

**SERIES:** P78A-1000 | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

- up to 1 A current output
- pin compatible with LM78XX linear regulators
- non-isolated switching regulator
- wide input voltage range
- efficiency up to 91%
- low ripple and noise
- short circuit protection
- ultra-compact SIP3 package
- low profile
- -40°C to +85°C temperature range

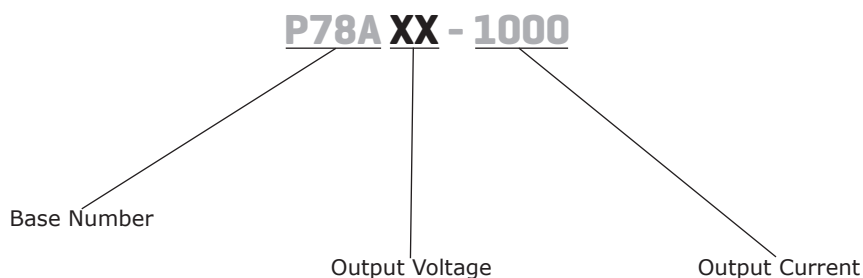


**MODEL**

MODEL	input voltage		output voltage	output current	output power	ripple & noise <sup>1</sup>	efficiency <sup>2</sup>
	typ (Vdc)	range (Vdc)	(Vdc)	max (mA)	max (W)	max (mVp-p)	typ (%)
P78A03-1000	24	7~28	3.3	1000	3.3	120	87
P78A05-1000	24	8~28	5	1000	5	120	91

Notes: 1. At full load, nominal input, 20 MHz bandwidth oscilloscope, output terminated with a 0.1 μF multilayer low ESR ceramic capacitor.  
 2. At min Vin.  
 3. 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	7	24	28	Vdc
	5 Vdc model	8	24	28	Vdc
no load input current	Vin = 24 Vdc		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			±1	%
load regulation	measured from 10~100% load, typical Vin			±1.5	%
voltage accuracy			±3	±5	%
switching frequency	Vin = 12 Vdc		330		kHz

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

## PROTECTIONS

parameter	conditions/description	min	typ	max	units
over current protection	output shut down, auto recovery			200	%
short circuit protection	output shut down, auto recovery				

## SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
MTBF	as per MIL-HDBK-217F, full load, 25 °C	3,875,000			hours
RoHS	2011/65/EU				

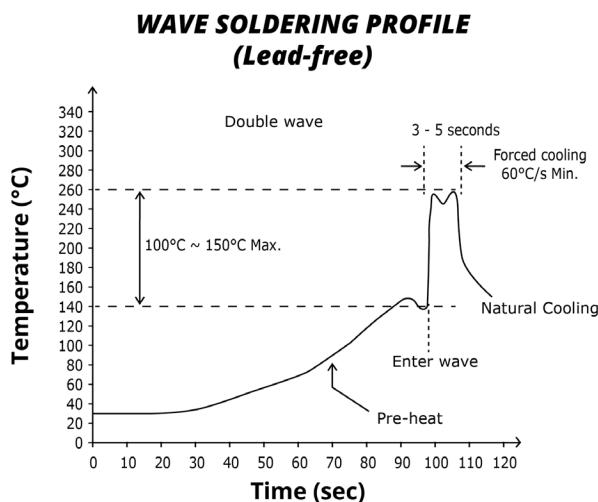
## ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		85	°C
storage temperature		-55		125	°C
operating humidity	non-condensing			95	%

