **MIL-STD-704A/D/E/F，DO160E cat A/B/ Z，EN2282，AIR2021E**

ABSOLUTE MAXIMUM RATINGS

Surge Input Voltage/Continuous Time (I_{OUT} =6A).....100V/70ms, 80V/100ms
Continuous Input Voltage V_{IN} (with respect to GND).....MFS281M-6C：8~32V
MFS281M-6C-H：8~36V
MFS281M-6C-S：8~40V

Continuous Output Current (I_{OUT}).....7A

Operating Temperature Range .....I: -40℃ to +85℃

M: -55℃ to +105℃

MV: -55℃ to +125℃

Storage Temperature Range .....-65℃ to +150℃

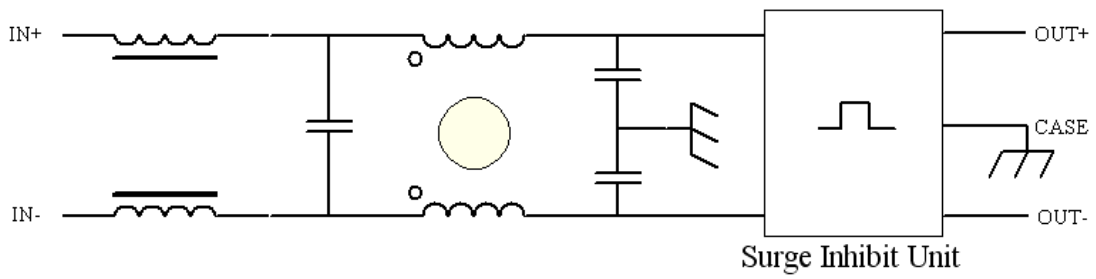
Lead Temperature (Soldering,3s) .....280℃

Electrical Characteristics, TA=25℃

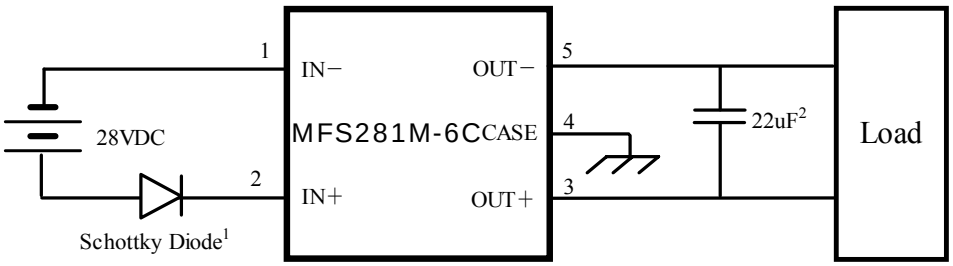
Storage Temperature :-65℃ to +150℃, at T_A=+25℃.

PARAMETER		MIN	TYP	MAX	UNITS
Line to Line				100	VDC/1min
Line-to-ground				200	VDC/1min
Isolation Resistance (Any Pin to Case, 100 VDC)		100			MΩ
Insertion Loss (f=500kHz)		40			dB
DC Input Voltage (V_{IN})	MFS281M-6C	8	28	32	V
	MFS281M-6C-H	8	28	36	
	MFS281M-6C-S	8	28	40	
V_{IN}-V_{OUT} Forward Voltage Drop △V		-	40	80	mV/A
Steady Output Voltage (V_{OUT})			V_{IN}–△V		V
Steady Output Current (I_{OUT})				6	A
Transient Surge Input Voltage (V_{INS})		8		80	V
Undervoltage Surge Output V_{OUT}			V_{IN}–△V		V
Overvoltage Surge Output V_{OUT}	MFS281M-6C		33	35	V
	MFS281M-6C-H		36	38	
	MFS281M-6C-S		40	42	
Transient Surge Continuous Time (V_{INS}=80V)			50	100	ms
Transient Peak Power Dissipation		330			W
Power Dissipation (V_{IN}=28V, I_{OUT}=6A)		-	1950	2200	mW
Space Time Between Two Surges		10	60		s

