ITE AC/DC Conduction Cooled Power Supply

PAA500

Features:

- 90-264 VAC universal input
- 500W with 30CFM Forced Air
- 450W with Conduction Cooling
- 330W with Natural Convection
- Active PFC function
- Build-in 12V / 0.3A Auxiliary Output
- U bracket or Enclosed Versions Available
- Safety Approval to UL/IEC/EN 62368-1
- No Load Power Consumption <0.5W
- -30°C to +80°C Wide Range Operating Temperature
- Operating Altitude 5000m
- I/O Isolation 4000VAC
- High Efficiency up to 92%

E199779

*Safety approvals may be model dependent. Consult TT Electronics for specifics or for additional safety approvals required.

Description:

The PAA500 series of AC/DC switching power supplies provides up to 500watts of continuous power across a wide range of operating temperatures . All models meet EN55032 and EN55035 for Class A and Class B emissions limits and comply with EN62368-1 standards.

Model	Output Voltage	Max. Output Wattage w/ (Natural Convection)	Max. Output Wattage w/ (Conduction Cooling)	Max. Output Wattage w/ (30CFM Forced Air Fan)	Max Current (A) w/(Natural Convection)	Max Current (A) w/ (30CFM Forced Air Fan)	Max Current (A) w/ (Conduction Cooling)
PAA500-12B	12VDC	250W (100VAC) 330W (230VAC)	400W (100VAC) 450W (230VAC)	500W	20.83A (100VAC) 27.5A (230VAC)	41.5A	33.3A (100VAC) 37.5A (230VAC)
PAA500-14B	24VDC	250W (100VAC) 330W (230VAC)	400W (100VAC) 450W (230VAC)	500W	10.42A (100VAC) 13.75A (230VAC)	20.8A	16.6A (100VAC) 18.75A (230VAC)
PAA500-18B	48VDC	250W (100VAC) 330W (230VAC)	400W (100VAC) 450W (230VAC)	500W	5.21A (100VAC) 6.87A (230VAC)	10.41A	8.33A (100VAC) 9.375A (230VAC)
PAA500-12C	12VDC	-	-	500W	-	41.5A	-
PAA500-14C	24VDC	-	-	500W	-	20.8A	-
PAA500-18C	48VDC	-	-	500W	-	10.41A	-

Notes.
1.Part numbering Formula
Model number ending with “B” indicates U-channel format
Model number ending with “C” indicates enclosed format

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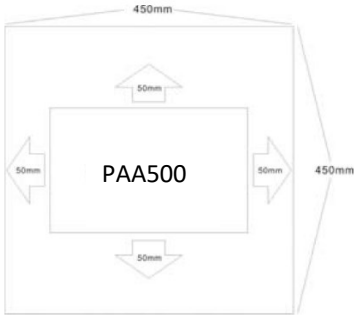
Specifications:

Model	Output Voltage	Maximum Capacitive Load	Ripple & Noise	Efficiency
PAA50-12B	12VDC	5000µF	160mV	90.5%
PAA500-14B	24VDC	2500µF	240mV	91%
PAA500-18B	48VDC	1250µF	480mV	92%
PAA500-12C	12VDC	5000µF	160mV	90%
PAA500-14C	24VDC	2500µF	240mV	90.5%
PAA500-18C	48VDC	1250µF	480mV	91.5%

Notes:

1. Ripple & Noise is measured by using a 20MHz bandwidth limited oscilloscope and terminated with a 0.1µF ceramic capacitor in parallel with a 47µF aluminium electrolytic capacitor at full load and nominal line.
2. Hold-up Time measured at 90% Vout.
3. Fan output voltage is between 10.2-13.3V, when the main output is greater than 3% of the maximum load, and fan's terminal block output current is higher than 0.1A (minimum)
4. Strongly recommend to conduct this test with DC Voltage. If customer wishes to test with AC Voltage, please disconnect all Y-Capacitors from the power supply.
5. The size of the suggested aluminium plate is shows as below. The aluminium plate must have an even and smooth surface (or coated with thermal grease), and PAA500 series must be firmly mounted at the center of the aluminium plate 450 x 450 x 3.0 mm. For other conduction cooling options, please contact TTE Engineering.



