

# 2500 LN series

www.martekpower.com

## Single Output DC/DC Converter



### DESCRIPTIONS

The 2500LN, single output power modules are 12 to 25 watt DC/DC converters available in a single output configuration providing 2.0 VDC to 15 VDC outputs and are fully compatible to Tyco series LW020 and LW025 providing both positive and negative on/of logic. These 400kHz, switching converters are available 48 inputs with efficiencies up to 87%. Offering pin for pin and full functionality to the Tyco LW series these converters are the only true second source available in the market.

### OUTPUT CHARACTERISTICS

|                            | Min | Typ   | Max | Unit/Comments                                                 |
|----------------------------|-----|-------|-----|---------------------------------------------------------------|
| Output Voltage Set Point   |     | ±1    |     | % Output voltage at nominal line & FL                         |
| Total Band Error           | -2  |       | +2  | % Output voltage including line/load regulation setting       |
| Line Regulation            |     | ±0.5  |     | % Output voltage measured from min. input line to max.        |
| Load Regulation            |     | ±0.5  |     | % Output voltage measured from FL to no load                  |
| Temperature Coefficient    |     | ±0.01 |     | % per degree C                                                |
| Ripple/Noise               |     | 60    | 100 | mV p-p measured at 20 MHz bandwidth with ext. 1 µf cap.       |
| Output Voltage and Current |     |       |     | Refer to model selection chart                                |
| Load Transient Response    |     | ±2    |     | % Deviation of output voltage for a 25% load change for 200µS |
| Output Voltage Trim        | -10 |       | +10 | % Output Voltage                                              |
| Short Circuit Protection   |     |       |     | Indefinite, Automatic Recovery                                |
| Overvoltage Protection     |     | 135   |     | %; Clamp type, (2.0 & 2.5 VDC output set at 3.9 VDC)          |

### FEATURES

- Second source to Tyco LW020 and LW025
- Positive and Negative Logic
- Up to 87% Efficiency
- Industry Standard 2.0" X 1.8" X 0.40" Package
- Remote On/Off, Output Over Voltage and Short Circuit Protection

### INPUT CHARACTERISTICS

|                             | Min | Typ  | Max                            | Units/Comments                  |
|-----------------------------|-----|------|--------------------------------|---------------------------------|
| Input Voltage               | 36  | 48   | 75                             | VDC                             |
| Under Voltage Lock out      | 33  |      | 80                             | VDC                             |
| Minimum Input Current       | 0   |      |                                | mA                              |
| Full Load Input Current     |     |      | 0.59 A (0.33 for 2.0VDC model) |                                 |
| Input Fuse Requirements     |     |      | 2                              | Amps; Slow blow type            |
| Efficiency by Model         |     |      |                                |                                 |
| 2502V0S48LN                 |     | 76   |                                | %; FL Nominal Line              |
| 2502V5S48LN                 |     | 78   |                                | %; FL Nominal Line              |
| 2503V3S48LN                 |     | 80   |                                | %; FL Nominal Line              |
| 2505S48LN                   |     | 84   |                                | %; FL Nominal Line              |
| 2512S48LN                   |     | 86   |                                | %; FL Nominal Line              |
| 2515S48LN                   |     | 87   |                                | %; FL Nominal Line              |
| Switching Frequency         | 360 | 400  | 440                            | kHz; Factory set                |
| Remote Shut Down (Optional) |     |      |                                |                                 |
| Positive Logic Off          | 0   |      | 0.80                           | VDC;Referenced to input         |
| Positive Logic On           | 3.5 |      |                                | VDC or open;Referenced to input |
| Negative Logic On           | 0   |      | 0.80                           | VDC;Referenced to input         |
| Negative Logic Off          | 3.5 |      |                                | VDC or open;Referenced to input |
| Input - Output Capacitance  |     | 1000 |                                | pF                              |
| Input Filter                |     |      |                                | LC type                         |
| Isolation Voltage           |     | 1500 |                                | VDC                             |
| Isolation Resistance        | 100 |      |                                | MOhms                           |

