

The Amantys isolated DC-DC Converter is optimised for use with Amantys Gate Drives and provides a high performance, high isolation power supply for a wide range of demanding 3.3kV to 6.5kV IGBT applications, for 2-level and multi-level applications.

- High isolation voltage 12kV
- Dual input voltage: 15V or 24V
- Output power: 15W - 24V supply; 8W – 15V supply
- High efficiency up to 90%
- Operating temperature range -40°C to +85°C
- Output short circuit and overload protection
- Input overvoltage protection
- Input reverse polarity protection
- LED status indication
- EN 50155 compliant for railway applications
- IEC 61800-5-1 compliant for variable speed drives
- Thermal shock and vibration to IEC 61373
- EMC compliant to EN 50121-3-2, EN 50121-5, IEC 61800-3
- Lead free design, RoHS compliant
- 12 months warranty

Absolute Maximum Ratings

Permanent damage may occur if the Absolute Maximum Ratings are exceeded

| Parameter | Notes | Units | Min | Typ | Max |
|-----------------------|---------------------------------|-------|-----|-----|------|
| Input Voltage | Configured for 15V input | V | | | 20 |
| | Configured for 24V input | V | | | 30 |
| Output current | | mA | | | 1100 |
| Input Current | | mA | | | 1200 |
| Working voltage | Peak repetitive input to output | kV | | | 12.0 |
| Operating temperature | | °C | -40 | | 85 |
| Storage temperature | | °C | -40 | | 85 |

Electrical Characteristics (15V input mode)

All data refers to +25 °C and 15.0 V input unless otherwise stated

| Parameter | Notes | Units | Min | Typ | Max |
|--------------------|------------|-------|-----|-----|-----|
| Input current | No load | mA | 10 | 22 | 50 |
| | Load 100mA | mA | | 180 | |
| | Load 200mA | mA | | 320 | |
| | Load 400mA | mA | | 560 | |
| Turn on threshold | | V | | 7.5 | |
| Turn off threshold | | V | | 7.0 | |
| Output voltage | No load | V | | 26 | |
| | Load 100mA | V | | 21 | |
| | Load 200mA | V | | 20 | |
| | Load 400mA | V | | 18 | |
| Output Power | | W | 0 | | 8 |
| Output resistance | | Ω | | 3 | |

Electrical Characteristics (24V input mode)

All data refers to +25 °C and 24.0 V input unless otherwise stated

| Parameter | Notes | Units | Min | Typ | Max |
|--------------------|------------|-------|-----|-----|-----|
| Input current | No load | mA | 10 | 19 | 50 |
| | Load 200mA | mA | | 230 | |
| | Load 400mA | mA | | 390 | |
| | Load 800mA | mA | | 760 | |
| Turn on threshold | | V | | 7.5 | |
| Turn off threshold | | V | | 7.0 | |
| Output voltage | No load | V | | 28 | |
| | Load 200mA | V | | 22 | |
| | Load 400mA | V | | 22 | |
| | Load 800mA | V | | 21 | |
| Output Power | | W | 0 | | 20 |
| Output resistance | | Ω | | 2.0 | |

General electrical specifications

All data refers to +25°C unless otherwise stated

| Parameter | Notes | Units | Min | Typ | Max |
|-----------------------------|---|-------|-----|------|-----|
| Coupling capacitance | Primary to secondary side | pF | | 6 | 10 |
| Maximum dV/dt | | kV/μs | | | 50 |
| Internal capacitance | Between Vout and GND-OUT | μF | | 50 | |
| Short circuit protection | Input current with output shorted (15V mode) | mA | | 150 | |
| | Input current with output shorted (24V mode) | mA | | 110 | |
| Short circuit protection | Output current with output shorted (15V mode) | mA | | 890 | |
| | Output current with output shorted (24V mode) | mA | | 1060 | |
| Reverse polarity protection | Indefinite - automatic recovery, 2.6A PTC fused | | | | |

