

FDD01 SERIES

DC - DC CONVERTER
1W SINGLE & DUAL OUTPUT



FEATURES

- EFFICIENCY UP TO 60%
- INPUT 5 V \pm 10%
- DIP24 PACKAGE
- I / O ISOLATION
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- 3 YEARS WARRANTY

MODEL LIST

| MODEL NO. | INPUT VOLTAGE | INPUT CURRENT (typ.) | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | CAPACITOR LOAD (max.) |
|-----------------------------|---------------|----------------------|----------------|----------------|----------------|-------------|-------------|-----------------------|
| Single Output Models | | | | | | | | |
| FDD01 - 05S0 | 4.5~5.5 VDC | 315 mA | 1 WATTS | + 5 VDC | 200 mA | 53% | 55% | 1000 μ F |
| FDD01 - 12S0 | 4.5~5.5 VDC | 310 mA | 1 WATTS | + 12 VDC | 84 mA | 58% | 60% | 470 μ F |
| FDD01 - 15S0 | 4.5~5.5 VDC | 300 mA | 1 WATTS | + 15 VDC | 66 mA | 58% | 60% | 330 μ F |
| Dual Output Models | | | | | | | | |
| FDD01 - 05D0 | 4.5~5.5 VDC | 315 mA | 1 WATTS | \pm 5 VDC | \pm 100 mA | 53% | 55% | \pm 680 μ F |
| FDD01 - 12D0 | 4.5~5.5 VDC | 310 mA | 1 WATTS | \pm 12 VDC | \pm 42 mA | 58% | 60% | \pm 150 μ F |
| FDD01 - 15D0 | 4.5~5.5 VDC | 300 mA | 1 WATTS | \pm 15 VDC | \pm 33 mA | 58% | 60% | \pm 68 μ F |

SPECIFICATION

All Specifications Typical At Nominal Line, Full Load, 25°C Unless Otherwise Noticed

GENERAL

| Characteristics | Conditions | min. | typ. | max. | unit |
|-------------------------|-----------------------------|-----------------------|-----------|--------|--------|
| Switching frequency | Vi nom, Io nom | 50 | | | KHz |
| Isolation voltage | Input - Output | 1,500 | | | VDC |
| Isolation resistance | Input - Output, @ 500VDC | 100 | | | MΩ |
| Ambient temperature | Operating at Vi nom, Io nom | -25 | | + 71 | °C |
| Case temperature | Operating at Vi nom, Io nom | | | + 90 | °C |
| Derating | Vi nom | See derating curve | | | |
| Storage temperature | Non operational | -40 | | + 100 | °C |
| Relative humidity | Vi nom, Io nom | 20 | | 95 | % RH |
| Temperature coefficient | Vi nom, Io min | | | ± 0.02 | % / °C |
| Dimension | | L31.8 x W20.3 x H12.7 | | | mm |
| MTBF | Bellcore issue 6@40°C, GB | | 2,050,000 | | Hours |
| Cooling | Free air convection | | | | |

INPUT SPECIFICATIONS

| Characteristics | Conditions | min. | typ. | max. | unit |
|--------------------------|---------------------------|------|------|------|------|
| Input voltage range | Ta min ... Ta max, Io nom | 4.5 | 5 | 5.5 | VDC |
| No load input current | Vi nom, Io = 0 | | | 65 | mA |
| Input voltage w/o damage | Io nom | | | 7 | VDC |
| Startup voltage | Io nom | | 4 | | VDC |

OUTPUT SPECIFICATIONS

| Characteristics | Conditions | min. | typ. | max. | unit |
|-------------------------------|---|--|------|------|------|
| Output voltage accuracy | Vi nom, Io nom | | | ± 2 | % |
| Minimum load | Vi nom single output models | 0 | | | % |
| | Vi nom dual output models (each output) | 20 | | | % |
| Line regulation | Io nom, Vi min ... Vi max | | | ± 1 | % |
| Load regulation | Vi nom, Io 0 ... Io nom, single output models | | | ± 2 | % |
| | Vi nom, Io min ... Io nom, dual output models | | | ± 3 | % |
| Cross regulation (Dual model) | Aymmetrical load 20% - 100% FL | | | ± 5 | % |
| Startup time | Vi nom, Io nom | | | 50 | ms |
| Transient recovery time | Vi nom, I ~ 0.5 Io nom | | | 3 | ms |
| Ripple & noise | Vi nom, Io nom, BW = 20MHz | | | 100 | mV |
| Efficiency | Vi nom, Io nom, Po / Pi | Up to 60%, See model list and efficiency curve | | | |