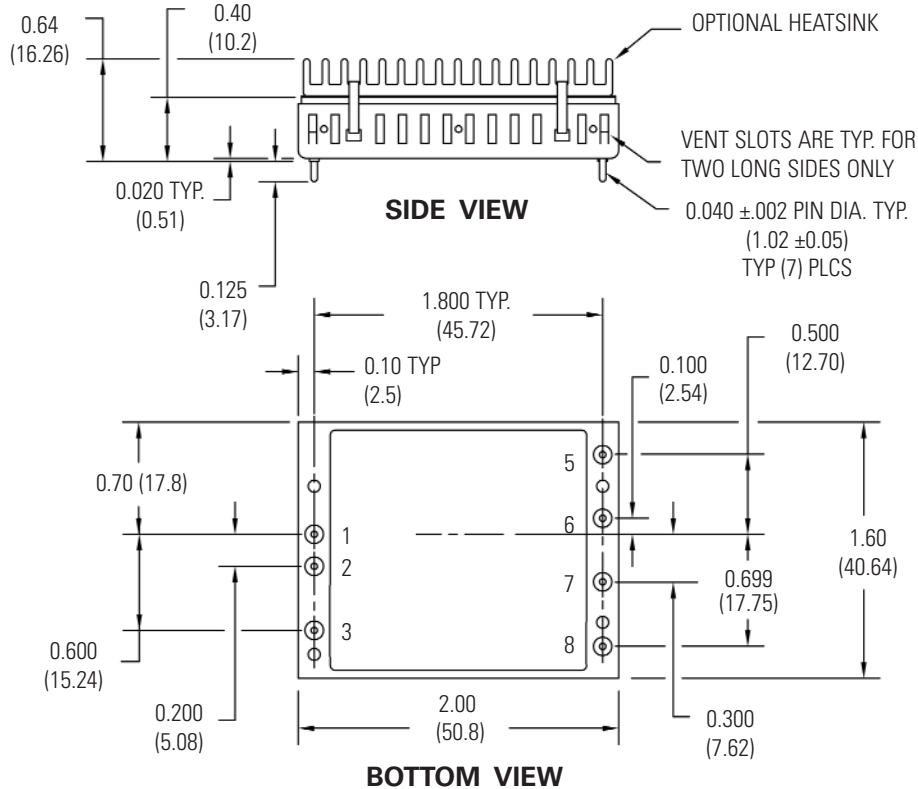
## MODEL SELECTION CHART

|             | Input Voltage (VDC) | Output Voltage (VDC) | Full Load Output Current(A) |
|-------------|---------------------|----------------------|-----------------------------|
| 2502V0S48LN | 48                  | 2.0                  | 6.0                         |
| 2502V5S48LN | 48                  | 2.0                  | 6.0                         |
| 2503V3S48LN | 48                  | 3.3                  | 6.0                         |
| 2505S48LN   | 48                  | 5.0                  | 5.0                         |
| 2512S48LN   | 48                  | 12.0                 | 2.0                         |
| 2515S48LN   | 48                  | 15.0                 | 1.66                        |

## GENERAL CHARACTERISTICS

|                       | Min | Typ | Max    | Unit/Comments              |
|-----------------------|-----|-----|--------|----------------------------|
| Operating Temp. Range | -40 |     | +105   | °C; measured at baseplate  |
| Storage Temp. Range   | -55 |     | +125   | °C; measured at baseplate  |
| Material Flammability |     |     |        | UL94V-0                    |
| Altitude: Operating   |     |     | 10,000 | Feet                       |
| Non-Operating         |     |     | 40,000 | Feet                       |
| Relative Humidity     | 5   |     | 95     | % Humidity, non-condensing |
| Weight                |     |     | 22     | Grams                      |
| Size                  |     |     |        | 2.0" X1.8" X0.40"          |
| Case Material         |     |     |        | Black coated aluminum      |
| Agency Approvals      |     |     |        | UL/CUL1950, TUV, EN60950   |

