

MB-1W Series



1W 2:1 Regulated Single & Dual output

Features

- 6 Pins SIL Package, Full SMD Technology Inside.
- Wide 2:1 Input Range
- 1500VDC Isolation
- Fully regulated output
- No minimum load required
- Continuous Short Circuit Protection
- Efficiency up to 81%
- Low Ripple and Noise
- -40°C ~ +85°C Operating Temperature Range



The MB-1W series is a family of cost effective 1W single & dual output DC-DC converters. These converters are consisted with Non-conductive Black Plastic in a 6-pin SIL package with high performance features such as 1500 VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line / load regulation. Devices are encapsulated using flame retardant resin. Input voltages of 5, 12, 24 and 48 with output voltage of 5,12,15,24, ±12 and ±15 Vdc. High performance features include high efficiency operation up to 80% and output voltage accuracy of ±2% maximum.

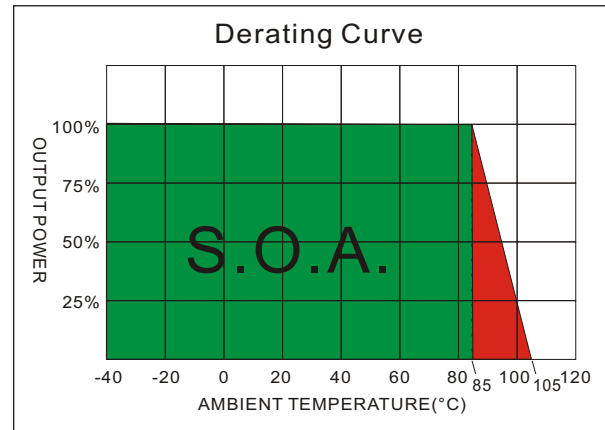
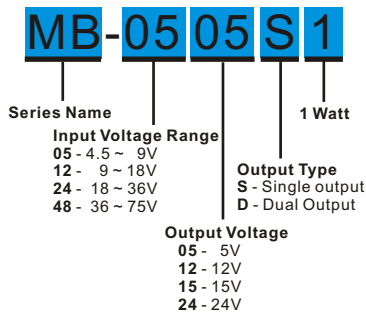
All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

OUTPUT SPECIFICATIONS		PHYSICAL SPECIFICATIONS	
Output Voltage Accuracy	±2%	Case Material	Non-conductive Black Plastic(UL94V-0 rated)
Minimum Output Current	0mA, min.	Pin Material	C5191R-H Solder-coated
Maximum Output Current	See table	Potting Material	Epoxy (UL94V-0 rated)
Line Regulation	±0.2%, max.	Weight	3.0g, typ.
Load Regulation (Single Output)(0% to 100%)	±1.0%, max.	Dimensions	0.67"x0.30"x0.43"
(Dual Output)(0% to 100%)	±2.0%, max.		
(Dual Output)(5% to 100%)	±1.0%, max.		
Cross Regulation (Dual Output) (1)	±5%	ENVIRONMENT SPECIFICATIONS	
Ripple&Noise (20 Mhz bandwidth) (2)	50mVpk-pk, max.	Operating Temperature	-40°C ~ +85°C(See Derating Curve)
Short Circuit Protection	Continuous(Automatic Recovery)	Maximum Case Temperature	105°C
Temperature Coefficient	±0.02%/°C	Storage Temperature	-55°C~125°C
Capacitive Load (3)	See table	Cooling	Nature Convection
Transient Recovery Time (4)	500us, typ.	ABSOLUTE MAXIMUM RATINGS(6)	
Transient Response Deviation (4)	±3%, max.	These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability.	
INPUT SPECIFICATIONS		Input Surge Voltage(1000mS)	
Input Voltage Range	See table.	05 Models	15 Vdc, max.
Input Filter	Capacitors	12 Models	25 Vdc, max.
Input Current (No-Load)	See table, max.	24 Models	50 Vdc, max.
Input Current (Full-Load)	See table, typ.	48 Models	100 Vdc, max.
Input Reflected Ripple Current (5)	35mA pk-pk	Soldering Temperature	260°C, max.
		(1.5mm from case 10 sec. max.)	
GENERAL SPECIFICATIONS		EMC SPECIFICATIONS	
Efficiency	See table, typ.	Radiated Emissions	EN55022 CLASS A
I/O Isolation Voltage (60 sec.)	1500 Vdc	Conducted Emissions (7)	EN55022 CLASS A
I/O Isolation Capacitance	70 pF, typ.	ESD	IEC 61000-4-2 Perf. Criteria A
I/O Isolation Resistance	1000M Ohm, min.	RS	IEC 61000-4-3 Perf. Criteria A
Switching Frequency	150~550KHz	EFT (8)	IEC 61000-4-4 Perf. Criteria A
Humidity	95% rel H	Surge (8)	IEC 61000-4-5 Perf. Criteria A
Reliability Calculated MTBF (MIL-HDBK-217 F)	> 2.8 Mhrs	CS	IEC 61000-4-6 Perf. Criteria A
Safety Standard	UL/cUL 60950-1 , IEC/EN 60950-1	PFMF	IEC 61000-4-8 Perf. Criteria A
Safety Approvals	UL/cUL 60950-1 , IEC/EN 60950-1		