6. If Input voltage is lower than 100VAC, please refer to the output derating V.S. input voltage curve for details.

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Specifications:

Input	
Input Voltage	90 - 264VAC
Input Frequency	47 - 63Hz
Input Current (Full load)	≤6.3 at 115VAC ≤3.15A at 230VAC
Inrush Current (<2ms)	≤40A at 115VAC ≤80A at 230VAC
Leakage Current	<0.1mA / 264VAC (Touch Current)
Power Factor (at 230VAC)	PF>0.94 at Full Load
Output	
Total Output Power	See Table on page 1
Output Voltage	See Table on page 1
Voltage Adj. Range	±5% Output Voltage
Voltage Accuracy	±2%
Line Regulation	±1%
Load Regulation (0-100%)	±1%
Hold Up Time (at 115VAC)	8ms min
Maximum Capacitive Load	See table on page 2
Ripple & Noise	See table on page 2
Protection Features	
Over Power Protection	Auto recovery.
Over Voltage Protection	Auto recovery.
Over Temperature Protection	Auto recovery.
Short Circuit Protection	Protection level 1 (nominal) : Continuous, Auto recovery Protection level 2 (instantaneous high current) : Latch
Isolation	
Input-Output	4000VAC or 5656VDC
Input-Earth Ground	2000VAC or 2828VDC
Output-Earth Ground	1500VAC or 2121VDC

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Specifications (continued):

Environment		
Operating Temperature	-30°C to +80°C (with derating) (For U-Bracket) -30°C to +70°C (with derating) (For Enclosed)	
Storage Temperature	-30°C to +85°C	
Temperature Coefficient	±0.03%/°C (0~50°C) ±0.06%/°C (-30°C~0°C)	
Altitude During Operation	5000m	
Humidity	95%RH	
MTBF	>160k hours @25°C	
Vibration	IEC 60068-2-6 (10~500Hz, 2G 10min./1cycle, 60min. Each along X,Y,Z axes)	
Shock	IEC60068-2-27 (Acceleration:50G ; pulse duration : 11ms; Filter :500Hz)	
General Specifications		
Dimensions (L x W x H)	5.12”x 3.27” x 1.57” (130mm x 83mm x 40mm) Tolerance ±0.5mm (For U-Bracket) 5.12”x3.27”x2.45” (130mm x 83mm x 62.3mm) Tolerance ±0.5mm (For Enclosed)	
Weight	650g (For U-Bracket) 710g (For Enclosed)	
Cooling Method	Natural Convection / Conduction Cooling / 30CFM Fan	
Safety		
Approvals*	UL 60950-1 UL / IEC / EN 62368-1	
*Safety approvals may be model dependent. Consult TT Electronics for specifics or for additional safety approvals required.		
EMC		
Conducted EMI	EN55032	Class B
Radiated EMI	EN55032	Class A
Harmonics Current	EN61000-3-2 (Full Load)	Class A
EN55032		Class A
ESD	IEC 61000-4-2 Air ±8KV, Contact ±4KV	Class A
RS	IEC 61000-4-3 3V/m	Class A
EFT/B	IEC 61000-4-4 ±1KV, ±2KV(L/N-PE)	Class A
Surge	IEC 61000-4-4 ±1KV, ±2KV(L/N-PE)	Class A
CS	IEC61000-4-6 3Vrms	Class A
PFMF	IEC61000-4-8 1A/m	Class A
Dips	IEC61000-4-11 70% 500ms	Class B
Interruptions	IEC61000-4-11 <5% 5000ms	Class B

