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AMEL10-277HAVZ



Encapsulated

AMEL10-277HAVZ series is an efficient 10W AC-DC power supply module. Offering a commercial input voltage range of 85-305VAC, output voltage ranges from 3.3-24V, low power consumption, high efficiency and high reliability.

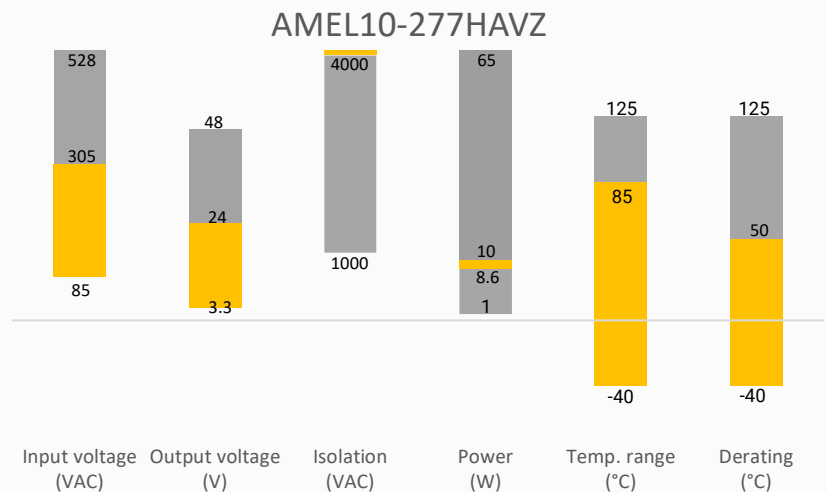
This new series offers great operating temperatures, from -40°C to 85°C with full power up to 50°C and features an isolation of 4000VAC for improved reliability and system safety. Furthermore, a high MTBF of 3200,000h, output short circuit protection (OSCP), output over-current protection (OCP) and an output over-voltage protection (OVP) come standard with the series.

The AMEL10-277HAVZ is suitable for grid power, instrumentation, industrial controls, communication, and civil applications.

Features

- Universal Input: 85 - 305VAC/100 - 430VDC
- Operating Temp: -40 °C to +85 °C
- High isolation voltage: 4000VAC
- Low ripple & noise, 100mV(p-p), max.
- Output short circuit, over-current, over-voltage protection
- Regulated Output
- Efficiency up to 85%
- Certified: UL62368-1, EN61558-1:2005+A1:2009, EN61558-2-16:2009+A1:2013
- Designed to meet: IEC/EN62368-1, EN60335-1, IEC/EN60601-1 (2xMOPP), IEC61558-2-16

Summary



Training



Product Training Video
(click to open)



Press Release

Coming Soon!

Application Notes

Applications



Power Grid



Industrial



Telecom



Instrumentation

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 (μF)	Efficiency @ 230VAC Typ. (%)
AMEL10-3S277HAVZ	85-305/47-60	100-430	8.6	3.3	2.6	6600	74
AMEL10-5S277HAVZ Ⓞ	85-305/47-60	100-430	10	5	2	5000	79
AMEL10-9S277HAVZ	85-305/47-60	100-430	10	9	1.1	3600	81
AMEL10-12S277HAVZ Ⓞ	85-305/47-60	100-430	10	12	0.83	2000	84
AMEL10-15S277HAVZ	85-305/47-60	100-430	10	15	0.66	820	84
AMEL10-24S277HAVZ	85-305/47-60	100-430	10	24	0.41	470	85

- Note:**
- Use suffix "ST" for chassis and suffix "STD" for DIN-Rail mounting (ex. AMEL10-3S277HAVZ -ST is chassis mounting and AMEL10-3S277HAVZ -STD is DIN-Rail mounting version).
 - Add suffix "-B" for single unit packaging or "-60" for volume packaging (ex. AMEL10-3S277HAVZ-B is single unit packaging and AMEL10-3S277HAVZ-60 is volume packaging).
 - Packaging information is not printed on the product label and is only used for ordering the product.
 - Models marked with Ⓞ that have an alternate options with higher start-up time and power consumption. Use suffix "-002" for the shorter lead time option. (ex. AMEL10-5S277HAVZ-002 is the shorter lead time version).

