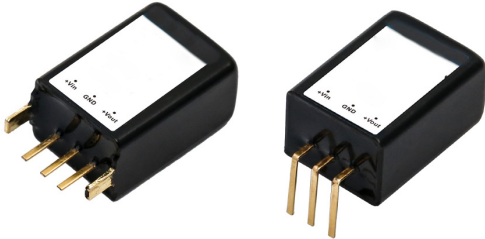


Non Isolated Board Mount DC / DC Converters

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**RoHS
Compliant**



Features

- Input voltage range up to 8:1
- High efficiency up to 92%
- No-load input current as low as 0.5mA
- Operating ambient temperature range: -40°C to +85°C
- Output short-circuit protection
- Meet MIL-STD-810F vibration test

Selection Guide

Part Number	Input Voltage (V DC)*	Output		Full Load Efficiency (%) MIN./Typ.		Capacitive Load (μF) Max.
	Nominal (Range)	Voltage (V DC)	Current (mA) Max.	Vin=24V	Vin=48V	
MP-K78Ux6-1000R3	48 (9-75)	6.5	1000	82/86	81/85	1200
MP-K78Ux6-1000R3L						

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

Input Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
No-load Input Current	Nominal input voltage	-	0.5	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	-	±1.5	±2.5	%
Linear Regulation	Full load, input voltage range	-	±0.6	±1.5	
Load Regulation	Nominal input voltage, 10% -100% load	-	±0.6	±1	
Ripple & Noise*	20MHz bandwidth, nominal input voltage, 10% -100% load	-	75	-	mVp-p
Temperature Coefficient	Operating temperature -40°C to +105°C	-	-	±0.02	%/°C
Transient Response Deviation	Nominal input voltage, 25% load step change	-	±100	±180	mV
Transient Recovery Time		-	150	250	μs
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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Non Isolated Board Mount DC / DC Converters



General Specifications

Item	Operating Conditions	Min.	Typ.	Max.	Unit
Operating Temperature	-	-40	-	+105	°C
Storage Temperature	Product	-55	-	+125	
	Tag	-40		+300	
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	-	-	+300	
Storage Humidity	Non-condensing	5	-	95	%RH
Vibration*	Bottom-filled silicone rubber	MIL-STD-810F			
Switching Frequency	Full load, nominal input voltage	-	250	-	kHz
MTBF	MIL-HDBK-217F@25°C	8215	-	-	k hours

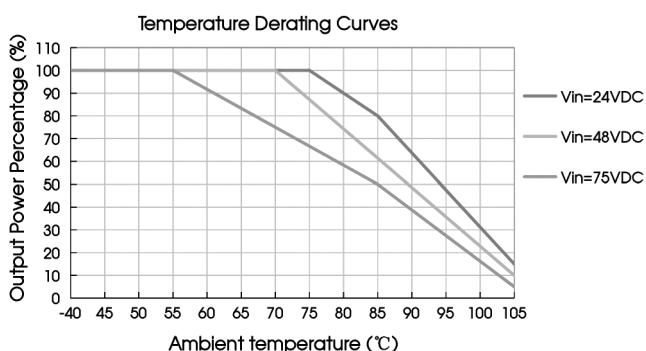
Note: * Meeting the vibration standard requires filling the bottom void of the product with silicone rubber.

Mechanical Specifications

Case Material	Black plastic; flame-retardant and heat-resistant (UL94V-0)	
Dimensions	MP-K78U24-700R3	12.1mm × 8.6mm × 17.5mm
	MP-K78U24-700R3L	20.35mm × 12.1mm × 8.6mm
Weight	MP-K78U24-700R3	6.2g (Typ.)
	MP-K78U24-700R3L	6.6g (Typ.)
Cooling Method	Free Air Convection	

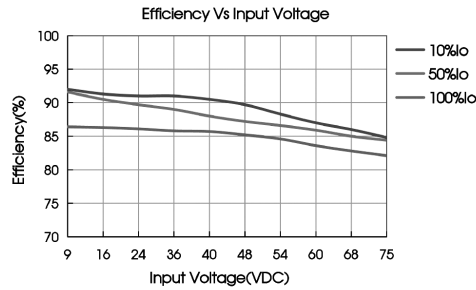
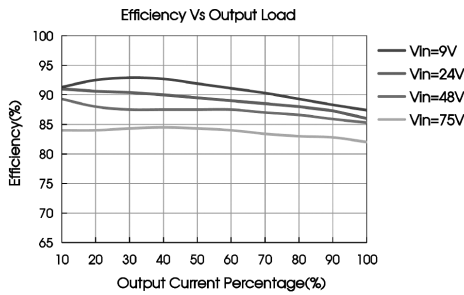
Typical Characteristic Curves

