

FEATURES

- 1.Package Type: 1 * 1
- 2.Operating Temperature Range: -40°C - +85°C
- 3.Isolation Voltage: 1500VDC
- 4.Wide Input Voltage Range: 2: 1
- 5.High efficiency up to 90%
- 6.With the output over current, output short circuit protection mechanism
- 7.Fields of application: electric power, industrial control, etc



3 years Warranty

Selection Guide

Part No.	Input Voltage (VDC)		Output		Full Load Efficiency% (Min./Typ.)	Capacitive Load Max. (μF)
	Nominal (Range)	Maximum	Voltage (VDC)	Current Max.(mA)		
MFB1203YMD-20WR3	12 (9-18)	20	3.3	5000/0	84/86	10000
MFB1205YMD-20WR3			5	4000/0	87/89	10000
MFB1212YMD-20WR3			12	1667/0	87/89	1600
MFB1215YMD-20WR3			15	1333/0	88/90	1000
MFB1224YMD-20WR3			24	833/0	88/90	500
MFB2403YMD-20WR3	24 (9-36)	40	3.3	5000/0	86/88	10000
MFB2405YMD-20WR3			5	4000/0	88/90	10000
MFB2412YMD-20WR3			12	1667/0	88/90	1600
MFB2415YMD-20WR3			15	1333/0	89/91	1000
MFB2424YMD-20WR3			24	833/0	89/91	500
MFA2405YMD-20WR3			±5	±2000/0	85/87	2000
MFA2412YMD-20WR3			±12	±833/0	88/90	800
MFA2415YMD-20WR3			±15	±667/0	88/90	600
MFA2424YMD-20WR3			±24	±417/0	87/89	300
MFB4803YMD-20WR3			48 (18-75)	80	3.3	5000/0
MFB4805YMD-20WR3	5	4000/0			88/90	10000
MFB4812YMD-20WR3	12	1667/0			89/91	1600
MFB4815YMD-20WR3	15	1333/0			89/91	1000
MFB4824YMD-20WR3	24	833/0			89/91	500
MFA4805YMD-20WR3	±5	±2000/0			84/86	2000
MFA4812YMD-20WR3	±12	±833/0			88/90	800

MFA4815YMD-20WR3			±15	±667/0	88/90	600
MFA4824YMD-20WR3			±24	±417/0	88/90	300

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load/no load)	12VDC Input	--	3.3V output	1599/40	1637/70	mA
			5V output	1873/45	1916/70	
			12V output	1873/7	1916/20	
			15V output	1852/7	1894/20	
			24V output	1852/12	1894/20	
	24VDC Input	--	3.3V output	782/30	800/50	
			5V output	926/35	947/55	
			6V output	936/50	958/70	
			12V output	926/6	947/15	
			15V output	916/6	937/15	
			24V output	916/10	937/20	
	48VDC Input	--	3.3V output	391/15	400/30	
			5V output	463/20	474/30	
			12V output	458/3	469/15	
			15V output	458/3	469/15	
24V output			458/4	469/15		
Reflected Ripple Current		--	30	--		
Impulse Voltage	12VDC Input	-0.7	--	25		
	24VDC Input	-0.7	--	50		
	48VDC Input	-0.7	--	100		
Starting Voltage	12VDC Input	--	--	9	VDC	
	24VDC Input	--	--	18		
	48VDC Input	--	--	36		
Undervoltage Protection	12VDC Input	5.5	6.5	--		
	24VDC Input	12	15.5			
	48VDC Input	26	30	--		
Start time		--	10	--	ms	
Ctrl	turn off module	connected GND or (0-1.2V)				
	turn on module	No connected or (3.5-12V)				
	Input current when off	--	5	8	mA	

Input Filter		PI filter
Hot Plug		Unavailable

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Output Voltage Accuracy	0% - 100% Load	--	±1	±3.0	%	
Linear Regulation	Full load, Input voltage from low limit to high limit	--	±0.2	±0.5		
Load Regulation	5% - 100% Load	--	±0.5	±1		
Ripple & Noise	20MHZ Bandwidth, 5% - 100% Load	--	50	100	mVp-p	
Transient Recovery Time	25% load step change	--	300	500	μs	
Transient Response Deviation		3.3V、5V、6V output	--	±5	±8	%
		Other	--	±3	±5	
Temperature Coefficient	Full Load	--	--	±0.03	%/°C	
Output voltage adjustment	input voltage range	90	--	110	%Io	
Over Current Protection		110	--	160		
Over Voltage Protection		110	150	190	%Vo	
Short-circuit Protection		Continuous, Self-Recovery				

