

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

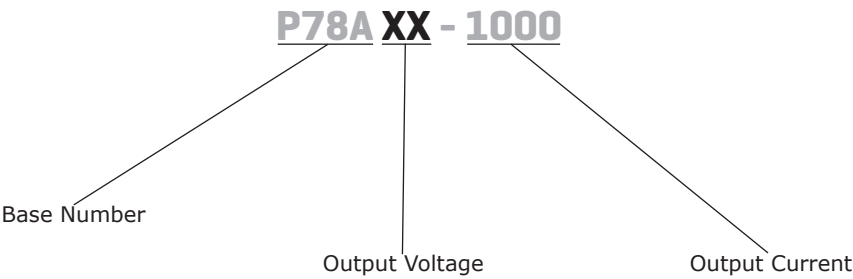


MODEL

| MODEL | input voltage | | output voltage | output current | output power | ripple & noise ¹ | efficiency ² |
|-------------|---------------|-------------|----------------|----------------|--------------|-----------------------------|-------------------------|
| | 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 μ F multilayer low ESR ceramic capacitor.
2. At min V_{in} .
3. All specifications measured at: $T_a=25^{\circ}\text{C}$, 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 ¹ | | | | 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

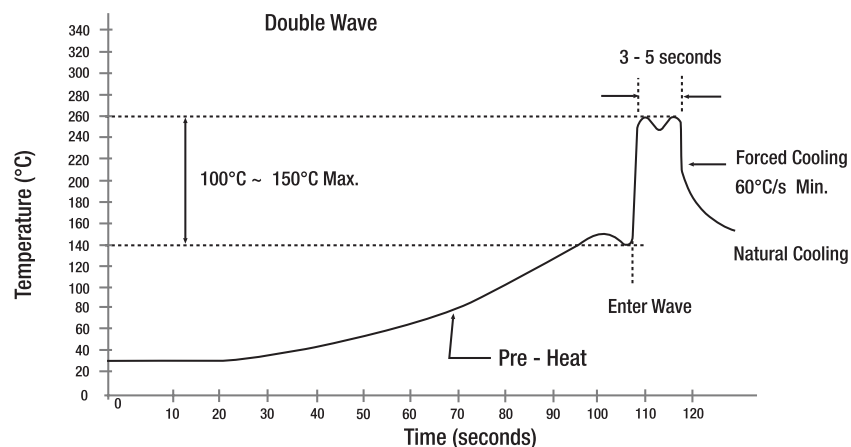
| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curve | -40 | | 85 | °C |
| storage temperature | | -55 | | 125 | °C |
| operating humidity | non-condensing | | | 95 |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

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.

