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AMEL30-277HAVZ



The AMEL30-277HAVZ series is an efficient 30W AC-DC power supply module. Offering a commercial input voltage range of 85-305VAC, output voltage ranges from 3.3-48V, low power consumption up to 0.1W, high efficiency, high reliability and safer isolation.

This new series offers great operating temperatures, from -40°C to 85°C with full power up to 50°C and features an isolation of 4200VAC with OVCIII rating for improved reliability and system safety. Furthermore, a high MTBF of 500,000h, output short circuit protection (OSCP), output over-current protection (OCP) and an output over-voltage protection (OVP) come standard with the series.

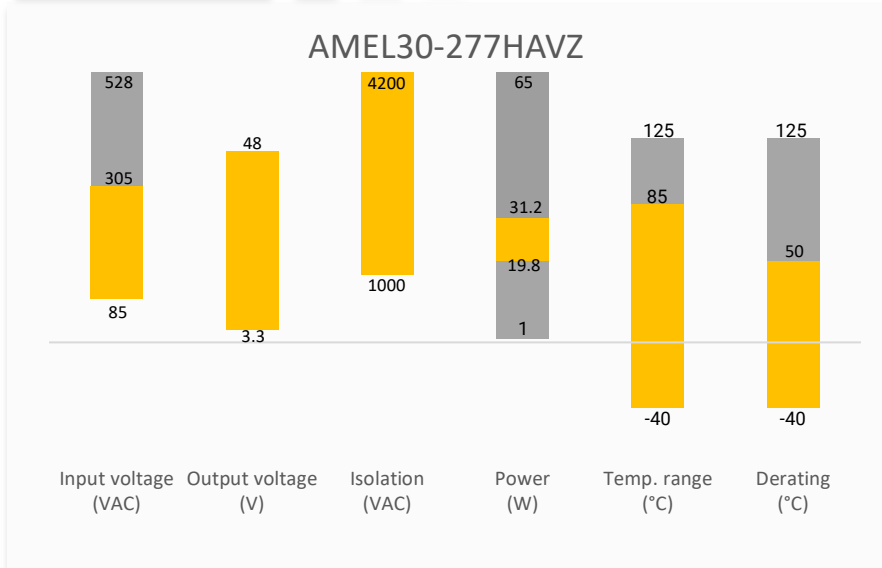
The AMEL30-277HAVZ is great for grid power, industrial instrumentation and controls, communication, and civil applications.

Features



- Universal Input: 85 - 305VAC/120 - 430VDC
- Operating Temp: -40 °C to +85 °C
- High isolation voltage: 4200VAC
- Low ripple & noise, 150mV(p-p), max.
- Output short circuit, over-current, over-voltage protection
- Low no-load power consumption of 0.1W
- Efficiency up to 90%
- Certified : EN/UL62368-1, EN61558-1:2019, EN61558-2-16:2009+A1:2013
- Designed to meet : IEC62368-1, EN60335-1

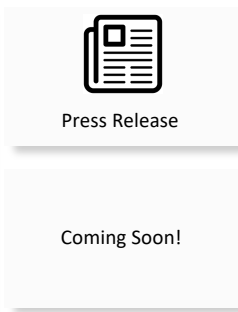
Summary



Training



Product Training Video
(click to open)



