

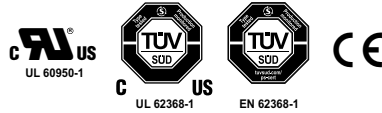
IDD10U SERIES

DC - DC CONVERTER
10W SINGLE & DUAL OUTPUT



FEATURES

- EFFICIENCY UP TO 89%
- 2:1 & 4:1 WIDE INPUT RANGE
- I/O ISOLATION
- INPUT Pi FILTER
- SHORT CIRCUIT PROTECTION
- HIGH PERFORMANCE
- UL/cUL/TUV/CE
- 3 YEARS WARRANTY



MODEL LIST

| MODEL NO. | INPUT VOLTAGE | INPUT CURRENT (typ.) (max.) | | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | CAPACITOR LOAD (max.) |
|-----------------------------|---------------|-------------------------------|--------|----------------|----------------|----------------|-------------|-------------|-----------------------|
| Single Output Models | | | | | | | | | |
| IDD10 - 03S1U | 9~18 VDC | 1.00 A | 1.34 A | 10 WATTS | + 3.3 VDC | 3000 mA | 81% | 83% | 3500 μ F |
| IDD10 - 05S1U | 9~18 VDC | 1.00 A | 1.34 A | 10 WATTS | + 5 VDC | 2000 mA | 83% | 85% | 3500 μ F |
| IDD10 - 12S1U | 9~18 VDC | 0.95 A | 1.30 A | 10 WATTS | + 12 VDC | 830 mA | 86% | 88% | 1000 μ F |
| IDD10 - 15S1U | 9~18 VDC | 0.95 A | 1.30 A | 10 WATTS | + 15 VDC | 670 mA | 87% | 89% | 1000 μ F |
| IDD10 - 03S2U | 18~36 VDC | 0.50 A | 0.67 A | 10 WATTS | + 3.3 VDC | 3000 mA | 80% | 82% | 3500 μ F |
| IDD10 - 05S2U | 18~36 VDC | 0.49 A | 0.67 A | 10 WATTS | + 5 VDC | 2000 mA | 83% | 85% | 3500 μ F |
| IDD10 - 12S2U | 18~36 VDC | 0.47 A | 0.64 A | 10 WATTS | + 12 VDC | 830 mA | 86% | 88% | 1000 μ F |
| IDD10 - 15S2U | 18~36 VDC | 0.48 A | 0.64 A | 10 WATTS | + 15 VDC | 670 mA | 87% | 89% | 1000 μ F |
| IDD10 - 03S3U | 35~75 VDC | 0.25 A | 0.35 A | 10 WATTS | + 3.3 VDC | 3000 mA | 81% | 83% | 3500 μ F |
| IDD10 - 05S3U | 35~75 VDC | 0.25 A | 0.35 A | 10 WATTS | + 5 VDC | 2000 mA | 83% | 85% | 3500 μ F |
| IDD10 - 12S3U | 35~75 VDC | 0.23 A | 0.35 A | 10 WATTS | + 12 VDC | 830 mA | 87% | 89% | 1000 μ F |
| IDD10 - 15S3U | 35~75 VDC | 0.23 A | 0.35 A | 10 WATTS | + 15 VDC | 670 mA | 87% | 89% | 1000 μ F |
| IDD10 - 03S4U | 9~36 VDC | 0.52 A | 1.41 A | 10 WATTS | + 3.3 VDC | 3000 mA | 78% | 80% | 3500 μ F |
| IDD10 - 05S4U | 9~36 VDC | 0.52 A | 1.37 A | 10 WATTS | + 5 VDC | 2000 mA | 80% | 82% | 3500 μ F |
| IDD10 - 12S4U | 9~36 VDC | 0.49 A | 1.37 A | 10 WATTS | + 12 VDC | 830 mA | 82% | 84% | 1000 μ F |
| IDD10 - 15S4U | 9~36 VDC | 0.50 A | 1.37 A | 10 WATTS | + 15 VDC | 670 mA | 83% | 85% | 1000 μ F |
| IDD10 - 03S5U | 18~75 VDC | 0.26 A | 0.71 A | 10 WATTS | + 3.3 VDC | 3000 mA | 78% | 80% | 3500 μ F |
| IDD10 - 05S5U | 18~75 VDC | 0.26 A | 0.70 A | 10 WATTS | + 5 VDC | 2000 mA | 80% | 82% | 3500 μ F |
| IDD10 - 12S5U | 18~75 VDC | 0.25 A | 0.70 A | 10 WATTS | + 12 VDC | 830 mA | 82% | 84% | 1000 μ F |
| IDD10 - 15S5U | 18~75 VDC | 0.25 A | 0.70 A | 10 WATTS | + 15 VDC | 670 mA | 82% | 84% | 1000 μ F |
| Dual Output Models | | | | | | | | | |
| IDD10 - 05D1U | 9~18 VDC | 1.00 A | 1.36 A | 10 WATTS | \pm 5 VDC | \pm 1000 mA | 83% | 85% | \pm 3500 μ F |
| IDD10 - 12D1U | 9~18 VDC | 0.96 A | 1.33 A | 10 WATTS | \pm 12 VDC | \pm 420 mA | 85% | 87% | \pm 1000 μ F |
| IDD10 - 15D1U | 9~18 VDC | 0.95 A | 1.33 A | 10 WATTS | \pm 15 VDC | \pm 340 mA | 86% | 88% | \pm 1000 μ F |
| IDD10 - 05D2U | 18~36 VDC | 0.49 A | 0.66 A | 10 WATTS | \pm 5 VDC | \pm 1000 mA | 84% | 86% | \pm 3500 μ F |



