
BOURNS®

## Features

- Industry standard SMT package
- Output voltage programmable from 0.75 Vdc to 5.5 Vdc via external resistor
- 3 A output current
- Up to 95 % efficiency
- Small size, low profile
- Cost-efficient
- Low output ripple and noise
- High reliability
- Remote on/off
- Output overcurrent protection (non-latching)

# MX3A-12SA(-P) SMT Non-Isolated Power Module

## Description

Bourns® MX3A-12SA(-P) is a non-isolated DC-DC converter offering designers a cost and space-efficient solution with standard features such as remote on/off, precisely regulated programmable output voltage and overcurrent protection.

## Specifications

| Parameter | Min. | Nom. | Max. | Units | Notes |
|---|---|---|---|---|---|
| **INPUT** | | | | | |
| Voltage | 8.3 | 12 | 14 | $V_{dc}$ | 18 V max. for -W version |
| Current | | | 2.0 | $A_{dc}$ | |
| Remote ON/OFF: Standard / -P Option | | | | | |
| Low or Open = On / Off | | | 0.4 | $V_{dc}$ | 10 µA max. |
| High = Off / On | 2.4 | | $V_{in}$ | $V_{dc}$ | 1 mA max. |
| **OUTPUT** | | | | | |
| Voltage Adjustment Range | 0.75 | | 5.5 | $V_{dc}$ | |
| Current | 0.0 | | 3.0 | $A_{dc}$ | |
| Voltage Setpoint Accuracy | -2.5 | | 2.5 | % $V_{o,set}$ | |
| Line Regulation | | 0.3 | | % $V_{o,set}$ | |
| Load Regulation | | 0.4 | | % $V_{o,set}$ | |
| Temperature Regulation | | 0.4 | | % $V_{o,set}$ | 0 to +85 °C |
| Ripple (pk-pk) (20 MHz Bandwidth) | | 30 | 50 | mVpk-pk | 1 µF ceramic//10 µF tantalum capacitors |
| Ripple (rms) | | 10 | 15 | mVrms | 1 µF ceramic//10 µF tantalum capacitors |
| Dynamic Load Response: 50 % to 100 % Load or 100 % to 50 % Load; ($\Delta i/\Delta t$ = 2.5 A/µs; 25 °C) | | 200<br>25 | | mV<br>µs | 1 µF ceramic//10 µF tantalum capacitors |
| 50 % to 100 % Load or 100 % to 50 % Load; ($\Delta i/\Delta t$ = 2.5 A/µs; 25 °C) | | 75<br>100 | | mV<br>µs | 2 x 100 µF polymer capacitors |
| **GENERAL** | | | | | |
| MTBF | | 13,000 | | kHrs | |
| Operating Temperature | -40 | | +85 | °C | |
| Storage Temperature | -55 | | +125 | °C | |
| Switching Frequency | | 300 | | kHz | |
| Efficiency (Vin = 12 Vdc, $T_A$= 25 °C, Full Load) | | 86.0 | | % | $V_{o,set}$ = 1.2 $V_{dc}$ |
| | | 88.0 | | % | $V_{o,set}$ = 1.5 $V_{dc}$ |
| | | 90.0 | | % | $V_{o,set}$ = 1.8 $V_{dc}$ |
| | | 91.0 | | % | $V_{o,set}$ = 2.5 $V_{dc}$ |
| | | 93.0 | | % | $V_{o,set}$ = 3.3 $V_{dc}$ |
| | | 95.0 | | % | $V_{o,set}$ = 5.0 $V_{dc}$ |



## Applications

- Intermediate Bus architecture
- Distributed power applications
- Workstations and servers
- Telecom equipment
- Enterprise networks including LANs/WANs
- Latest generation ICs (DSP, FPGA, ASIC) and microprocessor powered applications

*RoHS Directive 2002/95/EC Jan 27 2003 including Annex.
Specifications are subject to change without notice.
Customers should verify device performance in their specific applications.