Input Specifications

Parameters	Conditions	Typical	Maximum	Units
Input current	115VAC		230	mA
	230VAC		150	mA
Inrush current	115VAC	25		A
	230VAC	40		A
Leakage	277VAC, 50Hz		0.1	mA RMS
Fuse	2A/300V, Slow blow			

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±2		%
Line regulation	Full load	±0.5		%
Load regulation	0-100% load	±1		%
Ripple & Noise*	20MHz bandwidth	50	100	mV p-p
Start-up time	Standard models	1		S
	Ⓞ Models with suffix -002	2		S
Hold up time	115VAC	8		ms
	230VAC	40		ms

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

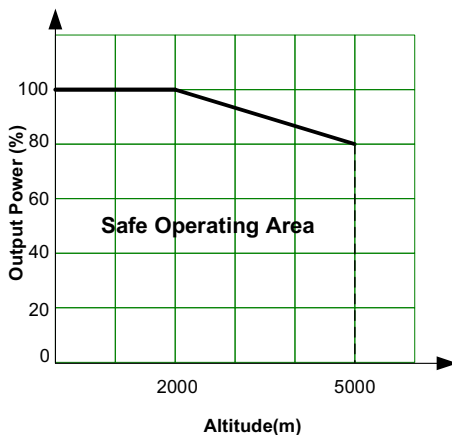
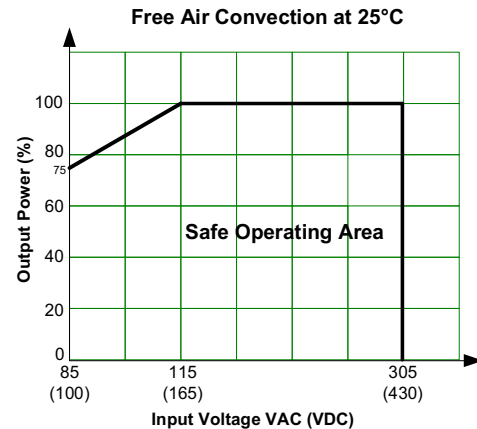
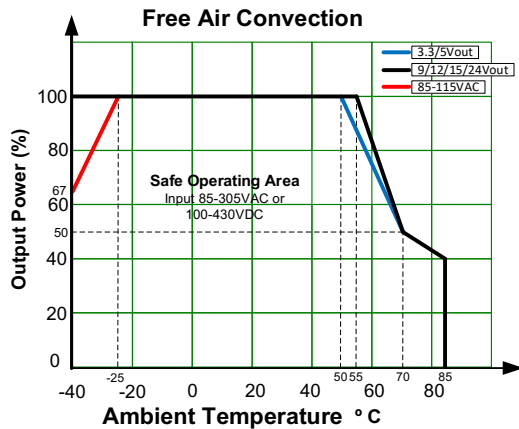
Isolation Specification				
Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage	60 sec, leakage \leq 5mA	4000		VAC
Resistance	500VDC	>100		M Ω

