

# ITE AC/DC Conduction Cooled

## Power Supply

### PAA240



#### Features:

- 90-264 VAC universal input
- 240W with 8CFM Forced Air
- 240W with Conduction Cooling
- 160W with Natural Convection
- Active PFC function
- Build-in 12V / 0.5A Fan Supply
- Open frame, U bracket or Enclosed Versions Available
- Class I (with PE) and Class II (without PE) Configuration
- 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

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

#### Description:

The PAA240 series of AC/DC switching power supplies provides up to 240 watts of continuous power across a wide range of operating temperatures . They are available as Class I or Class II input devices . 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 (Natural Convection )	Max. Output Wattage (Conduction Cooling)	Max. Output Wattage (8CFM Forced Air)	Max Current (Natural Convection)	Max Current (8CFM Forced Air)	Max Current (Conduction Cooling)
PAA240-12A	12VDC	160W	180W	240W	13.33A	20A	15A
PAA240-14A	24VDC	160W	180W	240W	6.6A	10A	7.5A
PAA240-18A	48VDC	160W	180W	240W	3.33A	5A	3.75A
PAA240-12B	12VDC	210W (100VAC) 234W (230VAC)	240W	240W	17.5A at 100VAC 19.5A at 230VAC	20A	20A
PAA240-14B	24VDC	215W (100VAC) 240W (230VAC)	240W	240W	8.96A at 100VAC 10A at 230VAC	10A	10A
PAA240-18B	48VDC	215W (100VAC) 240W (230VAC)	240W	240W	4.48A at 100VAC 5A at 230VAC	5A	5A
PAA240-12C	12VDC	210W (100VAC) 234W (230VAC)	240W	240W	17.5A at 100VAC 19.5A at 230VAC	20A	20A
PAA240-14C	24VDC	215W (100VAC) 240W (230VAC)	240W	240W	8.96A at 100VAC 10A at 230VAC	10A	10A
PAA240-18C	48VDC	215W (100VAC) 240W (230VAC)	240W	240W	4.48A at 100VAC 5A at 230VAC	5A	5A

#### Notes.

- 1.Part numbering formula.  
Model number ending with "A" indicates open frame format.  
Model number ending with "B" indicates U-channel format.  
Model number ending with "C" indicates enclosed format.  
For Header pin Configuration add "-H" to the end of Part Number.

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## Specifications:

<b>Input</b>	
Input Voltage	90 - 264VAC
Input Frequency	47 - 63Hz
Input Current (Full load)	≤3.0 at 115VAC ≤1.5A at 230VAC
Inrush Current (<2ms)	≤45A at 115VAC ≤90A at 230VAC
Leakage Current	<0.1mA / 264VAC (Touch Current)
Power Factor (at 230VAC)	PF>0.9 at Full Load
No Load	<0.5W (115/230 VAC)
<b>Output</b>	
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	8000µF (for 12VDC) 3000µF (for 24VDC) 470µF (for 48VDC)
Ripple & Noise	1% Vout
<b>Protection Features</b>	
Over Power Protection	Protection level 1 (nominal) : Auto recovery, Hiccup mode Protection level 2 (instantaneous high current): Latch
Over Voltage Protection	Protection level 1 (nominal) : Auto recovery Protection level 2 (instantaneous high voltage) : Latch
Over Temperature Protection	Auto recovery.
Short Circuit Protection	Protection level 1 (nominal) : Continuous, Auto recovery Protection level 2 (instantaneous high current) : Latch
<b>Isolation</b>	
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)
Storage Temperature	-30°C to +80°C
Temperature Coefficient	±0.05%/°C
Altitude During Operation	5000m
Humidity	20~90% RH
MTBF	>250k 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 )	4.01"x 2.05" x 1.09" (101.9mm x 52.1mm x 27.6mm) Tolerance ±0.5mm
Weight	220g
Cooling Method	Natural Convection / Conduction Cooling / 8CFM Forced Air
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 I Class B/Class II 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

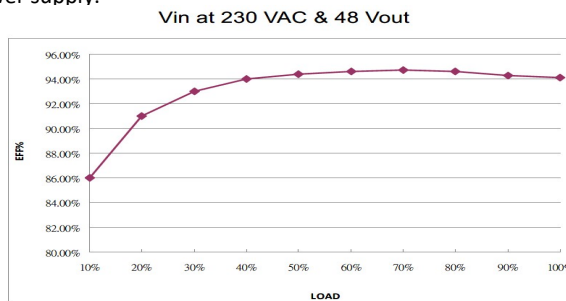
# ITE AC/DC Conduction Cooled Power Supply

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### Specifications (continued):

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 Supply=12V/0.5A (max) for driving fan
4. Please check the derating curve for more details.
5. 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.