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PART NUMBER STRUCTURE



MODEL SELECTION GUIDE

MODEL NUMBER	INPUT Voltage Range (Vdc)	INPUT Current		OUTPUT Voltage (Vdc)	OUTPUT Current		EFFICIENCY @FL (%)	Capacitive Load (uF)
		No-Load (mA)	Full Load (mA)		Min. load (mA)	Full load (mA)		
MB-0505S1	4.5-9	35	263	5	0	200	76	1680
MB-0512S1	4.5-9	35	253	12	0	83	79	820
MB-0515S1	4.5-9	35	250	15	0	67	80	680
MB-0524S1	4.5-9	35	250	24	0	42	80	470
MB-1205S1	9-18	20	107	5	0	200	78	1680
MB-1212S1	9-18	20	105	12	0	83	80	820
MB-1215S1	9-18	20	103	15	0	67	81	680
MB-1224S1	9-18	20	105	24	0	42	80	470
MB-2405S1	18-36	10	54	5	0	200	78	1680
MB-2412S1	18-36	10	52	12	0	83	80	820
MB-2415S1	18-36	10	52	15	0	67	80	680
MB-2424S1	18-36	10	52	24	0	42	81	470
MB-4805S1	36-75	7	28	5	0	200	76	1680
MB-4812S1	36-75	7	27	12	0	83	78	820
MB-4815S1	36-75	7	27	15	0	67	78	680
MB-4824S1	36-75	7	27	24	0	42	77	470
MB-0512D1	4.5-9	35	259	±12	0	±42	77	±470
MB-0515D1	4.5-9	35	254	±15	0	±33	79	±330
MB-1212D1	9-18	20	106	±12	0	±42	79	±470
MB-1215D1	9-18	20	105	±15	0	±33	80	±330
MB-2412D1	18-36	10	52	±12	0	±42	80	±470
MB-2415D1	18-36	10	53	±15	0	±33	79	±330
MB-4812D1	36-75	7	27	±12	0	±42	77	±470
MB-4815D1	36-75	7	27	±15	0	±33	77	±330

NOTE

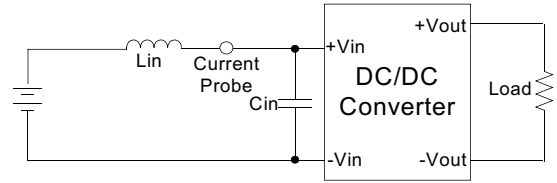
- One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- Ripple/Noise measured with a 1uF ceramic capacitor.
- Tested by minimal Vin and constant resistive load.
- Tested by normal Vin and 25% load step change (75%-50%-25% of Io).
- Measured Input reflected ripple current with a simulated source inductance of 12uH.
- Exceeding the absolute ratings of the unit could cause damage. It is not allowed for continuous operating.
- Input filter components are required to help meet conducted emission class A, which application refer to The EMI Filter of Design & feature configuration.
- An external filter capacitor is required if the module has to meet IEC61000-4-4 and IEC61000-4-5.
The filter capacitor Motien suggest: 5Vin models : Nippon - chemi - con KY series, 330uF/100V.
Other models : Nippon - chemi - con KY series, 220uF/100V.

The models listed above is just for standard type. If you need the special specification product, please contact our service member by telephone presented in shortform cover or e-mail to : sales@motien.com.tw

TEST CONFIGURATIONS

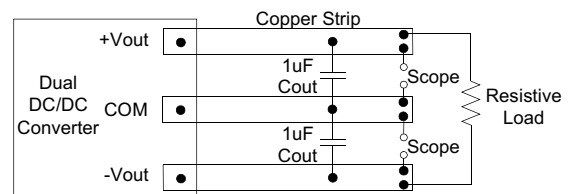
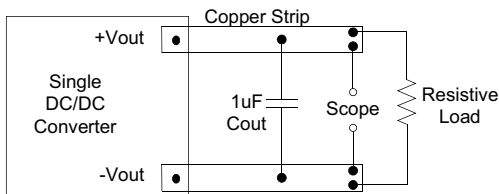
Input Reflected Ripple Current Test Step

Input reflected ripple current is measured through a source inductor L_{in} (12uH) and a source capacitor C_{in} (47uF, ESR<1.0Ω at 100KHz) at nominal input and full load.



