MORNSUN®

VFB_MP-6W Series

6W, WIDE INPUT, SINGLE OUTPUT DIP PACKAGE DC-DC CONVERTER

RoHS

FEATURES

- DIP package
- Efficiency up to 85%
- 2:1 wide input range
- 1.5KVDC isolation
- Short circuit protection
- Operating temperature range: -40°C ~ +85°C
- Metal shielding package
- Industry standard pinout
- MTBF>1,000,000 hours
- Good high temperature properties, can meet the industrial products technical requirements

PART NUMBER SYSTEM

VFB2405MP-6W

- Rated Power
- Package
- Output Voltage
- Input Voltage
- Product Series

APPLICATIONS

The VFB_MP-6W series are designed for application where before the power supply fluctuations and isolated output is required from a distributed power system.

These products apply to where:

1) Input voltage variation range ≤2:1;
2) 1.5KVDC input and output isolation;
3) Regulated and low ripple noise is required.

SELECTION GUIDE

Model	Input Voltage(VDC)		Output Voltage (VDC)	Output Current (mA)		Input Current (mA)(typ.)		Reflected Ripple Current (mA,typ.)	Max. Capacitive Load (μF)	Efficiency (%, Min./Typ.) @Max. Load
	Nominal (Range)	Max*		Max.	Min.	@Max. Load	@No Load			
VFB2424MP-6W	24 (18-36)	40	5	1200	120	303	3	272	100	78/80
VFB2424MP-6W			24	250	25	291	10	328	47	83/85

Note:1. * Input voltage can't exceed this value, or will cause the permanent damage.

INPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Input Surge Voltage(1sec.max.)	24VDC Input Models	-0.7	--	50	VDC
Start-up Voltage	24VDC Input Models	--	--	18	
Start-up Time	Nominal input& constant resistance load	--	200	--	ms
Short Circuit Input Power		--	--	3	W
Input Filter		L Filter			

OUTPUT SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Output Power		0.6	--	6	W
voltage accuracy	Refer to recommended circuit	--	±1	±3	%
Line Regulation	Full load, Input voltage from low to high	--	±0.2	±0.5	
Load Regulation	10% to 100% load	--	±0.5	±2	
Transient Recovery Time	25%~ 50%~25% load or 50%~75%~50% load step change	--	200	500	μs
Transient Response Deviation		--	±3	±5	%
Temperature Drift	100% full load	--	±0.02	--	%/°C
Noise&Ripple*	20MHz Bandwidth	--	100	300	mVp-p
Short Circuit Protection		Continuous, automatic recovery			

Note: 1.* Ripple and noise tested by "parallel cable" method. See detailed operation instructions at *DC-DC Application Notes*.

COMMON SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Isolation Voltage	Tested for 1 minute and leakage current less than 1 mA	1500	--	--	VDC
Isolation Resistance	Test at 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input/Output,100KHz/0.1V	--	100	--	pF

Switching Frequency	Full load, nominal input	--	300	--	KHz
MTBF	MIL-HDBK-217F@25℃	1000	--	--	K hours
Case Material		Aluminum Alloy			
Weight		--	14	--	g

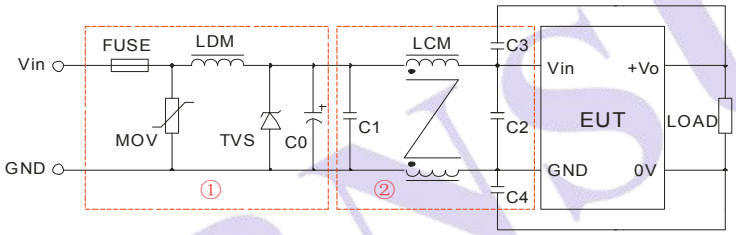
ENVIRONMENTAL SPECIFICATIONS

Item	Test Conditions	Min.	Typ.	Max.	Unit
Storage Humidity	Non condensing	--	--	95	%
Operating Temperature	Power derating (above 71℃)	-40	--	85	℃
Storage Temperature		-55	--	125	
Lead Temperature	1.5mm from case for 10 seconds	--	--	300	
Cooling		Free air convection			

EMC SPECIFICATIONS

EMI	CE	CISPR22/EN55022 CLASS A（External Circuit Refer to Figure1-②）
EMS	ESD	IEC/EN61000-4-2 Contact ±4KV perf. Criteria B
	EFT	IEC/EN61000-4-4 ±2KV perf. Criteria B（External Circuit Refer to Figure 1-①）
	Surge	IEC/EN61000-4-5 ±2KV perf. Criteria B（External Circuit Refer to Figure 1-①）

