AMES35-NZ

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Enclosed

The AMES35-NZ is an AC/DC converter that offers much greater cost effectiveness due to material normalization and production automation also leading to improved reliability and performance. Offering a commercial input voltage range of 85-264VAC and an output voltage range from 5-24V, this series will offer many benefits to your new system design.

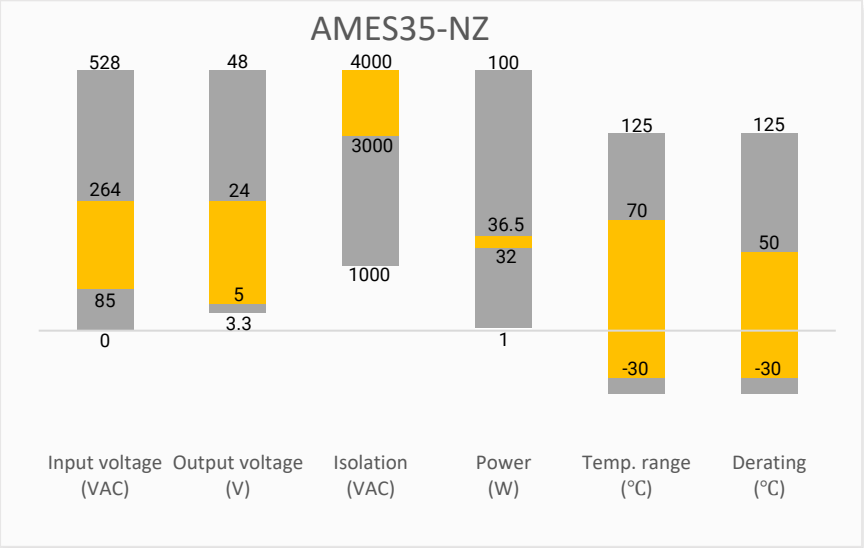
This new series offers great operating temperatures, from -30°C to 70°C and also features an isolation of 4000VAC for improved reliability and system safety. Furthermore, a high MTBF of 300,000h, output short circuit protection (OSCP), output over-current protection (OCP) and an output over-voltage protection (OVP) come standard with the series.

The AMES35-NZ is perfect for street lighting controls, grid power, instrumentation, industrial controls, communication, and civil applications.

Features

- Universal Input: 85 - 264VAC/120 - 373VDC
- Operating Temp: -30 °C to +70 °C
- High isolation voltage: Up to 4000VAC
- Low ripple & noise, 180mV(p-p) typ.
- Output short circuit, over-current, over-voltage protection
- Regulated Output
- Surge immunity: 300VAC for 5s

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 Voltage Adjustable Range (V)	Output Current max (A)	Maximum capacitive load (µF)	Efficiency @230VAC Typ. (%)
AMES35-5SNZ#	85-264/47-63	120-373	35	5	4.5-5.5	7	8000	83
AMES35-12SNZ#	85-264/47-63	120-373	36	12	10.2-13.8	3	1500	87
AMES35-15SNZ#	85-264/47-63	120-373	36	15	13.5-18	2.4	1000	89
AMES35-24SNZ#	85-264/47-63	120-373	36	24	21.6-28.8	1.5	750	88
Note: Add suffix "-P" for optional terminal protective cover (ex. AMES35-5SNZ-P is terminal with protective cover version) or suffix "-Q" for conformal coating (ex. AMES35-5SNZ-Q is conformal coating version).								

Dual Output								
Model	Input Voltage (VAC/Hz)	Input Voltage (VDC)	Max Output Wattage (W)	Output Voltage (Vo1/Vo2) (V)	Working Current Range (Io1/Io2) (A)*	Output Current (Io1/Io2) (A)	Maximum capacitive load (Vo1/Vo2) (µF)	Efficiency @230VAC (%)
AMES35-0512DNZ#	85-264/47-63	120-373	32	5/12	0.4-5/0.1-1.5	4/1	4000/1000	81
AMES35-0524DNZ#	85-264/47-63	120-373	35	5/24	0.22-4/0.1-1.3	2.2/1	2200/1000	83
Note: Use suffix "-Q" for conformal coating (ex. AMES35-0512DNZ -Q is conformal coating version). *Maximum duration 3sec when any of the outputs reaches its maximum working current. Total output power cannot exceed the rated power.								