General Specifications				
Parameters	Conditions	Typical	Maximum	Units
Protection class	Class II			
Oversoltage category	OVC III			
Over current protection	Auto recovery	\geq 110		% of Iout
Over voltage protection	3.3, 5Vout, voltage clamp, hiccup		7.5	VDC
	9Vout, voltage clamp, hiccup		15	VDC
	12, 15Vout, voltage clamp, hiccup		20	VDC
	24Vout, voltage clamp, hiccup		30	VDC
Short circuit protection	Hiccup, Continuous, Auto recovery			
Switching Frequency		65		KHz
Operating altitude			5000	m
Operating temperature	See derating graph	-40 to +85		$^{\circ}$ C
Storage temperature		-40 to +85		$^{\circ}$ C
Reflow soldering temperature	Duration 5 - 10s	260		$^{\circ}$ C
Manual soldering temperature	Duration 3 - 5s	360		$^{\circ}$ C
No-load power consumption	230VAC, standard models	0.1		W
	Ⓢ 230VAC, models with suffix -002	0.2		W
Power Derating	-40 $^{\circ}$ C to -25 $^{\circ}$ C, 85VAC to 115VAC	2.2		%/ $^{\circ}$ C
	+50 $^{\circ}$ C to +70 $^{\circ}$ C, 3.3/5Vout	2.5		%/ $^{\circ}$ C
	+55 $^{\circ}$ C to +70 $^{\circ}$ C, 9/12/15/24Vout	3.33		%/ $^{\circ}$ C
	+70 $^{\circ}$ C to +85 $^{\circ}$ C	0.66		%/ $^{\circ}$ C
	85VAC to 140VAC	0.83		%/VAC
	2000 - 5000m	6.7		%/km
Temperature coefficient		\pm 0.02		%/ $^{\circ}$ C
Cooling	Free air convection			
Humidity	Non-condensing		95	% RH
Case material	Plastic (flammability to UL 94V-0)			
Weight	PCB mountable models	34		g
	With optional -ST mounting plate	54		g
	With optional -STD mounting plate	74		g
Dimensions (L x W x H)	PCB mountable models	1.58 x 1.00 x 0.83 inches (40.00 x 25.40 x 21.00 mm)		
	With optional -ST mounting plate	2.99 x 1.24 x 1.17 inches (76.00 x 31.50 x 29.80 mm)		
	With optional -STD mounting plate	2.99 x 1.24 x 1.35 inches (76.00 x 31.50 x 34.40 mm)		
MTBF	> 3 200 000 hrs (MIL-HDBK -217F, t=+25 $^{\circ}$ C)			
NOTE: All specifications in this datasheet are measured at an ambient temperature of 25 $^{\circ}$ C, humidity<75%, nominal input voltage and at rated output load unless otherwise specified.				

Safety Specifications	
Parameters	
Agency Approval	UL 62368-1, EN61558-2-16:2009+A1:2013, EN61558-1:2005+A1:2009
Standards	Design to meet IEC/EN 62368-1, EN60335-1, IEC61558-2-16
	EMC - Conducted and radiated emission CISPR32 / EN55032, class B (without PE)

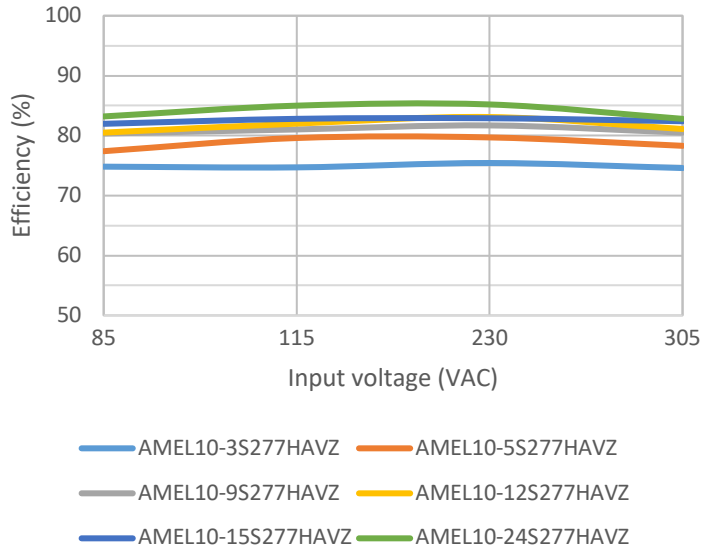
	CISPR32 / EN55032, class B with the recommended EMC circuit 2 (with PE) EN55014-1
Electrostatic Discharge Immunity	IEC 61000-4-2 Contact $\pm 8\text{KV}$, Air $\pm 15\text{KV}$, Criteria B EN55014-2, Criteria B
RF, Electromagnetic Field Immunity	IEC 61000-4-3 10V/m , Criteria A EN55014-2, Criteria A
Electrical Fast Transient/Burst Immunity	IEC 61000-4-4 $\pm 2\text{KV}$, Criteria B IEC 61000-4-4 $\pm 4\text{KV}$, Criteria B with the recommended EMC circuit 1 IEC 61000-4-4 $\pm 4\text{KV}$, Criteria A with the recommended EMC circuit 2 EN55014-2, Criteria B
Surge Immunity	IEC 61000-4-5 L-L $\pm 1\text{KV}$, Criteria B IEC 61000-4-5 L-L $\pm 2\text{KV}$, Criteria B with the recommended EMC circuit 1 IEC 61000-4-5 L-L $\pm 2\text{KV}$, L-LG $\pm 4\text{KV}$, Criteria A with the recommended EMC circuit 2 EN55014-2, Criteria B
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