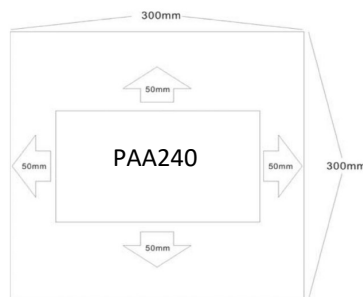


(After 30 minutes of burn-in)

6. The FAN supply is designed to serve as the source of the additive external fan for the cooling of the power supply, enabling the full load delivery and assuring the best life span of the product. Please do not use this FAN supply to drive other devices.

Main Output Power	Fan Voltage (at 0.1A)	Fan Voltage (at 0.25A)	Fan Voltage (at 0.5A)
25%	12.1V	11.8V	11.5V
50%	12.2V	11.9V	11.7V
75%	12.3V	12.0V	11.8V
100%	12.5V	12.2V	11.9V

7. Please secure the power supply unit to your metal case by using the four screw holes in the corners for either Class I or Class II equipment.
8. The ambient temperature derating of 3.5/1000m with fanless models and of 5/1000m with fan models for operating altitude higher than 2000m (6500ft).
9. At least 15mm insulation distance on the bottom of the unit should be kept and a Mylar film should be added between the unit and the system.
10. 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 PAA240 series must be firmly mounted in aluminium plate 300x300x 3.0 mm. Check Open Frame mechanical outline drawing for mounting. For other conduction cooling options, please contact TTE Engineering.



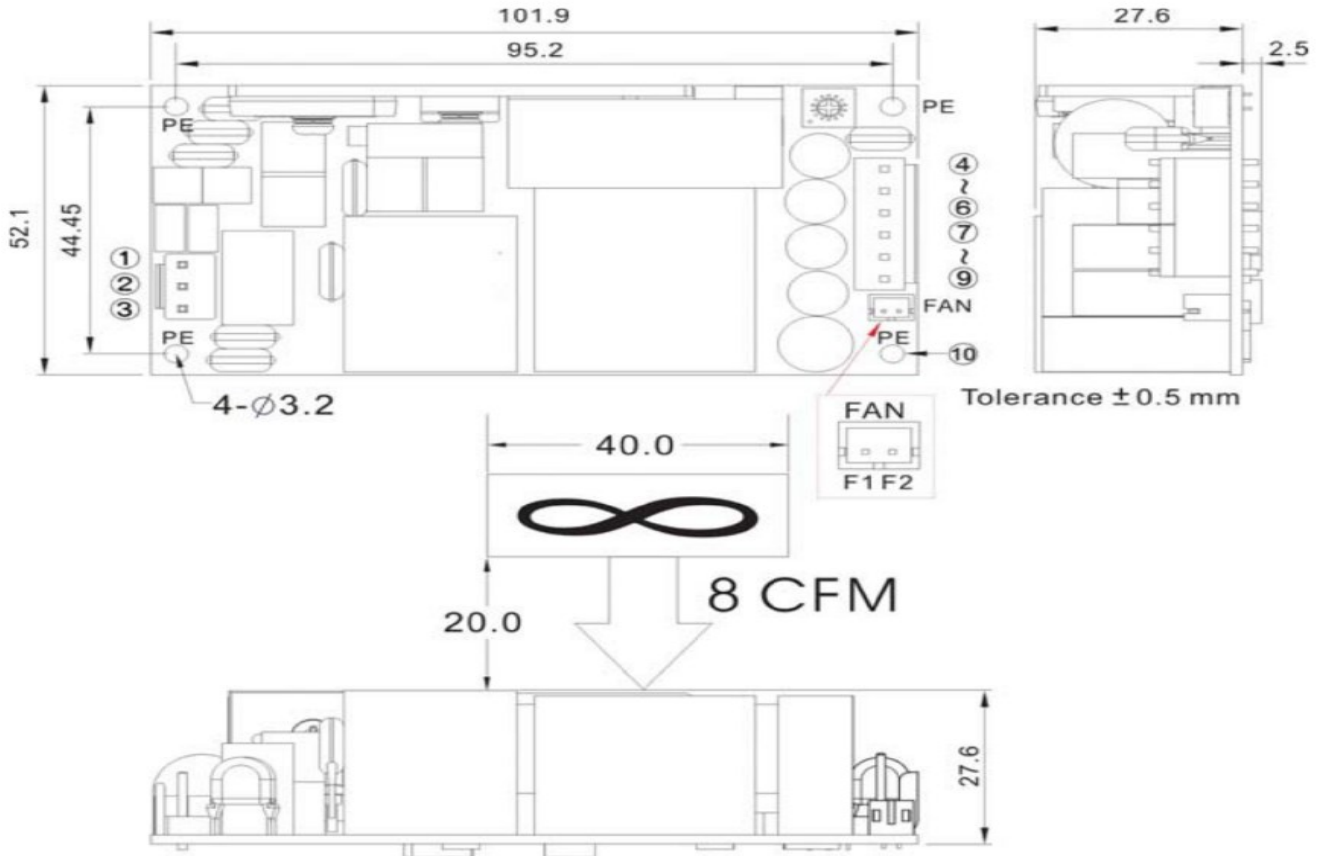
11. If Input voltage is lower than 100VAC, please refer to the output derating V.S. input voltage curve for details.
12. Double pole, neutral fusing. Disconnect mains before servicing.

**CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.**

# ITE AC/DC Conduction Cooled Power Supply PAA240

## Mechanical Outline: (Top View)

(OPEN FRAME Standard)



Brands		Alex		JST	
Pin #	Single	Mating Housing	Terminal	Mating Housing	Terminal
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 (90cNm) max.			
5	-DC OUT				
6	Earth Ground	—	—	—	—

Connector Pin (FAN)					
Brands		Cherng Weei		JST	
PIN #	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+AUX OUT	CX-H20-02	CP-T20B	PHR-2	SPH-002T-P0.5L
F2	-AUX OUT				

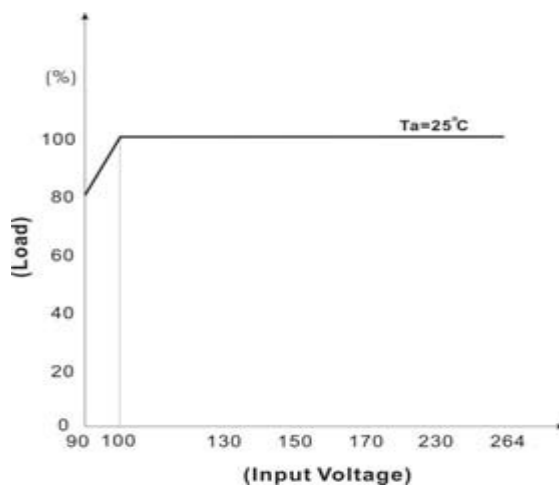
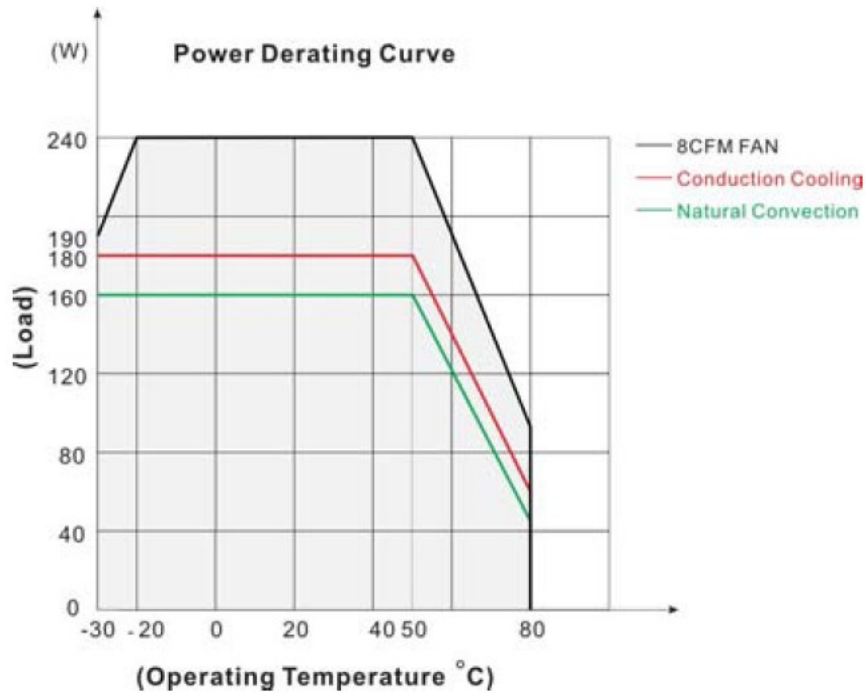


