


CUI INC

a bel group

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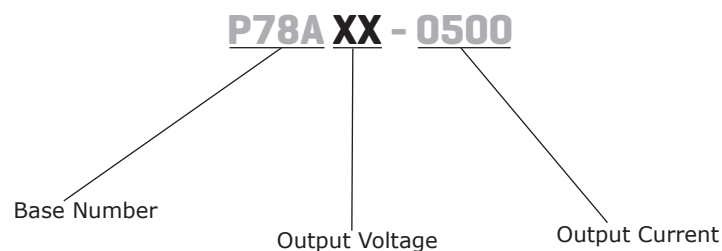
SERIES: P78A-0500 | DESCRIPTION: DC-DC CONVERTER
FEATURES

- 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

MODEL	input voltage		output voltage	output current		output power	ripple & noise ¹	efficiency ²
	typ (Vdc)	range (Vdc)	(Vdc)	min ³ (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 ¹				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

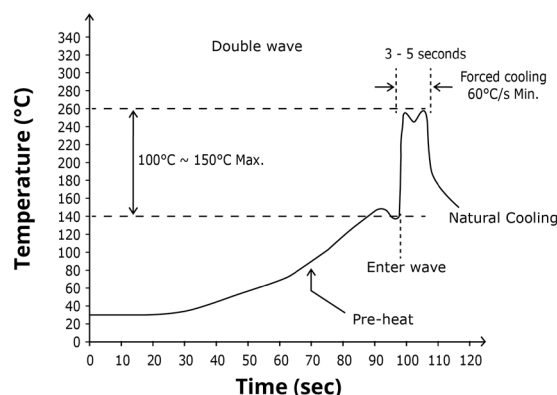
parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		85	°C
storage temperature		-55		125	°C
vibration	10~55 Hz, 30 minutes along each axis		2		G

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.

WAVE SOLDERING PROFILE (Lead-free)



