



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



**SERIES:** P78A-0500 | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

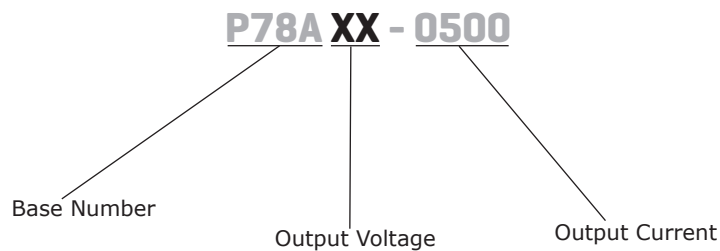
- up to 500 mA current output
- pin compatible with LM78XX linear regulators
- non-isolated switching regulator
- high start-up current capability
- wide input voltage range
- efficiency up to 95%
- low ripple and noise
- short circuit protection
- ultra-compact SIP3 package
- -40°C to +85°C temperature range



MODEL	input voltage		output voltage	output current		output power	ripple & noise <sup>1</sup>	efficiency <sup>2</sup>
	typ (Vdc)	range (Vdc)	(Vdc)	min <sup>3</sup> (mA)	max (mA)	max (W)	typ (mVp-p)	typ (%)
P78A03-0500	24	6~28	3.3	10	500	1.65	50	88
P78A05-0500	24	7~28	5	10	500	2.5	50	92

- Notes:
1. At full load, nominal input, 20 MHz bandwidth oscilloscope.
  2. At min Vin.
  3. Operation under minimum load will not affect the reliability of the converter; however, the ripple and noise may exceed the specified values.
  4. All specifications measured at: Ta=25°C, nominal input voltage, rated output load, and after warm up unless otherwise specified.

**PART NUMBER KEY**



## INPUT

parameter	conditions/description	min	typ	max	units
operating input voltage	3.3 Vdc model	6	24	28	Vdc
	5 Vdc model	7	24	28	Vdc
no load input current			1.5		mA

## OUTPUT

parameter	conditions/description	min	typ	max	units
maximum capacitive load <sup>1</sup>				220	μF
line regulation	measured from low to high line, full load		±0.5		%
load regulation	measured from 10~100% load		±1		%
voltage accuracy			±3		%
switching frequency			570		kHz

Note: 1. Maximum capacitive load is tested at minimum input voltage and full load.

## PROTECTIONS

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

## SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
conducted emissions	EN55022, class A, class B (external circuit required, see Figure 2)				
radiated emissions	EN55022, class A, class B (external circuit required, see Figure 2)				
MTBF	as per MIL-HDBK-217F, full load, 25 °C	4,185,000			hours
	as per MIL-HDBK-217F, full load, 85 °C	2,182,000			hours
RoHS	2011/65/EU				

## ENVIRONMENTAL

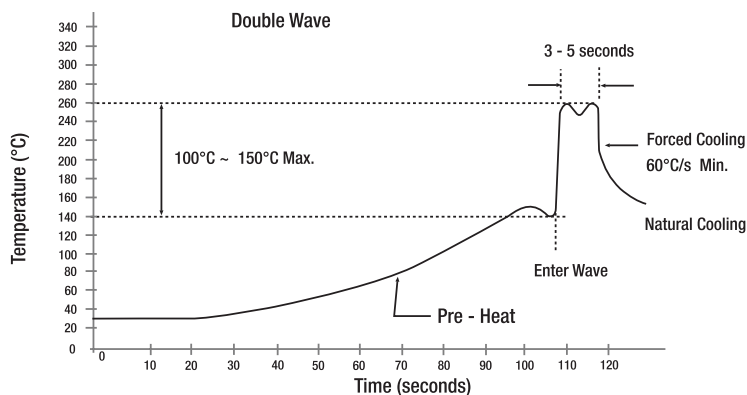
parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		85	°C
storage temperature		-55		125	°C
vibration	10~55 Hz, 30 minutes along each axis		2		G

## SOLDERABILITY

parameter	conditions/description	min	typ	max	units
wave soldering	see wave solder profile			260	°C

Note: 2. The wave solder profile is measured on lead temperature.  
3. Need to keep the solder parts internal temperature less than about 210°C.