Application Notes

Applications



Power Grid Industrial Telecom

Models & Specifications

Single Output

| Model | Input Voltage (VAC/Hz) | Input Voltage (VDC) | Max Output wattage (W) | Output Voltage (V) | Output Current max (A) | Maximum capacitive load (μ F) | Efficiency @ 230VAC Typ. (%) |
|-------------------|------------------------|---------------------|------------------------|--------------------|------------------------|------------------------------------|------------------------------|
| AMEL30-3S277HAVZ | 85-305/47-440 | 120-430 | 19.8 | 3.3 | 6 | 6600 | 85 |
| AMEL30-5S277HAVZ | 85-305/47-440 | 120-430 | 30 | 5 | 6 | 6600 | 86 |
| AMEL30-9S277HAVZ | 85-305/47-440 | 120-430 | 30.6 | 9 | 3.4 | 4400 | 88 |
| AMEL30-12S277HAVZ | 85-305/47-440 | 120-430 | 30 | 12 | 2.5 | 4400 | 90 |
| AMEL30-15S277HAVZ | 85-305/47-440 | 120-430 | 30 | 15 | 2 | 3300 | 90 |
| AMEL30-24S277HAVZ | 85-305/47-440 | 120-430 | 31.2 | 24 | 1.3 | 1000 | 88 |
| AMEL30-48S277HAVZ | 85-305/47-440 | 120-430 | 30.2 | 48 | 0.63 | 470 | 90 |

Note: Use suffix "ST" for chassis and suffix "STD" for DIN-Rail mounting (ex. AMEL30-3S277HAVZ -ST is chassis mounting and AMEL30-3S277HAVZ -STD is DIN-Rail mounting version).

Note: Note: Add suffix "-B" for single unit packaging or "-60" for volume packaging (ex. AMEL30-3S277HAVZ-B is single unit packaging and AMEL30-3S277HAVZ-60 is volume packaging).

Note: Packaging information is not printed on the product label and is only used for ordering the product.

Input Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|----------------|--------------------|---------|---------|--------|
| Input current | 115VAC | | 750 | mA |
| | 230VAC | | 500 | mA |
| Inrush current | 115VAC | 25 | | A |
| | 230VAC | 50 | | A |
| Leakage | 277VAC, 50Hz | | 0.1 | mA RMS |
| Built-in Fuse | 2A/300V, Slow blow | | | |

Output Specifications

| Parameters | Conditions | Typical | Maximum | Units |
|------------------|-------------------|--------------------|-----------|--------|
| Voltage accuracy | 3.3V output model | ± 3 | | % |
| | Others | ± 2 | | |
| Line regulation | Full load | ± 0.5 | | % |
| Load regulation | 0 to 100% load | 3.3V output | ± 2 | % |
| | | 5V output | ± 1.5 | |
| | | Others | ± 1 | |
| Ripple & Noise* | 20MHz bandwidth | 3.3V/5V/9V/12V/15V | 100 | mV p-p |
| | | Others | 100 | |
| Hold up time | 115VAC | 10 | | ms |
| | 230VAC | 50 | | ms |