Block Diagram



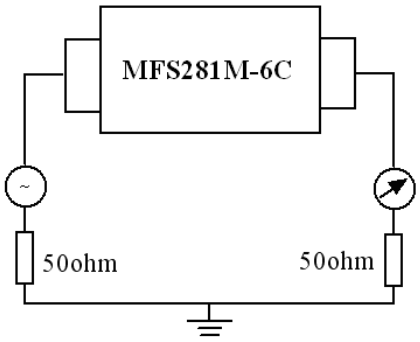
Typical Application



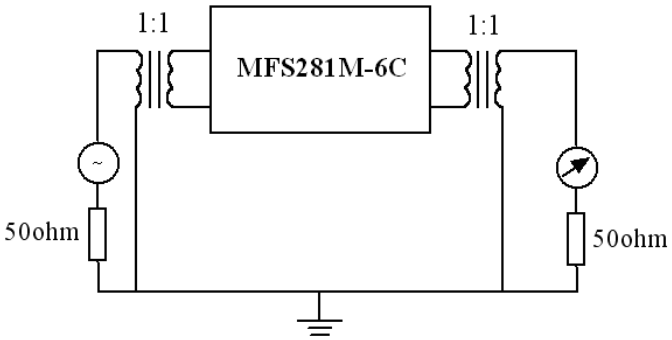
Note 1: In order to prevent the energy storage capacitor supply the electrical source with energy during the period of undervoltage surge, a Schottky diode should be added between the electrical source and the filter.

Note 2: Low ESR capacitors should be used on V_{OUT} to minimize the output ripple voltage, subjected to the inductance of load during surge protection. Typically a 22uF electrolytic or tantalum low ESR capacitor should be used.