### Lead-free Recommended Soldering Profile



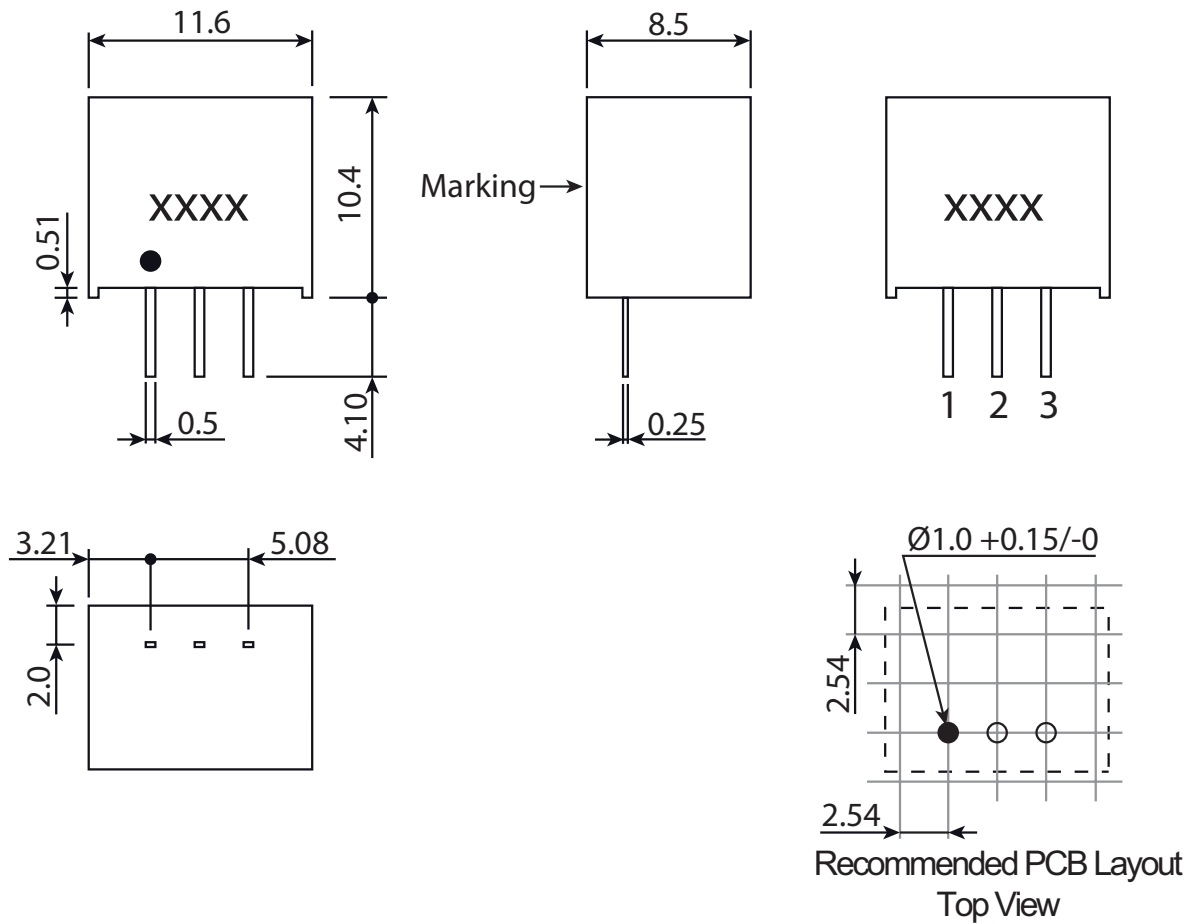
## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	11.6 x 8.5 x 10.4				mm
case material	non-conductive black plastic (UL94V-0)				
potting material	silicone (UL94V-0)				
weight			2		g

