

# 300WFS series

## Single & Dual Output DC/DC Converter



### DESCRIPTIONS

The 300WFS series 3 watts power modules are high efficiency, surface mount dc-dc converters that operate over a wide input voltage range of 9 - 18 VDC, 18 - 36 VDC and 36 - 75 VDC and provide precisely regulated output voltages of 3.3V, 5V, 12V, 15V,  $\pm 5V$ ,  $\pm 12V$  and  $\pm 15V$ .

The  $-40^{\circ}\text{C}$  to  $+71^{\circ}\text{C}$  operating temperature range makes it ideal for data communication equipment, mobile battery driven equipment, distributed power systems, telecommunication equipment, mixed analog/digital subsystems, process/machine control equipment, computer peripheral systems and industrial robot systems.

### OUTPUT CHARACTERISTICS

|                                | Min        | Typ        | Max | Unit/Comments  |
|--------------------------------|------------|------------|-----|--|
| Output Voltage Set Point       | $\pm 0.5$  | $\pm 1.0$  |     | % Output voltage at nominal line & FL  |
| Output Voltage Balance (Duals) | $\pm 0.5$  | $\pm 2.0$  |     | % Equal Output Loads   |
| Line Regulation                | $\pm 0.1$  | $\pm 0.3$  |     | % Output voltage measured from min. input line to maximum                            |
| Load Regulation                | $\pm 0.3$  | $\pm 1.0$  |     | % Output voltage measured from FL to 10% load  |
| Ripple/Noise                   |            | 50         | 75  | mV p-p, Nom.Line @FL, 20MHz B.W., using 1 $\mu\text{f}$ bypass capacitor             |
| Ripple/Noise                   |            |            | 100 | mV p-p, Over Line, Load & Temp., 20 MHz B.W., using 1 $\mu\text{f}$ bypass capacitor |
| Short Circuit Protection       |            |            |     | Continuous, Automatic Recovery   |
| Transient Response Deviation   | $\pm 2$    | $\pm 6$    |     | % deviation of $V_{\text{out}}$ for a 25% load change                                |
| Over Power Protection          | 120        |            |     | %  |
| Transient Recovery Time        |            | 200        | 500 | $\mu\text{s}$ for 25% load change  |
| Temperature Coefficient        | $\pm 0.01$ | $\pm 0.02$ |     | % per degree C   |

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### FEATURES

- SMT Package
- Up to 83% Efficiency
- Single & Dual Output, 3 watt converter
- 2 - 1 Input Range
- 1500 VDC Input / Output Isolation
- Short Circuit Protection
- MTBF > 1,000,000 Hours

### INPUT CHARACTERISTICS

|                                | Min | Typ | Max  | Unit/Comments      |
|--------------------------------|-----|-----|------|--------------------|
| Start Voltage                  |     |     |      |                    |
| 12 VDC Input Models            | 9   | 12  | 18   | VDC                |
| 24 VDC Input Models            | 18  | 24  | 36   | VDC                |
| 48 VDC Input Models            | 36  | 48  | 72   | VDC                |
| Input Fuse Requirements        |     |     |      |                    |
| 12 VDC Input Models            |     | 750 |      | mA; Slow blow type |
| 24 VDC Input Models            |     | 350 |      | mA; Slow blow type |
| 48 VDC Input Models            |     | 200 |      | mA; Slow blow type |
| Reverse Polarity Input Current |     |     | 0.5  | A                  |
| Short Circuit Input Power      |     |     | 1500 | mW                 |
| Input Filter                   |     |     |      | Pi Filter          |

### GENERAL CHARACTERISTICS

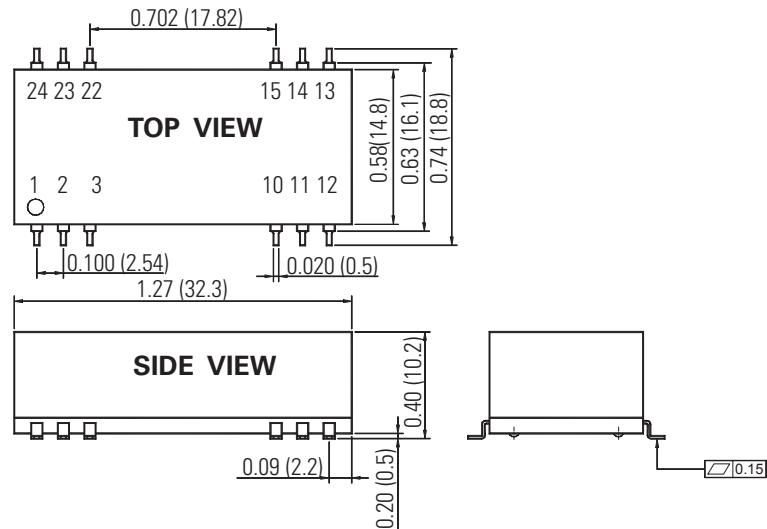
|                       | Min  | Typ | Max | Unit/Comments                       |
|-----------------------|------|-----|-----|-------------------------------------|
| Switching Frequency   |      | 300 |     | kHz                                 |
| Isolation Voltage     | 1500 |     |     | VDC, 1 minute                       |
| Isolation Resistance  | 1000 |     |     | Mohm, 500VDC                        |
| Isolation Capacitance |      | 65  | 100 | pF, 100kHz, 1Volt                   |
| MTBF (MIL-HBK-217F)   | 1    |     |     | Million Hours, +25°C, Ground Benign |