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Insulation Voltage	Input-output, test time 1 minute, leakage current less than 1mA	1500	--	--	VDC
Insulation Resistance	Input-output, insulated voltage 500VDC	1000	--	--	MΩ
Isolation Capacitance	Input-output, 100KHz/0.1V	--	2000	--	pF
Operating Temperature	(See Figure 1)	-40	--	+95	°C
			Other	--	
Storage Temperature		-55	--	+125	
Storage Humidity	Non-condensing	5	--	95	%RH
Pin welding can withstand the highest temperature	Soldering spot is 1.5mm away from case for 10 seconds	--	--	300	°C
Switching Frequency	PWM pattern	--	300	--	kHz

MTBF	MIL-HDBK-217F@25°C	1000Kh
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Mechanical Specifications

Case Material	Aluminum alloy, black anodized coating
Package Dimensions	25.40mm * 12.00mm * 25.40mm
Weight	15.00g(Typ.)
Cooling Method	Free air convection

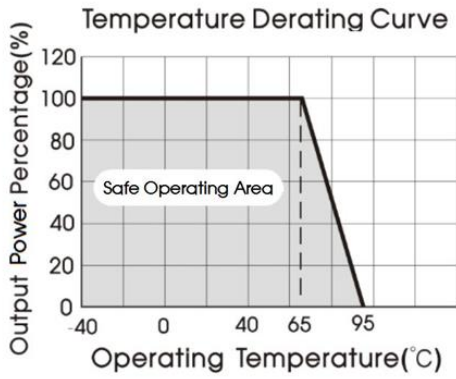
EMC Specifications

EMI	CE	CISPR32/EN55032 CLASS A(open board)/CLASS B (application circuit 3-②)	
	RE	CISPR32/EN55032 CLASS A(open board)/CLASS B (application circuit 3-②)	
EMS	ESD	IEC/EN61000-4-2 Contact±6KV,Air ±8KV	perf. CriteriaB
	RS	IEC/EN61000-4-3 10V/m	perf. CriteriaA
	EFT	IEC/EN61000-4-4 ±2KV(application circuit3-①)	Perf.Criteria A
	Surge	IEC/EN61000-4-5 line to line±2KV(application circuit3-①)	Perf.Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	Perf.Criteria A