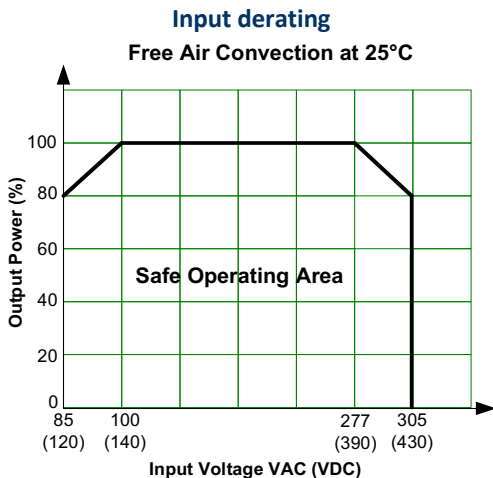
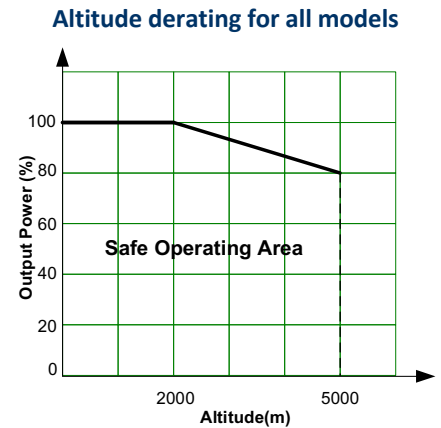
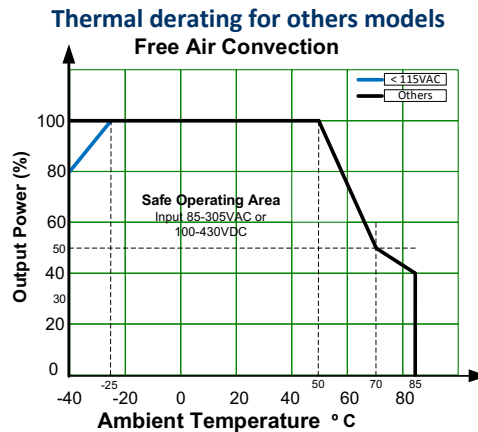
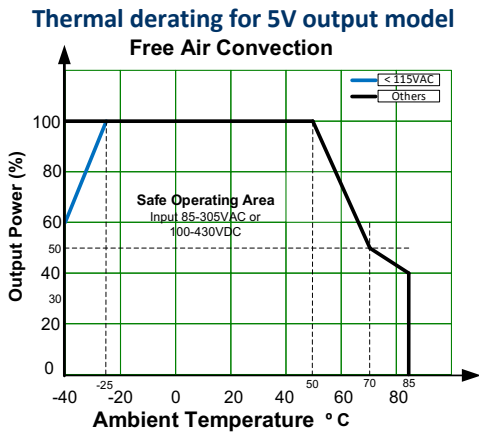
* Ripple and Noise are measured at 20MHz bandwidth with a 10 μ F electrolytic capacitor and a 1 μ F ceramic capacitor. Please refer to the application note for specific details.

| Isolation Specification | | | | |
|-------------------------|-----------------------|---------|---------|-------|
| Parameters | Conditions | Typical | Maximum | Units |
| Tested I/O voltage | 60 sec, leakage ≤ 5mA | 4200 | | VAC |
| Resistance | 500VDC | >100 | | MΩ |

| General Specifications | | | | |
|---|--|--|---------|-----------|
| Parameters | Conditions | Typical | Maximum | Units |
| Protection class | Class II | | | |
| Overvoltage category | OVC III | | | |
| Over current protection | Auto recovery | ≥ 110 | | % of Iout |
| Over voltage protection | 3.3Vout, voltage clamp, hiccup | | 6.3 | VDC |
| | 5V, 9V, 12Vout, voltage clamp, hiccup | | 16 | VDC |
| | 15Vout, voltage clamp, hiccup | | 25 | VDC |
| | 24Vout, voltage clamp, hiccup | | 35 | VDC |
| | 48Vout, voltage clamp, hiccup | | 60 | VDC |
| Short circuit protection | Hiccup, Continuous, Auto recovery | | | |
| Switching Frequency | | 65 | | KHz |
| Operating altitude | | | 5000 | m |
| Operating temperature | See derating graph | -40 to +85 | | °C |
| Storage temperature | | -40 to +85 | | °C |
| Wave soldering temperature | Duration 5 - 10s | 260 ± 5 | | °C |
| Manual soldering temperature | Duration 3 - 5s | 360 ± 10 | | °C |
| No-load power consumption | 230VAC, 48Vout | 0.15 | 0.2 | W |
| | 230VAC, others | 0.1 | 0.12 | W |
| Power Derating | -40 °C to -25 °C, 85VAC to 115VAC, 5V output | 2.67 | | %/°C |
| | -40 °C to -25 °C, 85VAC to 115VAC, Others | 1.33 | | %/°C |
| | +50 °C to +70 °C | 2.5 | | %/°C |
| | +70 °C to +85 °C | 0.67 | | %/°C |
| | 85VAC to 100VAC | 1.33 | | %/VAC |
| | 277VAC to 305VAC | 0.72 | | %/VAC |
| | 2000 - 5000m | 6.7 | | %/km |
| Temperature coefficient | | ±0.02 | | %/°C |
| Cooling | Free air convection | | | |
| Humidity | Non-condensing | | 95 | % RH |
| Case material | Plastic (flammability to UL 94V-0) | | | |
| Weight | PCB mountable models | 100 | | g |
| | With optional -ST mounting plate | 147 | | g |
| | With optional -STD mounting plate | 190 | | g |
| Dimensions (L x W x H) | PCB mountable models | 2.74 x 1.54 x 0.95 inches (69.50 x 39.00 x 24.00 mm) | | |
| | With optional -ST mounting plate | 3.78 x 2.13 x 1.28 inches (96.10 x 54.00 x 32.50 mm) | | |
| | With optional -STD mounting plate | 3.78 x 2.13 x 1.46 inches (96.10 x 54.00 x 37.10 mm) | | |
| MTBF | > 500 000 hrs (MIL-HDBK -217F, t=+25°C) | | | |
| NOTE: All specifications in this datasheet are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. | | | | |