Tri Output								
Model	Input Voltage (VAC/Hz)	Input Voltage (VDC)	Max Output Wattage (W)	Output Voltage (Vo1/Vo2/ Vo3) (V)	Working Current Range (Io1/Io2/Io3) (A)	Output Current (Io1/Io2/ Io3) (A)	Maximum capacitive load (Vo1/Vo2/Vo3) (µF)	Efficiency @230VAC (%)
AMES35-051212TNZ	85-264/47-63	120-373	33	+5/+12/-12	0.3-4/0.1-1.5/0.05-0.5	3/1/0.5	3000/1000/470	81
AMES35-051515TNZ	85-264/47-63	120-373	35	+5/+15/-15	0.25-3.5/0.1-1.5/0.05-0.5	2.5/1/0.5	2500/1000/470	81
AMES35-052412TNZ	85-264/47-63	120-373	36.5	+5/+24/+12	0.25-3.5/0.05-1/0.1-1	2.5/0.5/1	2500/470/1000	81
Note: Use suffix "-Q" for conformal coating (ex. AMES35-051212TNZ -Q is conformal coating version). *Maximum duration 3sec when any of the outputs reaches its maximum working current. Total output power cannot exceed the rated power.								

Parameters	Conditions	Typical	Maximum	Units
Input current	Single output, 115VAC		0.8	A
	Single output, 230VAC		0.6	A
	Others, 115VAC		0.75	A
	Others, 230VAC		0.5	A
Inrush current	Single output, cold start, 115VAC	30		A
	Single output, cold start, 230VAC	50		A
	Others, 115VAC	30		A
	Others, 230VAC	50		A
Leakage current	Single output, 240VAC		0.75	mA
	others, 240VAC		2.0	mA

Output Specifications				
Parameters	**Conditions**	**Typical**	**Maximum**	**Units**
Voltage accuracy	Single output, Full load, 5V output	±2		%
	Single output, Full load, Others	±1		%
	Dual output, Full load, Output 1	±2		%
	Dual output, Full load, AMES35-0512DNZ, Output 2	±8		%
	Dual output, Full load, AMES35-0524DNZ, Output 2	≥ -4	+8	%
	Tri output, Full load, Output 1	±2		%
	Tri output, Full load, AMES35-051212TNZ, Output 2	±6		%
	Tri output, Full load, Others, Output 2	±8		%
	Tri output, Full load, AMES35-051212TNZ, Output 3	±6		%
	Tri output, Full load, Others, Output 3	±8		%
Line regulation	Single output, Full load	±0.5		%
	Dual output, Full load, Output 1	±0.5		%
	Dual output, Full load, Output 2	±1.5		%
	Tri output, Full load, Output 1	±0.5		%
	Tri output, Full load, Output 2	±1		%
	Tri output, Full load, Output 3	±1		%
Load regulation**	Single output, 0-100% load, 5V output	±1		%
	Single output, 0-100% load, Others	±0.5		%
	Dual output, 10-100% load, Output 1	±0.5		%
	Dual output, 10-100% load, Output 2	±5		%
	Tri output, 10-100% load, Output 1	±1.5		%
	Tri output, 10-100% load, Output 2	±3		%
	Tri output, 10-100% load, Output 3	±3		%
Ripple & Noise*	Single output, 5V output	80		mV p-p
	Single output, 12V,15V output	120		mV p-p
	Single output, 24V output	150		mV p-p
	Dual output, Output 1	80		mV p-p
	Dual output, Output 2	150		mV p-p
	Tri output, Output 1	80		mV p-p
	Tri output, AMES35-051212TNZ, Output 2	120		mV p-p
	Tri output, others, Output 2	150		mV p-p
	Tri output, AMES35-051515TNZ, Output 3	150		mV p-p
	Tri output, others, Output 3	120		mV p-p
Hold up time	Single output, 115VAC	≥ 8		ms
	Single output, 230VAC	≥ 30		ms
	Others, 115VAC	5		ms
	Others, 230VAC	30		ms
Voltage adjustable range	Output 1 of dual, tri output models	4.75 – 5.5		V
Start-up delay time	Dual, tri output		2	S
Rise time	Dual, Tri output, 10-90%, 115VAC/60Hz, 230VAC/50Hz		30	mS