MODEL LIST

| MODEL NO. | INPUT VOLTAGE | INPUT CURRENT | | OUTPUT WATTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT | EFF. (min.) | EFF. (typ.) | CAPACITOR LOAD (max.) |
|---------------------------|---------------|---------------|--------|----------------|----------------|----------------|-------------|-------------|-----------------------|
| | | (typ.) | (max.) | | | | | | |
| Dual Output Models | | | | | | | | | |
| IDD10 - 12D2U | 18~36 VDC | 0.47 A | 0.66 A | 10 WATTS | ± 12 VDC | ± 420 mA | 85% | 87% | ± 1000 μ F |
| IDD10 - 15D2U | 18~36 VDC | 0.47 A | 0.66 A | 10 WATTS | ± 15 VDC | ± 340 mA | 86% | 88% | ± 1000 μ F |
| IDD10 - 05D3U | 35~75 VDC | 0.24 A | 0.34 A | 10 WATTS | ± 5 VDC | ±1000 mA | 84% | 86% | ± 3500 μ F |
| IDD10 - 12D3U | 35~75 VDC | 0.23 A | 0.34 A | 10 WATTS | ± 12 VDC | ± 420 mA | 87% | 89% | ± 1000 μ F |
| IDD10 - 15D3U | 35~75 VDC | 0.23 A | 0.34 A | 10 WATTS | ± 15 VDC | ± 340 mA | 87% | 89% | ± 1000 μ F |
| IDD10 - 05D4U | 9~36 VDC | 0.51 A | 1.40 A | 10 WATTS | ± 5 VDC | ±1000 mA | 80% | 82% | ± 3500 μ F |
| IDD10 - 12D4U | 9~36 VDC | 0.52 A | 1.40 A | 10 WATTS | ± 12 VDC | ± 420 mA | 80% | 82% | ± 1000 μ F |
| IDD10 - 15D4U | 9~36 VDC | 0.50 A | 1.40 A | 10 WATTS | ± 15 VDC | ± 340 mA | 82% | 84% | ± 1000 μ F |
| IDD10 - 05D5U | 18~75 VDC | 0.26 A | 0.70 A | 10 WATTS | ± 5 VDC | ±1000 mA | 80% | 82% | ± 3500 μ F |
| IDD10 - 12D5U | 18~75 VDC | 0.25 A | 0.70 A | 10 WATTS | ± 12 VDC | ± 420 mA | 81% | 83% | ± 1000 μ F |
| IDD10 - 15D5U | 18~75 VDC | 0.25 A | 0.70 A | 10 WATTS | ± 15 VDC | ± 340 mA | 82% | 84% | ± 1000 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 | | | 200 | | KHz |
| Isolation voltage | Input - Output | | 1,500 | | | VDC |
| Isolation resistance | Input - Output, @ 500VDC | | 100 | | | M Ω |
| Isolation capacitance | 100KHz / 1V | | | | 1,000 | PF |
| Ambient temperature | Operating at Vi nom, Io nom | | -40 | | + 71 | °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 W25.4 x H10.16 | | | mm |
| MTBF | Bellcore issue 6@40°C, GB | | | 1,284,000 | | Hours |
| Cooling | Free air convection | | | | | |