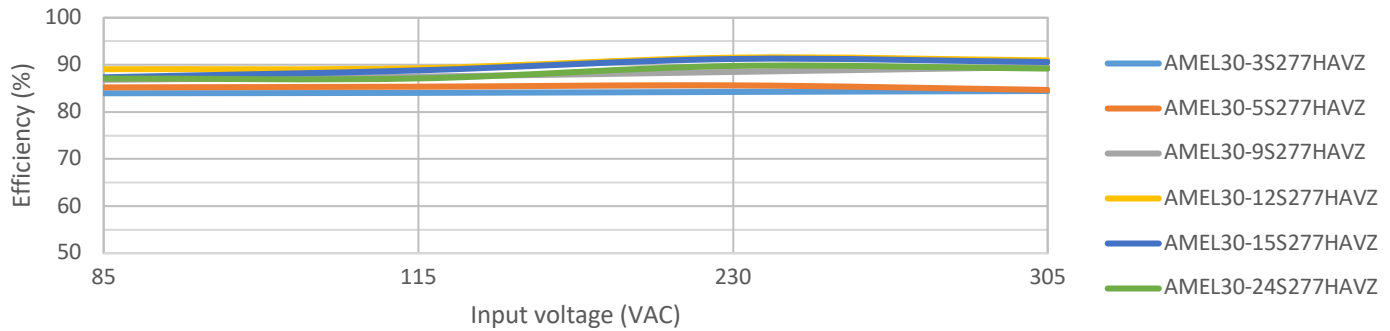
| Safety Specifications | | |
|-----------------------|---|---|
| Parameters | | |
| Agency approvals | cULus UL62368-1, EN62368-1:2020+A11:2020, EN61558-1:2019, EN61558-2-16:2009+A1:2013 | |
| Standards | Designed to meet IEC 62368-1, EN60335-1 | |
| | EMC - Conducted and radiated emission | CISPR32 / EN55032, class B EN55014-1 |
| | Electrostatic Discharge Immunity | IEC 61000-4-2 Contact $\pm 8\text{KV}$, Air $\pm 15\text{KV}$, Criteria A EN55014-2, Criteria A |
| | RF, Electromagnetic Field Immunity | IEC 61000-4-3 10V/m, Criteria A EN55014-2, Criteria A |
| | Electrical Fast Transient/Burst Immunity | IEC 61000-4-4 $\pm 2\text{KV}$, Criteria A IEC 61000-4-4 $\pm 4\text{KV}$, Criteria A with the recommended EMC circuit EN55014-2, Criteria A |
| | Surge Immunity | IEC 61000-4-5 L-L $\pm 2\text{KV}$, Criteria A IEC 61000-4-5 L-L $\pm 2\text{KV}$, L-GND $\pm 2\text{KV}$, Criteria A with the recommended EMC circuit EN55014-2, Criteria A |
| | RF, Conducted Disturbance Immunity | IEC 61000-4-6 10Vr.m.s, Criteria A EN55014-2, Criteria A |
| | Voltage dips, Short Interruptions Immunity | IEC 61000-4-11 0%, 70%, Criteria B EN55014-2, Criteria B |

