

# FDD I 5 SERIES

DC - DC CONVERTER  
10 ~ 15W SINGLE & DUAL OUTPUT



## FEATURES

- LOW COST
- 2:1 WIDE INPUT RANGE
- I/O ISOLATION
- LC INPUT FILTER
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- 2 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

|              |           |        |          |           |         |     |     |              |
|--------------|-----------|--------|----------|-----------|---------|-----|-----|--------------|
| FDD15 - 03S1 | 9~18 VDC  | 1.1 A  | 10 WATTS | + 3.3 VDC | 3000 mA | 75% | 77% | 4700 $\mu$ F |
| FDD15 - 05S1 | 9~18 VDC  | 1.08 A | 10 WATTS | + 5 VDC   | 2000 mA | 75% | 77% | 4700 $\mu$ F |
| FDD15 - 12S1 | 9~18 VDC  | 1.07 A | 10 WATTS | + 12 VDC  | 834 mA  | 75% | 77% | 3500 $\mu$ F |
| FDD15 - 15S1 | 9~18 VDC  | 1.07 A | 10 WATTS | + 15 VDC  | 667 mA  | 76% | 78% | 3500 $\mu$ F |
| FDD15 - 03S2 | 18~36 VDC | 0.54 A | 10 WATTS | + 3.3 VDC | 3000 mA | 75% | 77% | 4700 $\mu$ F |
| FDD15 - 05S2 | 18~36 VDC | 0.79 A | 15 WATTS | + 5 VDC   | 3000 mA | 78% | 80% | 4700 $\mu$ F |
| FDD15 - 12S2 | 18~36 VDC | 0.78 A | 15 WATTS | + 12 VDC  | 1250 mA | 79% | 81% | 3500 $\mu$ F |
| FDD15 - 15S2 | 18~36 VDC | 0.77 A | 15 WATTS | + 15 VDC  | 1000 mA | 80% | 82% | 3500 $\mu$ F |
| FDD15 - 03S3 | 36~72 VDC | 0.27 A | 10 WATTS | + 3.3 VDC | 3000 mA | 74% | 76% | 4700 $\mu$ F |
| FDD15 - 05S3 | 36~72 VDC | 0.39 A | 15 WATTS | + 5 VDC   | 3000 mA | 78% | 80% | 4700 $\mu$ F |
| FDD15 - 12S3 | 36~72 VDC | 0.39 A | 15 WATTS | + 12 VDC  | 1250 mA | 79% | 81% | 3500 $\mu$ F |
| FDD15 - 15S3 | 36~72 VDC | 0.39 A | 15 WATTS | + 15 VDC  | 1000 mA | 79% | 81% | 3500 $\mu$ F |

### Dual Output Models

|              |           |        |          |              |              |     |     |                    |
|--------------|-----------|--------|----------|--------------|--------------|-----|-----|--------------------|
| FDD15 - 12D1 | 9~18 VDC  | 1.12 A | 10 WATTS | $\pm$ 12 VDC | $\pm$ 417 mA | 73% | 76% | $\pm$ 1000 $\mu$ F |
| FDD15 - 15D1 | 9~18 VDC  | 1.09 A | 10 WATTS | $\pm$ 15 VDC | $\pm$ 334 mA | 75% | 78% | $\pm$ 1000 $\mu$ F |
| FDD15 - 12D2 | 18~36 VDC | 0.77 A | 15 WATTS | $\pm$ 12 VDC | $\pm$ 625 mA | 80% | 83% | $\pm$ 1000 $\mu$ F |
| FDD15 - 15D2 | 18~36 VDC | 0.77 A | 15 WATTS | $\pm$ 15 VDC | $\pm$ 500 mA | 80% | 83% | $\pm$ 1000 $\mu$ F |
| FDD15 - 12D3 | 36~72 VDC | 0.38 A | 15 WATTS | $\pm$ 12 VDC | $\pm$ 625 mA | 80% | 83% | $\pm$ 1000 $\mu$ F |
| FDD15 - 15D3 | 36~72 VDC | 0.38 A | 15 WATTS | $\pm$ 15 VDC | $\pm$ 500 mA | 80% | 83% | $\pm$ 1000 $\mu$ 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              |                       | 200    |        | KHz    |
| Isolation voltage       | Input - Output              | 1500                  |        |        | VDC    |
| Isolation resistance    | Input - Output, @ 500VDC    | 100                   |        |        | MΩ     |
| Isolation capacitance   | 100KHz / IV                 |                       |        | 1000   | PF     |
| Ambient temperature     | Operating at Vi nom, Io nom | -10                   |        | + 51   | °C     |
| Case temperature        | Operating at Vi nom, Io nom |                       |        | + 85   | °C     |
| Derating                | Vi nom                      | See derating curve    |        |        |        |
| Storage temperature     | Non operational             | -25                   |        | + 100  | °C     |
| Relative humidity       | Vi nom, Io nom              | 20                    |        | 95     | % RH   |
| Temperature coefficient | Vi nom, Io min              |                       |        | ± 0.02 | % / °C |
| Dimension               |                             | L50.8 x W50.8 x H12.0 |        |        |        |
| MTBF                    | Bellcore issue 6@40°C, GB   |                       | 889000 |        | Hours  |
| Cooling                 | Free air convection         |                       |        |        |        |