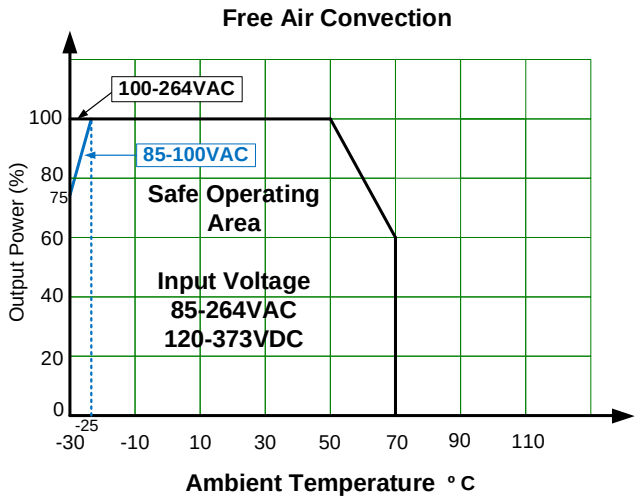
*** Ripple and Noise are measured at 20MHz bandwidth with a 47µF electrolytic capacitor and a 0.1µF ceramic capacitor. Please refer to the application note for specific details.**
**** Equal-scale load for dual and tri output models.**

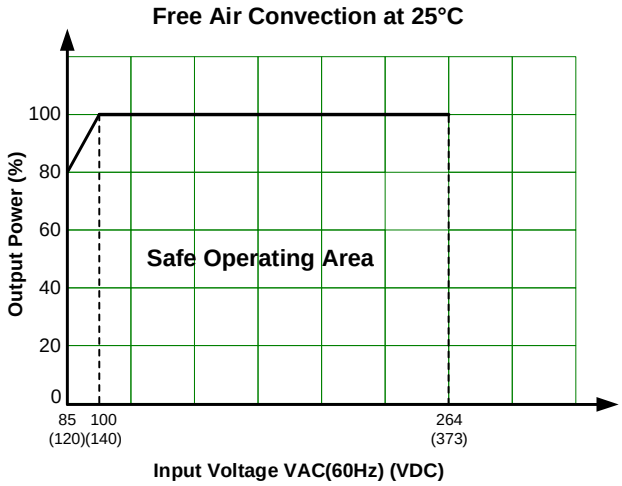
Isolation Specifications				
Parameters	**Conditions**	**Typical**	**Rated**	**Units**
Tested I/O voltage	60 sec, leakage current < 10mA, Single output		4000	VAC
	60 sec, leakage current < 10mA, Dual, tri output		3000	VAC
Tested Input to GND voltage	60 sec, leakage current < 10mA, Single, Dual, tri output		2000	VAC
Tested Output to GND voltage	60 sec, leakage current < 10mA, Single output		1250	VAC
	60 sec, leakage current < 10mA, Dual, tri output		500	VAC
Tested Vo1 to Vo2 voltage	Dual output model only		500	VDC
Resistance (I/O, I/O to GND)	500VDC, Single output		50	MΩ
	500VDC, Dual, tri output		100	MΩ

General Specifications				
Parameters	**Conditions**	**Typical**	**Maximum**	**Units**
Safety class	Class I			
Switching Frequency	Single output	65		KHz
Over Current protection	Single output, Auto recovery	≥ 110	200	% of Iout
	Dual output, equal-scale load, Auto recovery	≥ 110	220	% of Iout
	Tri output, equal-scale load, Auto recovery	≥ 110	180	% of Iout
Over voltage protection	Single output, 5V output, Voltage clamp		6.3	VDC
	Single output, 12V output, Voltage clamp		16.2	VDC
	Single output, 15V output, Voltage clamp		21.75	VDC
	Single output, 24V output, Voltage clamp		33.6	VDC
	Dual, tri output, Voltage clamp	5.75 ≤ Output 1 ≤ 6.75		VDC
Short circuit protection	Hiccup, Continuous, Auto recovery, Recovery time < 5 sec			
Operating temperature	See derating graph	-30 to +70		°C
Storage temperature		-40 to +85		°C
Power consumption	Single output		0.3	W
Power derating	Single output, -30°C to -25°C, 85VAC - 100VAC	5		% / °C
	Single output, 50 °C to 70 °C	2		% / °C
	Single output, 85VAC - 100VAC	1.33		% / VAC
	Dual, tri output, 50 °C to 70 °C	2.5		% / °C
	Dual, tri output, 85VAC - 115VAC	0.667		% / VAC
	Dual, tri output, 120VDC - 160VDC	0.5		% / VDC
Ambient temperature derating	Operating altitude > 2000m	5		°C / 1000m
Temperature coefficient		±0.03		% / °C
Cooling	Free air convection			
Humidity	Non-condensing	≥ 10	95	% RH
Case material	Metal (1100 Aluminum, SGCC)			
Weight	Single output	170		g
	Dual, tri output	210		g
Dimensions (L x W x H)	Single output	3.90 x 3.23 x 1.18inch (99.0 x 82.0 x 30.0mm)		
	Dual, tri output	3.90 x 3.82 x 1.18inch (99.0 x 97.0 x 30.0mm)		
MTBF	> 300 000 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.				