Typical Characteristic Curves

MFB24_YMD-20WR3/MFB48_YMD-20WR3 series

Nominal input voltage, 3.3V, 5V output



MFB24_YMD-20WR3/MFB48_YMD-20WR3 series

Nominal input voltage, 12V, 15V, 24V output

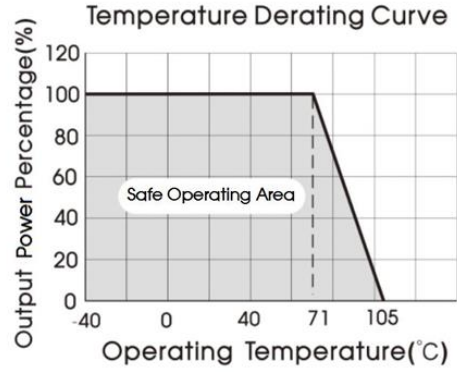
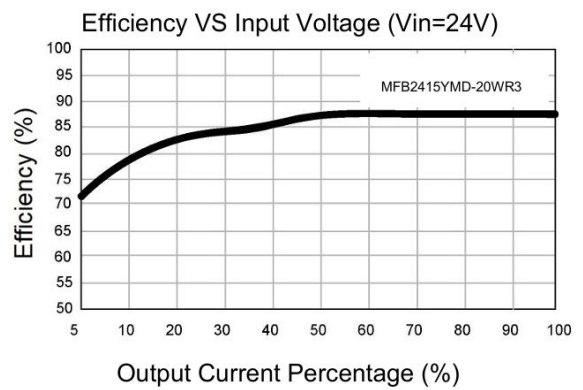
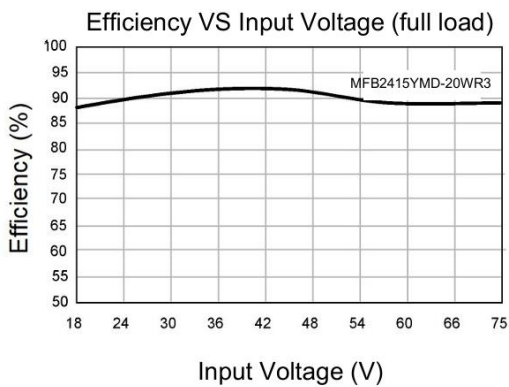
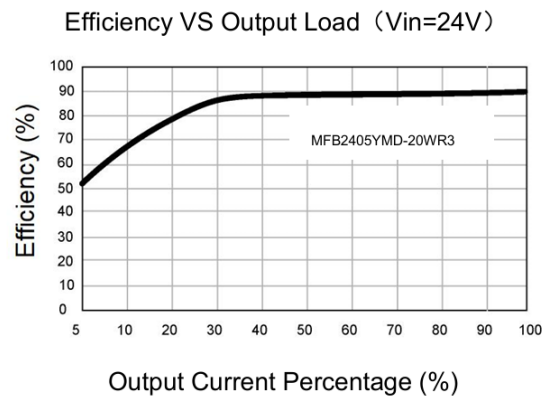
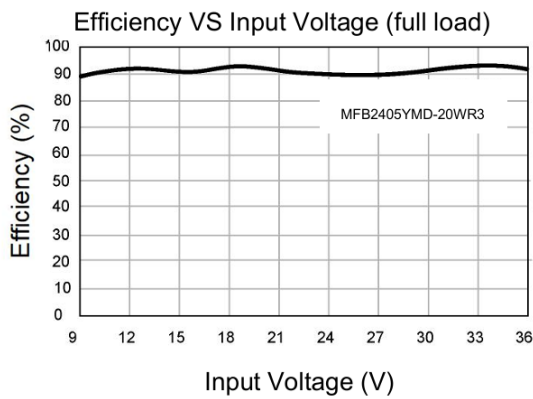
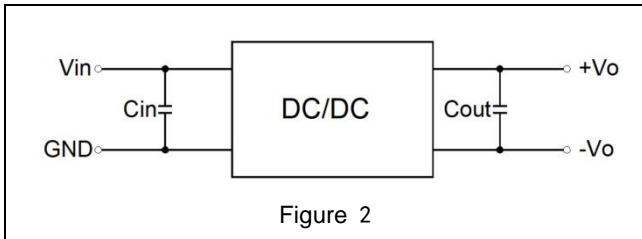


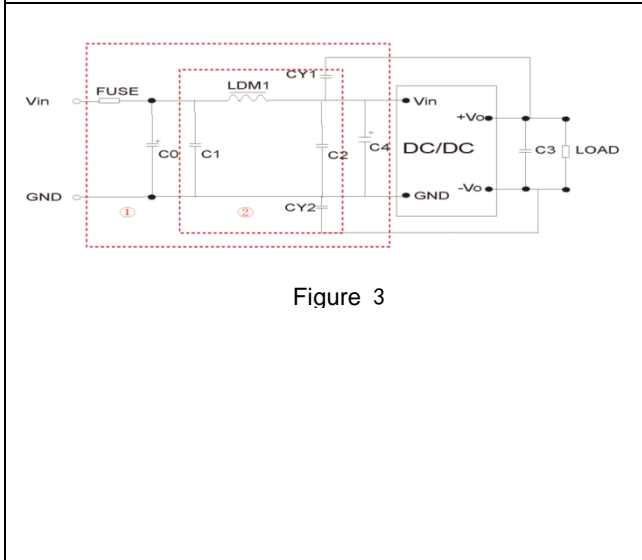
Fig. 1



Circuit Design and Application

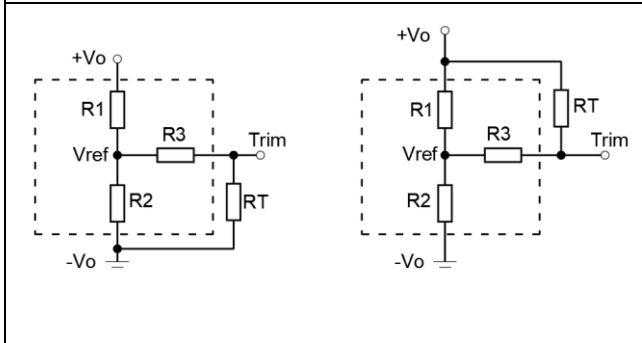


Recommended Capacitive Load Value Table		
Vin(VDC)	Cin	Cout
24	100uF	100uF
48	10uF-47uF	