EMI Measurement Methods Diagrams



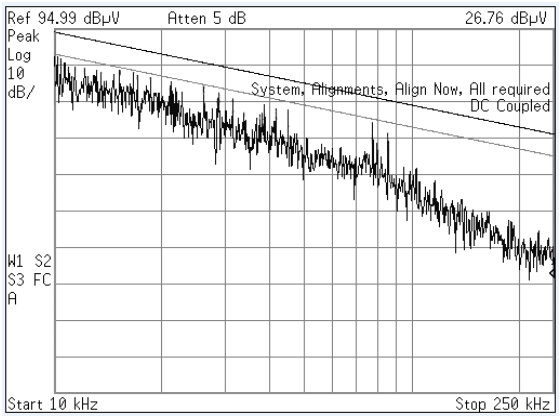
CM Measurement Method

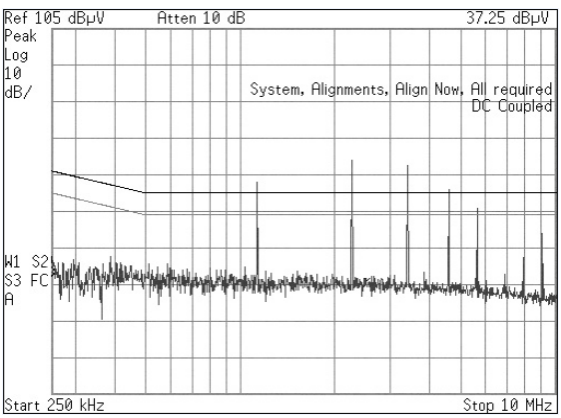


DM Measurement Method

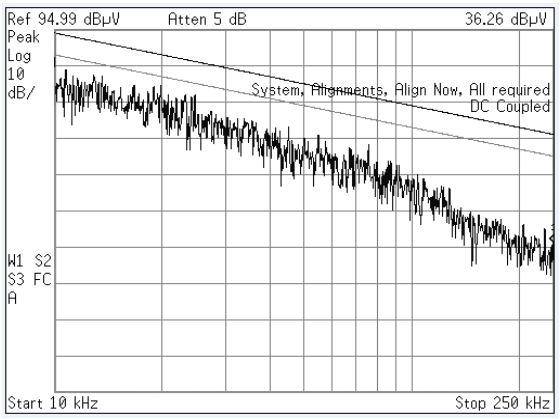
EMI PERFORMANCE CURVES

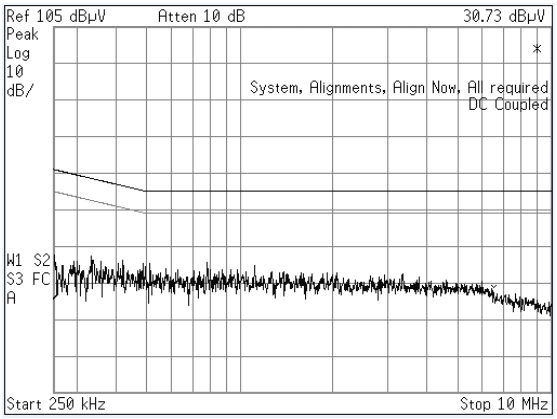
(T_{CASE} = 25°C, V_{IN} = +28V ± 5%, I_{OUT}=6A, Unless Otherwise Specified)