# ITE AC/DC Conduction Cooled Power Supply



PAA240

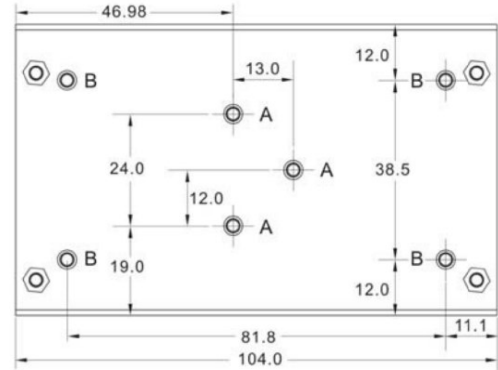
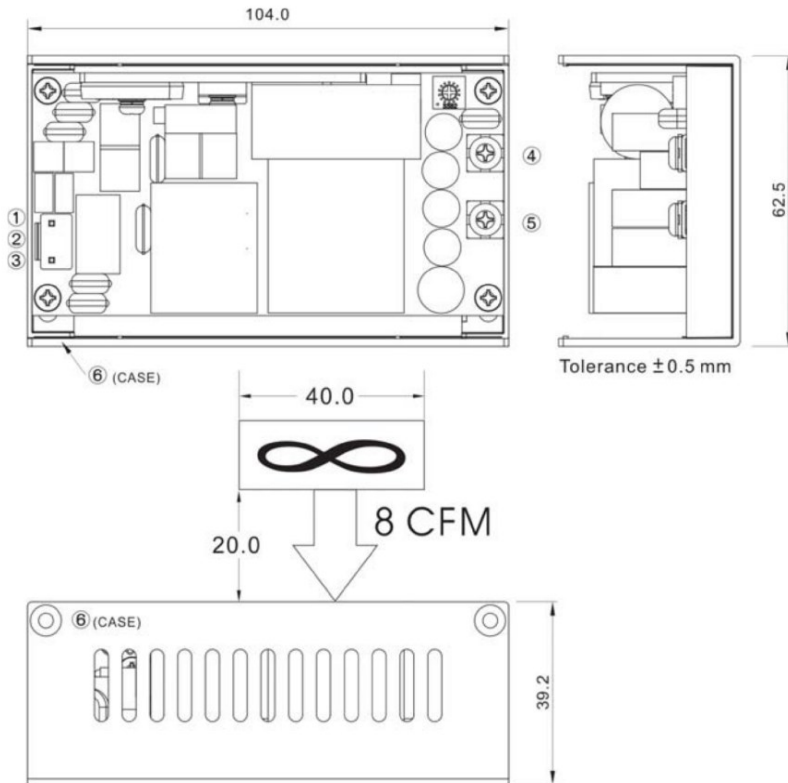
Derating Curve: (OPEN FRAME)



# ITE AC/DC Conduction Cooled Power Supply PAA240

## Mechanical Outline: (Top View)

## ( U-BRACKET Standard)

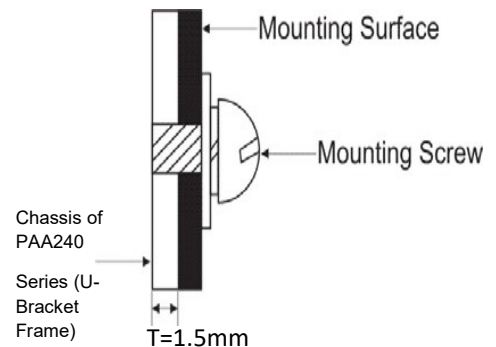


A= For fixture to chassis only  
A=M3x0.5P  
B=For fixture to pcb/chassis only  
B=M3x0.5P  
Torque:3±0.5 Kgf.cm

