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AMEL60-277HAVZ



Encapsulated

The AMEL60-277HAVZ series is an efficient 60W AC-DC power supply module. Offering a wide commercial input voltage range of 85-305VAC, output voltage ranges from 3.3-48V, low power consumption, 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 OVCI rating for improved reliability and system safety. Additionally, it has 2000m-5000m operational altitude de rating. 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 AMEL60-277HAVZ is great for grid power, industrial instrumentation and controls, communication, and civil applications.

Features

- Universal Input: 85 - 305VAC/100 - 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 0.3W
- Efficiency up to 91%
- OVC III(EN62477, 5000m altitude)
- Designed to meet :IEC/61000-4, CISPR32/EN55032, IEC/UL/EN62368, IEC/EN60335/62477, EN61558 standards



Training



Product Training Video
(coming soon)



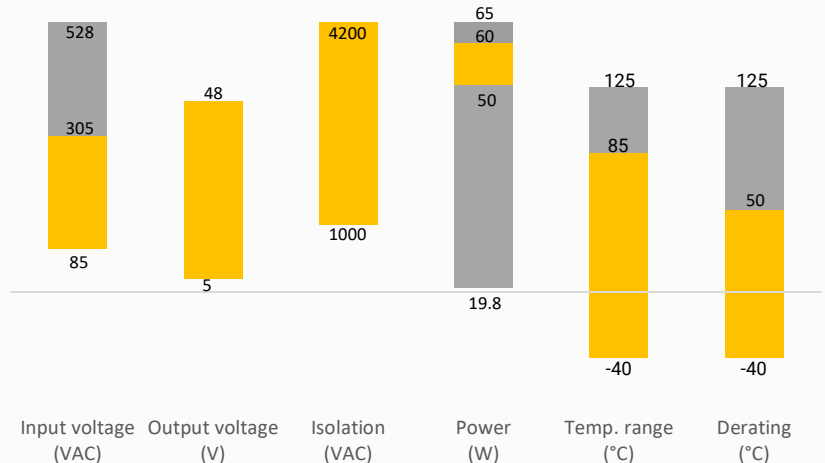
Press Release

Coming Soon!

Application Notes

Summary

AMEL60-277HAVZ



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 (μF)	Efficiency @ 230VAC Typ. (%)
AMEL60-5S277HAVZ	85-305/47-440	100-430	50	5	10	20000	89
AMEL60-12S277HAVZ	85-305/47-440	100-430	60	12	5	5000	91
AMEL60-15S277HAVZ	85-305/47-440	100-430		15	4	3000	90
AMEL60-24S277HAVZ	85-305/47-440	100-430		24	2.5	1800	90
AMEL60-48S277HAVZ	85-305/47-440	100-430		48	1.25	470	91

Input Specifications

Parameters	Conditions	Typical	Minimum	Maximum	Units
Input current	115VAC			1.8	A
	230VAC			1	A
Inrush current	115VAC	30			A
	230VAC	60			A
Leakage	277VAC, 50Hz			0.25	mA RMS
Input Frequency			47	63	Hz
Input Voltage Range	AC Input		85	305	VAC
	DC Input		100	430	VDC
Hot Plug		Unavailable			
Recommended External I/p Fuse		3.15A/300V, Slow blow, required			

Output Specifications

Parameters	Conditions	Typical	Maximum	Units
Voltage accuracy		±2		%
Line regulation	Full load	±1		%
Load Regulation	0%-100% load	±1.5		%
Ripple & Noise*	20MHz bandwidth (peak to peak value)	80	150	mV p-p
Hold up time	115VAC	8		ms
	230VAC	65		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. Note: *The "parallel cable" method is used for ripple and noise test, output parallel 10uF electrolytic capacitor and 1uF ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information;

Isolation Specification

Parameters	Conditions	Typical	Maximum	Units
Tested I/O voltage	60 sec, leakage $\leq 5\text{mA}$	4200		VAC
Resistance	500VDC	>100		M Ω