CONTROL AND PROTECTION

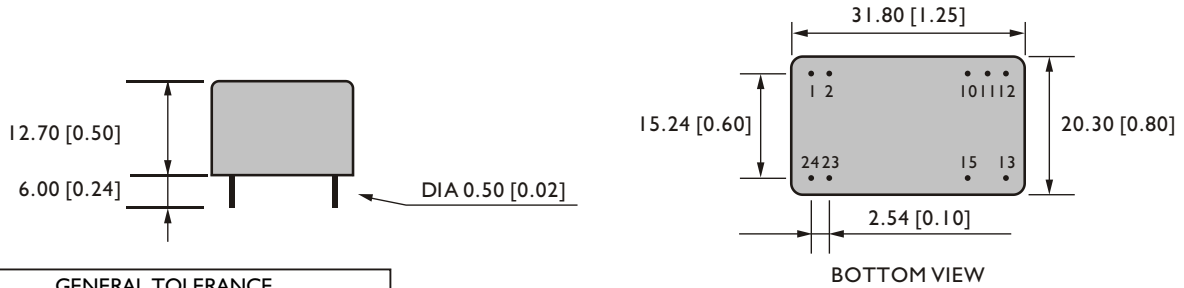
| | |
|----------------------|--|
| Input reversed | External shunt diode, external fuse recommended 0.5A |
| Output short circuit | Current limited (Auto-recovery) |

PHYSICAL CHARACTERISTICS

| | |
|------------------|---|
| Case size | 31.8 × 20.3 × 12.7 mm (1.25 × 0.8 × 0.5 inches) |
| Case material | Plastic |
| Weight | 15 g |
| Potting material | Epoxy |

MECHANISM & PIN CONFIGURATION

mm [inch]



| GENERAL TOLERANCE | |
|----------------------------|-------------|
| 0.00[0.00] - 30.00[1.18] | ±0.30[0.01] |
| 30.00[1.18] - 120.00[4.72] | ±0.50[0.02] |

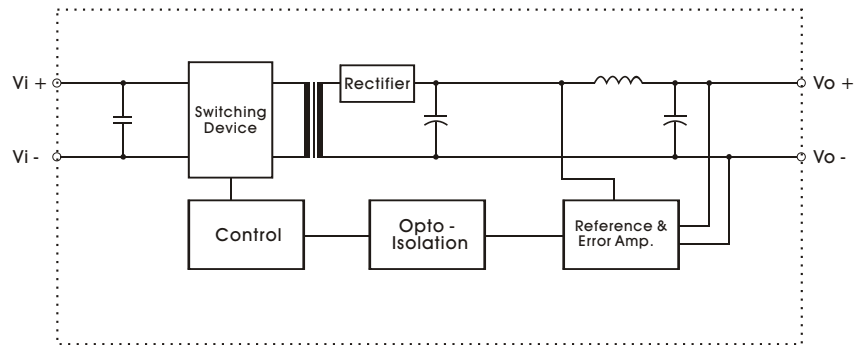
PIN ASSIGNMENT

GENERAL

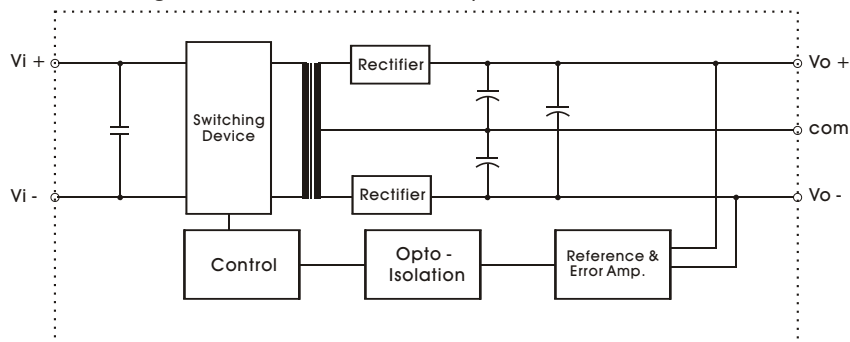
| PIN NO. | 1 & 2 | 10 | 11 | 12 | 13 | 15 | 23 & 24 |
|---------|-------|--------|--------|--------|------|--------|---------|
| SINGLE | Vi + | NO PIN | NO PIN | Vo - | Vo + | NO PIN | Vi - |
| DUAL | Vi + | com | com | NO PIN | Vo - | Vo + | Vi - |