#### INPUT SPECIFICATIONS

| Characteristics          | Conditions                  | min.       | typ. | max. | unit |
|--------------------------|-----------------------------|------------|------|------|------|
| Input voltage range      | Ta min ...Ta max,<br>Io nom | 9          | 12   | 18   | VDC  |
|                          |                             | 18         | 24   | 36   | VDC  |
|                          |                             | 36         | 48   | 72   | VDC  |
| No load input current    | Vi nom, Io = 0              | 12V models |      | 30   | mA   |
|                          |                             | 24V models |      | 25   | mA   |
|                          |                             | 48V models |      | 15   | mA   |
| Input voltage w/o damage | Io nom                      | 12V models |      | 20   | VDC  |
|                          |                             | 24V models |      | 40   | VDC  |
|                          |                             | 48V models |      | 75   | VDC  |
| Startup voltage          | Io nom                      | 12V models |      | 8.5  | VDC  |
|                          |                             | 24V models |      | 15   | VDC  |
|                          |                             | 48V models |      | 35   | VDC  |
| Input filter             | Pi type                     |            |      |      |      |

#### 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 |                                                |      | ± 5         | %    |
| Cross regulation (Dual model) | Aymmetrical load 20% - 100% FL               |                                                |      | ± 5         | %    |
| Startup time                  | Vi nom, Io nom                               |                                                |      | 1000        | ms   |
| Transient recovery time       | Vi nom, I ~ 0.5 Io nom                       |                                                |      | 500         | μs   |
| Ripple & noise                | Vi nom, Io nom, 3.3V model                   |                                                |      | 100         | mV   |
|                               | BW = 20MHz 5V, 12V, 15V & dual               |                                                |      | Vout x ± 1% | mV   |
| Efficiency                    | Vi nom, Io nom, Po / Pi                      | Up to 83%, See model list and efficiency curve |      |             |      |

#### CONTROL AND PROTECTION

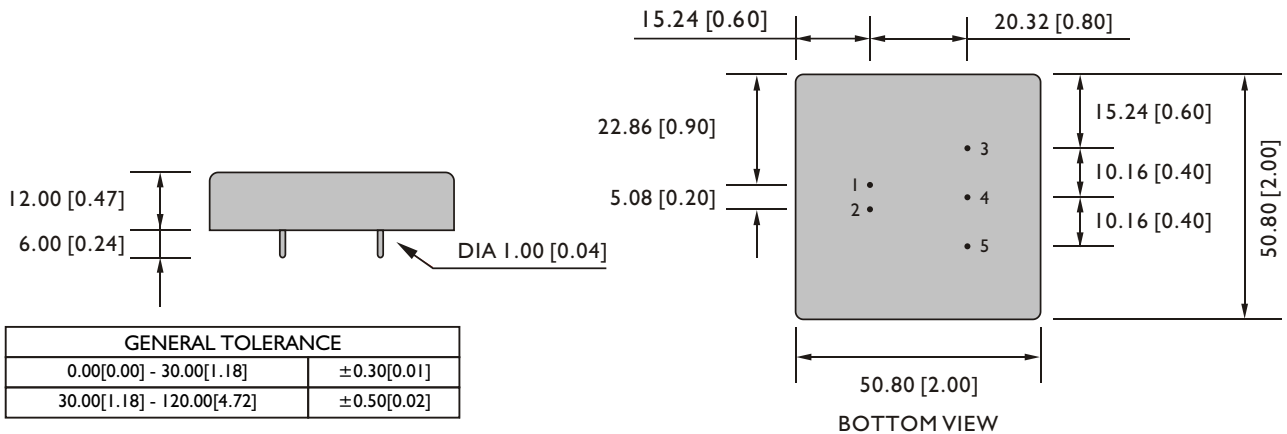
|                            |                                                                                            |
|----------------------------|--------------------------------------------------------------------------------------------|
| Input reversed             | Shunt diode built in, external fuse recommended (12Vin : 1.5A, 24Vin : 1 A, 48Vin : 0.5 A) |
| Output short circuit       | Current limited (Auto-recovery)                                                            |
| Rated over load protection | 110%min....140%max                                                                         |