EMC RECOMMENDED CIRCUIT



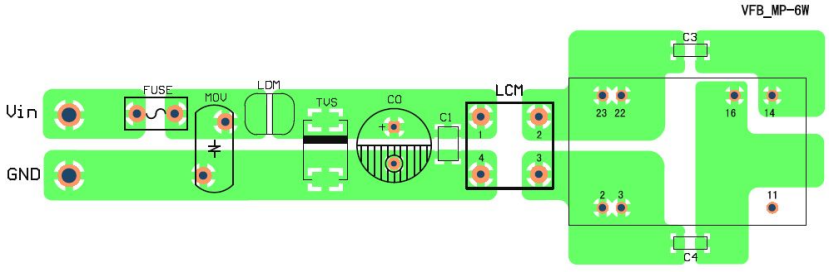
(Figure1)

VFB_MP-6W Recommended external circuit parameters:

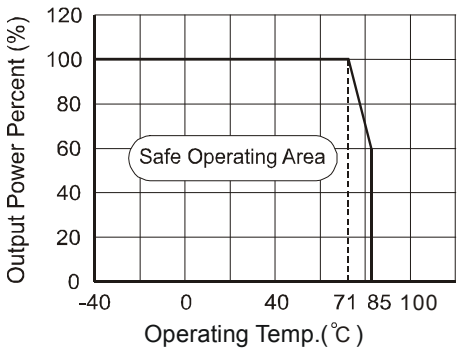
Model		Vin: 24V
EMS	FUSE	Choose according to practical input current
	MOV	S20K30
	LDM	56μH
	TVS	SMCJ48A
	C0	120μF/50V
EMI	C1	4.7μF/50V
	LCM	3.3mH
	C3	--
	C4	100pF/2KV

Note: 1. In Figure 1,part①is EMS Recommended external circuit, part②is EMI recommended external circuit. Choose according to requirements.
2. If there is no recommended parameters, the model no require the external component.

EMC RECOMMENDED CIRCUIT PCB LAYOUT

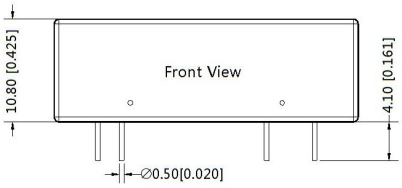


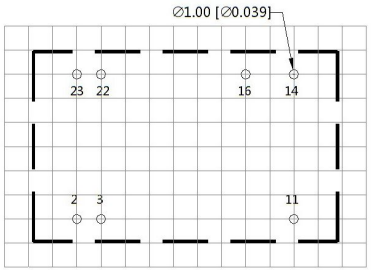
PRODUCT TYPICAL CURVE



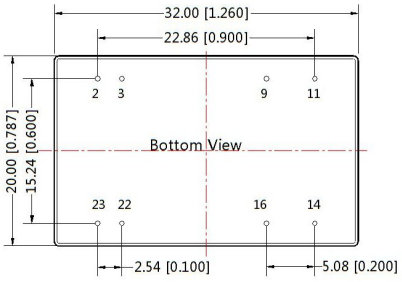
OUTLINE DIMENSIONS, RECOMMENDED FOOTPRINT & PACKAGING

THIRD ANGLE PROJECTION





Note:Grid 2.54*2.54mm



PIN CONNECTION	
Pin	Function
2,3	GND
9	No Pin
11	NC
14	+Vo
16	0V
22,23	Vin

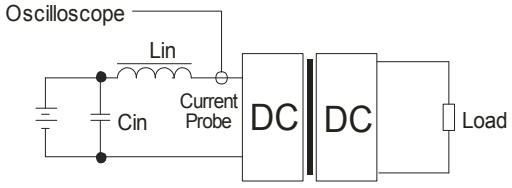
NC: No Connection

Note:
Unit :mm[inch]
Pin diameter tolerances :±0.10[±0.004]
General tolerances:±0.50[±0.020]

TEST CONFIGURATIONS

Input Reflected-Ripple Current Test Setup

Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate source impedance.



Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

DESIGN CONSIDERATIONS

1) Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load ***could not be less than 10% of the full load.*** If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power.

2) Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is add a circuit breaker to the circuit.

3) Recommended circuit

All the VFB_MP-6W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. Never be tested under no load (see Figure 3).

If you want to further decrease the output ripple, you can increase a capacitance properly or choose capacitors with low ESR. However, the capacitance can't exceed the maximum capacitor load in the list (Table 1).

(Figure 3)

EXTERNAL CAPACITOR TABLE (TABLE 1)

Output Voltage	Capacitance	Cout (μF)	Cin(μF)
Single	5V	220	100
	24V	47	

4) **Cannot use in parallel and hot swap**

Note:

1. Packing Information please refer to 'Product Packing Information'. The Packing bag number of Horizontal package : 58210008;
2. Recommend to use module with more than 10% load, if not, the ripple of the product may exceeds the specification, but does not affect the reliability of the product;
3. Max. Capacitive Load tested at input voltage range and full load.
4. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
5. In this datasheet, all the test methods of indications are based on our corporate standards.
6. All characteristics are for listed model only, non-standard models may perform differently, please contact our technical person for more detail.
7. Contact us for your specific requirement.
8. Specifications subject to change without prior notice.

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