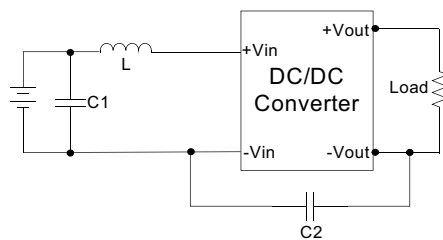
Output Ripple & Noise Measurement Test

Use a capacitor C_{out} (1.0uF) measurement. The Scope measurement bandwidth is 20MHz.

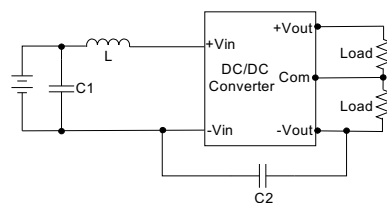


EMI Filter

Input filter components (C_1, C_2, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise.

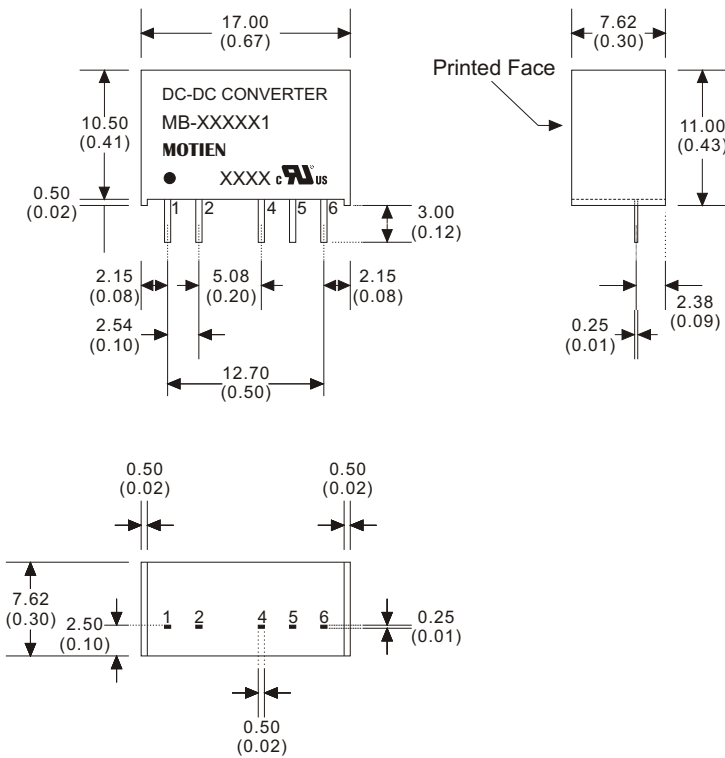


	C1	C2	L
MB-05XXS1	MLCC 4.7uF/50V	MLCC 220pF/3KV	4.7uH
MB-12XXS1	MLCC 4.7uF/50V	MLCC 220pF/3KV	4.7uH
MB-24XXS1	MLCC 4.7uF/50V	MLCC 220pF/3KV	18 uH
MB-48XXS1	MLCC 4.7uF/100V	MLCC 220pF/3KV	18 uH



	C1	C2	L
MB-05XXD1	MLCC 4.7uF/50V	MLCC 220pF/3KV	4.7uH
MB-12XXD1	MLCC 4.7uF/50V	MLCC 220pF/3KV	4.7uH
MB-24XXD1	MLCC 4.7uF/50V	MLCC 220pF/3KV	18 uH
MB-48XXD1	MLCC 4.7uF/100V	MLCC 220pF/3KV	18 uH

MECHANICAL SPECIFICATIONS



PIN CONNECTIONS		
PIN NUMBER	SINGLE	DUAL
1	-V Input	-V Input
2	+V Input	+V Input
4	+V Output	+V Output
5	N.P.	Common
6	-V Output	-V Output

6 Pin SIL Package

- Notes : All dimensions are typical in millimeters (inches).
1. Pin diameter: 0.5 ± 0.05 (0.02 ± 0.002)
 2. Pin pitch and length tolerance: ± 0.35 (± 0.014)
 3. Pin to case tolerance: ± 0.5 (± 0.02)
 4. Case Tolerance: ± 0.5 (± 0.02)
 5. Stand-off tolerance: ± 0.1 (± 0.004)