EMI Recommended Parameter Table		
Model	Vin: 24V	Vin: 48V
FUSE	Select according to the actual input current of the customer	
C0、C4	330μF/50V	330μF/100V
C1、C2	4.7μF/50V	4.7μF/100V
C3	Refer to Figure 2 Cout parameter	
LCM1	2.2uH/4A	2.2uH/2A
CY1、CY2	1nF/2KV	

Note: Part 1 in Figure 3 is for EMC testing;
The second part is used for EMI filtering, which can be selected according to the demand.



Trim resistor calculation				
Vout(V)	R1(KΩ)	R2(KΩ)	R3(KΩ)	Vref(V)
3.3	10	6.064	13.622	1.24
5	2.4	2.344	13.622	2.5
12	8.2	2.153	17.346	2.5
15	12	2.388	21.016	2.5
24	10	1.158	10.714	2.5

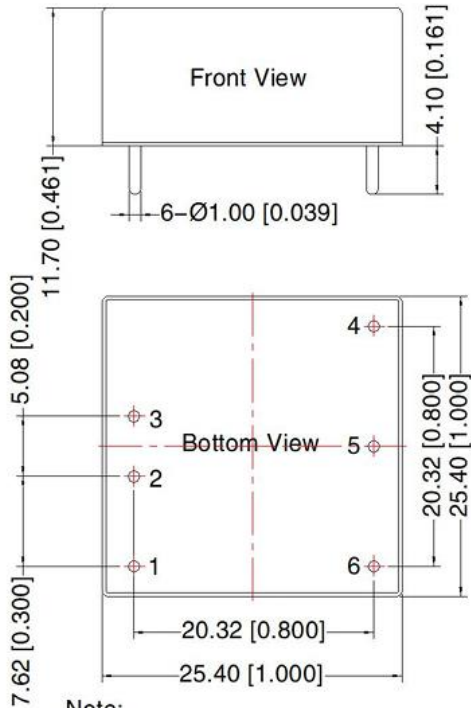
$$Up: Rt = \frac{nR2}{R2-n} - R3 \quad n = \frac{Vref}{Vo-Vref} * R1$$

$$Down: Rt = \frac{nR1}{R1-n} - R3 \quad n = \frac{Vo-Vref}{Vref} * R2$$

Note: Part 1 in Figure 3 is for EMC testing; The second part is used for EMI filtering, which can be selected according to the demand.

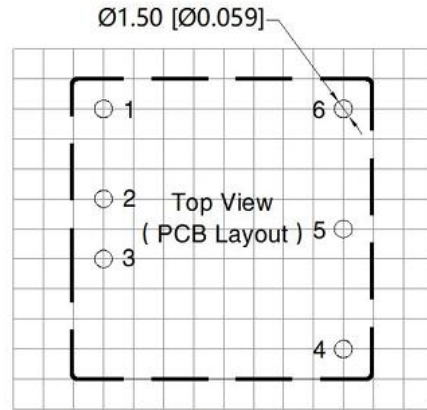
Dimensions and Recommended Layout

Dimensions
PCB Printing Layout & Pin Definition Table



Note:
 Unit: mm[inch]
 PIN1/2/3/4/5/6: ϕ 1.0mm
 Pin diameter tolerances: ± 0.10 [± 0.004]
 General tolerances: ± 0.50 [± 0.020]

THIRD ANGLE PROJECTION



Note: Grid 2.54*2.54mm

Pin-Out	
Pin	Mark
1	Ctrl
2	GND
3	Vin
4	+Vo
5	Trim
6	0V

Note:

1. If the product works under the minimum required load, it cannot guarantee that the performance of the product complies with all the performance indicators in this manual;
2. The maximum capacitive load is tested under the input voltage range and full load condition;
3. Unless otherwise stated, all indexes in this manual are measured at Ta=25°C, humidity <75%RH, nominal input voltage and rated output load;
4. All index testing methods in this manual are based on the enterprise standards of the company;
5. Our company can provide product customization, specific needs can directly contact our technical staff;