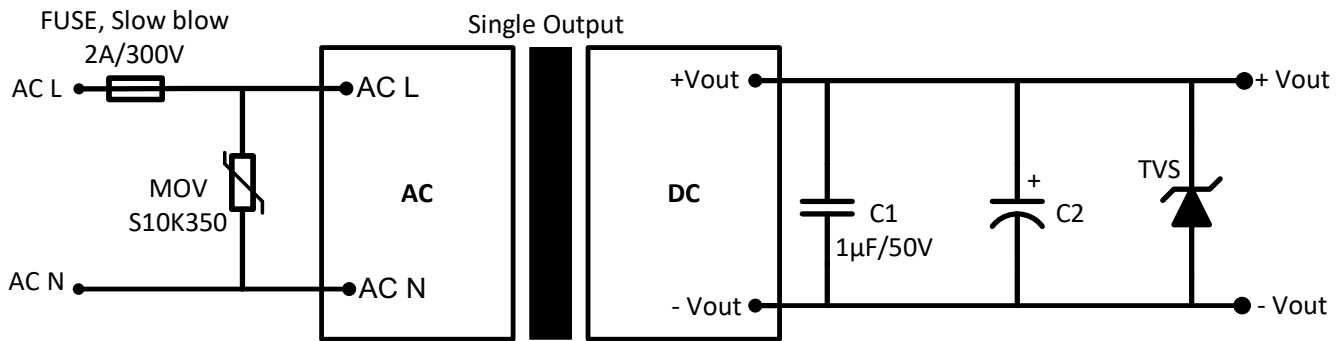


Efficiency vs input voltage

Efficiency vs input voltage (Full load)



Typical Application Circuit

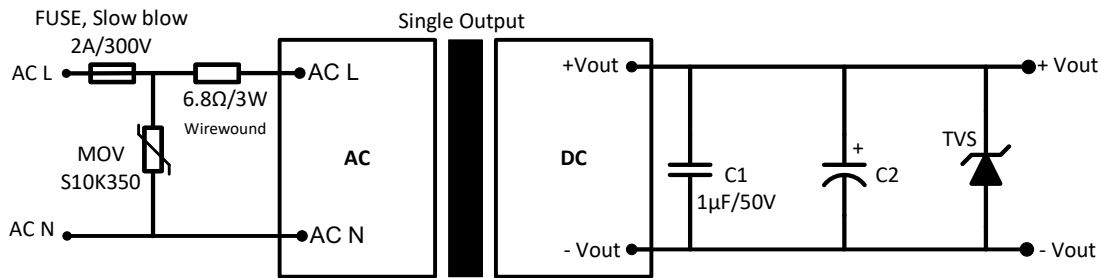


Model	C2	TVS
3.3, 5Vout	220µF/16V	7V
9Vout	100µF/25V	12V
12, 15Vout	100µF/25V	20V
24Vout	100µF/35V	30V