Standards Compliance

All data refers to +25°C unless otherwise stated

| | Notes | Test Standard |
|---|---|---------------------------|
| Impulse test (Type test) | 25 kV 1.2/50 μs input/output to base 40 kV 1.2/50 μs input to output | |
| Dielectric test (Type test) | 11.6 kVrms input/output to base, 50 Hz, 60 sec 18.5 kVrms input to output, 50 Hz, 60 sec | |
| Partial discharge (Type test and production test) | ≥11.0 kV rms extinction, <10 pC, input to output | |
| EMC Immunity | EN 50121-3-2 Rolling Stock, EN 50121-5 Trackside, IEC 61800-3 Variable Speed Drives | |
| Electrostatic discharge | Air ±8 kV, contact ±6 kV, Perf Criterion B | IEC 61000-4-2 |
| Radiated immunity | 10 V/m 80-2000 MHz, Perf Criterion A | IEC 61000-4-3 |
| Fast burst immunity | ±4 kV, Perf Criterion A | IEC 61000-4-4 |
| Surge immunity | ±2 kV, Perf Criterion B | IEC 61000-4-5 |
| Conducted immunity | 10 Vrms, Perf Criterion A | IEC 61000-4-6 |
| Magnetic field immunity | 100 A/m AC, 300 A/m DC, Perf Criterion A | IEC 61000-4-8 |
| Damped osc. voltage | 2.5 kV line-earth, Perf Criterion B | IEC 61000-4-12 |
| Radiated emissions (E-field) | 20-230/230-1000 MHz, 50/57 dBμV/m q-pk, 3 m | EN 55011 class A, group 1 |
| Conducted emissions | 0.15-0.5/0.5-30 MHz 99/93 dBμV/m quasi-pk | EN 55016-2-1 |

General specifications

All data refers to +25°C unless otherwise stated

| Parameter | Notes | Units | Min | Typ | Max |
|------------------------------|--|-------|-----|-----|------|
| Operating temperature | | °C | -40 | | 85 |
| Storage temperature | | °C | -40 | | 85 |
| Humidity | Compliant to EN 50155 Railways Applications Electronic Equipment Used on Rolling Stock | % | | 85 | 95 |
| Material flammability rating | UL94V-0 rated | | | | |
| Pollution degree | Class 2 | | | | |
| Weight | | g | | 260 | |
| Maximum altitude | Derate above this: Amantys to advise | m | | | 2000 |
| Reliability - See Note 1 | Failure rate (normal life) - Calculated | FIT | | 125 | |
| | Lifetime (end of life) - Calculated | years | | 20 | |
| Environmental compliance | Reach | | | | |
| | RoHS | | | | |
| Creepage | Input to output | mm | 80 | | |
| | Input or output to mounting base | mm | 65 | | |
| Clearance | Input to output | mm | 65 | | |
| | Input or output to mounting base | mm | 42 | | |

Notes:

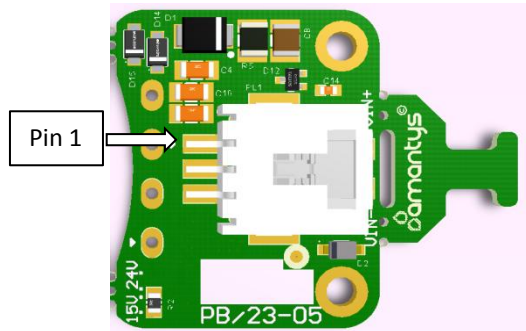
- 1 - Failure rate and lifetime are calculated figures and can not be warranted by Amantys Power Electronics Limited.