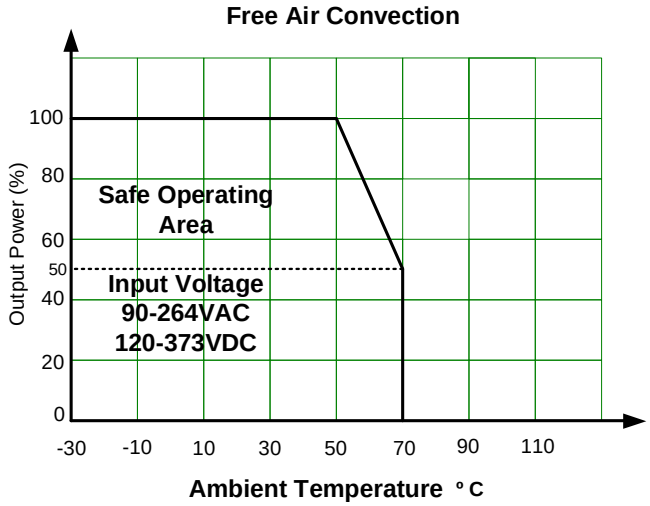
Safety Specifications		
Parameters		
Agency approvals	UL 62368-1 (Only for the models marked #)	
Standards	Information technology Equipment	Design to meet IEC/EN/UL 62368-1, EN60335, GB4943, EN61558 (single output only)
	EMC - Conducted and radiated emission	CISPR32 / EN55032, class B
	Harmonic current	IEC 61000-3-2 Class A
	Electrostatic Discharge Immunity	IEC 61000-4-2 Contact ±6KV / Air ±8KV, Criteria A
	RF, Electromagnetic Field Immunity	IEC 61000-4-3 10V/m, Criteria A
	Electrical Fast Transient/Burst Immunity	IEC 61000-4-4 ±2KV, Criteria A
	Surge Immunity	IEC 61000-4-5 L-L ±2KV/L-G ±4KV, Criteria A
	RF, Conducted Disturbance Immunity	IEC 61000-4-6 10Vr.m.s, Criteria A
	Voltage dips, Short Interruptions Immunity	IEC 61000-4-11 0%, 70%, Criteria B