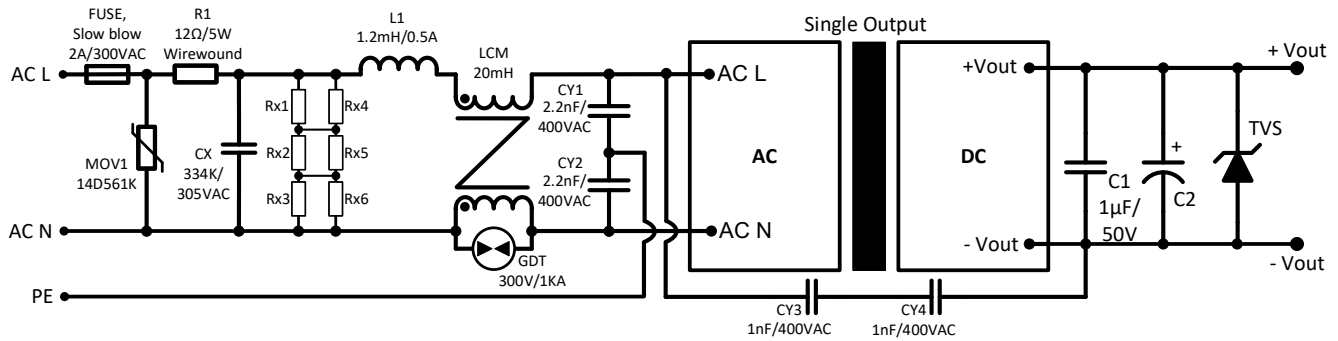
For filtering components:

The input fuse is recommended to use slow blow type. Choose capacitors with at least 20% voltage margin. 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