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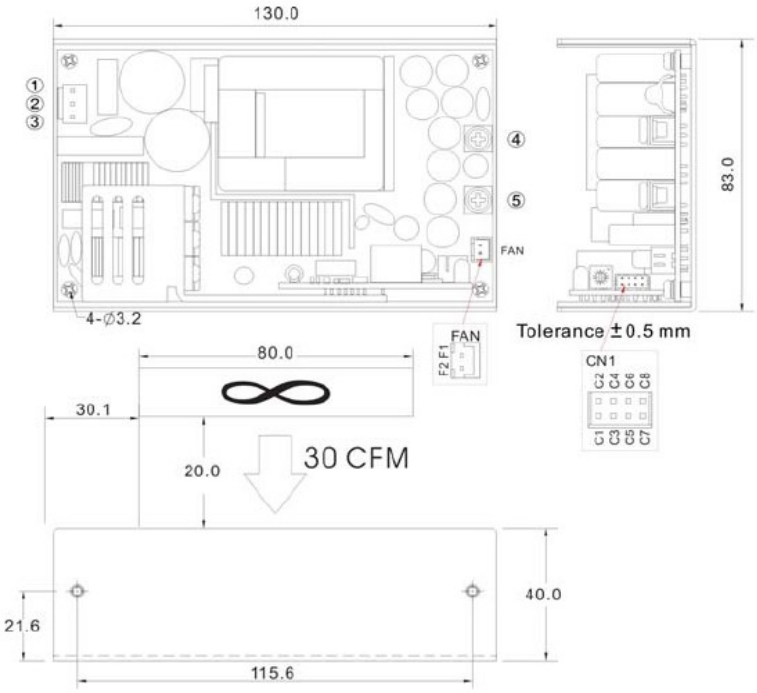
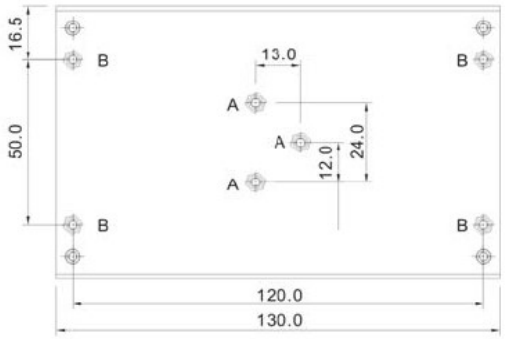
Mechanical Outline:

(U-Bracket)





A= For fixture to chassis only
A=M3x0.5P
B=For fixture to pcb/chassis only
B=M3x0.5P

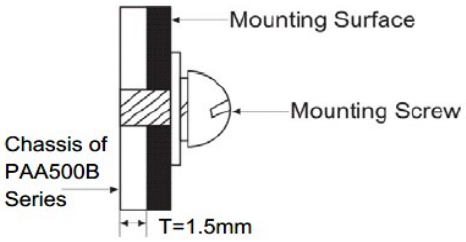
Torque:3±0.5 Kgf.cm

Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
A,B	PE	—	—	—	—
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			
5	-DC OUT				

ASSEMBLY INSTRUCTIONS

*U Case T=1.5mm

Customer is advised to screw into the threads no more than 1.5mm



Connector Pin (CN1)					
Brands		Cherng Weei		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
C1	-5V SB	PHD-H20-2X4P	PHD-T20	PHDR-08VS	SPHD-001T-P0.5
C2	+5V SB				
C3	GND				
C4	DC-OK				
C5	-RC				
C6	+RC				
C7	-S				
C8	+S				

Connector Pin (FAN) (Note 4)					
Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+12V	8821-2	8820T	XHP-2	SXH-002T-P0.6
F2	GND				

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Mechanical Outline: **(U-Bracket)**

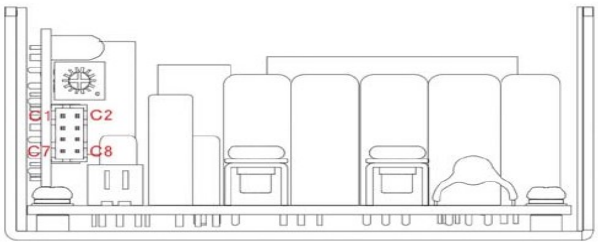
FUNCTION DESCRIPITON of CN1

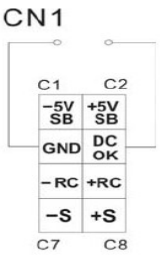
Pin No.	Function	Description
C1	-5VSB	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C2	+5VSB	Stand by voltage output ground 4.1~5.5V, referenced to pin C1(-5VSB). The maximum load current is 1A with Fan, 0.4A without Fan..
C3	GND	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C4	DC OK	DC-OK Signal is a DC output, referenced to pin C3(DC-OK GND).
C5	-RC	This pin connects to the negative terminal(-V). Return for DC-OK and -RC signal output.
C6	+RC	Turns the output on and off by electrical or dry contact between pin C5 (-RC), Short: Power OFF, Open: Power ON. The input voltage must be less than 1V in order to disable VOUT and greater than 3.3V (up to 5V) to enable it.
C7	-S	Negative sensing. The -S signal should be connected to the negative terminal of the load. The -S and +S leads should be twisted in pair to minimize noise pick-up effect.
C8	+S	Positive sensing. The +S signal should be connected to the positive terminal of the load. The +S and -S leads should be twisted in pair to minimize noise pick-up effect.