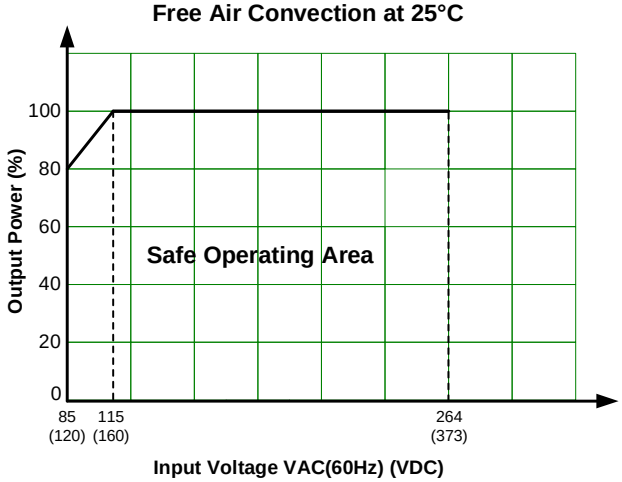
Single Output Models Derating



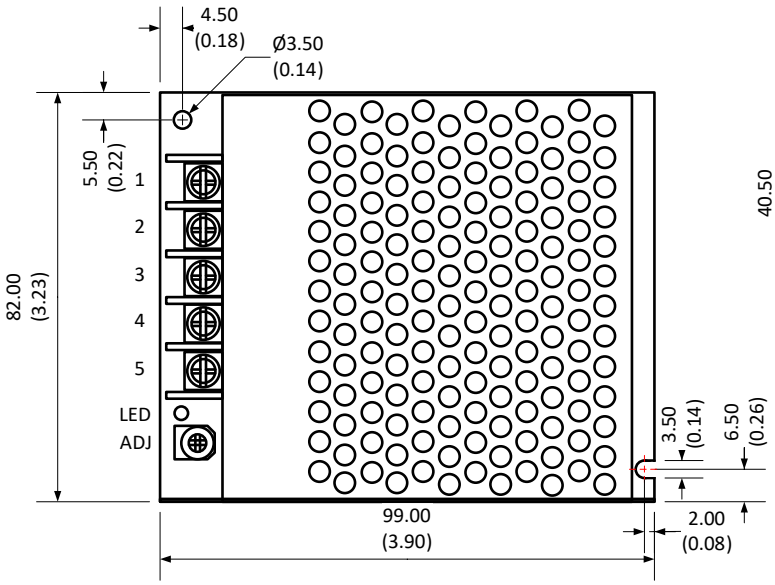


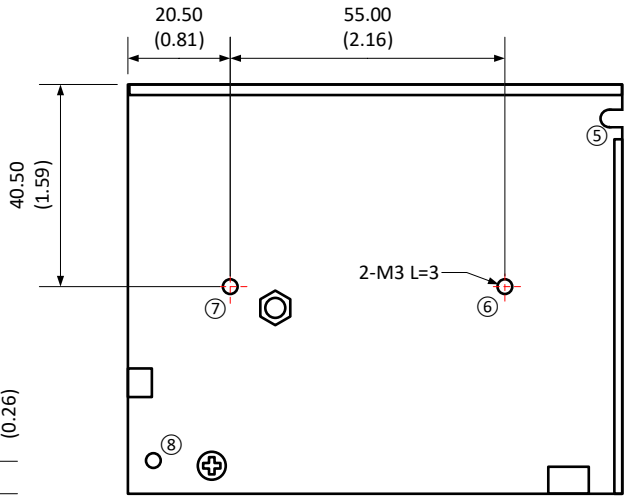
Dual, Tri Output Models Derating

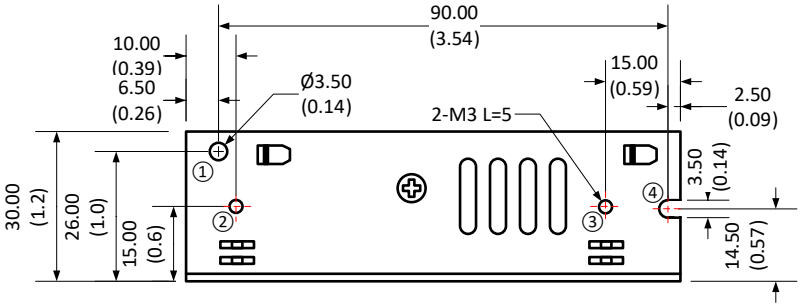




Single Output Models Dimensions



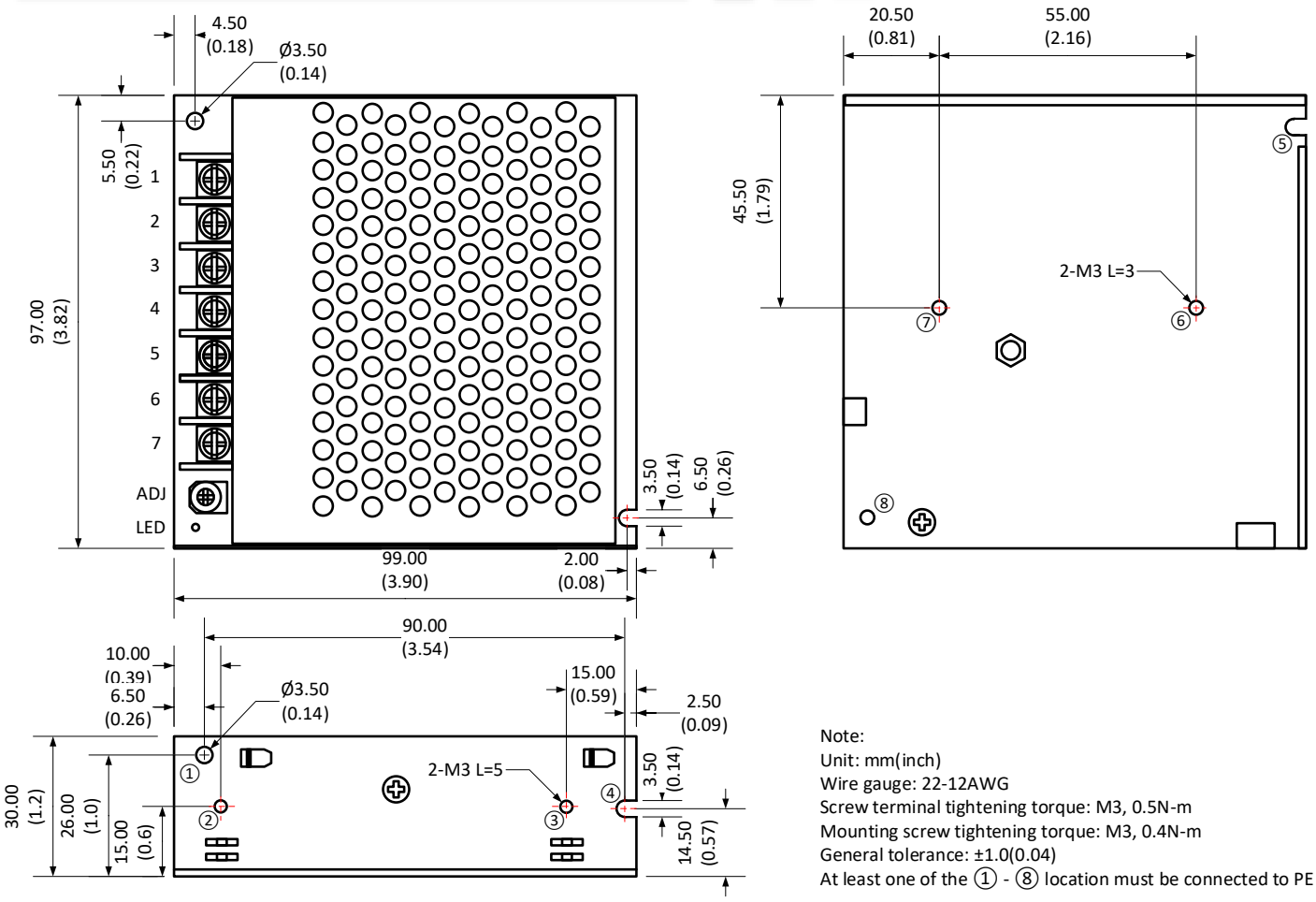




Note:
Unit: mm(inch)
Wire gauge: 22-12AWG
Screw terminal tightening torque: M4, 1.2N-m
Mounting screw tightening torque: M3, 0.4N-m
General tolerance: ±1.0(0.04)
At least one of the ① - ⑧ location must be connected to PE

Single Pin Output Specifications	
Pin	**Function**
1	-V Input (L)
2	+V Input (N)
3	PE GND
4	-V Output
5	+V Output
ADJ	Vo1 voltage adj knob

Dual, Tri Output Models Dimensions



Note:
Unit: mm(inch)
Wire gauge: 22-12AWG
Screw terminal tightening torque: M3, 0.5N-m
Mounting screw tightening torque: M3, 0.4N-m
General tolerance: ±1.0(0.04)
At least one of the ① - ⑧ location must be connected to PE

Dual Pin Output Specifications	
Pin	Function
1	Input (L)
2	Input (N)
3	PE GND
4	-V Output 2
5	+V Output 2
6	-V Output 1
7	+V Output 1
ADJ	Vo1 voltage adj knob

Triple Pin Output Specifications	
Pin	Function
1	Input (L)
2	Input (N)
3	PE GND
4	+V Output 3
5	+V Output 2
6	Common
7	+V Output 1
ADJ	Vo1 voltage adj knob