### PHYSICAL CHARACTERISTICS

|                  |                                             |
|------------------|---------------------------------------------|
| Case size        | 50.8 x 50.8 x 12.0 mm (2 x 2 x 0.47 inches) |
| Case material    | Plastic base / Metal case                   |
| Weight           | 70 g                                        |
| Patting material | Epoxy                                       |

### MECHANISM & PIN CONFIGURATION

mm [inch]

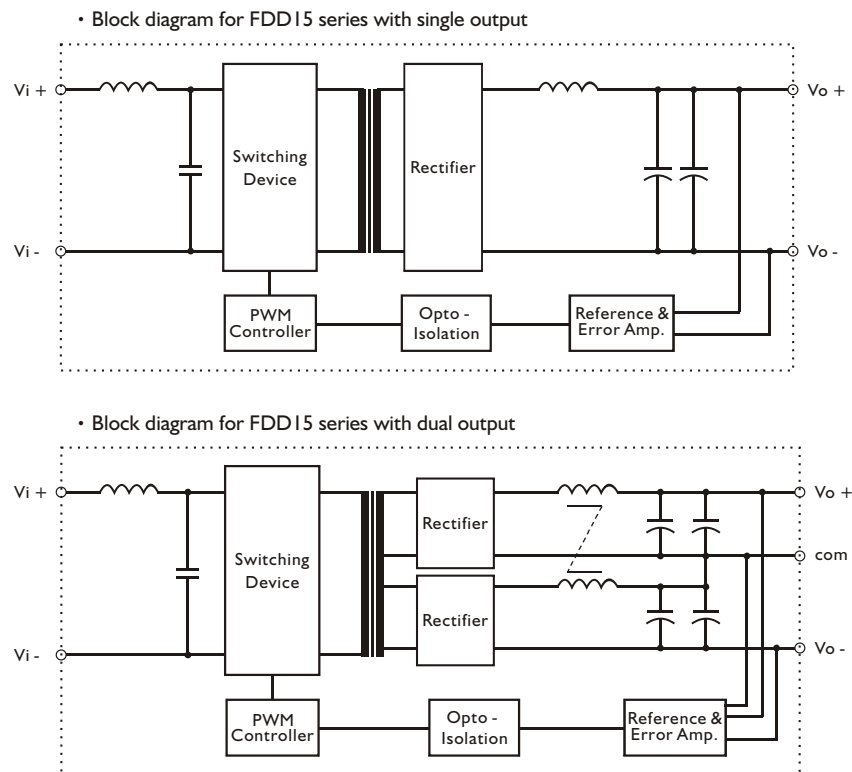


### PIN ASSIGNMENT

#### GENERAL

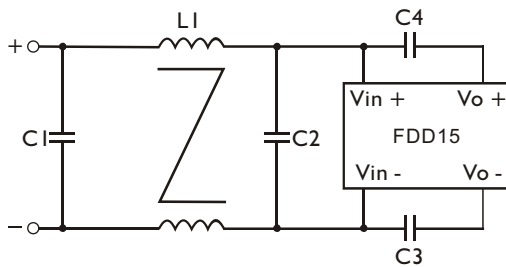
| PIN NO. | 1    | 2    | 3    | 4      | 5    |
|---------|------|------|------|--------|------|
| SINGLE  | Vi + | Vi - | Vo + | NO PIN | Vo - |
| DUAL    | Vi + | Vi - | Vo + | com    | Vo - |