### ASSEMBLY INSTRUCTIONS

\*U Case T=1.5mm

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

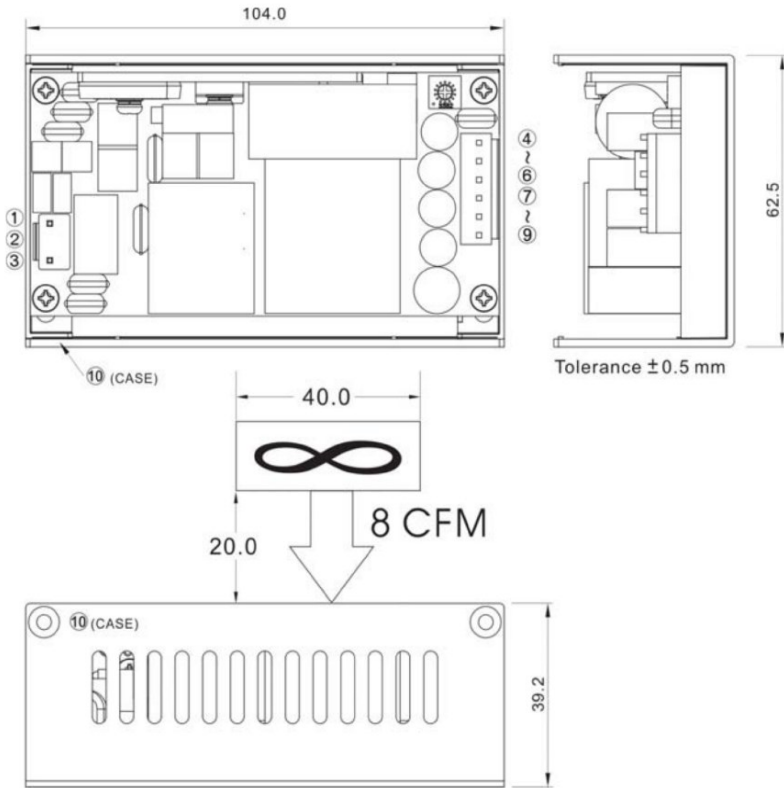


Brands		Alex		JST	
Pin #	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M3.5 Pan HD screw in 2 positions Torque to 8lbs-in (90cNm) max			
5	-DC OUT				
6	Earth Ground	—	—	—	—

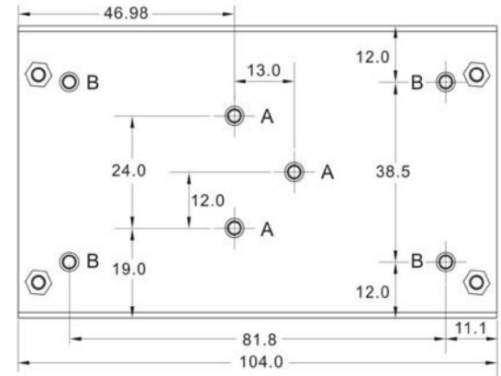


# ITE AC/DC Conduction Cooled Power Supply PAA240

## Mechanical Outline: (Top View)



## ( U—BRACKET with Headers “-H”)

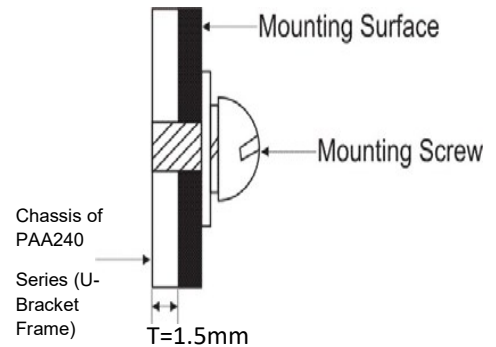


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B=M3x0.5P  
Torque:3±0.5 Kgf.cm