Interfaces

| Interface | Description | Manufacturer | Part Number |
|-----------|-----------------|------------------------|---|
| Input | 3 way connector | TE Connectivity (Tyco) | AMP - 104257-2 - Housing, Receptacle, 3-way |
| Output | 4 wayconnector | TE Connectivity (Tyco) | AMP - 104257-3 - Housing, Receptacle, 4-way |

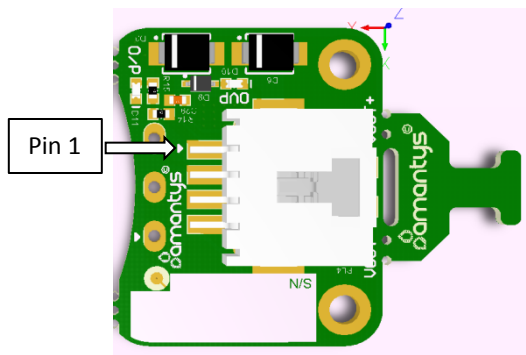
Power Supply Input

| Pinout | Voltage | Pins |
|--------|-----------------|------|
| Supply | 0V | 1 |
| Supply | V _{DC} | 2 |
| Supply | 0V | 3 |



Power Supply Output

| Pinout | Voltage | Pins |
|----------|-----------------|--------------|
| Supply + | V _{DC} | 1 |
| Tx1 | AC | 2 (Reserved) |
| Tx2 | AC | 3 (Reserved) |
| Supply - | 0V | 4 |



LED Status Indication

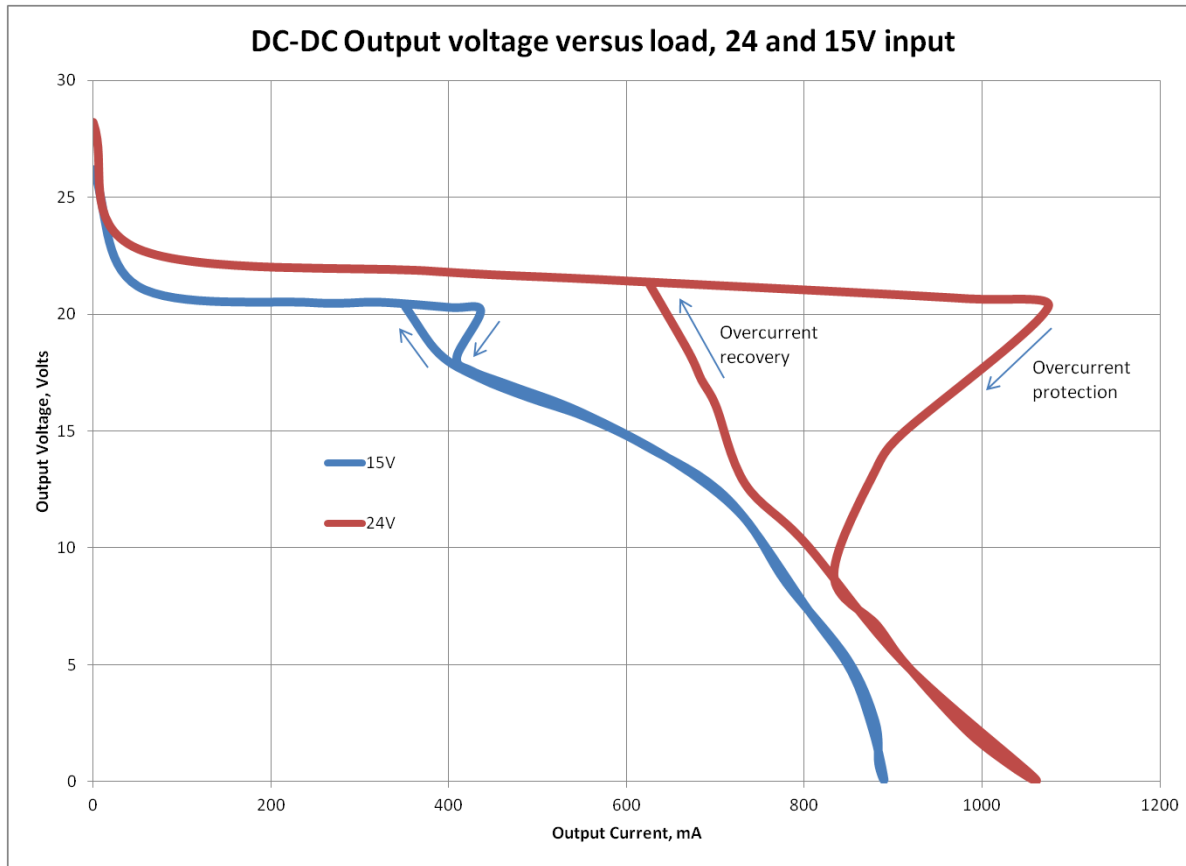
| Green LED | Red LED | Indication |
|-----------|---------|--|
| ON | OFF | Output voltage present - DC-DC Converter operational |
| ON | ON | Output overvoltage - See Note 1 below |

