

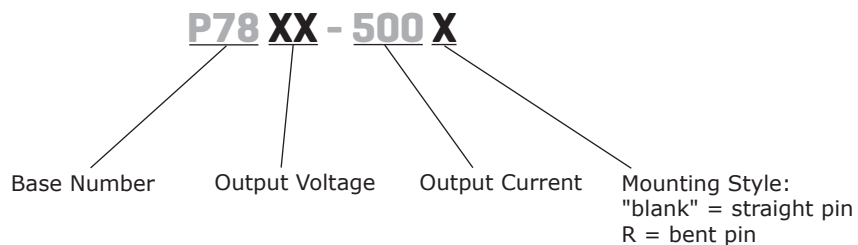
**SERIES: P78-500 | DESCRIPTION: NON-ISOLATED SWITCHING REGULATOR**
**FEATURES**

- 0.5 A output current
- up to 10:1 input range (9~90 Vdc)
- straight and bent pin options
- certified to EN/IEC 62368
- no-load input current as low as 1.5 mA
- -40°C to +85°C temperature range



MODEL	input voltage <sup>1</sup>		output voltage (Vdc)	output current max (mA)	output power max (W)	ripple and noise <sup>2</sup> max (mVp-p)	efficiency	
	typ (Vdc)	range (Vdc)					Vin min (%)	Vin max (%)
P7803-500	48	9 ~ 90	3.3	500	1.65	80	82	69
P7805-500	48	9 ~ 90	5.0	500	2.50	80	87	75
P7806-500	48	9 ~ 90	6.5	500	3.25	80	91	78
P7809-500	48	14 ~ 90	9.0	500	4.50	80	91	80
P7812-500	48	18 ~ 90	12.0	500	6.0	80	91	83
P7815-500	48	20 ~ 90	15.0	500	7.50	80	93	84
P7824-500	48	36 ~ 90	24.0	300	7.2	80	93	85

Notes: 1. For input voltage exceeding 80 Vdc, an input capacitor of 22µF/100V is required.  
 2. The ripple and noise are measured at 20 MHz BW using the parallel cable method at nominal input voltage, full load. See Application notes.

**PART NUMBER KEY**


## INPUT

parameter	conditions/description	min	typ	max	units
no load input current	at nominal input			1.5	mA
reverse polarity at input	avoid / not protected				
input filter	capacitance filter				

## OUTPUT

parameter	conditions/description	min	typ	max	units
line regulation	Vin = min ~ max, at full load		±0.6	±1.5	%
	3.3, 5, 6.5 Vdc output models		±0.6	±2.0	%
	9, 12, 15 Vdc output models		±1.2	±2.5	%
	24 Vdc output model				
load regulation	at nominal input, 10% ~ 100% load		±1.0	±2.0	%
voltage accuracy	at nominal input, 10% ~ 100% load				
	3.3 Vdc output model		±3.5	±4.5	%
	all other output models		±2.0	±3.0	%
switching frequency <sup>3</sup>	at nominal input, full load		330		kHz
temperature coefficient	-40°C ~ 80°C			±0.03	%/°C
transient response deviation	at nominal input, 25% load step change		±0.4	±1.5	%
transient recovery time	at nominal input, 25% load step change		0.2	1	ms

Note: 3. Different output voltage with different switching frequency.

## PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, auto recovery				

## SAFETY AND COMPLIANCE

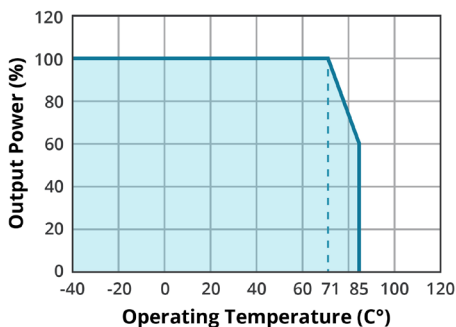
parameter	conditions/description	min	typ	max	units
safety approvals	certified to 62368: EN, IEC				
conducted emissions	CISPR32/EN55032 Class B (see Figure 2-2)				
radiated emissions	CISPR32/EN55032 Class B (see Figure 2.2)				
ESD	IEC/EN 61000-4-2 Contact±4kV, perf. Criteria B				
radiated immunity	IEC/EN 61000-4-3 10V/m, perf. Criteria B				
EFT/burst	IEC/EN 61000-4-4 100kHz±1kV, perf. Criteria B (see Figure 2-1)				
surge	IEC/EN 61000-4-5 line to line±1kV, perf. Criteria B (see Figure 2-1)				
conducted immunity	IEC/EN 61000-4-6 3Vr.m.s, perf. Criteria B				
MTBF	as per MIL-HDBK-217 at 25°C	2,000,000			hours
RoHS compliant	yes				

## ENVIRONMENTAL

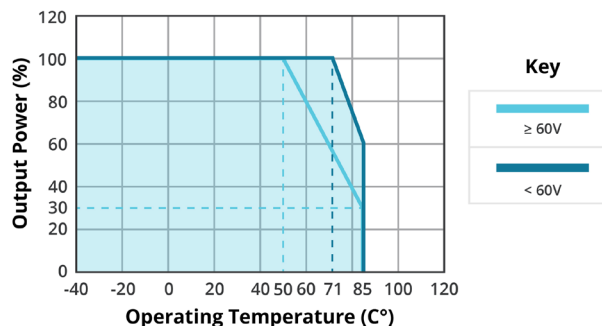
parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-55		125	°C
storage humidity	non-condensing	5		95	%
pin soldering resistance temperature	1.5 mm from case for 10 seconds			300	°C