Lead-free Recommended Soldering Profile



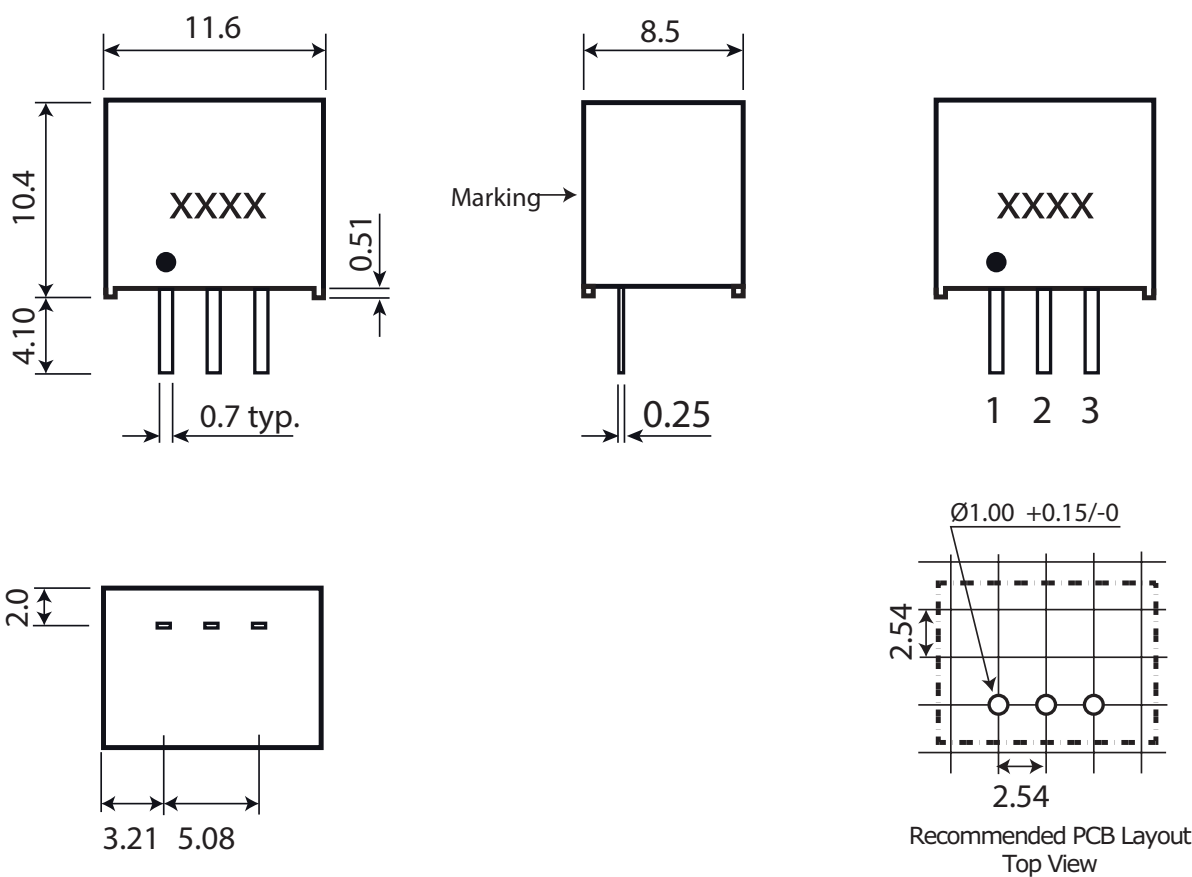
MECHANICAL

| 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 | epoxy (UL94V-0) | | | | |
| weight | | | 2 | | g |