		General Specifications				
Parameters		Conditions	Typical	Minimum	Maximum	Units
Protection class			Class II			
Overvoltage category			OVC III			
Over current protection		Auto recovery	≥ 140			% of Iout
Over voltage protection		5Vout, voltage clamp, hiccup			9	VDC
		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			
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	0.3		0.45	W
Power Derating		-40 °C to -25 °C, 85VAC to 200VAC Input		3.33		%/°C
		-40 °C to -25 °C, 200VAC to 305VAC Input		1.33		
		+40 °C to +70 °C(5VDC Output)		1.5		
		+70 °C to +85 °C		2		
		+45 °C to +70 °C (85-165 VAC input,12/15/24/48 VDC output)		1.8		%/°C
		+50 °C to +70 °C (≥165 VAC input,12/15/24/48 VDC output)		2.25		%/°C
		85VAC to 100VAC		1.33		%/VAC
		277VAC to 305VAC		0.72		%/VAC
		2000 - 5000m		6.67		%/km
		Temperature coefficient		±0.02		
Cooling			Free air convection			
Humidity		Non-condensing			95	% RH
Case material			Black Plastic (flammability to UL 94V-0)			
Weight		PCB mountable models	130			g
Dimensions (L x W x H)		PCB mountable models		2.76 x 1.88x1.06 (inches), 70 x 48.00 x 27.00 (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.				

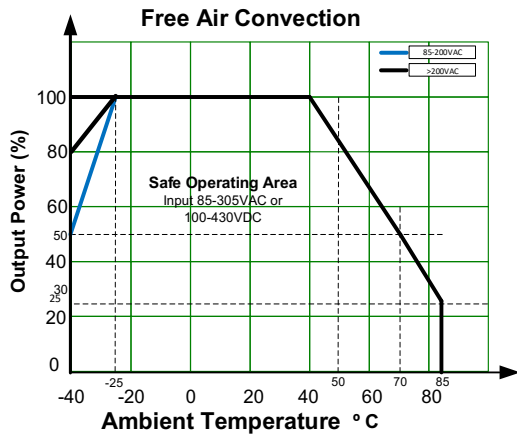
Safety Specifications

Parameters

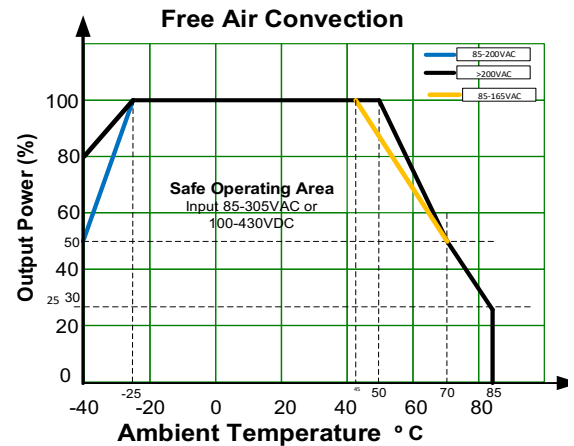
Agency approvals	Designed to meet IEC/UL/EN62368-1, IEC/EN60335-1/62477-1, EN61558-1	
Standards	EMC - Conducted and radiated emission	CISPR32 / EN55032, class B
	Electrostatic Discharge Immunity	IEC/EN 61000-4-2 Contact $\pm 6\text{KV}$, Air $\pm 8\text{KV}$, Criteria A
	RF, Electromagnetic Field Immunity	IEC/EN 61000-4-3 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity	IEC/EN 61000-4-4 $\pm 2\text{KV}$, Criteria A
	Surge Immunity	IEC/EN 61000-4-4 $\pm 4\text{KV}$, Criteria A with the recommended EMC circuit
	Surge Immunity	IEC/EN 61000-4-5 L-L $\pm 2\text{KV}$, Criteria A IEC/EN 61000-4-5 L-L $\pm 2\text{KV}$, L-GND $\pm 4\text{KV}$, Criteria A with the recommended EMC circuit
	RF, Conducted Disturbance Immunity	IEC/EN 61000-4-6 10Vr.m.s, Criteria A
	Voltage dips, Short Interruptions Immunity	IEC/EN 61000-4-11 0%, 70%, Criteria B