### CIRCUIT SCHEMATIC



### RECOMMENDED CIRCUIT

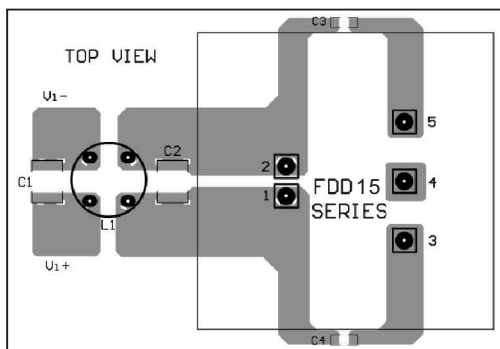
- Recommended filter for EN55022 Class B compliance



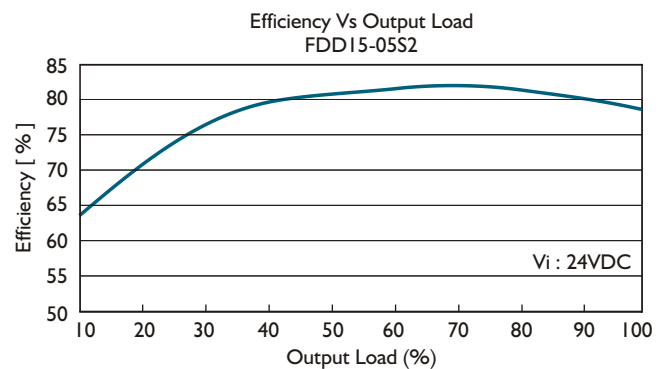
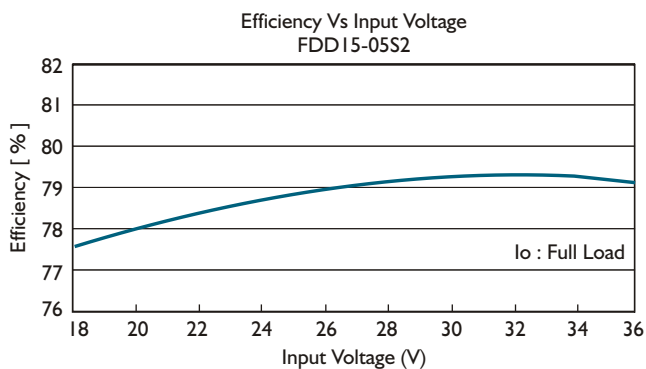
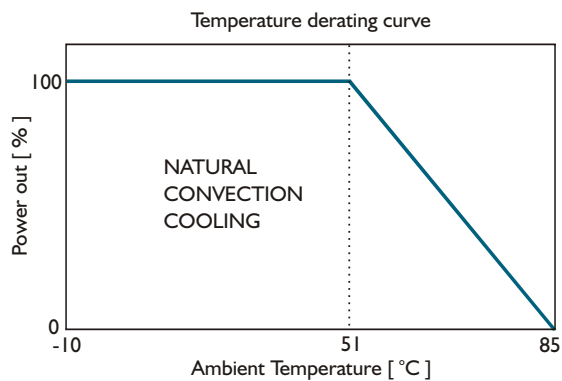
- The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

|            | C1                      | C2                      | C3             | C4             | L1                 |
|------------|-------------------------|-------------------------|----------------|----------------|--------------------|
| FDD15-XXX1 | 6.8 $\mu$ F / 50V MLCC  | 4.7 $\mu$ F / 50V MLCC  | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 0.5mH Common Choke |
| FDD15-XXX2 | 4.7 $\mu$ F / 50V MLCC  | 4.7 $\mu$ F / 50V MLCC  | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 0.5mH Common Choke |
| FDD15-XXX3 | 4.7 $\mu$ F / 100V MLCC | 4.7 $\mu$ F / 100V MLCC | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 0.5mH Common Choke |

- Recommended EN 55022 Class B filter circuit layout.



