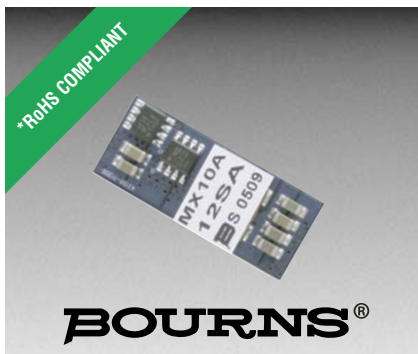




## Features

- Industry standard SMT package
- Output voltage programmable from 0.75 V<sub>dc</sub> to 5.5 V<sub>dc</sub> via external resistor
- 10 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)
- Optional sequencing function

## MX(T)10A-12SA SMT Non-Isolated Power Module

### Description

Bourns® MX(T)10A-12SA 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 and optional output voltage sequencing.

### Specifications

| Parameter                                                                                        | Min.        | Nom.          | Max.            | Units                 | Notes                                     |
|--------------------------------------------------------------------------------------------------|-------------|---------------|-----------------|-----------------------|-------------------------------------------|
| <b>INPUT</b>                                                                                     |             |               |                 |                       |                                           |
| Voltage                                                                                          | 8.3         | 12            | 14              | V <sub>dc</sub>       |                                           |
| Current                                                                                          |             |               | 7.0             | A <sub>dc</sub>       |                                           |
| Remote: ON/OFF                                                                                   |             |               |                 |                       |                                           |
| Low or Open =                                                                                    | Standard On | -P option Off | 0.4             | V <sub>dc</sub>       | 10 µA max.                                |
| High =                                                                                           | Off         | On            | V <sub>in</sub> | V <sub>dc</sub>       | 1 mA max.                                 |
| <b>OUTPUT</b>                                                                                    |             |               |                 |                       |                                           |
| Voltage Adjustment Range                                                                         | 0.75        |               | 5.5             | V <sub>dc</sub>       |                                           |
| Current                                                                                          | 0.0         |               | 10.0            | A <sub>dc</sub>       |                                           |
| Voltage Setpoint Accuracy                                                                        | 2.0         |               | 2.0             | % V <sub>o, set</sub> |                                           |
| Line Regulation                                                                                  |             | 0.3           |                 | % V <sub>o, set</sub> |                                           |
| Load Regulation                                                                                  |             | 0.4           |                 | % V <sub>o, set</sub> |                                           |
| Temperature Regulation                                                                           |             | 0.4           |                 | % V <sub>o, set</sub> | 0 to +85 °C                               |
| Ripple (pk-pk) (20 MHz Bandwidth)                                                                |             | 30            | 75              | mVpk-pk               | 1 µF ceramic//10 µF tantalum capacitors   |
| Ripple (rms)                                                                                     |             | 12            | 30              | mVrms                 | 1 µF ceramic//10 µF tantalum capacitors   |
| Dynamic Load Response:<br>50 % to 100 % Load or 100 % to 50 % Load;<br>(Δi/Δt = 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;<br>(Δi/Δt = 2.5 A/µs; 25 °C)                           |             | 100<br>25     |                 | mV<br>µs              | 2 x 150 µF polymer capacitors             |
| <b>GENERAL</b>                                                                                   |             |               |                 |                       |                                           |
| MTBF                                                                                             |             | 10,000        |                 | kHrs                  |                                           |
| Operating Temperature                                                                            | -40         |               | +85             | °C                    |                                           |
| Storage Temperature                                                                              | -55         |               | +125            | °C                    |                                           |
| Switching Frequency                                                                              |             | 300           |                 | kHz                   |                                           |
| Efficiency<br>(V <sub>in</sub> = 12 V <sub>dc</sub> , T <sub>A</sub> = 25 °C, Full Load)         |             | 87.5          |                 | %                     | V <sub>o, set</sub> = 1.2 V <sub>dc</sub> |
|                                                                                                  |             | 89.0          |                 | %                     | V <sub>o, set</sub> = 1.5 V <sub>dc</sub> |
|                                                                                                  |             | 90.0          |                 | %                     | V <sub>o, set</sub> = 1.8 V <sub>dc</sub> |
|                                                                                                  |             | 92.0          |                 | %                     | V <sub>o, set</sub> = 2.5 V <sub>dc</sub> |
|                                                                                                  |             | 93.0          |                 | %                     | V <sub>o, set</sub> = 3.3 V <sub>dc</sub> |
|                                                                                                  |             | 95.0          |                 | %                     | V <sub>o, set</sub> = 5.0 V <sub>dc</sub> |