| INPUT SPECIFICATIONS | | | | | | |
|--------------------------|---------------------------|-----|------|------|------|------|
| Characteristics | Conditions | | min. | typ. | max. | unit |
| Input voltage range | Ta min ... Ta max, Io nom | 2:1 | 9 | 12 | 18 | VDC |
| | | | 18 | 24 | 36 | VDC |
| | | | 35 | 48 | 75 | VDC |
| | | 4:1 | 9 | 24 | 36 | VDC |
| | | | 18 | 48 | 75 | VDC |
| No load input current | Vi nom, Io = 0 | 12V | | 25 | mA | |
| | | 24V | | 20 | mA | |
| | | 48V | | 15 | mA | |
| Input voltage w/o damage | Io nom | 12V | | 20 | VDC | |
| | | 24V | | 40 | VDC | |
| | | 48V | | 80 | VDC | |
| startup voltage | Io nom | 12V | 8.5 | | VDC | |
| | | 24V | 16 | | VDC | |
| | | 48V | 33 | | VDC | |
| Input filter | Pi type | | | | | |

SPECIFICATION

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

OUTPUT SPECIFICATIONS

| Characteristics | Conditions | min. | typ. | max. | unit |
|-------------------------------|----------------------------------------------|------------------------------------------------|-----------------|------|------|
| Output voltage accuracy | Vi nom, Io nom | | | ± 2 | % |
| Minimum load | Vi nom single output models | 0 | | | % |
| | dual output models (each output) | 10 | | | % |
| 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) | Asymmetrical load 10% - 100% FL | | | ± 5 | % |
| 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 | | 3.3V & 5V | 100 | mV |
| | | | 12V, 15V & dual | 150 | mV |
| Efficiency | Vi nom, Io nom, Po / Pi | Up to 89%, See model list and efficiency curve | | | |

* Note : Output must be added 0.1 μF / 35V capacitor when application.

SPECIFICATION

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

CONTROL AND PROTECTION

| | |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Input reversed | Shunt diode built in, external fuse recommended 2:1 models (12Vin:1.5A, 24Vin:1A, 48Vin:1A) 4:1 models (24Vin:2A, 48Vin:1A) |
| Output short circuit | Current limited (Auto-recovery) |
| Rated over load protection | 110%min....160%max |