### DERATING AND EFFICIENCY CURVE



# FDD I 5 SERIES

DC - DC CONVERTER  
10 ~ 15W TRIPLE OUTPUT



## FEATURES

- LOW COST
- 2:1 WIDE INPUT RANGE
- I/O ISOLATION
- LC INPUT FILTER
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- 2 YEARS WARRANTY

## MODEL LIST

| MODEL NO. | INPUT VOLTAGE | INPUT CURRENT (typ.) | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | CAPACITOR LOAD (max.) |
|-----------|---------------|----------------------|----------------|----------------|----------------|-------------|-------------|-----------------------|
|-----------|---------------|----------------------|----------------|----------------|----------------|-------------|-------------|-----------------------|

### Triple Output Models

|                |           |        |          |              |                |     |     |                              |
|----------------|-----------|--------|----------|--------------|----------------|-----|-----|------------------------------|
| FDD15 - 0512T1 | 9~18 VDC  | 1.07 A | 10 WATTS | +5 / ±12 VDC | 1.5A / ± 0.12A | 77% | 79% | 4700 $\mu$ F / ±2200 $\mu$ F |
| FDD15 - 0515T1 | 9~18 VDC  | 1.07 A | 10 WATTS | +5 / ±15 VDC | 1.5A / ± 0.1 A | 77% | 79% | 4700 $\mu$ F / ±2200 $\mu$ F |
| FDD15 - 0512T2 | 18~36 VDC | 0.76 A | 15 WATTS | +5 / ±12 VDC | 2 A / ± 0.2 A  | 80% | 82% | 4700 $\mu$ F / ±2200 $\mu$ F |
| FDD15 - 0515T2 | 18~36 VDC | 0.76 A | 15 WATTS | +5 / ±15 VDC | 2 A / ± 0.16A  | 80% | 82% | 4700 $\mu$ F / ±2200 $\mu$ F |
| FDD15 - 0512T3 | 36~72 VDC | 0.38 A | 15 WATTS | +5 / ±12 VDC | 2 A / ± 0.2 A  | 80% | 82% | 4700 $\mu$ F / ±2200 $\mu$ F |
| FDD15 - 0515T3 | 36~72 VDC | 0.38 A | 15 WATTS | +5 / ±15 VDC | 2 A / ± 0.16A  | 80% | 82% | 4700 $\mu$ F / ±2200 $\mu$ 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              |                       | 180    |        | KHz    |
| Isolation voltage       | Input - Output              | 1500                  |        |        | VDC    |
| Isolation resistance    | Input - Output, @ 500VDC    | 100                   |        |        | MΩ     |
| Isolation capacitance   | 100KHz / 1V                 |                       |        | 1000   | PF     |
| Ambient temperature     | Operating at Vi nom, Io nom | -10                   |        | + 51   | °C     |
| Case temperature        | Operating at Vi nom, Io nom |                       |        | +100   | °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               |                             | L50.8 x W50.8 x H12.0 |        |        | mm     |
| MTBF                    | Belcore issue 6@40°C, GB    |                       | 720000 |        | Hours  |
| Cooling                 | Free air convection         |                       |        |        |        |

#### INPUT SPECIFICATIONS

| Characteristics          | Conditions                | min.       | typ. | max. | unit |
|--------------------------|---------------------------|------------|------|------|------|
| Input voltage range      | Ta min ... Ta max, Io nom | 9          | 12   | 18   | VDC  |
|                          |                           | 18         | 24   | 36   | VDC  |
|                          |                           | 36         | 48   | 72   | VDC  |
| No load input current    | Vi nom, Io = 0            | 12V models |      | 30   | mA   |
|                          |                           | 24V models |      | 25   | mA   |
|                          |                           | 48V models |      | 15   | mA   |
| Input voltage w/o damage | Io nom                    | 12V models |      | 20   | VDC  |
|                          |                           | 24V models |      | 40   | VDC  |
|                          |                           | 48V models |      | 75   | VDC  |
| Startup voltage          | Io nom                    | 12V models |      | 8.5  | VDC  |
|                          |                           | 24V models |      | 13.6 | VDC  |
|                          |                           | 48V models |      | 24   | VDC  |
| Input filter             | Pi type                   |            |      |      |      |