FUNCTION MANUAL & APPLICATION NOTE

1. DC-OK Signal

Between DC-OK and GND	Output Status
3.7~6V	ON
0~1V	OFF

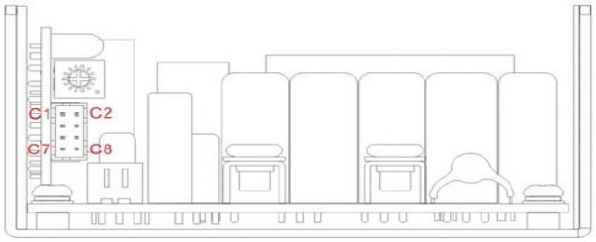


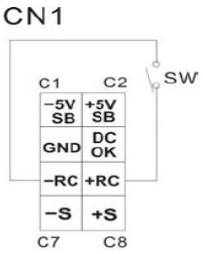


2. Remote Control

It can be turned ON/OFF by using the "Remote Control" function.

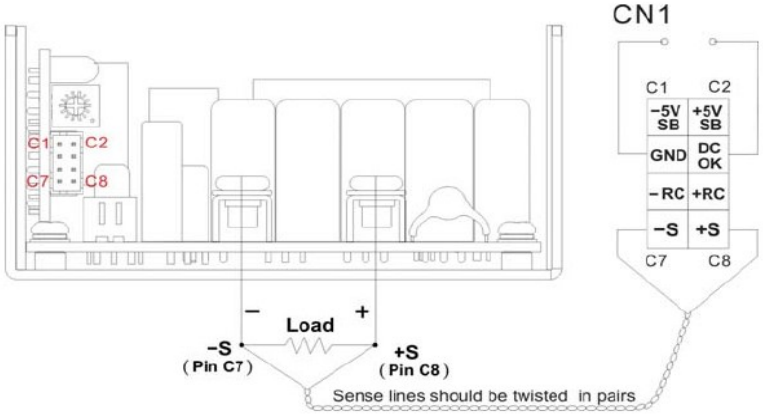
Between +RC and -RC	Output Status
SW ON (Short)	OFF
SW OFF (Open)	ON





2. +S and -S Sense

Shorter wiring to each unit is recommended, as well as twisting +S and -S in pairs, as shown below



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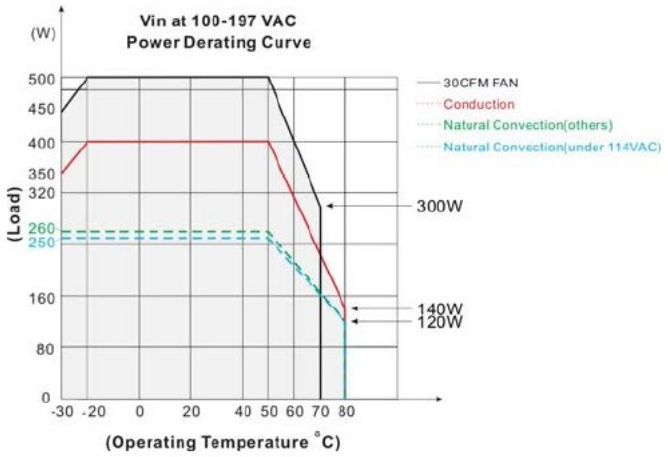
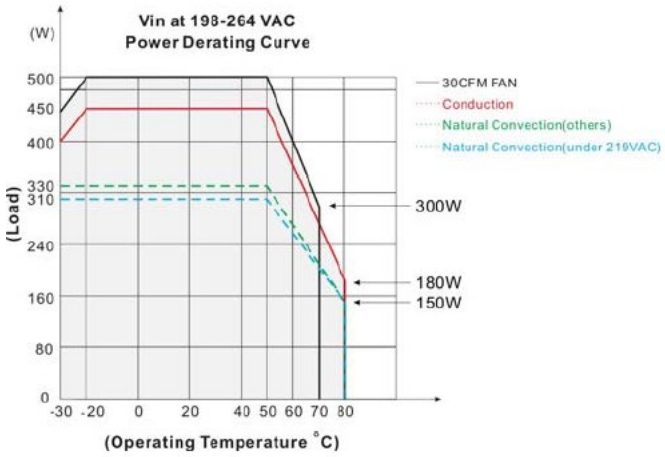
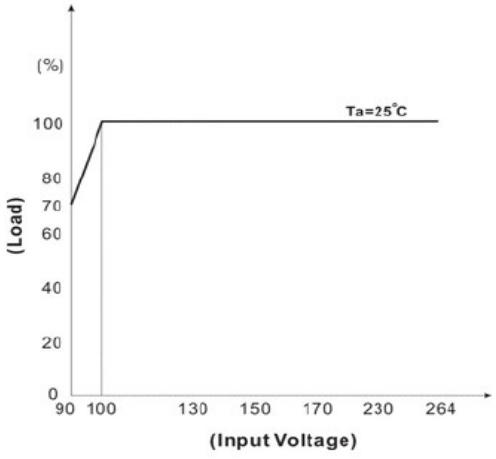
Derating Curve: **(U-Bracket)**