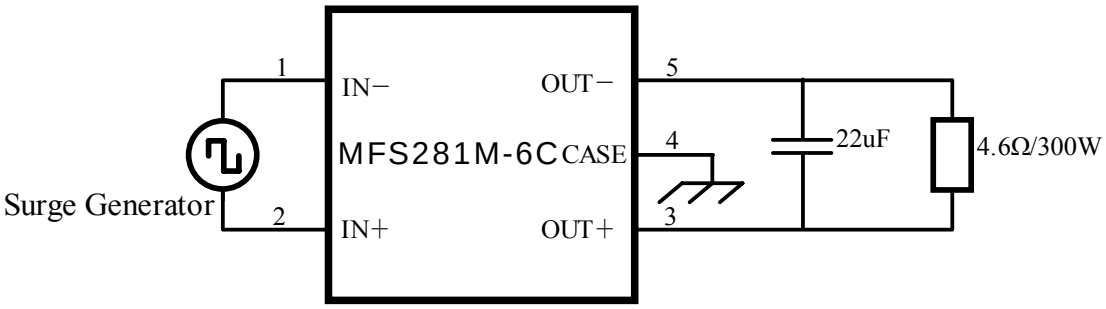
Power Supply Circuit Without MFS281M-X





Power Supply Circuit With MFS281M-X

Test Circuit For Figure1-4



Surge Test Circuit

Figure 1 Overvoltage Input-Output Waveform

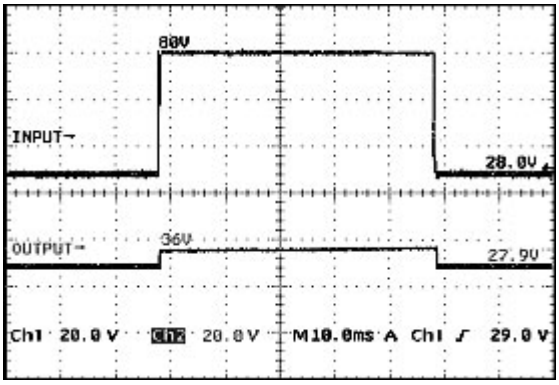


Figure 2 Undervoltage Input-Output Waveform

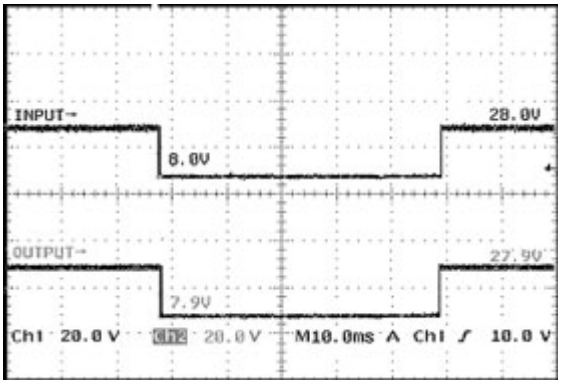


Figure3 Peak Input-Output Waveform

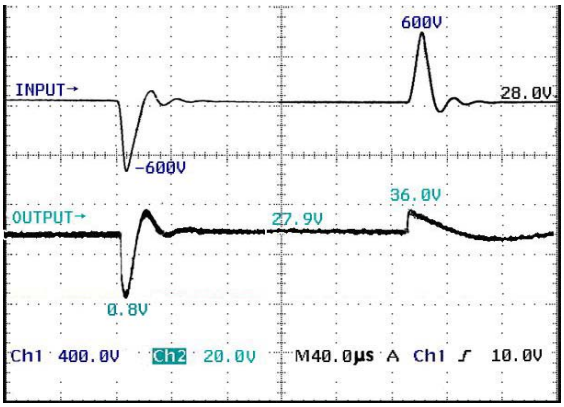


Figure4 Input-Output Waveform

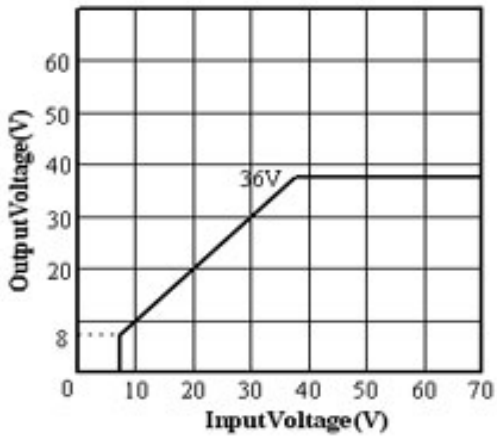


Figure5 Typical Output Characteristics

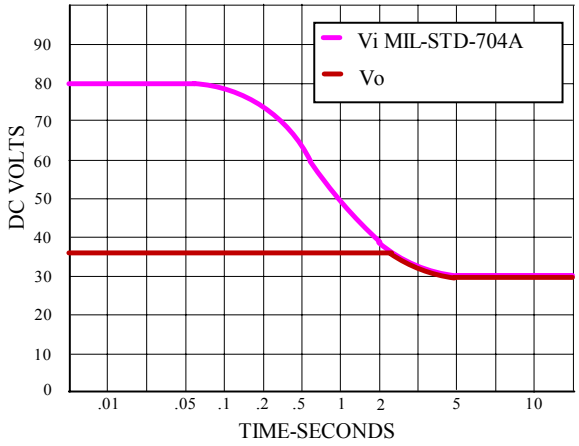
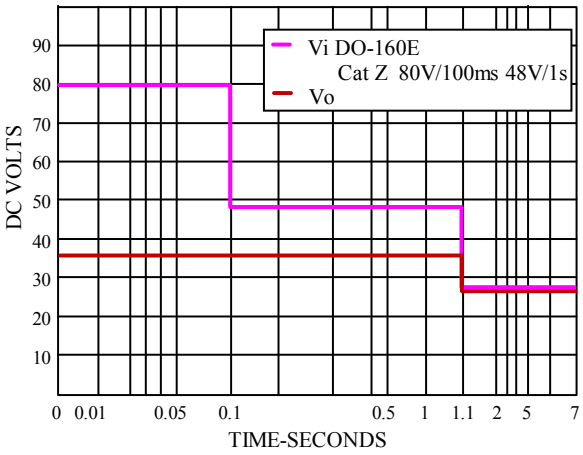