Derating

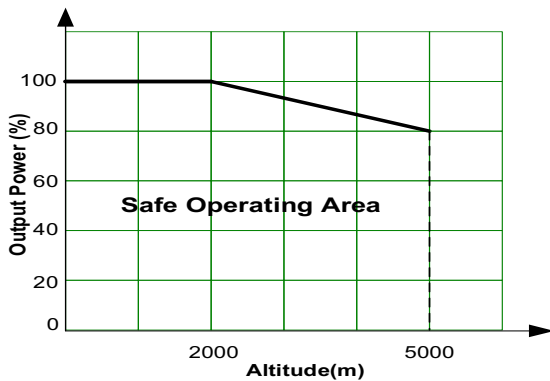
Thermal Derating for all 5VDC model



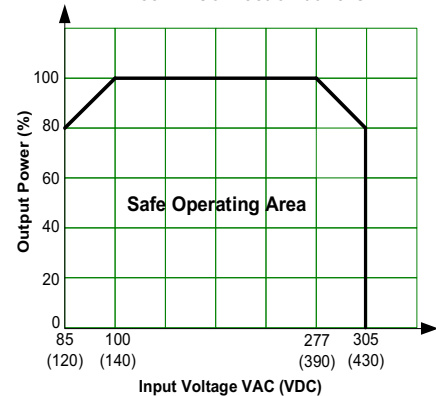
Thermal Derating for all other models



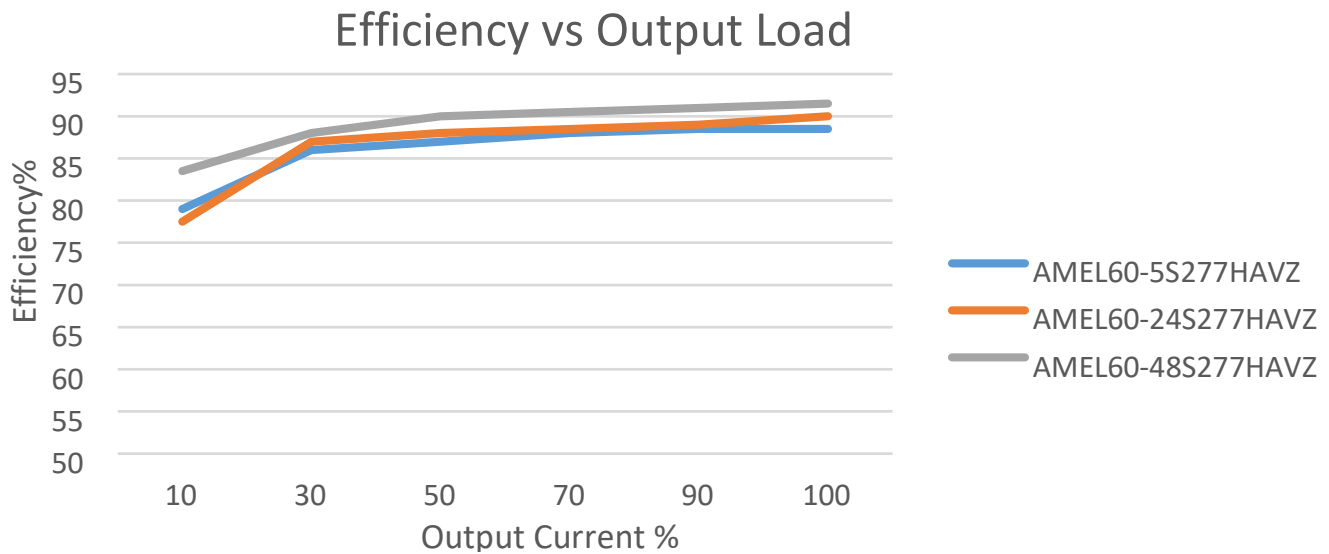
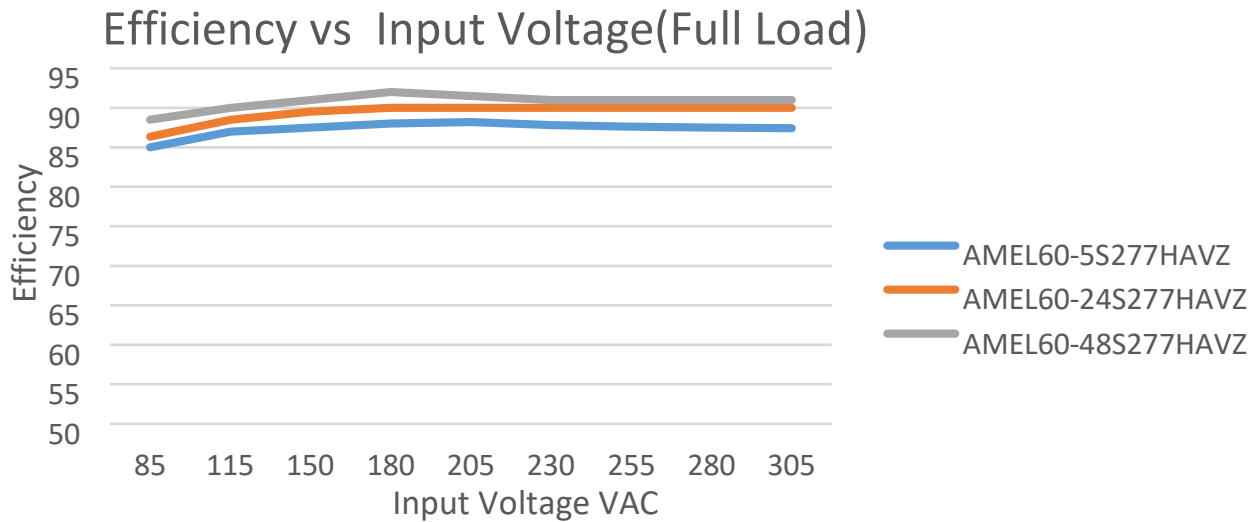
Altitude Derating