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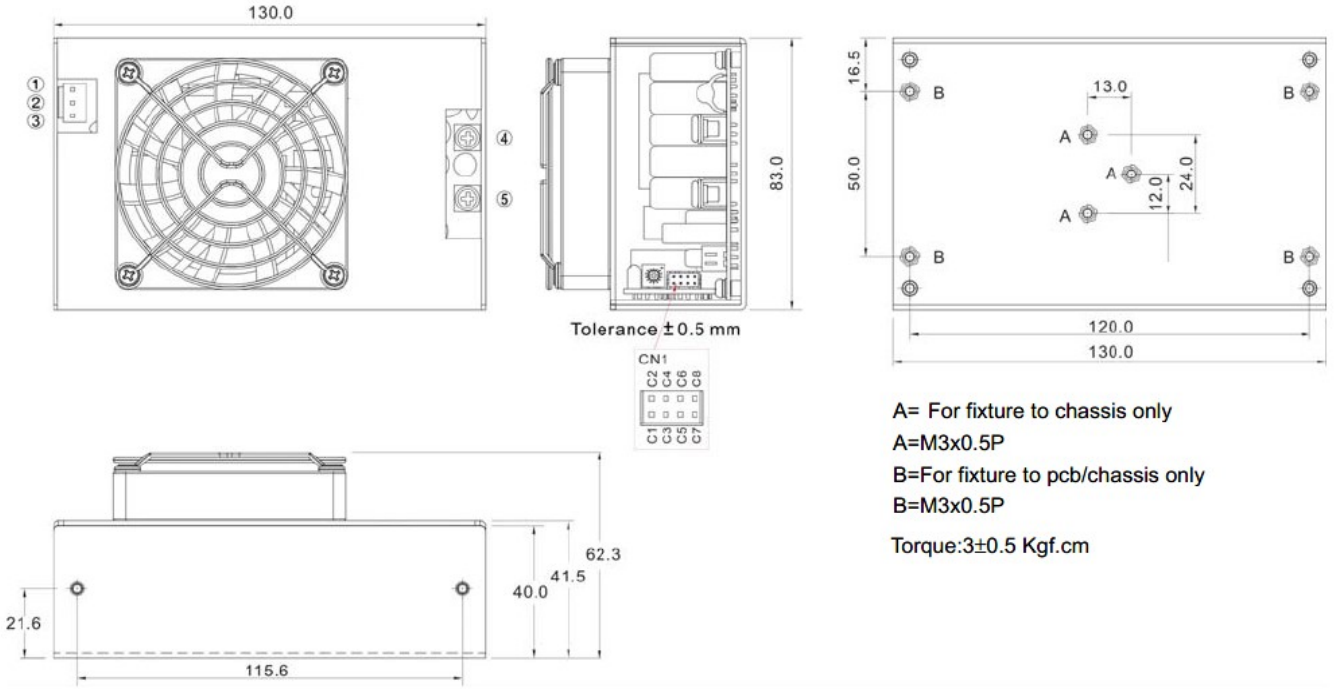
Mechanical Outline: **(ENCLOSED)**



Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
A,B	PE	—	—	—	—
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
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4	+DC OUT	Terminal : M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			
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ASSEMBLY INSTRUCTIONS

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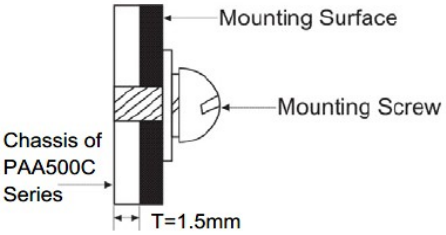