Figure6 Typical Output Characteristics



Availability and Processing

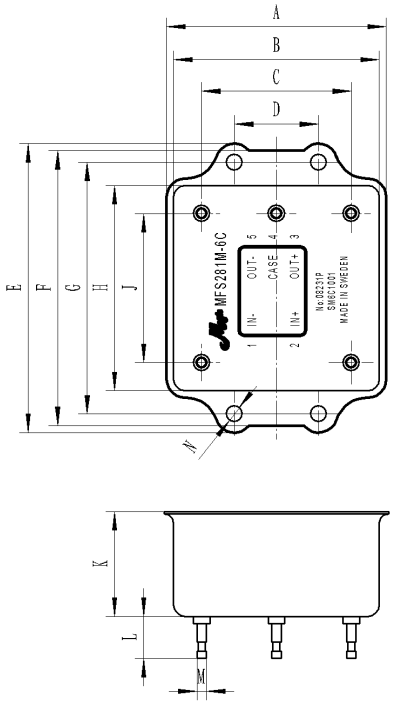
The product design matches the technique condition of MIL-STD-704A, MIL-STD-461 and DO-160E.

Full temperature range

Parameter	Limit or typical	Units	MFS281M-6C	MFS281M-6C-H	MFS281M-6C-S
Voltage transients limit	MIL-STD-704A	80V/75ms	Compliant	Compliant	Compliant
	AECMA EN2282	60V/50ms	Compliant	Compliant	Compliant
	AIR2021E	60V/100ms	Compliant	Compliant	Compliant
	DO160E cat A/Z	80V/100ms	Compliant	Compliant	Compliant
Voltage spike limit (50 Ohms impedance)	MIL-STD-704A	600V/10us	Compliant	Compliant	Compliant
	AECMA EN2282	400V/100us	Compliant	Compliant	Compliant
	AIR2021E	600V/10us	Compliant	Compliant	Compliant
	DO160E cat A/Z	600V/10us	Compliant	Compliant	Compliant

PACKAGE DIMENSION

NOTE: inches(millimeters) unless otherwise noted，tolerance: ±0.01(±0.2mm).



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	46.8	47.2	1.84	1.85
B	43.8	44.2	1.72	1.74
C	31.9	32.1	1.25	1.26
D	17.9	18.1	0.70	0.71
E	61.8	62.2	2.43	2.45
F	58.8	59.2	2.31	2.33
G	53.9	54.1	2.12	2.13
H	43.8	44.2	1.72	1.74
J	31.9	32.1	1.25	1.26
K	22.3	22.7	0.88	0.89
L	8.8	9.2	0.35	0.36
M	1.9	2.1	0.07	0.08
N	3.2	3.5	0.13	0.14

PINS INFORMATION

Pin No	Mnemonic	Description
1	IN-	Power Negative Input Terminal
2	IN+	Voltage Input，Power Positive Input Terminal
3	OUT+	Voltage Output，Positive Output Terminal
4	CASE	Case GND
5	OUT-	Negative Output Terminal

Ordering Information

PART	TEMP RANGE
MFS281I-6C	-40~+85℃
MFS281I-6C-H	
MFS281I-6C-S	
MFS281M-6C	-55~+105℃
MFS281M-6C-H	
MFS281M-6C-S	
MFS281MV-6C	-55~+125℃
MFS281MV-6C-H	
MFS281MV-6C-S	

Description

MFS	28	1	M	-6	C	-H
1	2	3	4	5	6	7

（1）	（2）	（3）	（4）	（5）	（6）	（7）
Product Series	Nominal Input Voltage	Number of Inputs	LEVEL	Output Current	Fixing	Input Range
MFS	28V	1	I： Industry M：Military MV ： Aerospace	-6: 6A	C: Case	None: 8~32V -H: 8~36V -S: 8~40V

Please contact your sales representative or the Magic Inc. Sales Department for more information concerning additional environmental screening and testing, different input voltage, output voltage, power requirement, source inspection, and/or special element evaluation for space or other higher quality applications.

Contact Information

To request a quotation or place orders please contact your sales representative or the Magic Inc. Sales Department at:

E-mail: sales@magic-module.com

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