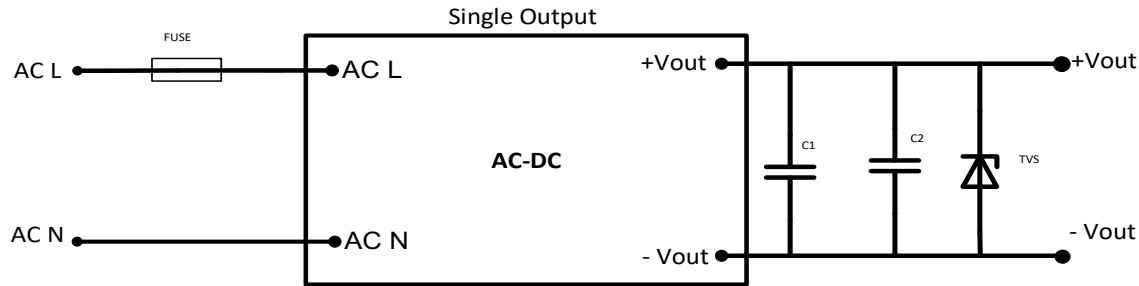
Free Air Convection at 25°C



Efficiency curves



Typical Application Circuit

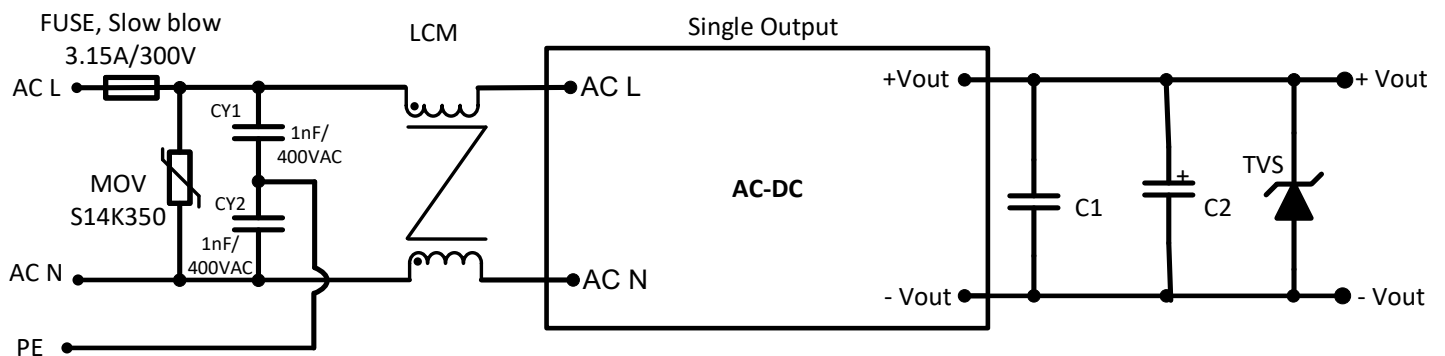


Model	C1	C2	TVS
5Vout	1 μ F/50V	470 μ F/16V	10V
12Vout		330 μ F/25V	20V
15Vout		330 μ F/25V	30V
24Vout		220 μ F/35V	40V
48Vout	1 μ F/100V	100 μ F/63V	60V

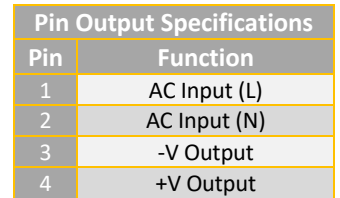
For filtering components:

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



Dimensions



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