APPROVALS AND STANDARD

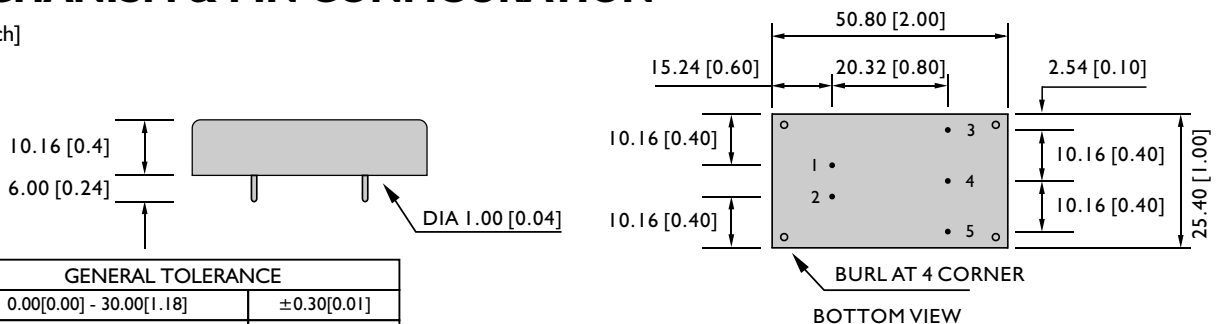
| | |
|-----------|-----------------------------------------------------------------------------------|
| UL/cUL | UL 60950-1 Recognized |
| cTUVus | UL 62368-1 |
| TUV | EN 62368-1 |
| CE | EN 61204-3, EN 55032 Class A, EN 61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-6 |
| Vibration | meet IEC 60068-2-6 (10-500 Hz, 2G, along X, Y, Z each Axis, 60 min for each Axis) |

PHYSICAL CHARACTERISTICS

| | |
|------------------|---------------------------------------------|
| Case size | 50.8 x 25.4 x 10.16 mm (2 x 1 x 0.4 inches) |
| Case material | Plastic base / Metal case |
| Weight | 35 g |
| Potting material | Silicone |

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] |

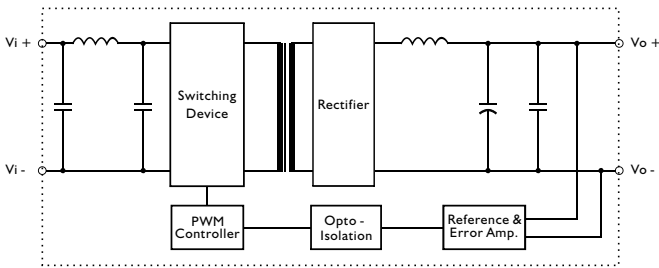
PIN ASSIGNMENT

GENERAL

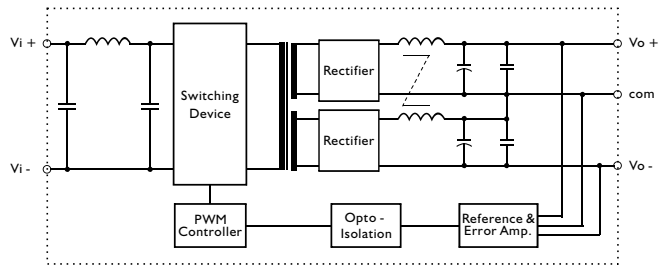
| PIN NO. | 1 | 2 | 3 | 4 | 5 |
|---------|------|------|------|--------|------|
| SINGLE | Vi + | Vi - | Vo + | NO PIN | Vo - |
| DUAL | Vi + | Vi - | Vo + | com | Vo - |

CIRCUIT SCHEMATIC

• Block diagram for IDD10U series with single output

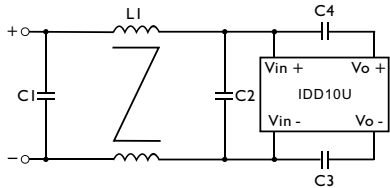


• Block diagram for IDD10U series with dual output

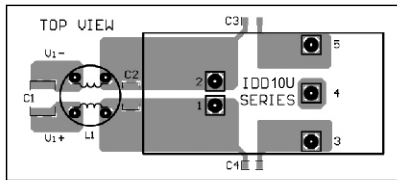


RECOMMENDED CIRCUIT

• Recommended filter for EN 55032 Class B compliance



• Recommended EN 55032 Class B filter circuit layout.