## 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.



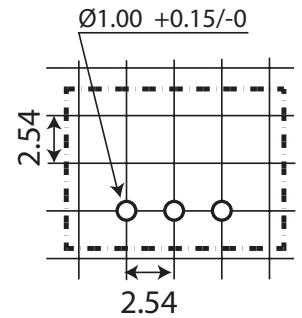
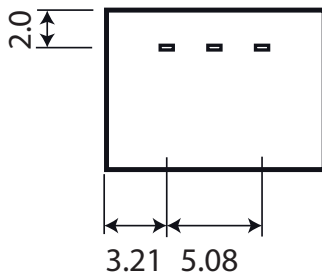
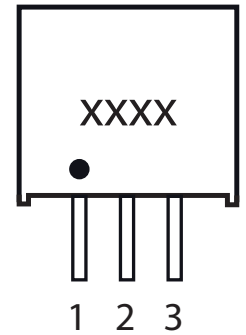
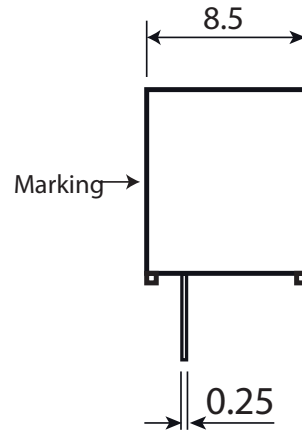
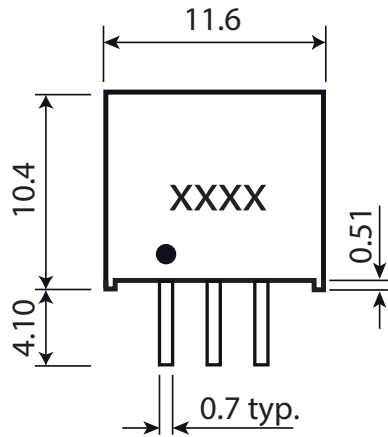
## MECHANICAL

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	epoxy (UL94V-0)				
weight			2		g

## MECHANICAL DRAWING

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

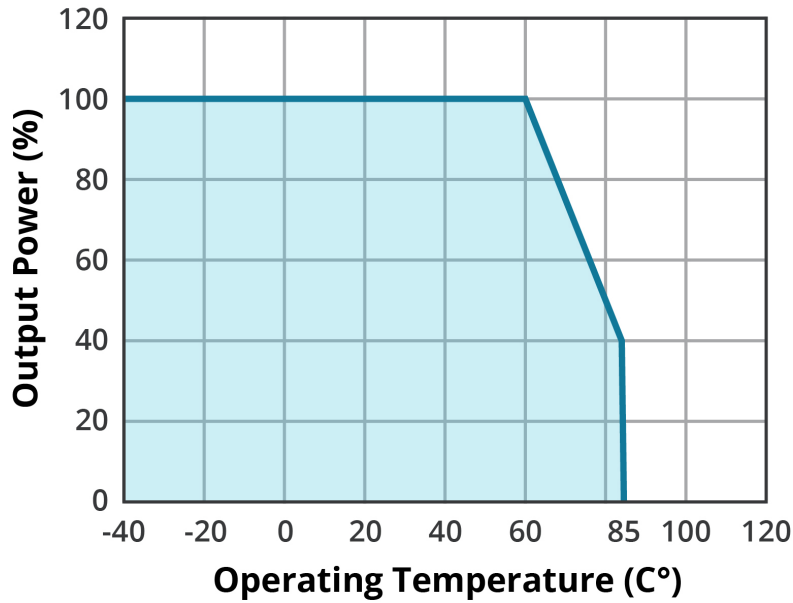
PIN CONNECTIONS	
PIN	Function
1	+Vin
2	GND
3	+Vout



