

Non Isolated Board Mount DC / DC Converters

multicomp PRO

**RoHS
Compliant**



Features

- High efficiency up to 96%
- No-load input current as low as 0.3mA
- Operating ambient temperature range: -40°C to +85°C
- Support the negative output
- Output short-circuit protection

Selection Guide

Part Number	Certification	Input Voltage (V DC)*	Output		Full Load Efficiency(%) Vin Min. / Vin Max.	Capacitive Load (µF) Max.
		Nominal (Range)	Voltage (V DC)	Current (mA) Max.		
MP-K7803M-1000R3	EN/BS EN	24 (6-36)	3.3	1000	90/80	680
MP-K7805M-1000R3		24 (8-36)	5	1000	93/85	680
		12 (8-27)	-5	-500	85/81	330
MP-K78X6M-1000R3		24 (10-36)	6.5	1000	93/85	680
MP-K7809M-1000R3		24 (13-36)	9	1000	94/89	680
MP-K7812M-1000R3		24 (16-36)	12	1000	95/92	680
		12 (8-20)	-12	-300	88/87	330
MP-K7815M-1000R3		24 (20-36)	15	1000	96/93	680
		12 (8-18)	-15	-300	87/88	330

Note: For input voltages exceeding 30V DC, an input capacitor of 22µF/50V is required.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Input Current	Positive output	-	0.3	1	mA
	Negative output	-	1	4	
Reverse Polarity at Input		Avoid / Not protected			
Input Filter		Capacitance filter			

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Output Specifications

Item	Operating Conditions		Min.	Typ.	Max.	Unit
Voltage Accuracy	Full load, Input Voltage Range	MP-K7803M-1000R3	-	±2	±4	%
		Others	-	±1.5	±3	
Linear Regulation	Full load, input voltage range		-	±0.2	±0.4	%
Load Regulation	Nominal input voltage, 10% -100% load	Positive output	-	±0.4	±0.6	
		Negative output	-	±0.4	±0.8	
Ripple & Noise*	20MHz bandwidth, nominal input voltage, 20% -100% load		-	25	75	mVp-p
Temperature Coefficient	100% load		-	-	±0.03	%/°C
Transient Response Deviation	Nominal input voltage, 25% load step change		-	±60	±200	mV
Transient Recovery Time			-	-	1	ms
Short-circuit Protection	Nominal input voltage		Continuous, self-recovery			

Notes:

- *1. The "parallel cable" method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information;
2. With light loads at or below 20%, the maximum Ripple and Noise for 3.3/5V output parts increase to 100mVp-p and for 6.5/9/12/15V output parts increase to 2%Vo.

General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature*	-	-40	-	85	°C
Storage Temperature	-	-55	-	125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	-	-	260	
Storage Humidity	Non-condensing	-	-	95	%RH
Switching Frequency	Full load, nominal input	-	520	-	kHz
MTBF	MIL-HDBK-217F @ 25°C	2000	-	-	k hours

Note: *When Vin >30V, for positive output of 6.5V/9V/12V/15V, product start to derating from temperature ≥ 55°C and derating to 40%Io if the temperature is 85°C.