#### OUTPUT SPECIFICATIONS

| Characteristics         | Conditions                     | min.                                           | typ. | max.        | unit |
|-------------------------|--------------------------------|------------------------------------------------|------|-------------|------|
| Output voltage accuracy | Vi nom, Io nom                 | + 5V                                           |      | ± 2         | %    |
|                         |                                | ±12V or ±15V                                   |      | ± 6         | %    |
| Minimum load            | Vi nom                         | + 5V                                           |      | 10          | %    |
|                         |                                | ±12V or ±15V                                   |      | 20          | %    |
| Line regulation         | Vi min ... Vi max, Io nom      | + 5V                                           |      | ± 2         | %    |
|                         |                                | ±12V or ±15V                                   |      | ± 6         | %    |
| Load regulation         | Vi nom, Io min ... Io nom      | + 5V                                           |      | ± 2         | %    |
|                         |                                | ±12V or ±15V                                   |      | ± 6         | %    |
| Cross regulation        | Aymmetrical load 20% - 100% FL |                                                |      | ± 6         | %    |
| Startup time            | Vi nom, Io nom                 |                                                |      | 30          | ms   |
| Transient recovery time | Vi nom, I ~ 0.5 Io nom         |                                                |      | 500         | μs   |
| Ripple & noise          | Vi nom, Io nom, BW = 20MHz     |                                                |      | Vout x ± 1% | mV   |
| Efficiency              | Vi nom, Io nom, Po / Pi        | Up to 82%, See model list and efficiency curve |      |             |      |

#### CONTROL AND PROTECTION

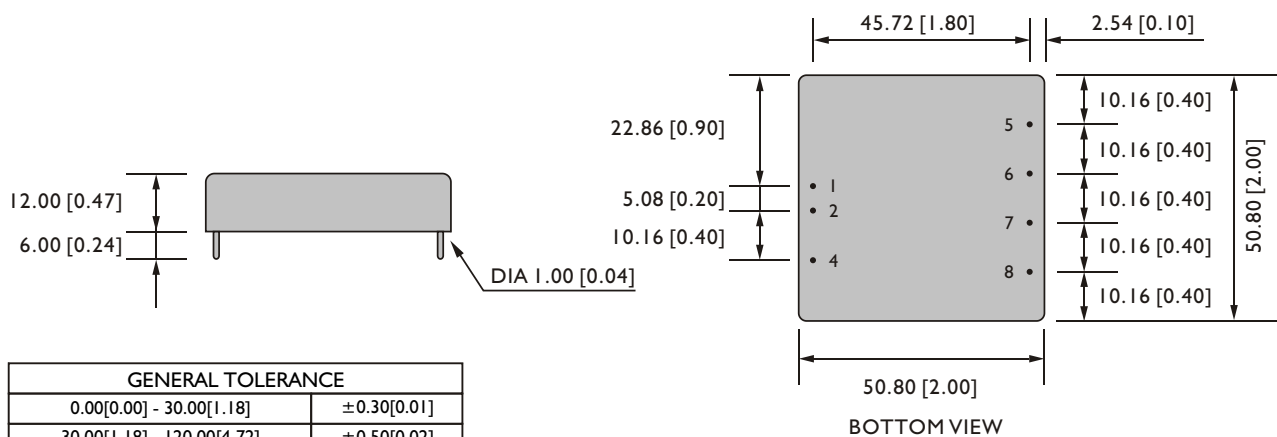
|                            |                                                                                                               |
|----------------------------|---------------------------------------------------------------------------------------------------------------|
| Remote ON / OFF            | ON : opened or 8 ~ 10VDC applied, reference to input GND<br>OFF : -0.3 ~ 2VDC applied, reference to input GND |
| Input reversed             | Shunt diode built in, external fuse recommended (12Vin : 1.5A, 24Vin : 1A, 48Vin : 0.5A)                      |
| Output short circuit       | Current limited (Auto-recovery)                                                                               |
| Rated over load protection | 110%min....140%max                                                                                            |

### PHYSICAL CHARACTERISTICS

|                  |                                             |
|------------------|---------------------------------------------|
| Case size        | 50.8 x 50.8 x 12.0 mm (2 x 2 x 0.47 inches) |
| Case material    | Plastic base / Metal case                   |
| Weight           | 70 g                                        |
| Patting material | Epoxy                                       |