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

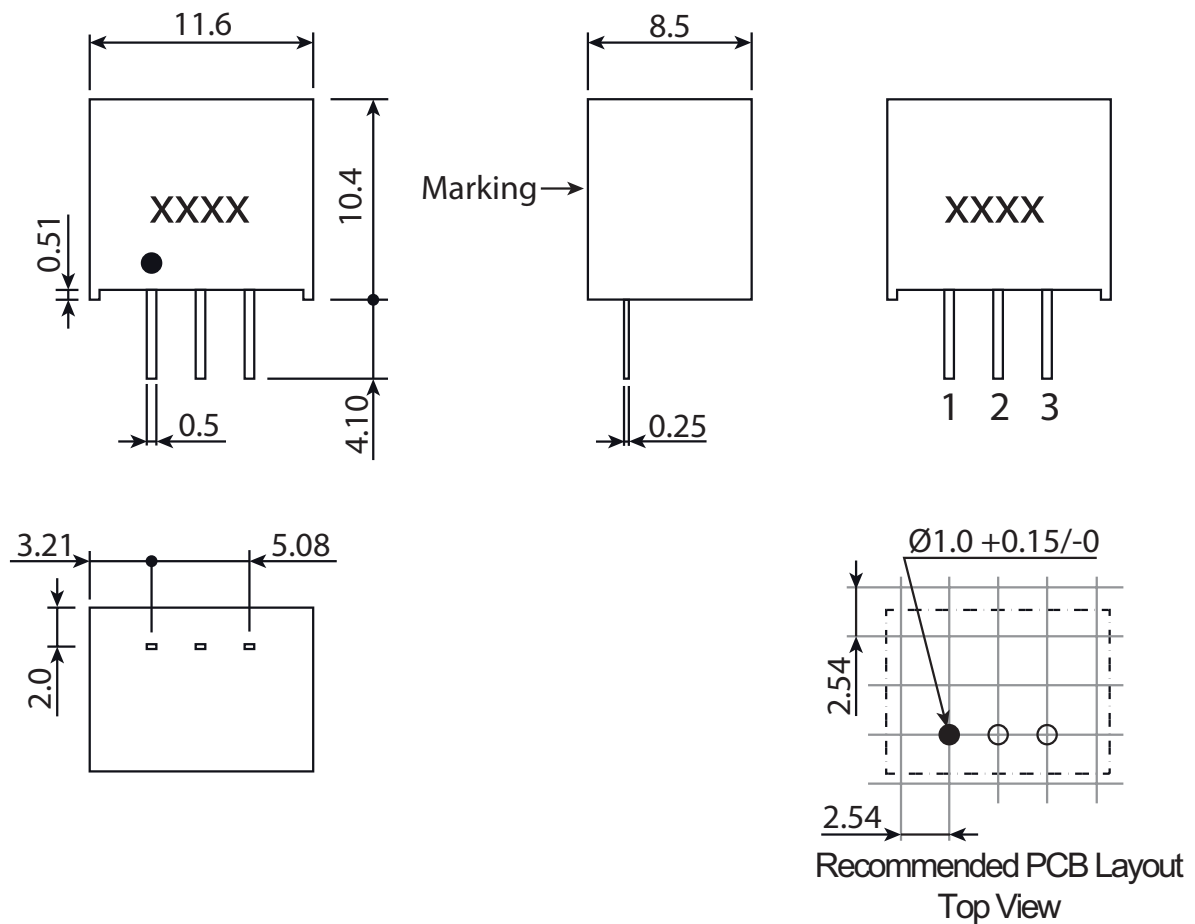
MECHANICAL DRAWING

units: mm

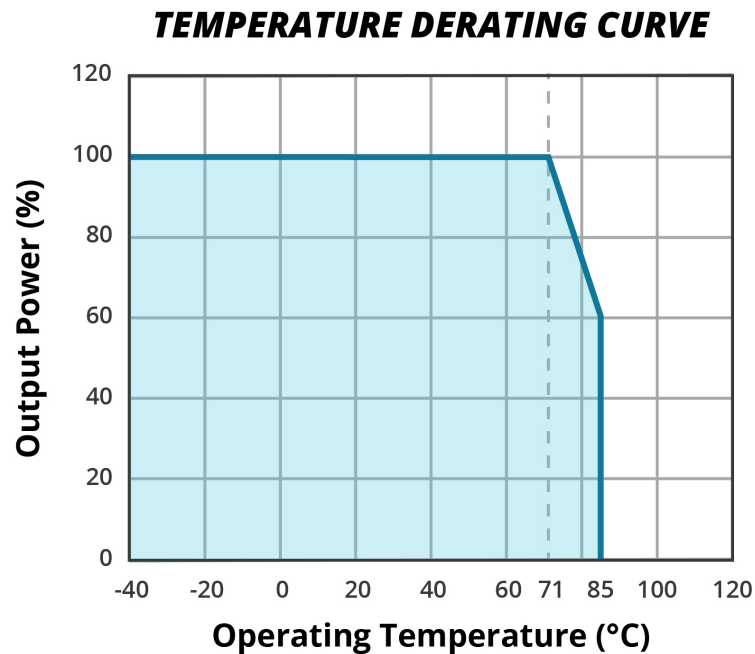
tolerance: XX.X=±0.50 mm

XX.XX=±0.25 mm

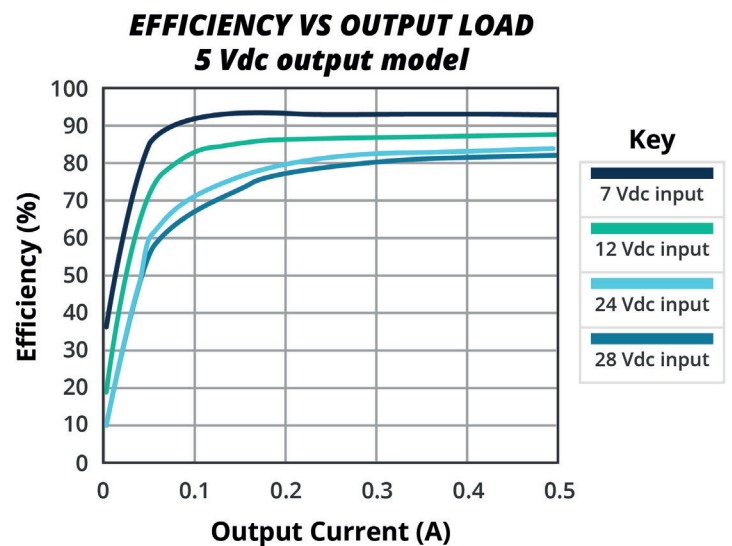
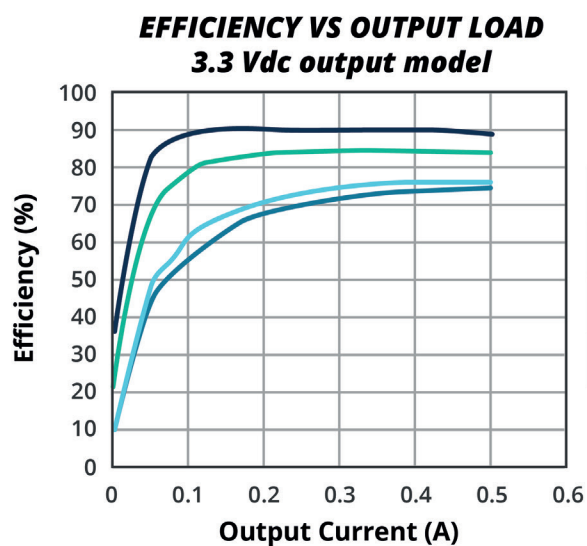
PIN CONNECTIONS	
PIN	Function
1	+Vin
2	GND
3	+Vout