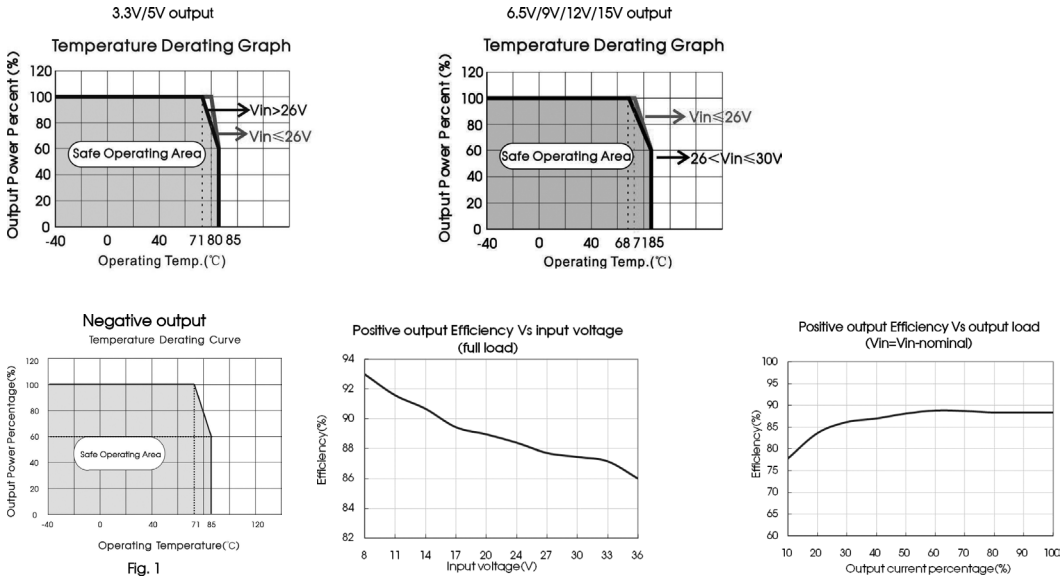
Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)
Dimensions	11.5mm × 8mm × 10.4mm
Weight	1.9g (Typ.)
Cooling Method	Free Air Convection

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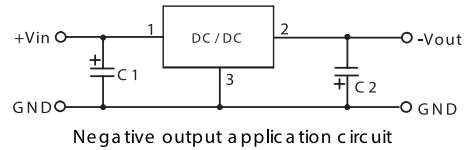
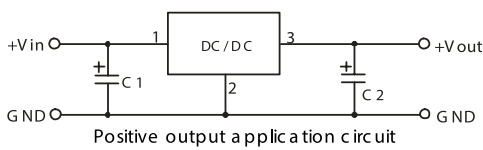


Typical Characteristic Curves



Design Reference

Typical application



Typical application circuit

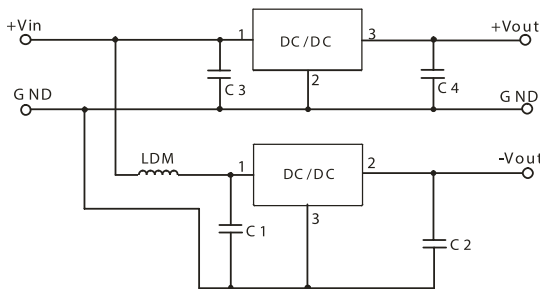


Table 1

Part Number	C1/C3 (Ceramic Capacitor)	C2/C4 (Ceramic Capacitor)
MP-K7803M-1000R3	10μF/50V	22μF/10V
MP-K7805M-1000R3		22μF/10V
MP-K78X6M-1000R3		22μF/16V
MP-K7809M-1000R3		22μF/16V
MP-K7812M-1000R3		22μF/25V
MP-K7815M-1000R3		22μF/25V

Notes:

1. The required capacitors C1 and C2 (C3 and C4) must be connected close as possible to the terminals of the module.
2. Refer to Table 1 for C1 and C2 (C3 and C4) capacitor values.
3. For certain applications, increased values for C2 and C4 and/or tantalum or low ESR electrolytic capacitors may also be used instead.
4. When using configurations as shown, we recommended to add an inductor (LDM) with a value of up to 10μH which helps reducing mutual interference.
5. Converter cannot be used for hot swap and with output in parallel.