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C2	+5V SB				
C3	GND				
C4	DC-OK				
C5	-RC				
C6	+RC				
C7	-S				
C8	+S				

Connector Pin (FAN) (Note 4)					
Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+12V	8821-2	8820T	XHP-2	SXH-002T-P0.6
F2	GND				

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Mechanical Outline: **(ENCLOSED)**

FUNCTION DESCRIPITON of CN1

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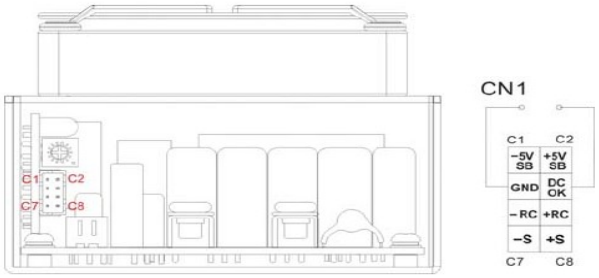
FUNCTION MANUAL & APPLICATION NOTE

1. DC-OK Signal

Between DC-OK and GND	Output Status
3.7~6V	ON
0~1V	OFF



2. Remote Control

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Between +RC and -RC	Output Status
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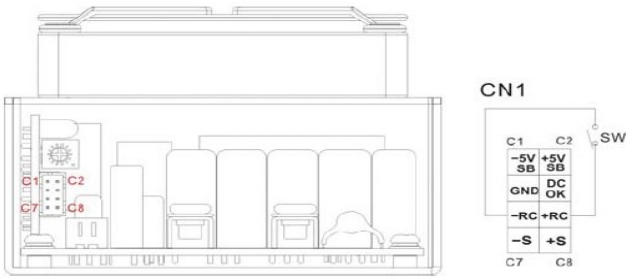
SW OFF (Open)	ON



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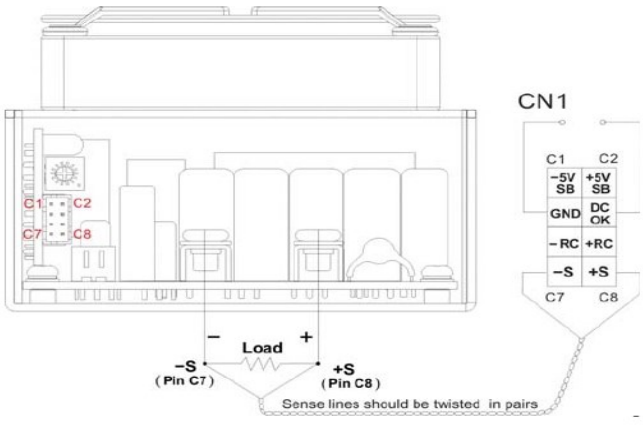

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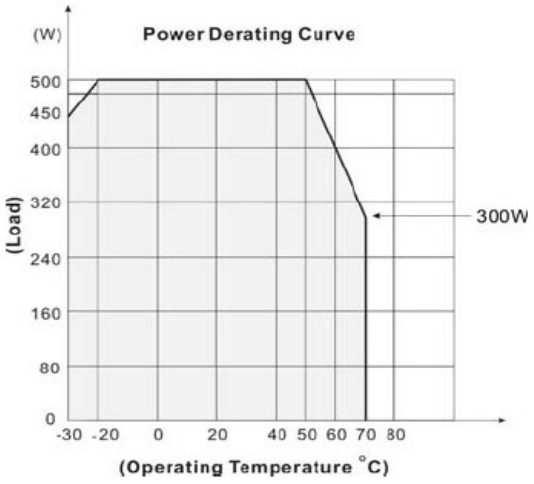
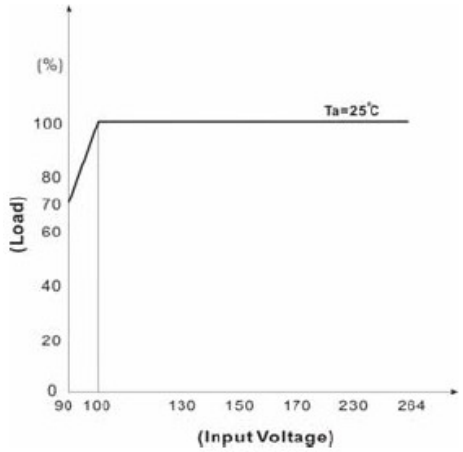
Derating Curve: **(ENCLOSED)**





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