Recommended PCB Layout  
Top View

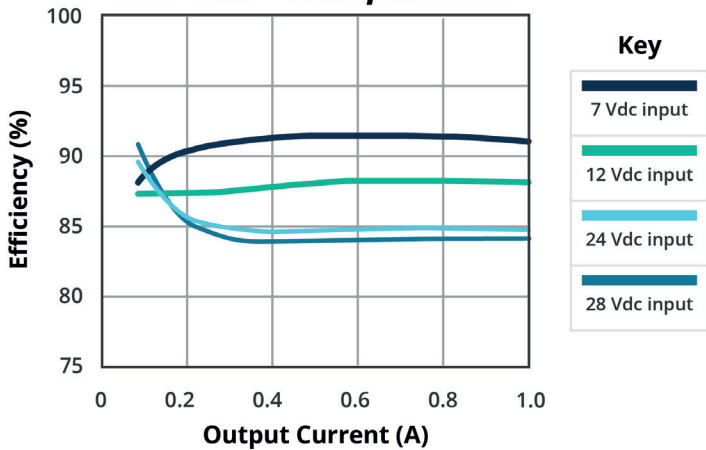
## DERATING CURVE

### TEMPERATURE DERATING CURVE

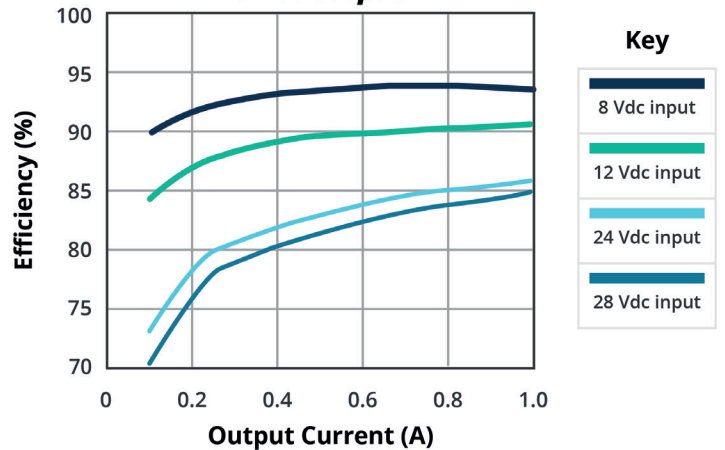


## EFFICIENCY CURVES

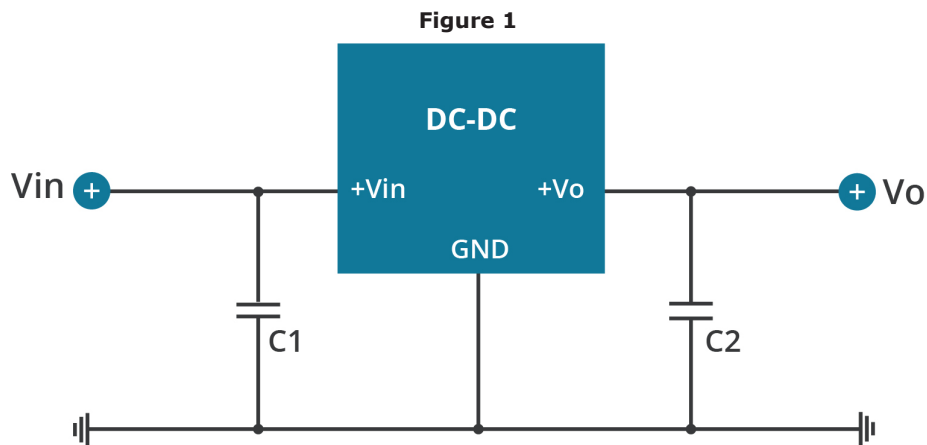
**EFFICIENCY VS OUTPUT LOAD**  
3.3 Vdc output



**EFFICIENCY VS OUTPUT LOAD**  
5 Vdc output



## APPLICATION CIRCUIT



**Table 1**

Optional External Components	
C1	10 $\mu$ F MLCC
C2	10 $\mu$ F MLCC

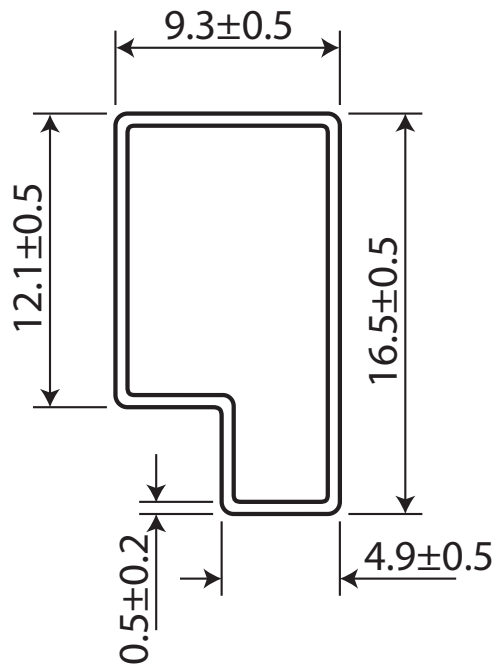
Notes: 1. To protect the converter during power-up, use soft start power supply.  
2. The converter cannot be used as a positive to negative converter.

## PACKAGING

units: mm

Tube Size: 520 x 16.5 x 9.3 mm

QTY: 42 pcs



## REVISION HISTORY

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rev.	description	date
1.0	initial release	05/16/2016
1.01	company logo updated	04/14/2021
1.02	derating curve, efficiency curves and application circuit updated	09/21/2021

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



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