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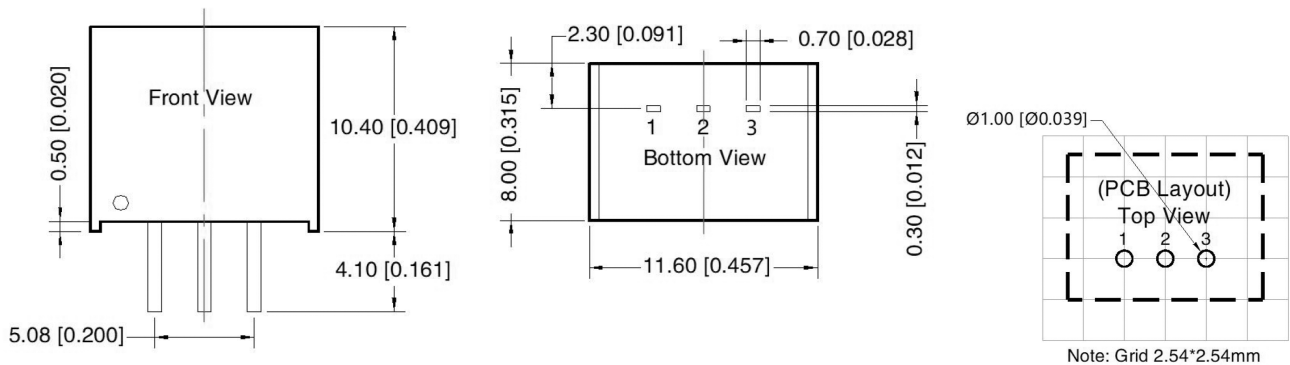
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EMC compliance circuit

Recommended compliance circuit

	EMC recommended compliance circuit	Parameter description														
Positive Output		<table border="1"> <tr> <td>FUSE</td> <td>Select fuse value according to actual input current</td> </tr> <tr> <td>MOV</td> <td>S20K30</td> </tr> <tr> <td>LDM1</td> <td>82μH</td> </tr> <tr> <td>C0</td> <td>680μF /50V</td> </tr> <tr> <td>LCM1</td> <td>4.7mH</td> </tr> <tr> <td>C1/C2</td> <td>4.7μF /50V</td> </tr> <tr> <td>C3</td> <td>Refer to the Count in table 1</td> </tr> </table>	FUSE	Select fuse value according to actual input current	MOV	S20K30	LDM1	82μH	C0	680μF /50V	LCM1	4.7mH	C1/C2	4.7μF /50V	C3	Refer to the Count in table 1
FUSE	Select fuse value according to actual input current															
MOV	S20K30															
LDM1	82μH															
C0	680μF /50V															
LCM1	4.7mH															
C1/C2	4.7μF /50V															
C3	Refer to the Count in table 1															
Negative Output		<table border="1"> <tr> <td>FUSE</td> <td>Select fuse value according to actual input current</td> </tr> <tr> <td>MOV</td> <td>S20K30</td> </tr> <tr> <td>LDM1</td> <td>82μH</td> </tr> <tr> <td>C0</td> <td>680μF /50V</td> </tr> <tr> <td>LCM1</td> <td>4.7mH</td> </tr> <tr> <td>C1/C3/C4</td> <td>4.7μF /50V</td> </tr> <tr> <td>C2</td> <td>10μF /50V</td> </tr> </table>	FUSE	Select fuse value according to actual input current	MOV	S20K30	LDM1	82μH	C0	680μF /50V	LCM1	4.7mH	C1/C3/C4	4.7μF /50V	C2	10μF /50V
FUSE	Select fuse value according to actual input current															
MOV	S20K30															
LDM1	82μH															
C0	680μF /50V															
LCM1	4.7mH															
C1/C3/C4	4.7μF /50V															
C2	10μF /50V															

Diagram



Dimensions : Millimetres (Inches)
Pin Diameter Tolerances: ±0.1mm (±0.004")
General Tolerances: ±0.5mm (±0.02")

Pin-Out		
Pin	Positive Output	Negative Output
1	Vin	Vin
2	GND	-Vo
3	+Vo	GND

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Part Number Table

Description	Part Number
Non Isolated Board Mount, DC / DC Converters, 3.3V, 1A	MP-K7803M-1000R3
Non Isolated Board Mount, DC / DC Converters, 5V, 1A	MP-K7805M-1000R3
Non Isolated Board Mount, DC / DC Converters, 6.5V, 1A	MP-K78X6M-1000R3
Non Isolated Board Mount, DC / DC Converters, 9V, 1A	MP-K7809M-1000R3
Non Isolated Board Mount, DC / DC Converters, 12V, 1A	MP-K7812M-1000R3
Non Isolated Board Mount, DC / DC Converters, 15V, 1A	MP-K7815M-1000R3

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