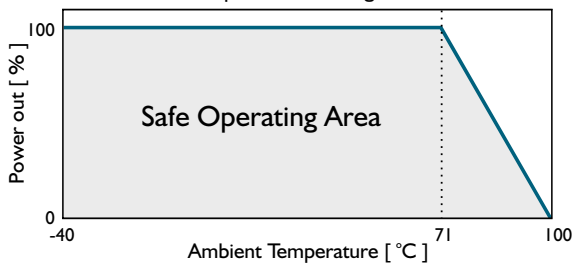


• The components used in the above figure, together with the manufacturer part numbers for these components, are as follows.

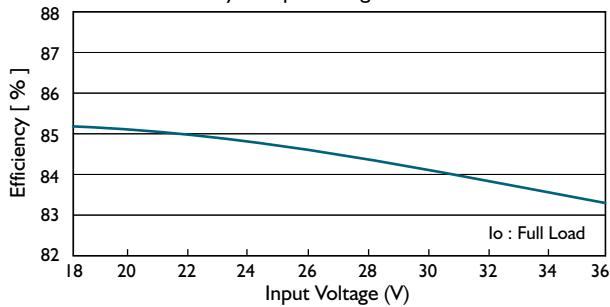
| | C1 | C2 | C3 | C4 | LI |
|-------------|-------------------------|-------------------------|----------------|----------------|--------------------------|
| IDD10-XXX1U | 3.3 μ F / 50V MLCC | 2.2 μ F / 50V MLCC | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 500 μ H Common choke |
| IDD10-XXX2U | 3.3 μ F / 50V MLCC | 2.2 μ F / 50V MLCC | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 500 μ H Common choke |
| IDD10-XXX3U | 3.3 μ F / 100V MLCC | 2.2 μ F / 100V MLCC | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 500 μ H Common choke |
| IDD10-XXX4U | 3.3 μ F / 50V MLCC | 2.2 μ F / 50V MLCC | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 500 μ H Common choke |
| IDD10-XXX5U | 3.3 μ F / 100V MLCC | 2.2 μ F / 100V MLCC | 1nF / 2KV MLCC | 1nF / 2KV MLCC | 1 mH Common choke |

DERATING AND EFFICIENCY CURVE

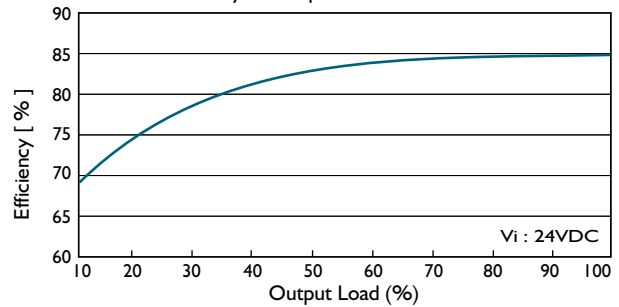
Temperature derating curve



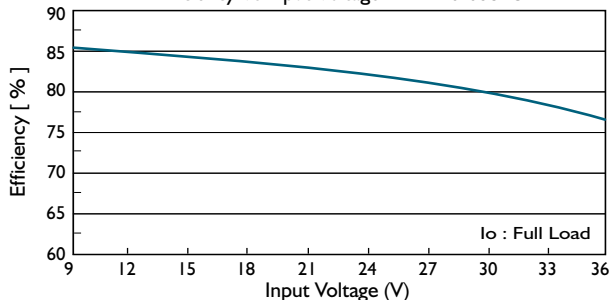
Efficiency Vs Input Voltage IDD10-05S2U



Efficiency Vs Output Load IDD10-05S2U



Efficiency Vs Input Voltage IDD10-05S4U



Efficiency Vs Output Load IDD10-05S4U