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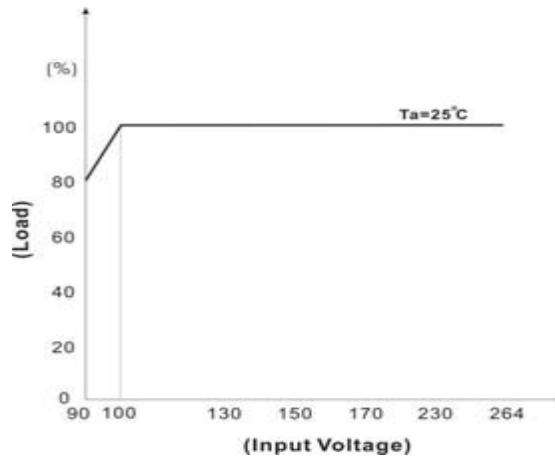
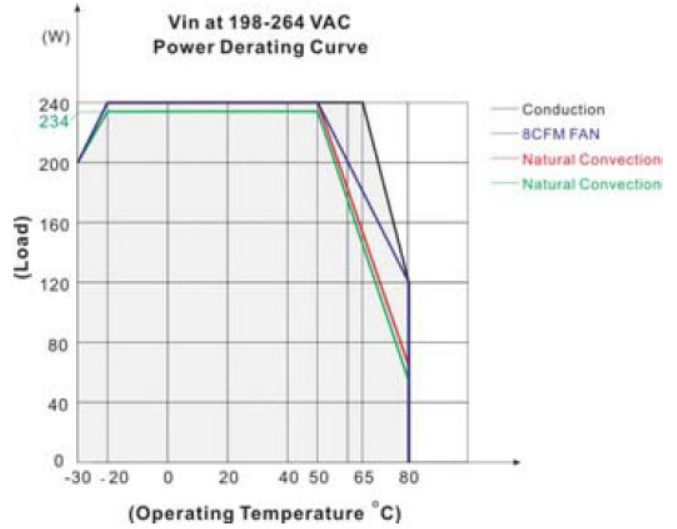
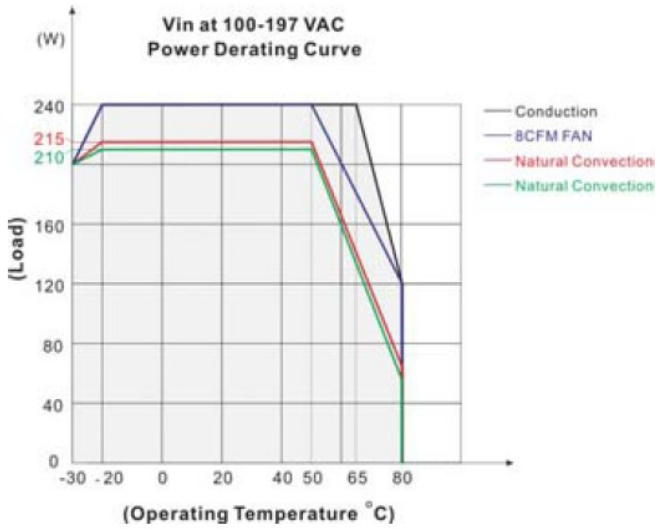
Brands		Alex		JST	
Pin #	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)	9396-3	96T series	VHR-6N	SVH-41T-P1.1
4-6	+DC OUT				
7-9	-DC OUT				
10	Earth Ground	—	—	—	—

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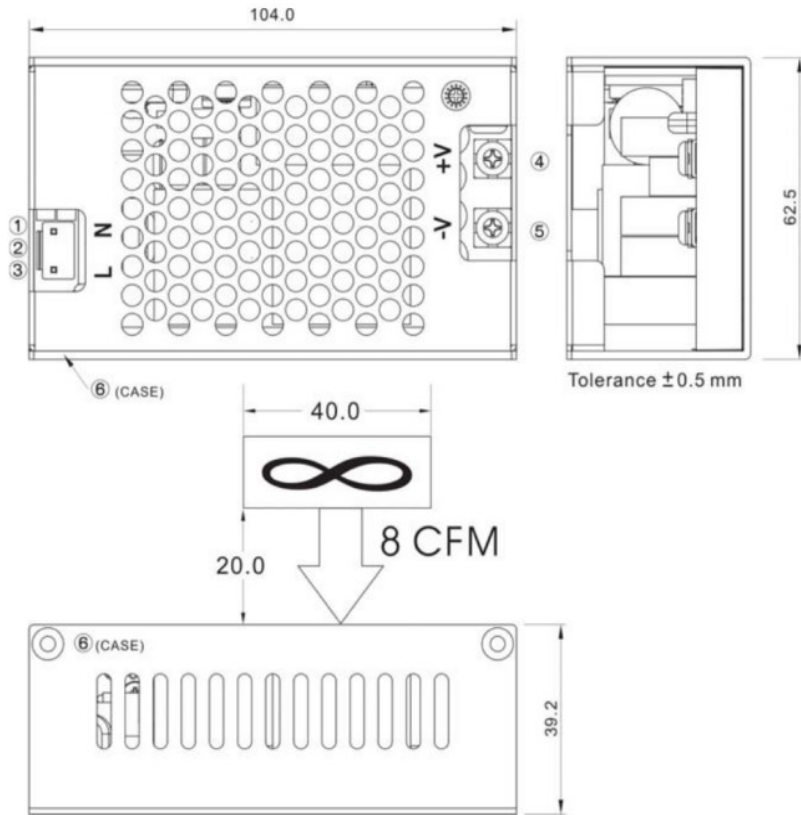
Derating Curve: ( U—BRACKET)



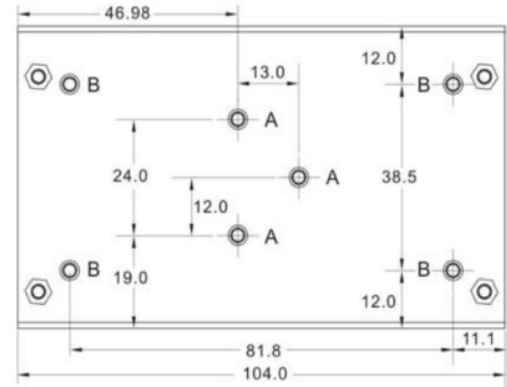
# ITE AC/DC Conduction Cooled Power Supply