**ENVIRONMENTAL SPECIFICATIONS**

|                       | Min | Typ | Max  | Unit/Comments              |
|-----------------------|-----|-----|------|----------------------------|
| Operating Temp. Range | -40 |     | +71  | °C; Ambient                |
| Operating Temp. Range | -40 |     | +90  | °C; Case                   |
| Storage Temp. Range   | -40 |     | +125 | °C                         |
| Relative Humidity     |     |     | 95   | % Humidity; non-condensing |
| Cooling               |     |     |      | Free-Air Convection        |

**PHYSICAL CHARACTERISTICS**

|               | Unit/Comments                                       |
|---------------|---|
| Case Size     | 1.27 X 0.74 X 0.4 inches<br>(32.3 X 18.8 X 10.2 mm) |
| Case Material | Non-conductive Black Plastic                        |
| Flammability  | UL94V-0   |
| Weight        | 8.8 Grams max.                                      |

**OUTLINE DRAWING****PIN OUT CHART**

| Pins | Single | Dual   |
|------|--------|--------|
| 1    | - Vin  | - Vin  |
| 2    | - Vin  | - Vin  |
| 3    | NC     | NC     |
| 10   | NC     | Common |
| 11   | NC     | NC     |
| 12   | NC     | - Vout |
| 13   | + Vout | + Vout |
| 14   | NC     | NC     |
| 15   | - Vout | Common |
| 22   | NC     | NC     |
| 23   | + Vin  | + Vin  |
| 24   | + Vin  | + Vin  |

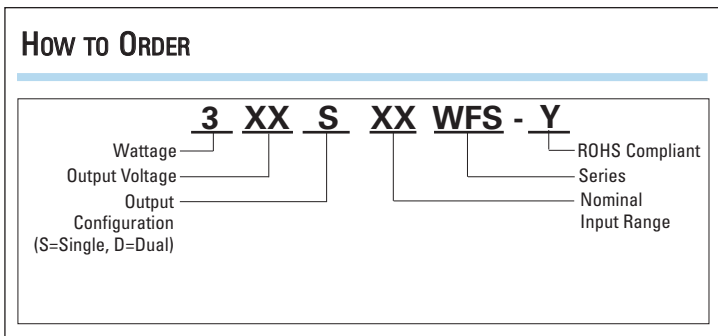
NC = No Connection

**Notes:**

1. Unless otherwise specified dimensions are in inches (mm).

| Tolerances | Inches         | mm           |
|------------|----------------|--------------|
|            | X.XX = ±0.02   | X.X = ±0.5   |
|            | X.XXX = ±0.010 | X.XX = ±0.25 |
| Pin :      | ±0.002         | ±0.05        |

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.



**MODEL SELECTION CHART**

| Model     | Nominal Input Voltage (VDC) | Input Voltage Range (VDC) | Output Voltage (VDC) | Full Load Output Current (mA) | Input Current No Load Typ. (mA) | Efficiency @ FL (%) |
|-----------|-----------------------------|---------------------------|----------------------|-------------------------------|---------------------------------|---------------------|
| 303S12WFS | 12                          | 9 - 18                    | 3.3                  | 700                           | 20                              | 75                  |
| 305S12WFS | 12                          | 9 - 18                    | 5.0                  | 600                           | 20                              | 79                  |
| 312S12WFS | 12                          | 9 - 18                    | 12.0                 | 250                           | 20                              | 82                  |
| 315S12WFS | 12                          | 9 - 18                    | 15.0                 | 200                           | 20                              | 82                  |
| 305D12WFS | 12                          | 9 - 18                    | ±5.0                 | ±300                          | 20                              | 78                  |
| 312D12WFS | 12                          | 9 - 18                    | ±12.0                | ±125                          | 20                              | 81                  |
| 315D15WFS | 12                          | 9 - 18                    | ±15.0                | ±100                          | 20                              | 81                  |
| 303S24WFS | 24                          | 18 - 36                   | 3.3                  | 700                           | 5                               | 76                  |
| 305S24WFS | 24                          | 18 - 36                   | 5.0                  | 600                           | 5                               | 80                  |
| 312S24WFS | 24                          | 18 - 36                   | 12.0                 | 250                           | 5                               | 83                  |
| 315S24WFR | 24                          | 18 - 36                   | 15.0                 | 200                           | 5                               | 83                  |
| 305D24WFS | 24                          | 18 - 36                   | ±5.0                 | ±300                          | 5                               | 79                  |
| 312D24WFS | 24                          | 18 - 36                   | ±12.0                | ±125                          | 5                               | 82                  |
| 315D24WFS | 24                          | 18 - 36                   | ±15.0                | ±100                          | 5                               | 82                  |
| 303S48WFS | 48                          | 36 - 72                   | 3.3                  | 700                           | 3                               | 76                  |
| 305S48WFS | 48                          | 36 - 72                   | 5.0                  | 600                           | 3                               | 80                  |
| 312S48WFS | 48                          | 36 - 72                   | 12.0                 | 250                           | 3                               | 83                  |
| 315S48WFS | 48                          | 36 - 72                   | 15.0                 | 200                           | 3                               | 83                  |
| 305D48WFS | 48                          | 36 - 72                   | ±5.0                 | ±300                          | 3                               | 79                  |
| 312D48WFS | 48                          | 36 - 72                   | ±12.0                | ±125                          | 3                               | 82                  |
| 315D48WFS | 48                          | 36 - 72                   | ±15.0                | ±100                          | 3                               | 82                  |

**MODEL 300WFS**