CIRCUIT SCHEMATIC

• Block diagram for FDD01 series with single output



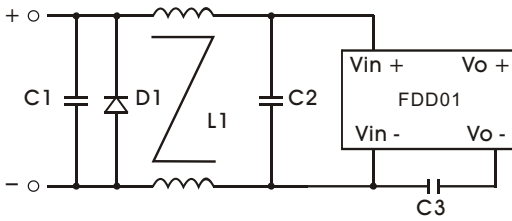
• Block diagram for FDD01 series with dual output



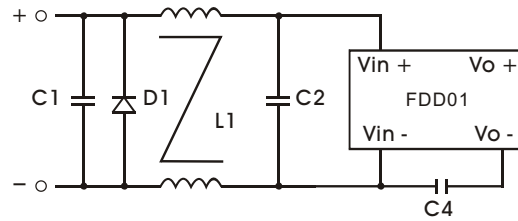
RECOMMENDED CIRCUIT

- Recommended filter for EN55022 Class B compliance

SINGLE OUTPUT MODELS



DUAL OUTPUT MODELS

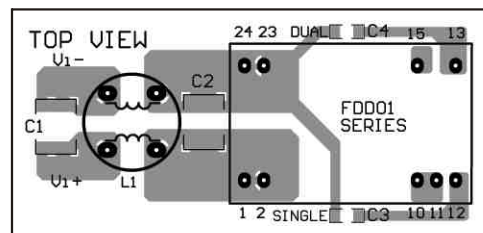


Note: D1 - Reverse Diode (1A/100V)

- The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

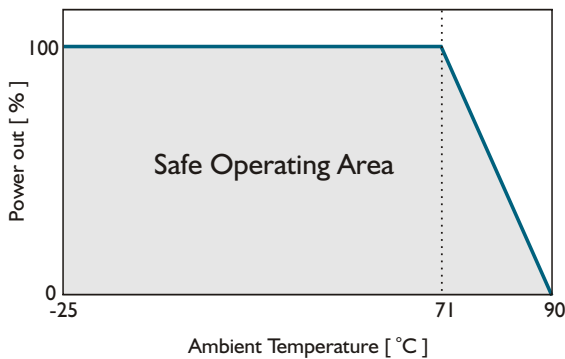
| | C1 | C2 | C3 | C4 | L1 |
|------------|------------------------|------------------------|--------------|--------------|------------------|
| FDD01-XXS0 | 3.3 μ F / 16V MLCC | 4.7 μ F / 16V MLCC | 1nF/2KV MLCC | | 3mH Common Choke |
| FDD01-XXD0 | 3.3 μ F / 16V MLCC | 4.7 μ F / 16V MLCC | | 1nF/2KV MLCC | 3mH Common Choke |

- Recommended EN 55022 Class B filter circuit layout.

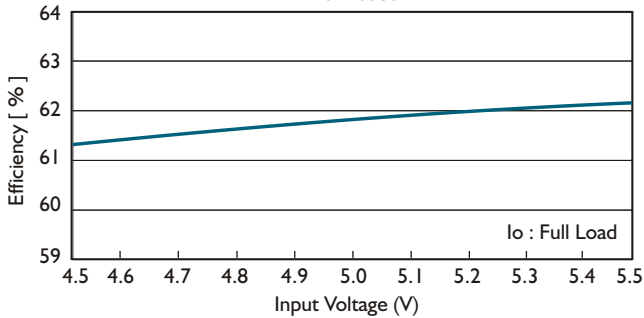


DERATING AND EFFICIENCY CURVE

Temperature derating curve



Efficiency Vs Input Voltage
FDD01-05S0



Efficiency Vs Output Load
FDD01-05S0