## PAA240

### Mechanical Outline: (Top View)



### (ENCLOSED Standard)

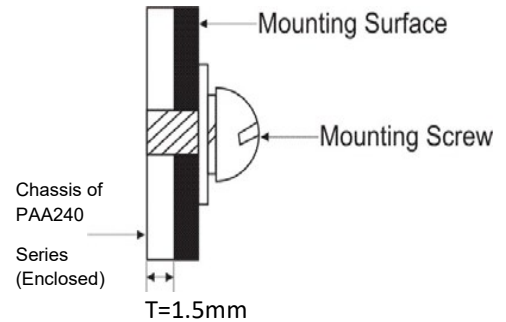


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 A=M3x0.5P  
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 B=M3x0.5P  
 Torque:3±0.5 Kgf.cm

### ASSEMBLY INSTRUCTIONS

\*Heatsink T=1.5mm

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

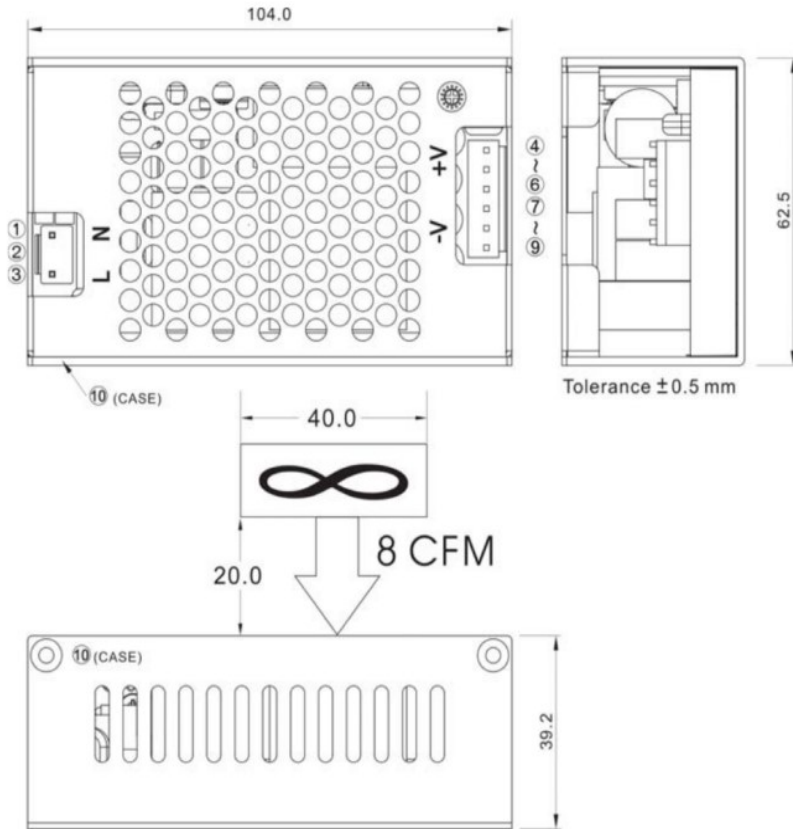


Brands		Alex		JST	
Pin #	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M3.5 Pan HD screw in 2 positions Torque to 8lbs-in (90cNm) max			
5	-DC OUT				
6	Earth Ground	—	—	—	—

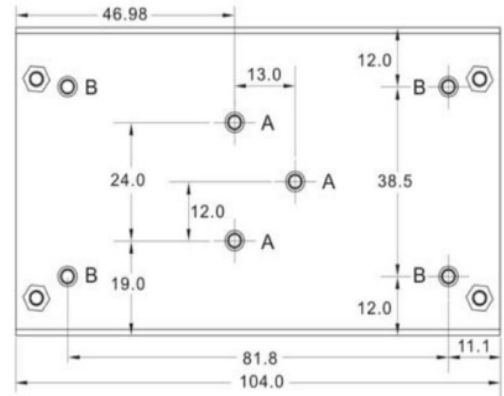
# ITE AC/DC Conduction Cooled Power Supply