## MECHANICAL DRAWING

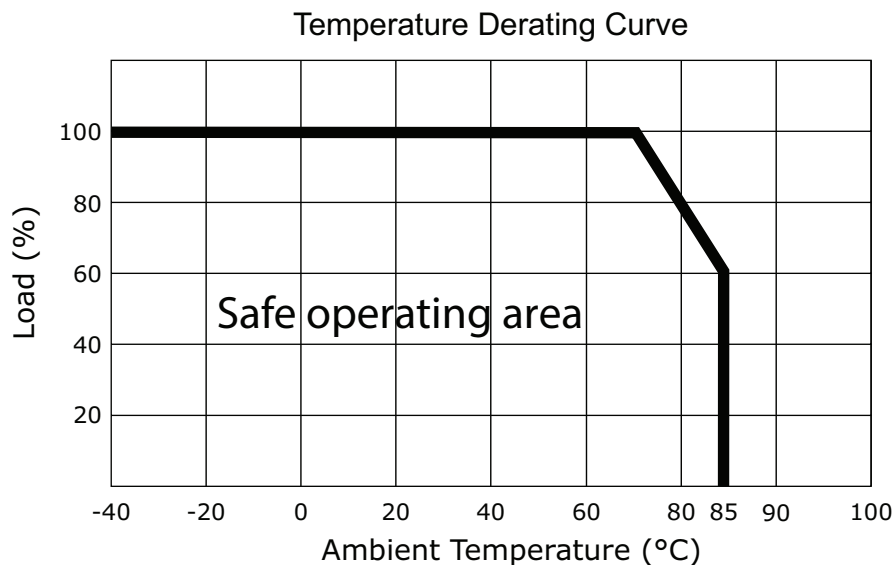
units: mm  
 tolerance: XX.X=±0.50 mm  
 XX.XX=±0.25 mm