Derating

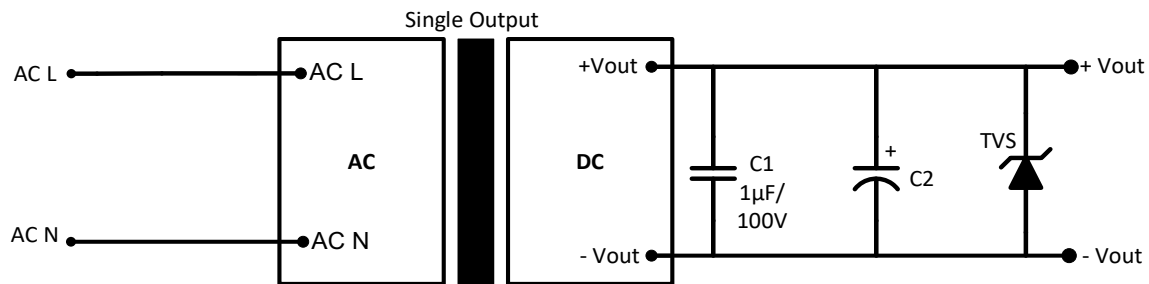


Efficiency vs input voltage

Efficiency vs input voltage (Full load)



Typical Application Circuit

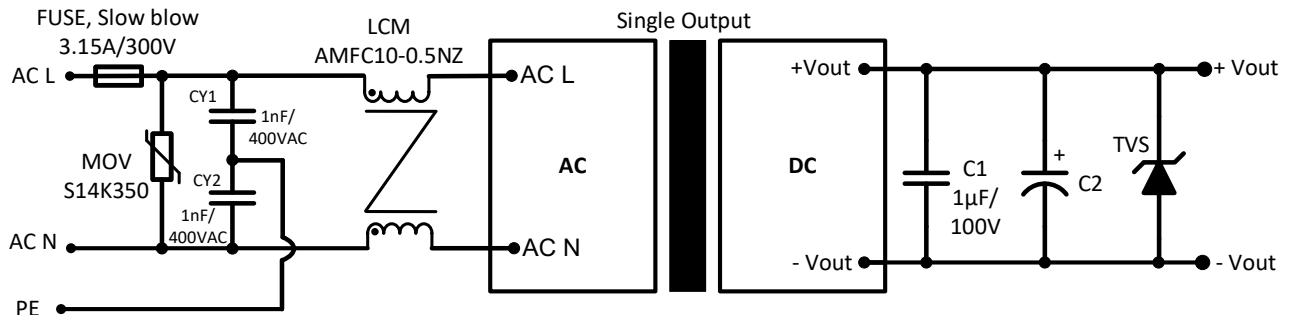


| Model | C2 | TVS |
|------------|----------|-----|
| 3.3, 5Vout | 10µF/50V | 7V |
| 9Vout | 10µF/50V | 12V |
| 12, 15Vout | 10µF/50V | 20V |
| 24Vout | 10µF/50V | 30V |
| 48Vout | 10µF/63V | 60V |