## OUTLINE DRAWING



## PIN OUT CHART

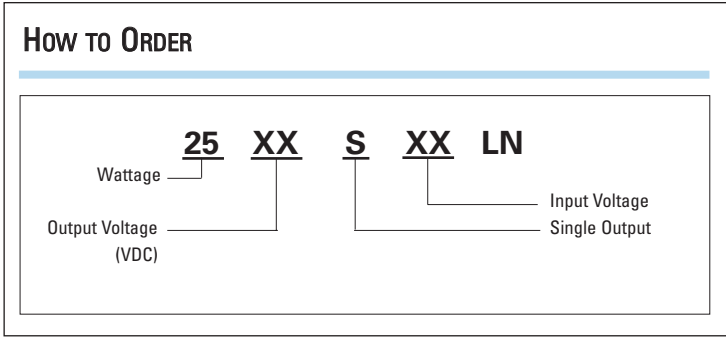
| PINS | FUNCTION |
|------|----------|
| 1    | + INPUT  |
| 2    | - INPUT  |
| 4    | CONTROL  |
| 5    | + OUTPUT |
| 6    | COMMON   |
| 7    | - OUTPUT |
| 8    | TRIM     |

### Notes:

- Unless otherwise specified dimensions are in inches (mm).  
Tolerances: X.XX = ±0.020 (0.5)  
X.XXX = ±0.010 (0.25)
- Controlling dimension in inch.

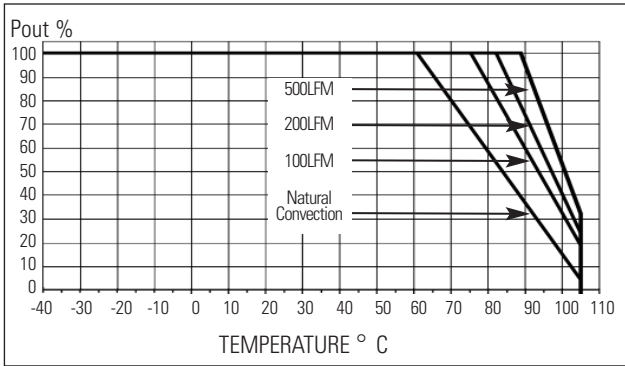
All specifications are typical at nominal input, nominal load and 25° C unless otherwise specified.  
External, low ESR, 10 microfarad (minimum) capacitor across input is recommended for operation.

# How To ORDER

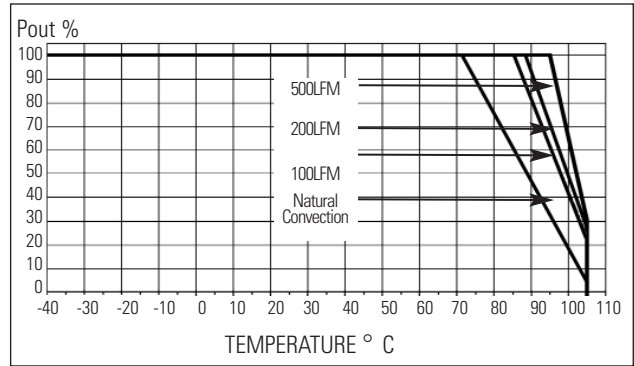


# DERATING CURVES

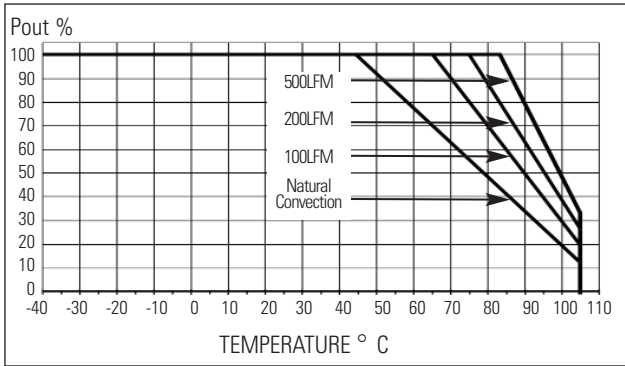
**MODEL 2500LN Single 2V & 2.5V (Without heatsink)**



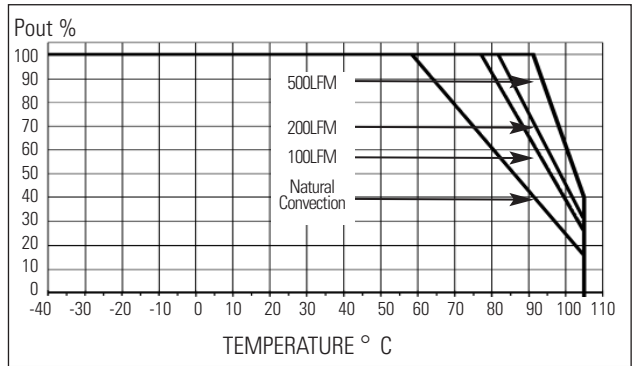
**MODEL 2500LN Single 2V & 2.5V (With heatsink)**