PIN CONNECTIONS	
PIN	Function
1	+Vin
2	GND
3	+Vout

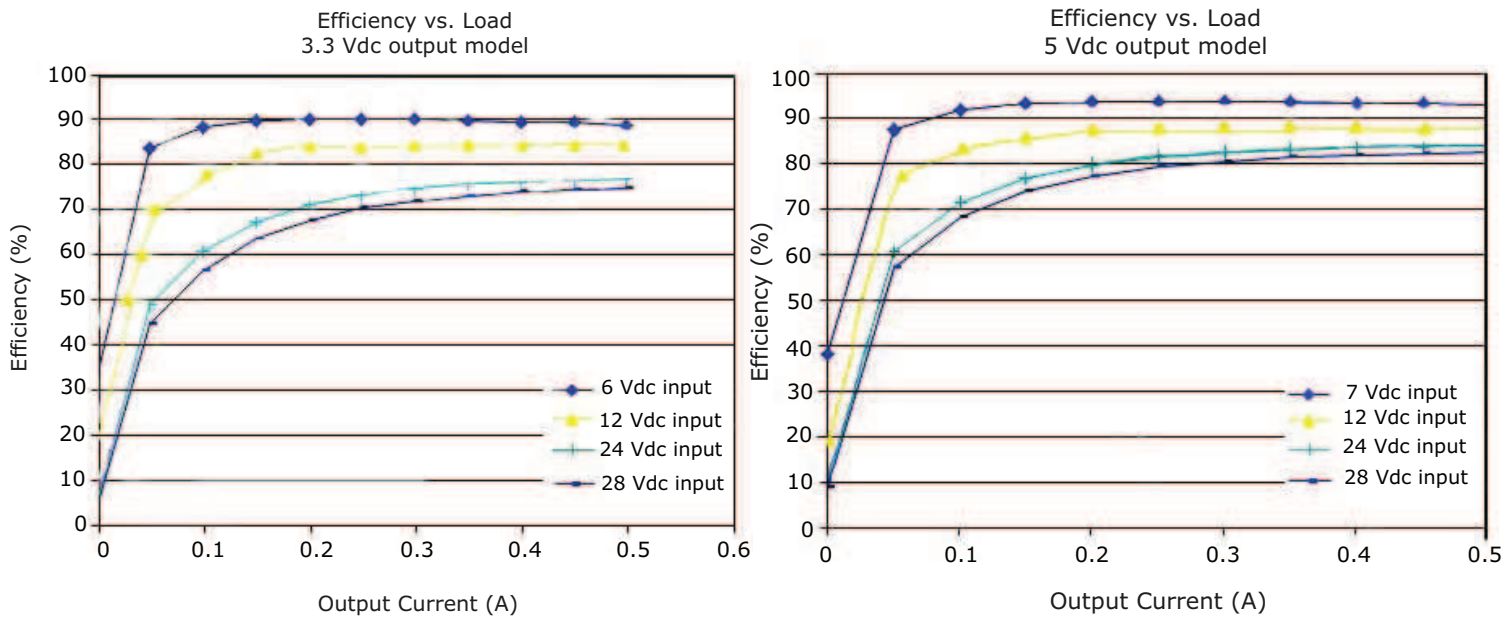




## DERATING CURVE



## EFFICIENCY CURVES



## APPLICATION CIRCUIT

Figure 1

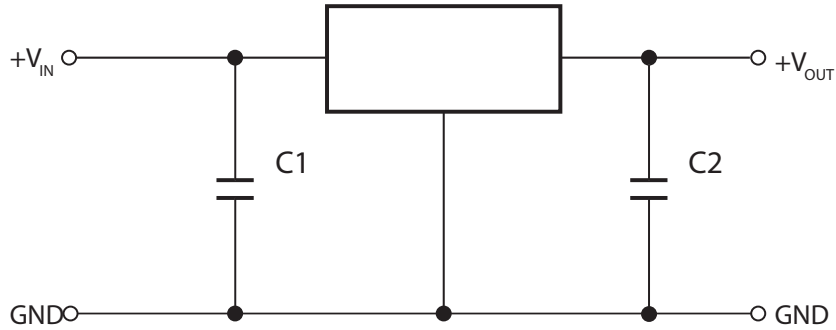


Table 1

Optional External Components	
C1	10μF MLCC
C2	10μF MLCC

Notes: 1. The converter cannot be used as a positive to negative converter.

## EMC RECOMMENDED CIRCUIT

### EMC FILTERING

Figure 2

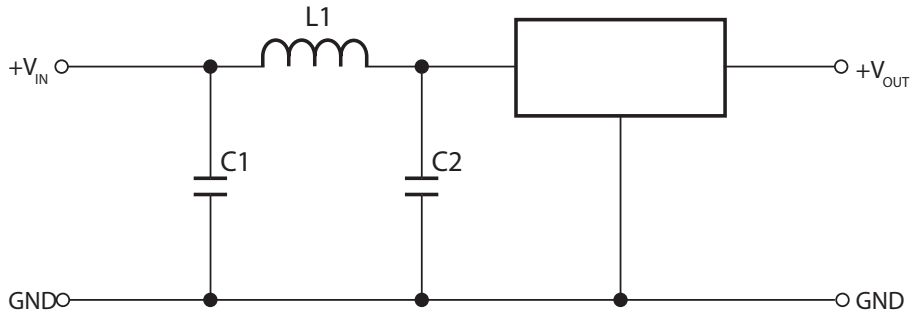


Table 2

EN55022 Class A Recommended External Circuit Components		
C1	L1	C2
1206 4.7μF, 50V MLCC	3.3μH	NC

Table 3

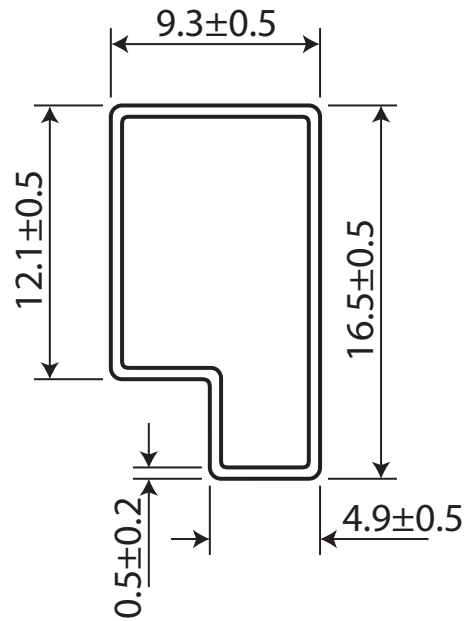
EN55022 Class B Recommended External Circuit Components		
C1	L1	C2
1210 10μF, 50V MLCC	10μH	1206 4.7μF, 50V MLCC

## PACKAGING

units: mm

Tube Size: 520 x 16.5 x 9.3 mm

QTY: 42 pcs



## REVISION HISTORY

---

rev.	description	date
1.0	initial release	05/25/2016

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



**CUI INC**<sup>®</sup>

**Headquarters**  
20050 SW 112th Ave.  
Tualatin, OR 97062  
**800.275.4899**

Fax 503.612.2383  
**cui.com**  
techsupport@cui.com

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

CUI reserves the right to make changes to the product at any time without notice. Information provided by CUI is believed to be accurate and reliable. However, no responsibility is assumed by CUI for its use, nor for any infringements of patents or other rights of third parties which may result from its use.

CUI products are not authorized or warranted for use as critical components in equipment that requires an extremely high level of reliability. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.