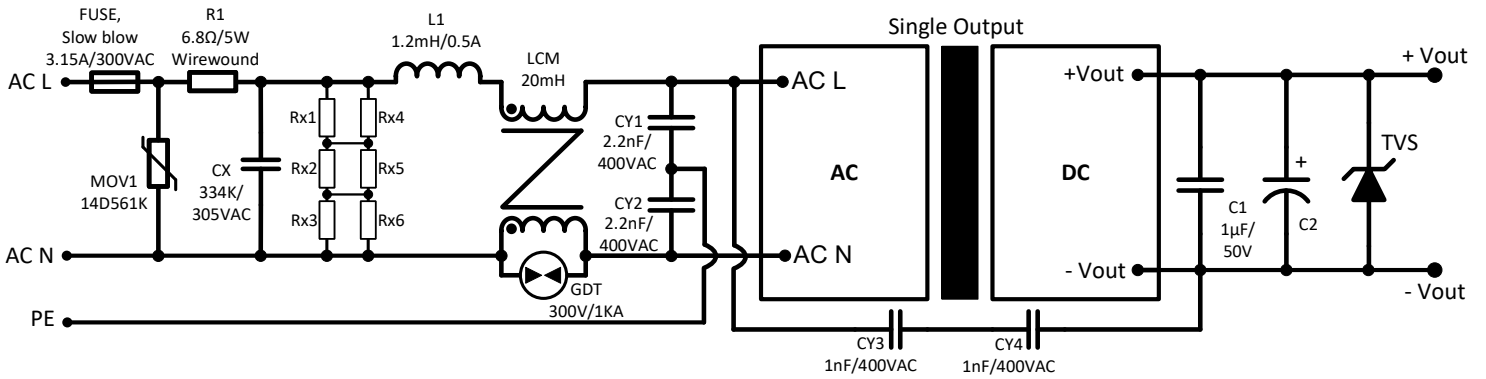
For filtering components:

The C2 capacitor is recommended to use electrolytic type with high frequency and low ESR rating. The C1 capacitor is recommended to use ceramic type for filtering high-frequency noise.

Recommended EMC Circuit 1

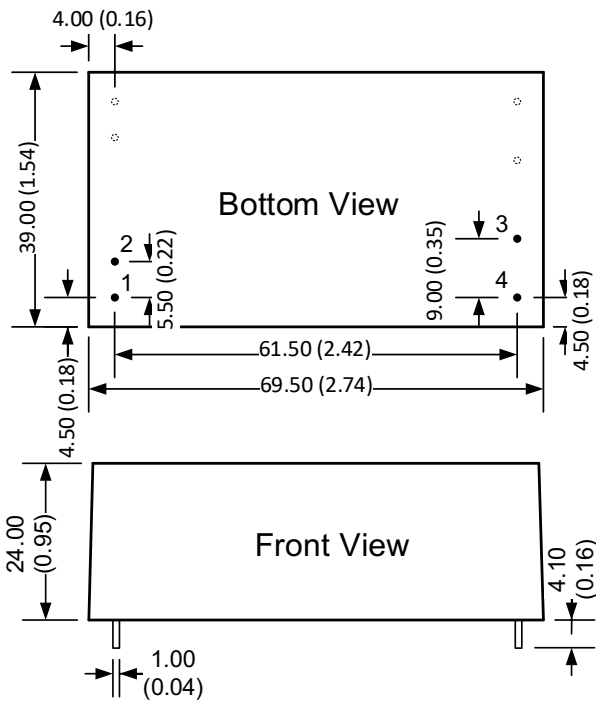


Recommended EMC Circuit 2



Rx1, Rx2, Rx3, Rx4, Rx5, Rx6
1.5MΩ/150VDC

Dimensions

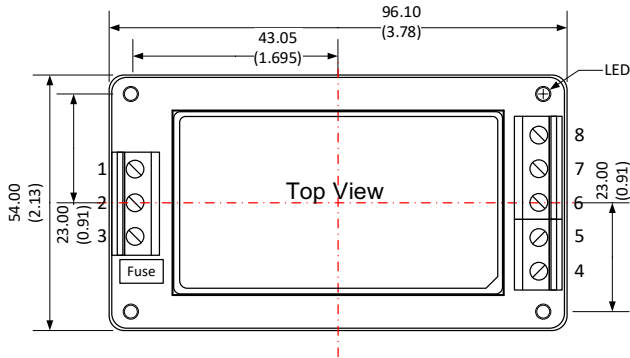


Dimensions mm (inch).
 Pin diameter tolerance ± 0.1 (± 0.004)
 General tolerance ± 0.5 (± 0.02)