Notes:

- 1) If the Red LED comes on check that the input voltage is correct.

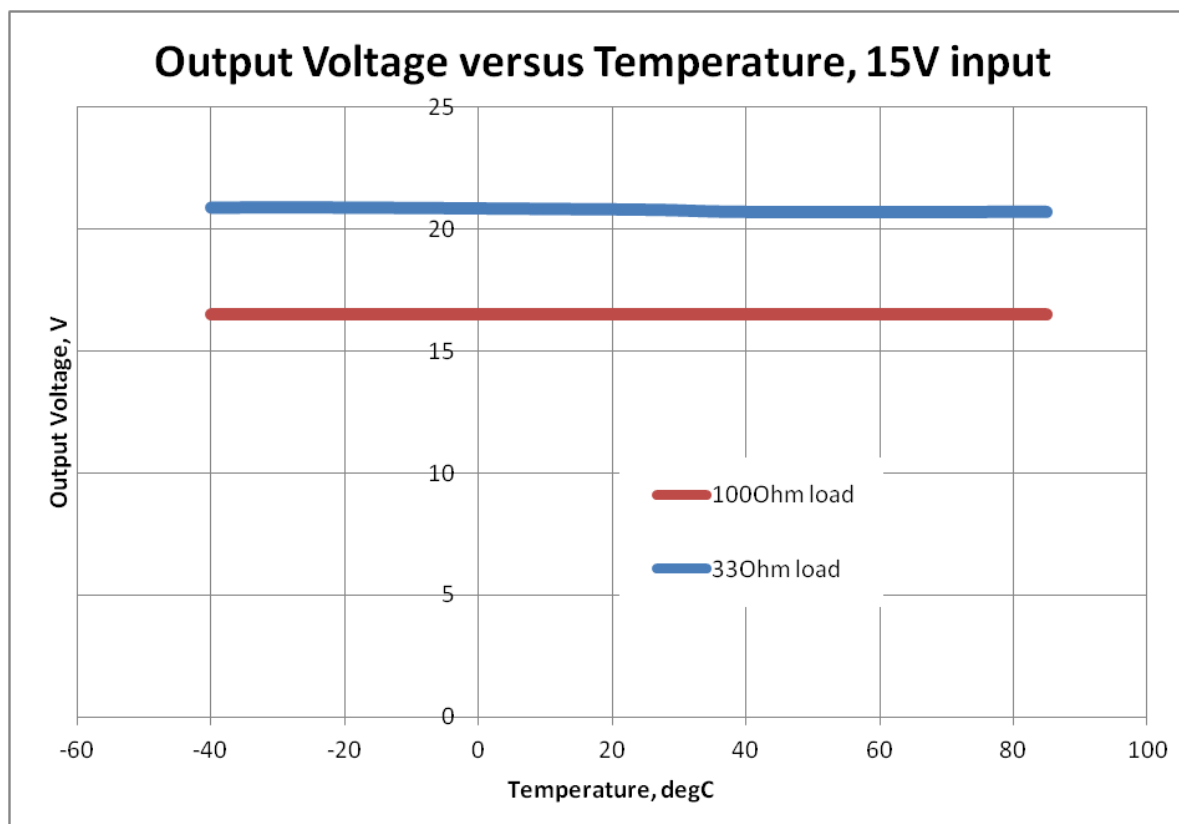
Typical Performance Graphs

Output voltage vs Output current ($V_{in} = 15V$ and $V_{in} = 24V$)