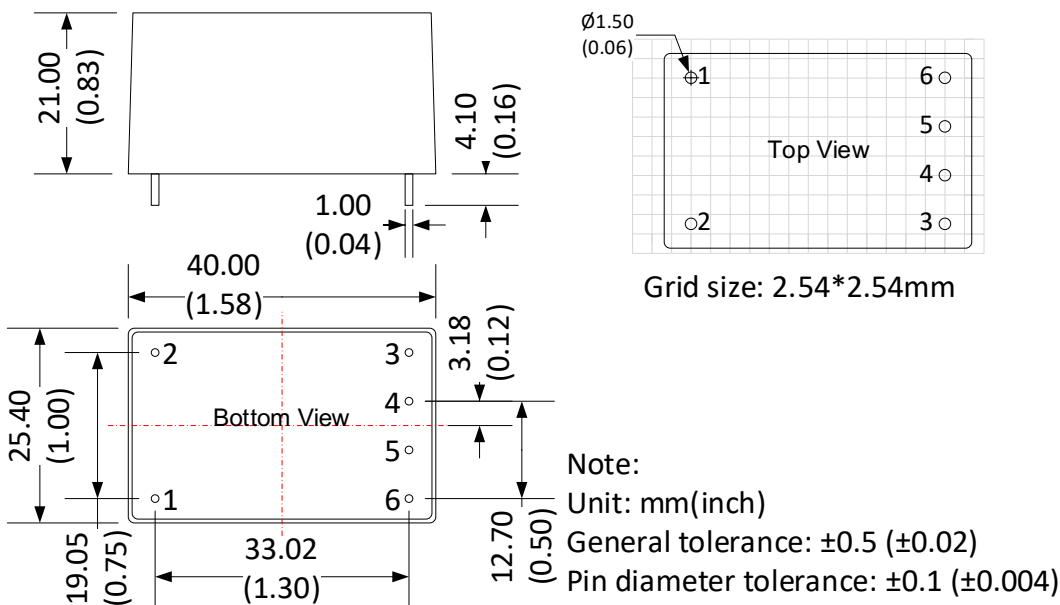


Recommended EMC Circuit 2



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

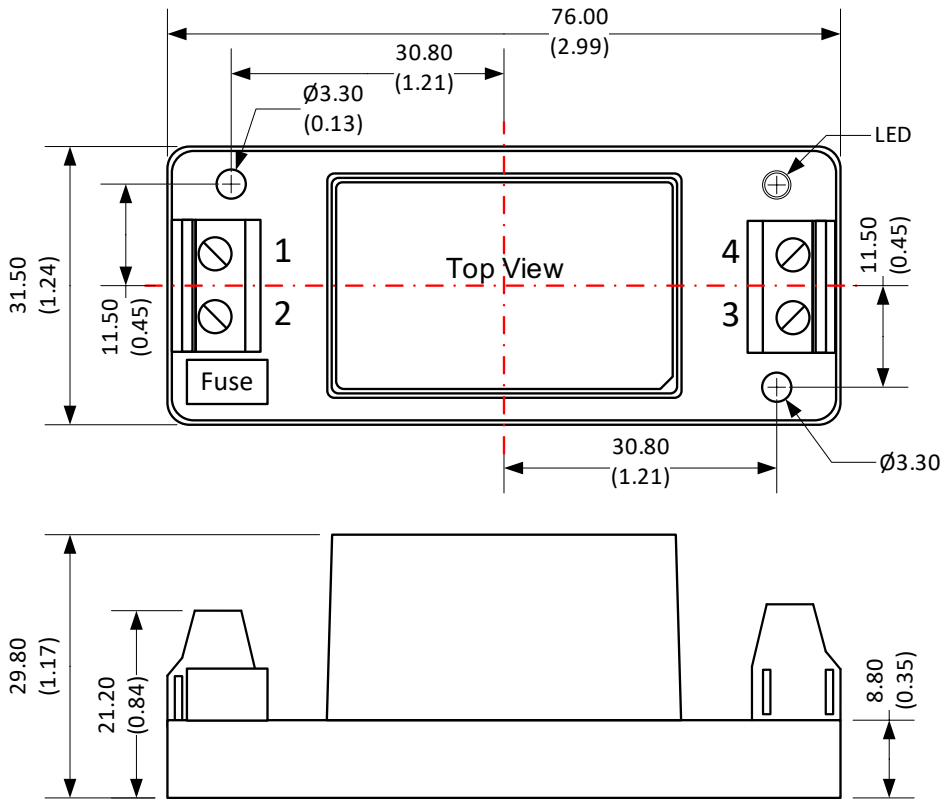
Dimensions



Pin Output Specifications

Pin	Function
1	AC Input (L)
2	AC Input (N)
3	No Pin
4	+V Output
5	No Pin
6	-V Output

Dimensions with ST Optional



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

Note:

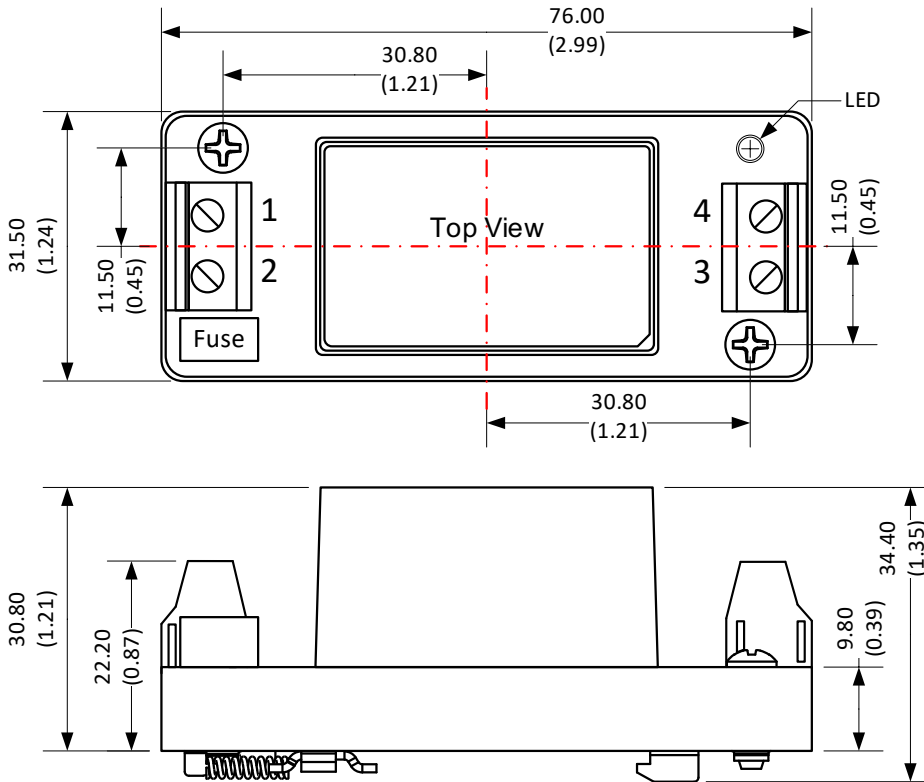
Unit: mm(inch)

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	AC Input (N)
2	AC Input (L)
3	-V Output
4	+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.