DERATING CURVE



EFFICIENCY CURVES



APPLICATION CIRCUIT

Figure 1

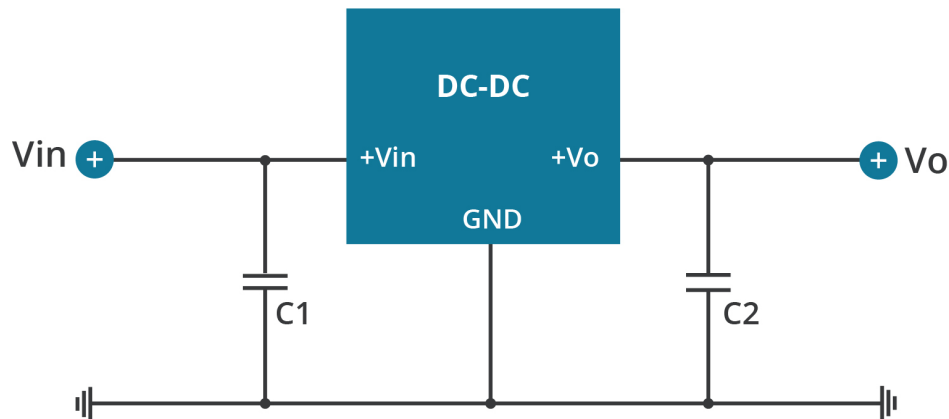


Table 1

Optional External Components	
C1	10 μ F MLCC
C2	10 μ F MLCC

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

EMC RECOMMENDED CIRCUIT

EMC FILTERING

Figure 2

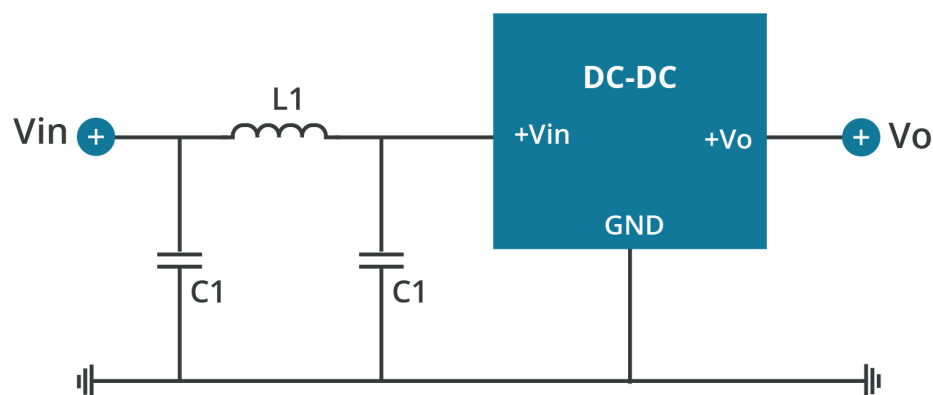


Table 2

EN55022 Class A Recommended External Circuit Components		
C1	L1	C2
1206 4.7 μ F, 50V MLCC	3.3 μ H	NC

Table 3

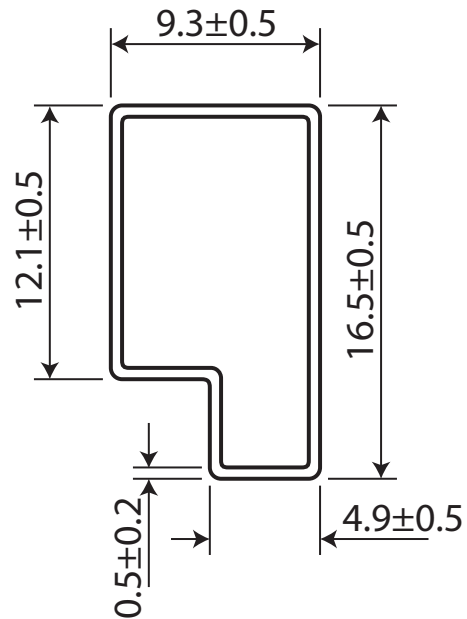
EN55022 Class B Recommended External Circuit Components		
C1	L1	C2
1210 10 μ F, 50V MLCC	10 μ H	1206 4.7 μ F, 50V MLCC

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
1.01	company logo updated	04/14/2021
1.02	derating curve, efficiency curves and circuit figures updated	09/20/2021

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.

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.