## DERATING CURVES

**TEMPERATURE DERATING CURVE**  
3V, 5V, 6V, 9V, 12V, 15V models



**TEMPERATURE DERATING CURVE**  
24V model



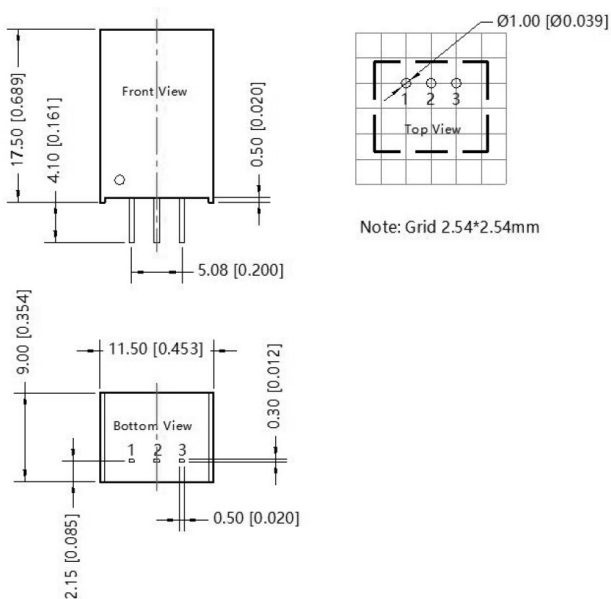
## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	straight pin models: 17.50 x 11.50 x 9.00 [0.689 x 0.453 x 0.354 inch] bent pin models: 19.00 x 11.50 x 9.00 [0.748 x 0.453 x 0.354 inch]				mm mm
case material	black plastic, flame retardant and heat resistant (UL94-V0)				
weight			3.8		g
cooling	natural convection				

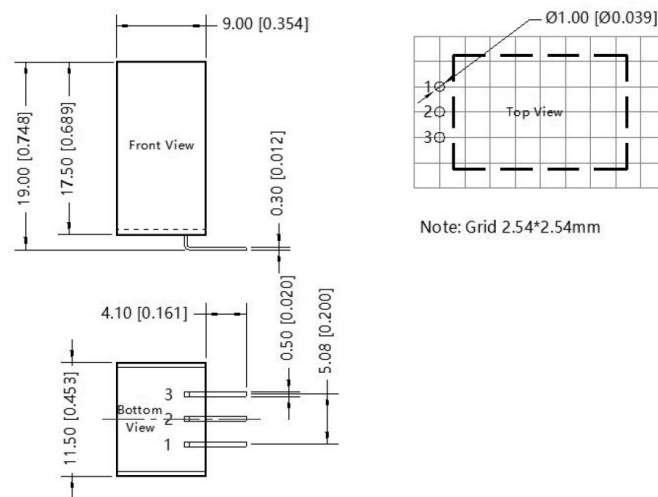
## MECHANICAL DRAWING

units: mm [inches]  
tolerance:  $\pm 0.50$  [ $\pm 0.020$ ]  
pin section tolerance:  $\pm 0.10$  mm [ $\pm 0.004$ ]

### Straight pin



### Bent pin



PIN CONNECTIONS	
PIN	FUNCTION
1	+Vin
2	GND
3	+Vo

## TYPICAL APPLICATION CIRCUIT

Figure 1

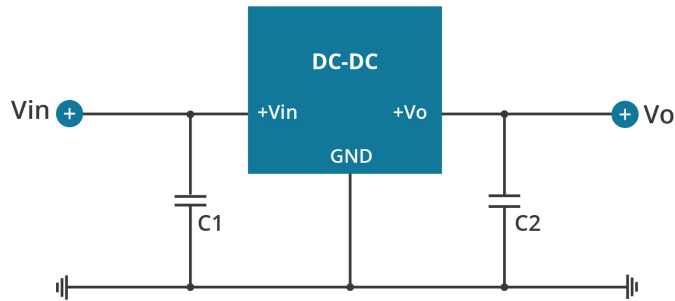


Table 1

Output Voltage (Vdc)	C1 (ceramic capacitor)	C2 (ceramic capacitor)
3.3, 5, 6.5	10µF/100V	22µF/10V
9		22µF/16V
12, 15		22µF/25V
24		10µF/50V

1. The required C1 and C2 capacitors must be connected as close as possible to 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 RECOMMENDED CIRCUIT

Figure 2

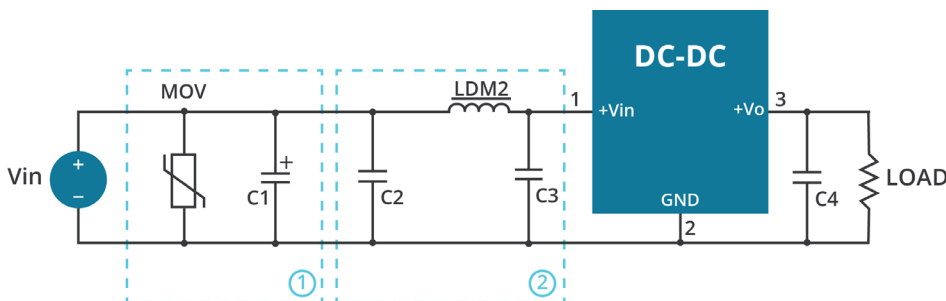


Table 2

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

## REVISION HISTORY

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rev.	description	date
1.0	initial release	05/26/2022

The revision history provided is for informational purposes only and is believed to be accurate.



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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

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