## PAA240

### Mechanical Outline: (Top View)



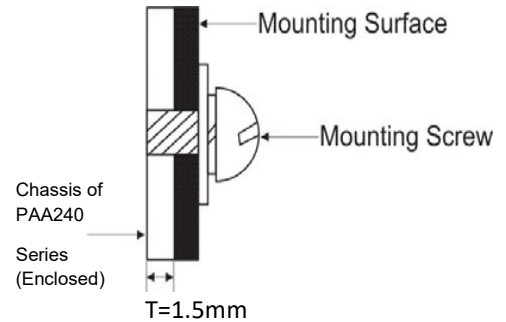
### (ENCLOSED with Headers "H")



A= For fixture to chassis only  
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 Torque:3±0.5 Kgf.cm

### ASSEMBLY INSTRUCTIONS

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Pin #	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)				
4-6	+DC OUT	9396-6	96T series	VHR-6N	SVH-41T-P1.1
7-9	-DC OUT				
8	Earth Ground	—	—	—	—

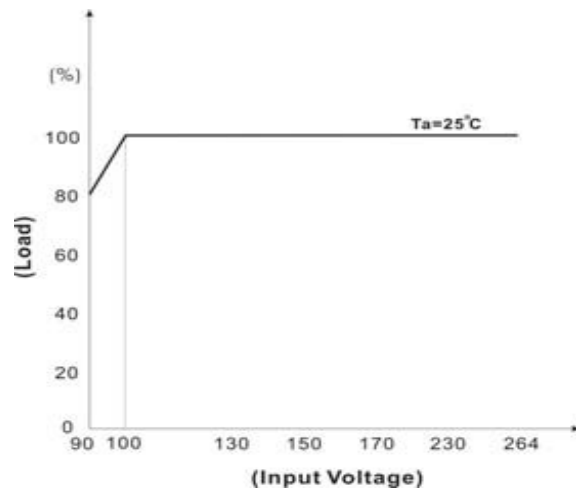
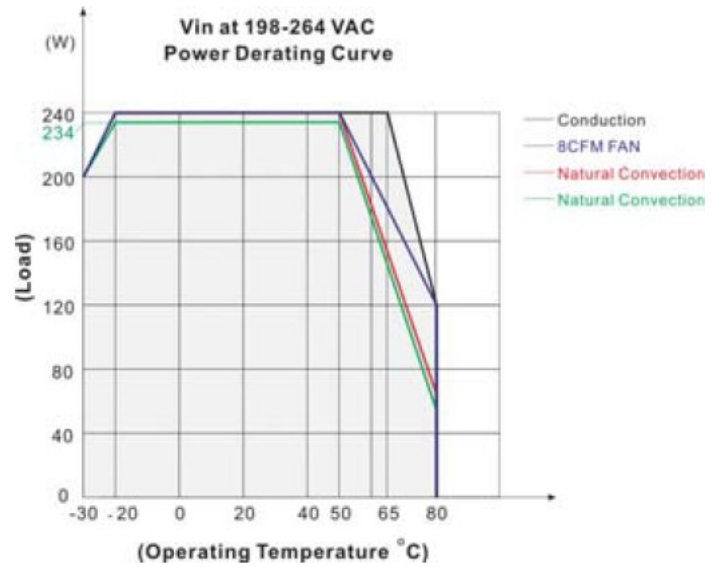
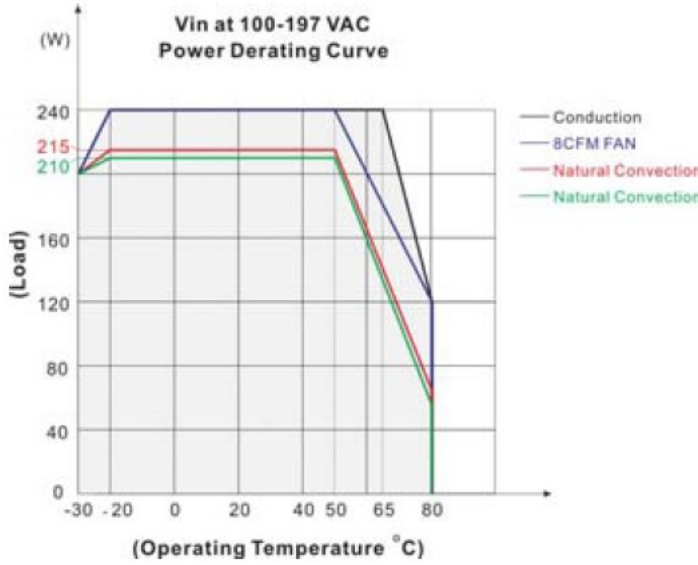
# ITE AC/DC Conduction Cooled Power Supply



PAA240

Derating Curve:

(ENCLOSED)



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