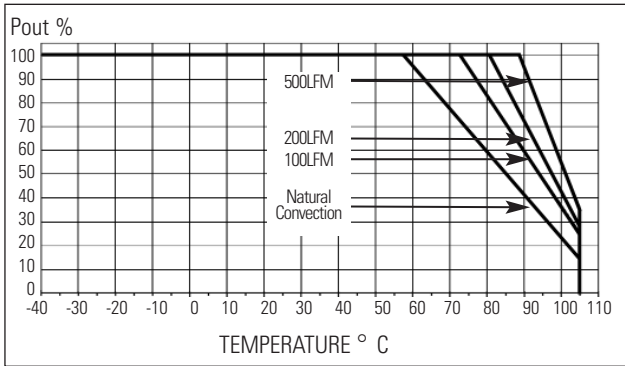
**MODEL 2500LN Single 3.3V & 5V (Without heatsink)**



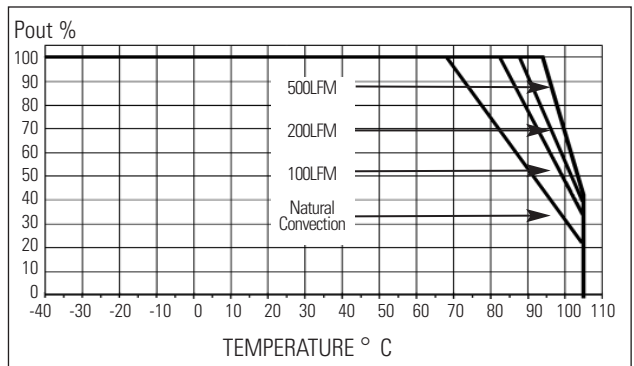
**MODEL 2500LN Single 3.3V & 5V (With heatsink)**



**MODEL 2500LN Single 12V & 15V (Without heatsink)**



**MODEL 2500LN Single 12V & 15V (With heatsink)**



## OUTPUT VOLTAGE ADJUSTMENT (2500LN SINGLE SERIES)

Output voltage trim allows the user to increase or decrease the output voltage set point of a module. This is accomplished by connecting an external resistor between the TRIM pin and either the Vo(+) or Vo(-) pins. With an external resistor between the TRIM and Vo(+) pins (Radj-down), the output voltage set point (Vo, adj) decreases. With an external resistor between the TRIM pin and Vo(-) pin (Radj-up), Vo, adj increases.

The following equations determine the required external resistor value to obtain an output voltage change of  $\Delta\%$ :

$$\text{Radj-down} = \left[ \frac{A - C}{\Delta\%} - (A + B) \right] \text{K}\Omega$$

$$\text{Radj-up} = \left[ \frac{C}{\Delta\%} - B \right] \text{K}\Omega$$

### EXAMPLE

| Device | A     | B     | C    | - 5% Vo Radj-down | + 5% Vo Radj-up  |
|--------|-------|-------|------|-------------------|------------------|
| +5Vo   | 4.02  | 16.90 | 2.01 | 19.3 K $\Omega$   | 23.3 K $\Omega$  |
| +12Vo  | 15.40 | 15.40 | 1.58 | 245.6 K $\Omega$  | 16.0 K $\Omega$  |
| +15Vo  | 21.50 | 16.90 | 1.76 | 356.3 K $\Omega$  | 18.2 K $\Omega$  |
| +3.3Vo | 14.0  | 51.10 | 5.19 | 110.9 K $\Omega$  | 52.8 K $\Omega$  |
| +2.5Vo | 14.0  | 51.10 | 7.02 | 75.3 K $\Omega$   | 88.9 K $\Omega$  |
| +2.0Vo | 14.0  | 51.10 | 8.75 | 39.9 K $\Omega$   | 123.9 K $\Omega$ |

#### NOTE:

THE ADJUSTED OUTPUT VOLTAGE CANNOT EXCEED +/- 10% OF THE NOMINAL OUTPUT VOLTAGE.

TRIM FUNCTION MATCHES THAT OF TYCO™ LW020 SERIES.

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