### MECHANISM & PIN CONFIGURATION

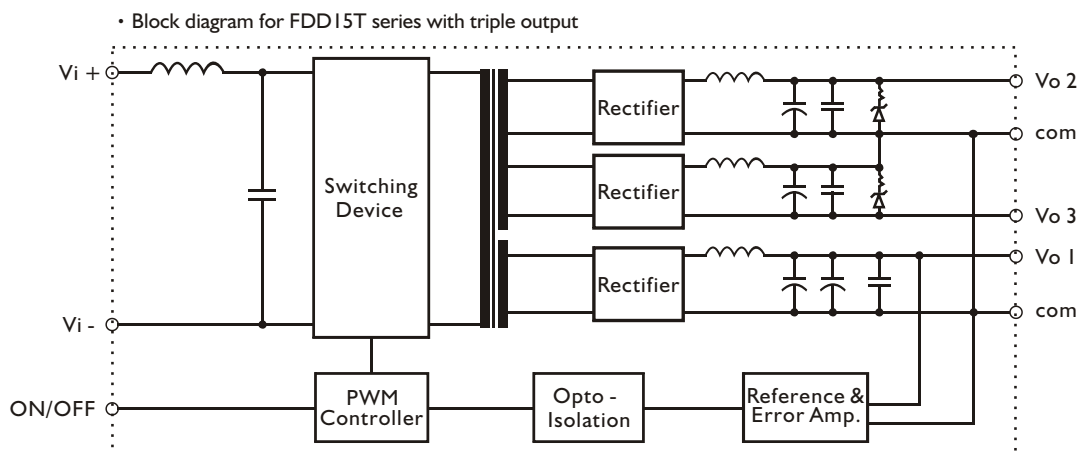
mm [inch]



### PIN ASSIGNMENT

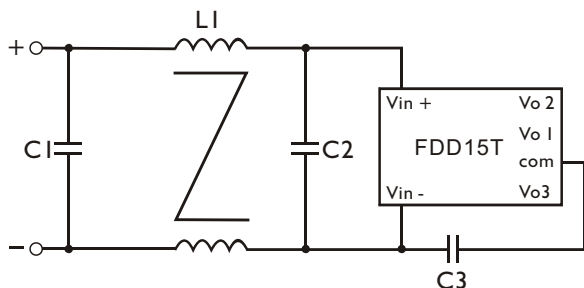
| GENERAL |     |      |          |                |               |     |                |
|---------|-----|------|----------|----------------|---------------|-----|----------------|
| PIN NO. | 1   | 2    | 4        | 5              | 6             | 7   | 8              |
| TRIPLE  | Vi+ | Vi - | ON / OFF | Vo2<br>(+ OUT) | Vo1<br>(+ 5V) | com | Vo3<br>(- OUT) |

### CIRCUIT SCHEMATIC



### RECOMMENDED CIRCUIT

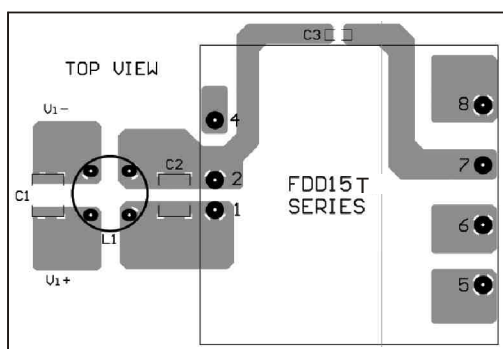
- Recommended filter for EN55022 Class B compliance



