

Non Isolated Board Mount DC / DC Converters

multicomp PRO

**RoHS
Compliant**



Features

- Input voltage range up to 10:1
- High efficiency up to 93%
- No-load input current as low as 1.5mA
- Operating ambient temperature range: -40°C to +85°C
- Output short-circuit protection

Selection Guide

Part Number	Input Voltage (V DC)*	Output		Full Load Efficiency (%) Typ. Vin Min./Vin Max.	Capacitive Load (μF) Max.
	Nominal (Range)	Voltage (V DC)	Current (mA) Max.		
MP-K78Ux6-500R3	48 (9-90)	6.5	500	91/78	100
MP-K78UX6-500R3L					

Note: *For input voltage exceeding 60V DC, an input capacitor of 100uF/100V is required.

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Input Current	Nominal input voltage	-	-	1.5	mA
Reverse Polarity at Input	-	Avoid / Not protected			
Input Filter	-	Capacitance filter			

Output Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Voltage Accuracy	10%-100%, input voltage range	-	±2	±3	%
Linear Regulation	Full load, input voltage range	-	±0.6	±1.5	
Load Regulation	Nominal input voltage, 10% -100% load	-	±1	±2	
Ripple & Noise*	20MHz bandwidth, nominal input voltage, 10% -100% load	-	40	80	mVp-p
Temperature Coefficient	Operating temperature -40°C to +105°C	-	-	±0.03	%/°C
Transient Response Deviation	Nominal input voltage, 25% load step change	-	±0.4	±1.5	mV
Transient Recovery Time		-	0.2	1	ms
Short-circuit Protection	Input voltage range	Ambient temperature ≤85°C		Continuous, self-recovery	
		Ambient temperature >85°C		Short ≤3s	

Notes:

*The "parallel cable" method is used for ripple and noise test, refer to DC-DC Converter Application Notes for specific information.

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General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	-	-40	-	+85	°C
Storage Temperature	Product	-55	-	+125	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	-	-	+300	
Storage Humidity	Non-condensing	5	-	95	%RH
Switching Frequency	Full load, nominal input voltage	-	300	-	kHz
MTBF	MIL-HDBK-217F@25°C	8215	-	-	k hours

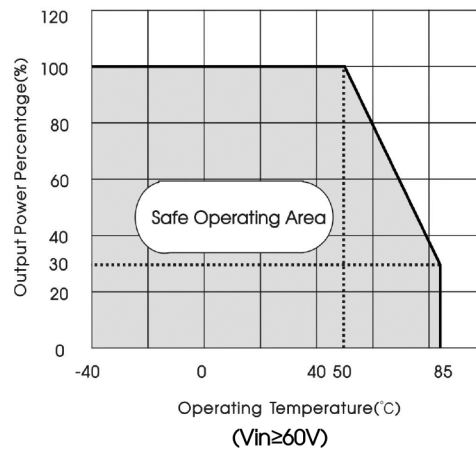
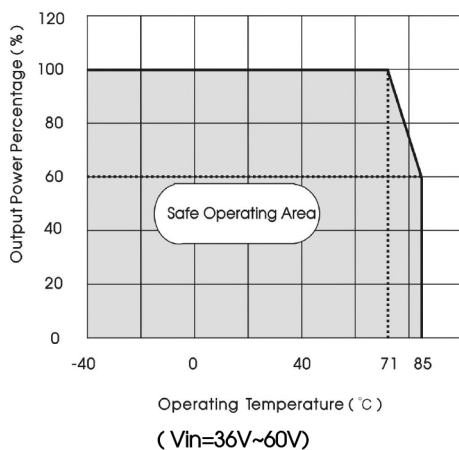
Note: * Meeting the vibration standard requires filling the bottom void of the product with silicone rubber.