## Output Voltage Programming

Via external trim resistor between Trim and GND:

$$Rtrim = \left[\frac{10.5}{V_o - 0.7525} - 1.0\right] k\Omega$$

Via application of external voltage between Trim and GND:

$$Vtrim = (0.7 - 0.0667 \times \{Vo - 0.7525\})$$

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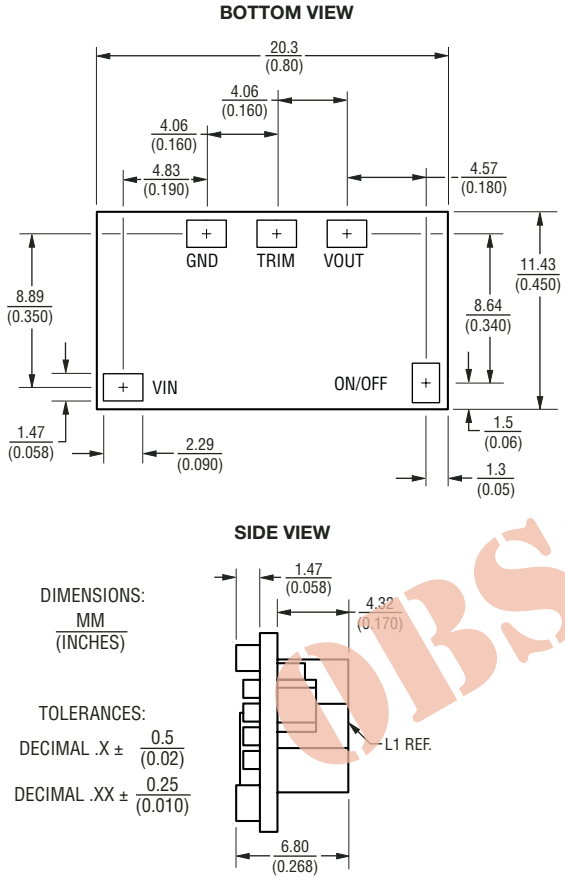
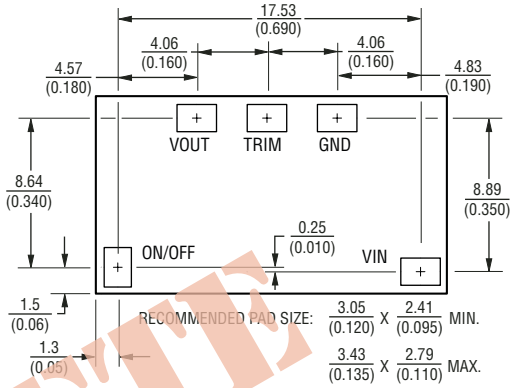
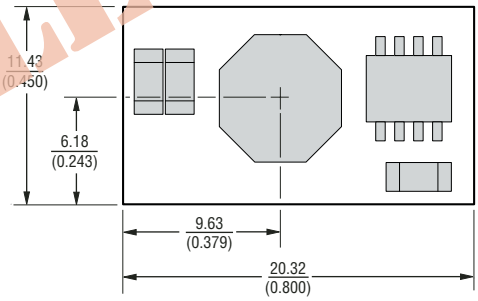
### Product Dimensions



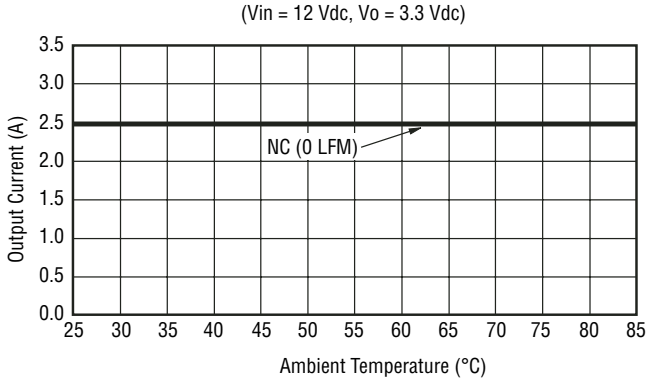

### Recommended Pad Layout




### Pick and Place Location




### Derating Output Current vs. Local Ambient Temp & Airflow




### How to Order

**M X 3A - 12 S A (-P)**

Configuration
- M = Surface Mount Device

Internal Identifier

Output Current (Amps)

Input Voltage (V)

Outputs
- S = Single

Output Voltage (V)
- A = Adjustable

Optional Positive On/Off Logic

Fixed output voltage parts and optional features available; contact factory.



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REV. A 06/06