Temperature Derating Curves



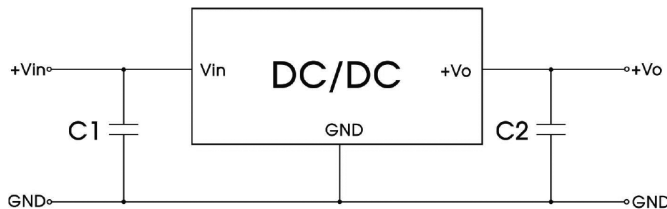
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Design Reference

Typical application

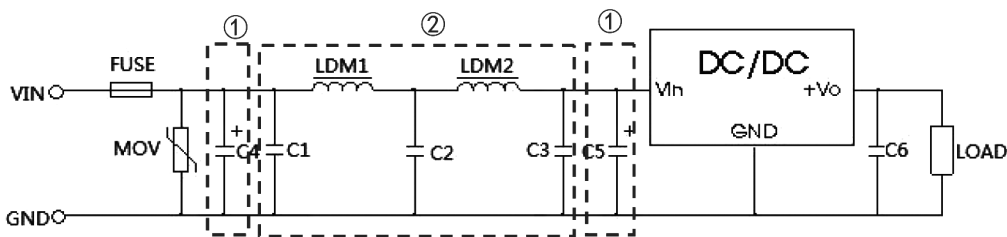


Part Number	C1 (Ceramic Capacitor)	C2 (Ceramic Capacitor)
MP-K78Ux6-1000R3	10μF/100V	22μF/10V
MP-K78Ux6-1000R3L		

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



C4/C5	C1/C2/C3	C6	LDM1	LDM2
680μF/100V	4.7μF/100V	10μF/50V	10μH	22μH

PCB Heat Dissipation Copper Foil Recommended

Series	Heat dissipation copper foil layer	Heat dissipation copper foil area
MP-K78UXX-1000R3	double	15mm×15mm
MP-K78UXX-1000R3L	single	20mm×20mm

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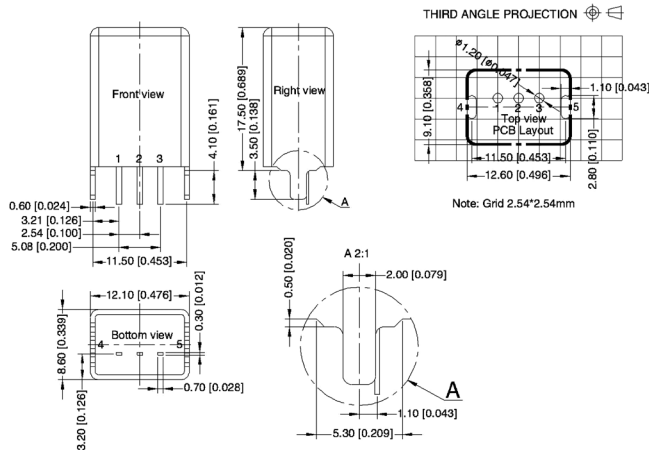
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Diagram

MP-K78U24-700R3

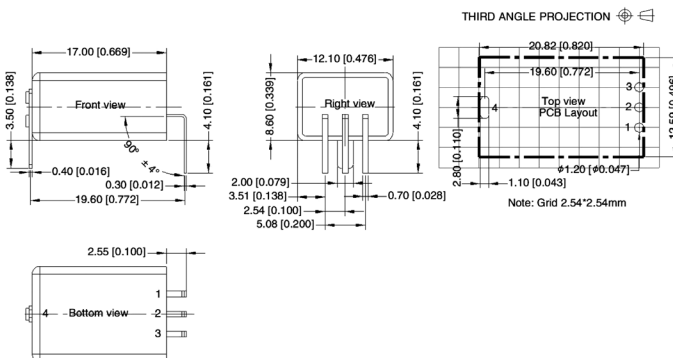


Pin-Out	
Pin	Mark
1	+Vin
2	GND
3	+Vout
4	Case Pin
5	Case Pin

Note:

PIN4 and PIN5 are shell terminals for heat dissipation. When using the product, connect the terminals to the rear PCB board, and the PCB must be suspended.

MP-K78U24-700R3L



Pin-Out	
Pin	Mark
1	+Vin
2	GND
3	+Vout
4	Case Pin

Note: PIN4 is the shell terminal, which dissipates heat. When using the product, connect the terminal to the rear PCB board. The PCB must be suspended in the air.

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 Converters, 6.5V, 1A	MP-K78Ux6-1000R3
Non Isolated Board Mount, DC / DC Converters, 6.5V, 1A	MP-K78Ux6-1000R3L

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