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)	
Dimensions	MP-K78Ux6-500R3	11.5mm × 9mm × 17.5mm
	MP-K78UX6-500R3L	19mm × 11.5mm × 9mm
Weight	3.8g (Typ.)	
Cooling Method	Free Air Convection	

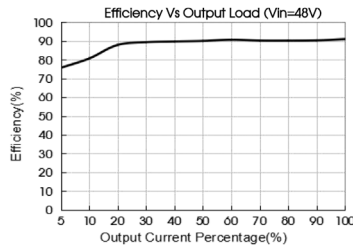
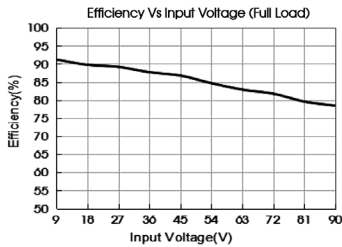
Typical Characteristic Curves

Temperature Derating Curves



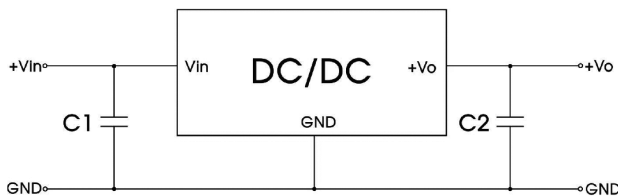
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Design Reference

Typical application

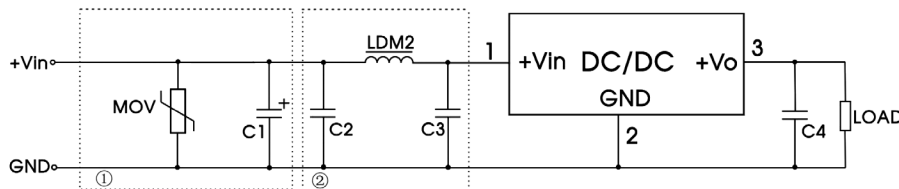


Part Number	C1 (Ceramic Capacitor)	C2 (Ceramic Capacitor)
MP-K78Ux6-500R3	10µF/100V	22µF/10V
MP-K78UX6-500R3L		

Notes:

1. The required C1 and C2 capacitors must be connected as close as possible to the terminals of the module;
2. Refer to Table 1 for C1 and C2 capacitor values. For certain applications, increased values and/or tantalum or low ESR electrolytic capacitors may also be used instead;
3. Converter cannot be used for hot swap and with output in parallel.

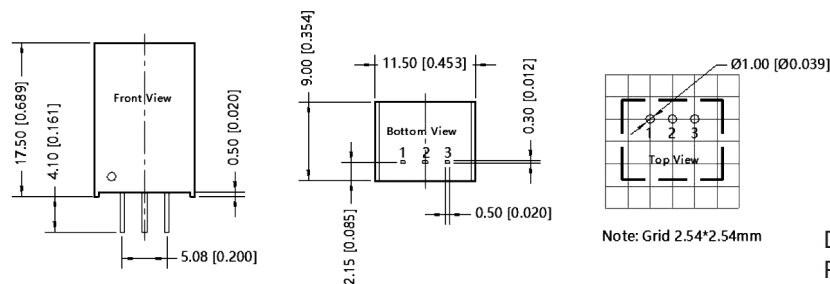
EMC compliance circuit



MOV	C1	C2	LDM2	C3	C4
S20K30	680µF /100V	4.7µF/100V	120µH	4.7µF/100V	10µF/50V

Diagram

MP-K78Ux6-500R3



Note: Grid 2.54*2.54mm

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

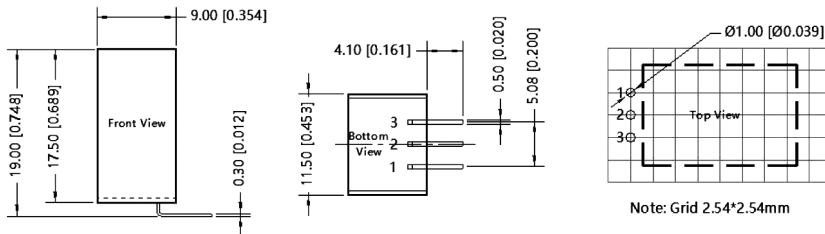
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MP-K78UX6-500R3L



Pin-Out	
Pin	Function
1	Vin
2	GND
3	+Vo

Dimensions : Millimetres (Inches)
Pin Diameter Tolerances: $\pm 0.1\text{mm}$ ($\pm 0.004''$)
General Tolerances: $\pm 0.5\text{mm}$ ($\pm 0.02''$)

Part Number Table

Description	Part Number
Non Isolated Board Mount, DC / DC Converter, 6.5V, 0.5A	MP-K78Ux6-500R3
Non Isolated Board Mount, DC / DC Converter, 6.5V, 0.5A	MP-K78UX6-500R3L

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