### 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:

$$R_{\text{trim}} = \left[ \frac{10.5}{V_O - 0.7525} - 1.0 \right] \text{ k}\Omega$$

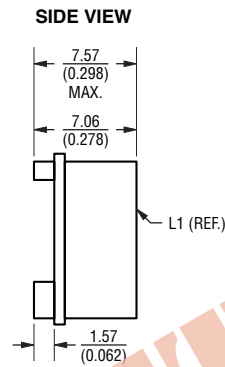
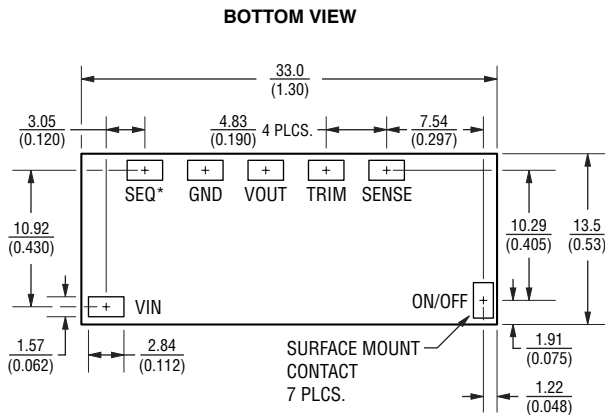
Via application of external voltage between Trim and GND:

$$V_{\text{trim}} = (0.7 - 0.0667 \times \{V_O - 0.7525\})$$

## MX(T)10A-12SA SMT Non-Isolated Power Module

**BOURNS®**

### Product Dimensions

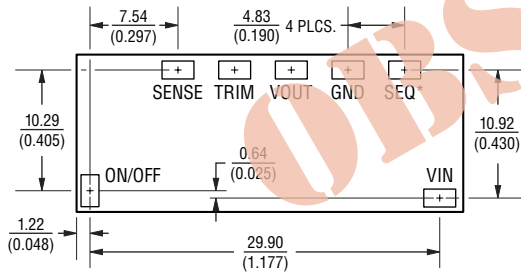


DIMENSIONS:  
MM  
(INCHES)

TOLERANCES:  
DECIMAL .X ± 0.5  
(0.02)  
DECIMAL .XX ± 0.25  
(0.010)

\*Pin Stuffed with MXT10A option only, absent with MX10A standard

### Recommended Pad Layout



RECOMMENDED PAD SIZE:  $\frac{3.56}{(0.140)} \times \frac{2.41}{(0.095)}$  MIN.  
 $\frac{4.19}{(0.165)} \times \frac{2.79}{(0.110)}$  MAX.

\*Pad required with MXT10A option only,  
not required with MX10A standard

### How to Order

**M X (T) 10A - 12 S A (-P)**

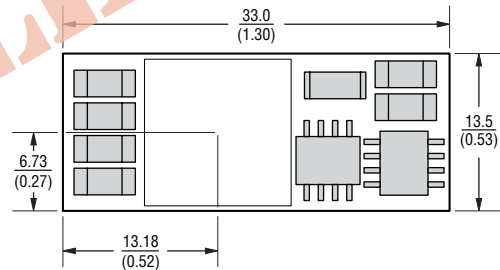
Configuration \_\_\_\_\_  
M = Surface Mount Device  
Internal Identifier \_\_\_\_\_  
Identifies Sequencing Pin Function (optional) \_\_\_\_\_  
Output Current (Amps) \_\_\_\_\_  
Input Voltage (V) \_\_\_\_\_  
Outputs \_\_\_\_\_  
S = Single  
Output Voltage (V)\* \_\_\_\_\_  
A = Adjustable  
Optional Positive On/Off Logic \_\_\_\_\_

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

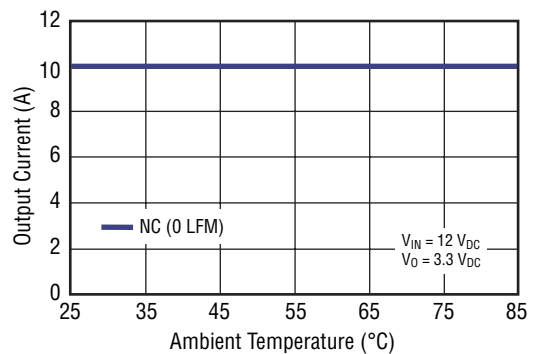
REV. C 08/06

Specifications are subject to change without notice.  
Customers should verify device performance in their specific applications.

### Pick and Place Location



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



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