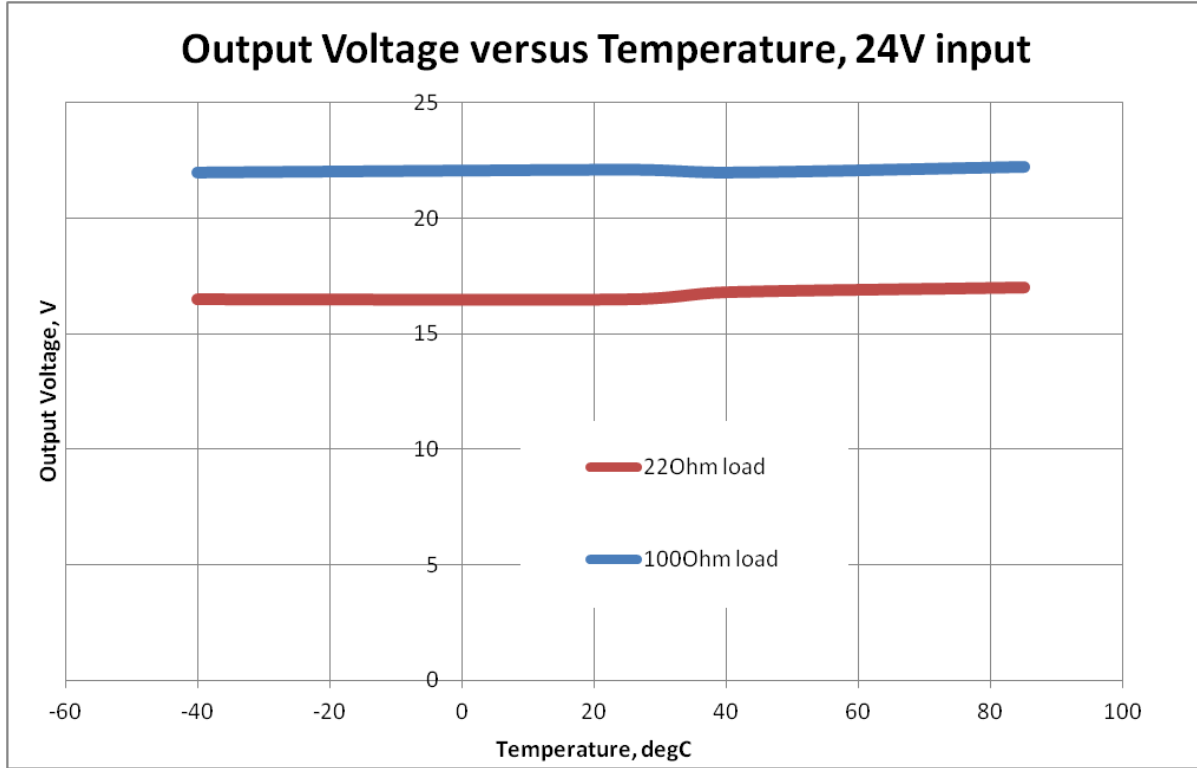


Output voltage vs temperature

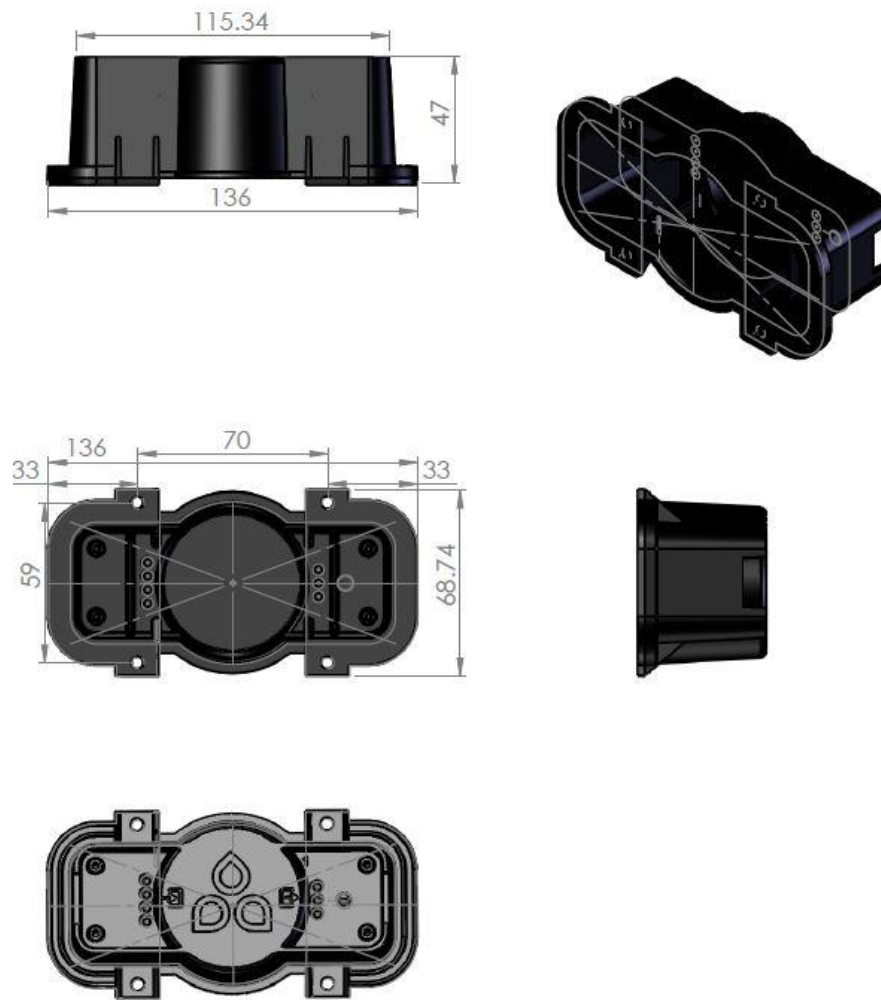
$V_{in} = 15V$, Load = 50 Ω , 100 Ω , 200 Ω



Vin = 24V, Load = 25Ω, 50Ω, 100V

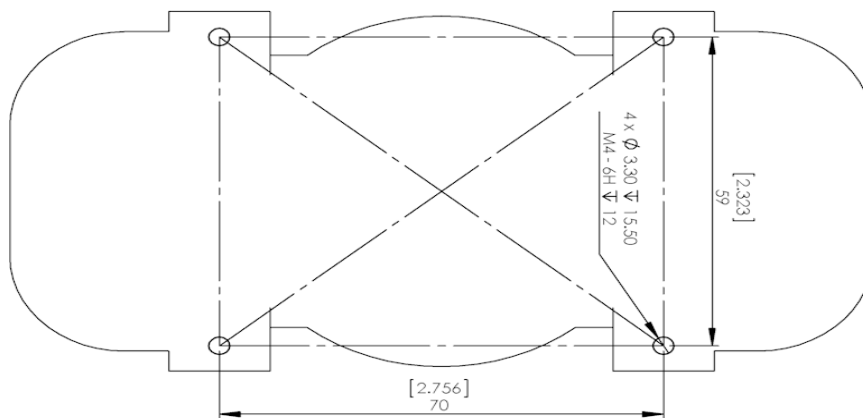


Drilling Template



Note: All dimensions in mm

Drilling Template



Legal Disclaimer

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