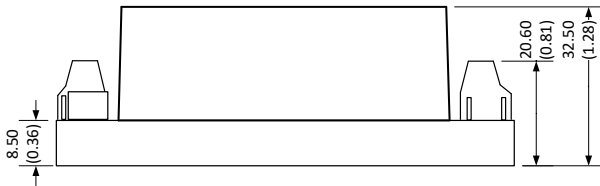
Pin Output Specifications

| Pin | Function |
|-----|--------------|
| 1 | AC Input (L) |
| 2 | AC Input (N) |
| 3 | +V Output |
| 4 | -V Output |

Dimensions with ST Optional

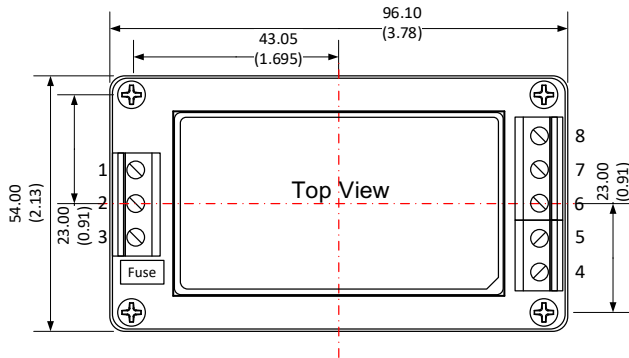


| Pin Output Specifications | |
|---------------------------|--------------|
| Pin | Function |
| 1 | NC |
| 2 | AC Input (L) |
| 3 | AC Input (N) |
| 4 | +V Output |
| 5 | NC |
| 6 | NC |
| 7 | NC |
| 8 | -V Output |

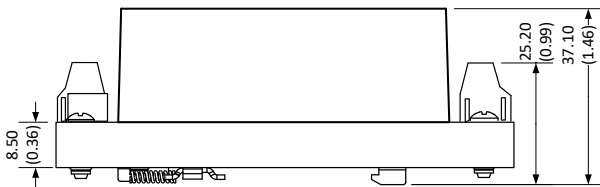


Note:
Unit: mm(inch)
Wire range : 24-12 AWG
Tightening torque : Max 0.4 N.m
General tolerance ± 1.00 : (± 0.04)

Dimensions with STD Optional



| Pin Output Specifications | |
|---------------------------|--------------|
| Pin | Function |
| 1 | NC |
| 2 | AC Input (L) |
| 3 | AC Input (N) |
| 4 | +V Output |
| 5 | NC |
| 6 | NC |
| 7 | NC |
| 8 | -V Output |



Note:
Unit: mm(inch)
Wire range : 24-12 AWG
Mounting rail: TS35
Tightening torque : Max 0.4 N.m
General tolerance ± 1.00 : (± 0.04)
Mounting rail must be grounded.

NOTE: **1.** Datasheets are updated as needed and as such, specifications are subject to change without notice. Once printed or downloaded, datasheets are no longer controlled by Aimtec; refer to www.aimtec.com for the most current product specifications. **2.** Product labels shown, including safety agency certifications on labels, may vary based on the date manufactured. **3.** Mechanical drawings and specifications are for reference only. **4.** All specifications are measured at an ambient temperature of 25°C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified. **5.** Aimtec may not have conducted destructive testing or chemical analysis on all internal components and chemicals at the time of publishing this document. CAS numbers and other limited information are considered proprietary and may not be available for release. **6.** This product is not designed for use in critical life support systems, equipment used in hazardous environments, nuclear control systems or other such applications which necessitate specific safety and regulatory standards other the ones listed in this datasheet. **7.** Warranty is in accordance with Aimtec's standard Terms of Sale available at www.aimtec.com.