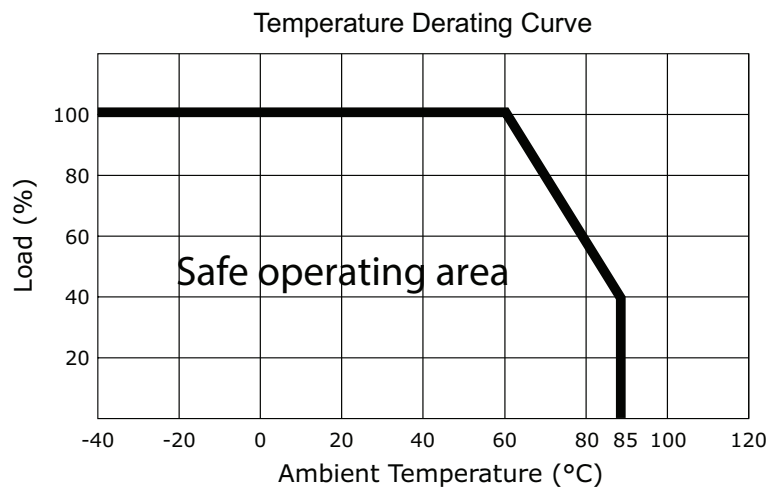
MECHANICAL DRAWING

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

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

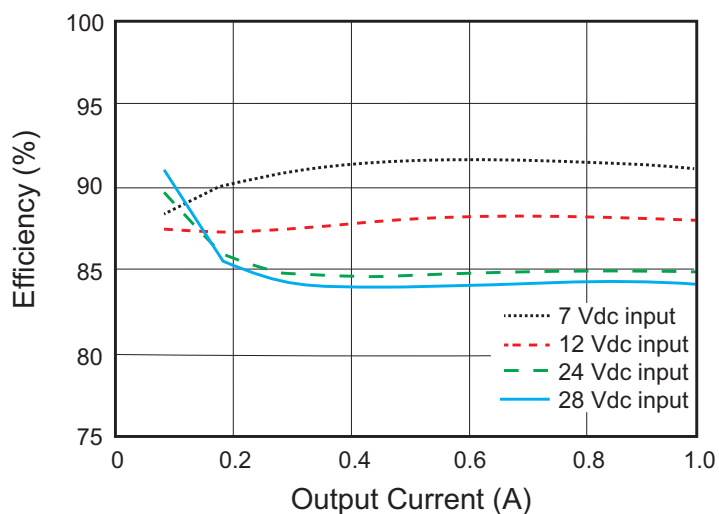


DERATING CURVE

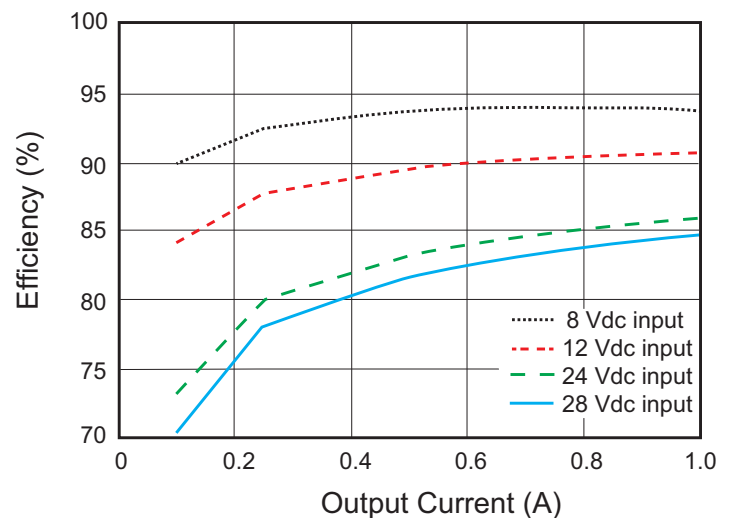


EFFICIENCY CURVES

Efficiency vs. Load
3.3 Vdc output model



Efficiency vs. Load
5 Vdc output model



APPLICATION CIRCUIT

Figure 1

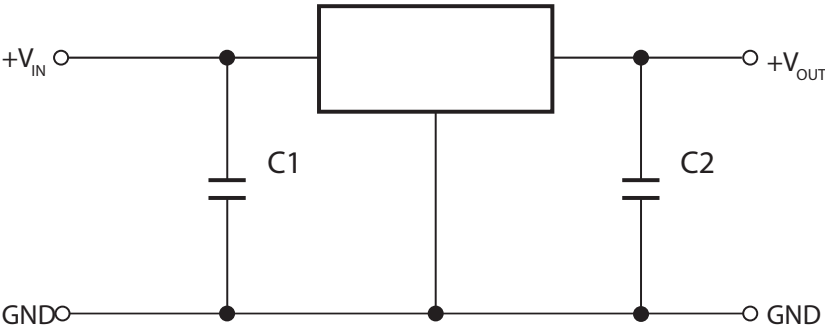


Table 1

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

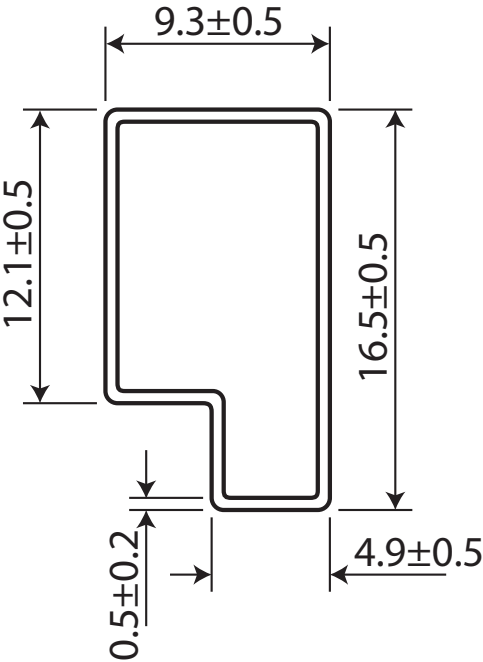
Notes: 1. To protect the converter during power-up, use soft start power supply.
2. The converter cannot be used as a positive to negative converter.

PACKAGING

units: mm

Tube Size: 520 x 16.5 x 9.3 mm

QTY: 42 pcs



REVISION HISTORY

| rev. | description | date |
|------|-----------------|------------|
| 1.0 | initial release | 05/16/2016 |

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



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