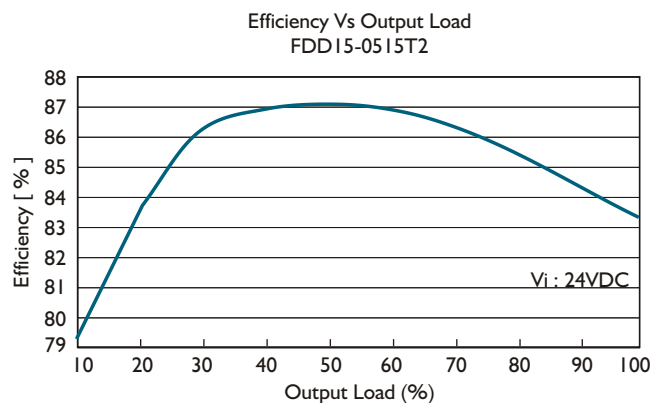
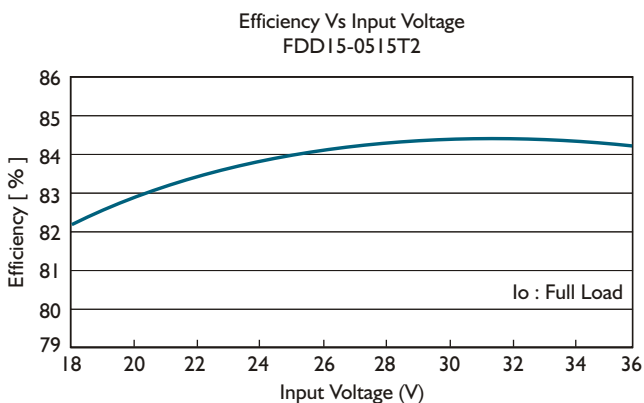
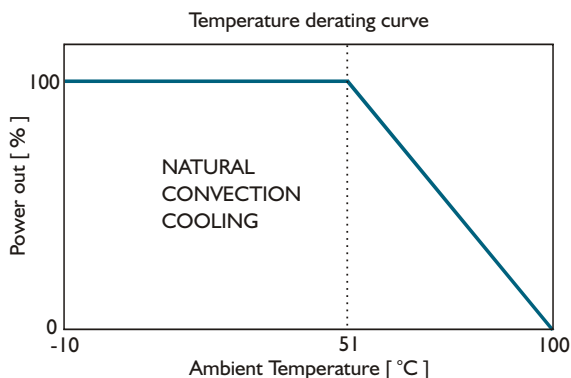
- The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

|              | C1                      | C2                      | C3             | L1                 |
|--------------|-------------------------|-------------------------|----------------|--------------------|
| FDD15-XXXXT1 | 3.3 $\mu$ F / 50V MLCC  | 3.3 $\mu$ F / 50V MLCC  | InF / 2KV MLCC | 0.5mH Common Choke |
| FDD15-XXXXT2 | 3.3 $\mu$ F / 50V MLCC  | 3.3 $\mu$ F / 50V MLCC  | InF / 2KV MLCC | 0.5mH Common Choke |
| FDD15-XXXXT3 | 2.2 $\mu$ F / 100V MLCC | 2.2 $\mu$ F / 100V MLCC | InF / 2KV MLCC | 0.5mH Common Choke |

- Recommended EN 55022 Class B filter circuit layout.



### DERATING AND EFFICIENCY CURVE





## О компании

ООО "ТрейдЭлектроникс" - это оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов. Реализуемая нашей компанией продукция насчитывает более полумиллиона наименований.

Благодаря этому наша компания предлагает к поставке практически не ограниченный ассортимент компонентов как оптовыми, мелкооптовыми партиями, так и в розницу.

Наличие собственной эффективной системы логистики обеспечивает надежную поставку продукции по конкурентным ценам в точно указанные сроки.

Срок поставки со стоков в **Европе и Америке – от 3 до 14 дней.**

Срок поставки из **Азии – от 10 дней.**

Благодаря развитой сети поставщиков, помогаем в поиске и приобретении экзотичных или снятых с производства компонентов.

Предоставляем спец цены на элементы для создания инженерных сэмплов.

**Упорный труд, качественный результат дают нам право быть уверенными в себе и надежными для наших клиентов.**

### Наша компания это:

- Гарантия качества поставляемой продукции
- Широкий ассортимент
- Минимальные сроки поставок
- Техническая поддержка
- Подбор комплектации
- Индивидуальный подход
- Гибкое ценообразование

Наша организация особенно сильна в поставках модулей, микросхем, пассивных компонентов, ксайленсах (XC), EPF, EPM и силовой электроники.

Большой выбор предлагаемой продукции, различные виды оплаты и доставки, позволят Вам сэкономить время и получить максимум выгоды от сотрудничества с нами!

## Перечень производителей, продукцию которых мы поставляем на российский рынок





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качества выпускаемой продукции

С удовольствием будем прорабатывать для Вас поставки всех необходимых компонентов по текущим запросам для скорейшего выявления групп элементов, по которым сотрудничество именно с нашей компанией будет для Вас максимально выгодным!

С уважением,

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