

HD240 SERIES

AC-DC ITE SWITCHING PSU - 240 WATT



KEY FEATURES

Digital Power's HD240 Series are switching power supplies that produce superior output wattages with natural convection. The series include enclosed, open frame and U bracket format with output voltage options of 12V, 24V and 48V. Featured with compact, low profile footprint, and best-in-class performance, HD240 Series are optimal for broad Industrial and Telecommunication Applications.

Designed with energy saving in mind, Digital Power's HD240 Series boasts not only high operating efficiency up to 94%, but also high-power density with full input range of 90-264Vac and built-in active PFC.

HD240 Series operates over wide temperature range from -30°C to $+80^{\circ}\text{C}$ with complete protections; EMI configured for both Class I and Class II and certified to UL / IEC / EN 62368-1.

PRODUCT SPECIFICATION

Enclosed, Open Frame, U Bracket Switching Power Supply

- Universal Input Range 90-264VDC
- High Efficiency up to 94%
- O/P Voltage: 12,24,48V
- No Load Power Consumption < 0.5W
- -30°C to +80°C Wide Operation Temperature Range
- Built-in 12V / 0.5A Fan Supply (HD240O)
- Operating Altitude 5000M
- Active PFC Function
- I/O Isolation 4000VAC
- EMI for Both Class I (with PE) and Class II (without PE) Configuration
- UL / IEC / EN 62368-1 Safety Approvals
- Ultra Compact Size:
HD240E/U: 4.1 x 2.46 x 1.54 Inches
HD240O: 4.02 x 2.05 x 1.09 Inches

ELECTRICAL SPECIFICATION - HD2400 SERIES

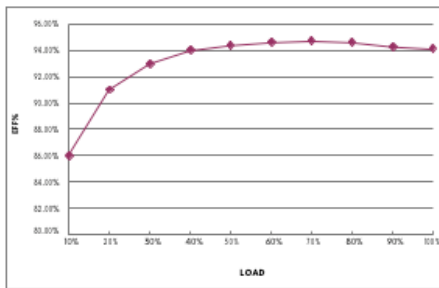
Model No.	HD2400-112	HD2400-124	HD2400-148
Max Output Wattage (with 8CFM FAN) (W)	240 W		
Max Output Wattage (Conduction Cooling) (W) (Note 12)	180 W		
Max Output Wattage (Natural Convection) (W)	160 W		
Input	Voltage (Note 4)		
	90-264 VAC		
	Frequency (Hz)		
	47-63 Hz		
	Current (Full load)		
	< 3.0 A max. (115 VAC) / < 1.5 A max. (230 VAC)		
Input	Inrush Current (<2ms)		
	< 45 A max. (115 VAC) / < 90 A max. (230 VAC)		
	Power Factor		
	PF>0.9 at Full Load		
	No Load		
	< 0.5W (115 / 230 VAC)		
Output	Voltage (V.DC.)		
	12V	24V	48V
	Voltage Adj Range (V.DC.)		
	±5% Output Voltage		
	Voltage Accuracy		
	±2%		
	Current (with 8CFM FAN) (A) (max.)		
	20	10	5
	Current (Conduction Cooling) (A) (max.)		
	15	7.5	3.75
	Current (Natural Convection) (A) (max.)		
	13.33	6.66	3.33
	Line Regulation		
±1%			
Load Regulation (0-100%)			
±1%			
Minimum Load			
0%			
Maximum Capacitive Load			
8000µF	3000µF	470µF	
Ripple & Noise (max.) (Note 1)			
1% Vout			
Efficiency (at 230VAC) (Note 6)			
92.5%	93%	94%	
Hold-up Time (at 115 VAC) (Note 2)			
10 ms min.			
Protection	Over Power Protection		
	Auto recovery, Hiccup mode		
	Over Voltage Protection		
	Auto recovery		
Protection	Overt Temperature Protection		
	Auto recovery		
	Short Circuit Protection		
	Protection level 1 (nominal) : Continuous, Auto recovery Protection level 2 (instantaneous high current) : Latch		
Isolation	Input-Output (Note 5)		
	4000VAC or 5656VDC		
	Input-PE (Note 5)		
2000VAC or 2828VDC			
Isolation	Output-PE (Note 5)		
	1500VAC or 2121VDC		
	Environment	Operating Temperature	
-30°C...+80°C (with derating)			
Storage Temperature			
-30°C...+80°C			
Temperature Coefficient			
±0.05%/°C			
Altitude During Operation			
5000m			
Environment	Humidity		
	20~90% RH		
	MTBF		
	>250,000 h @ 25°C (MIL-HDBK-217F, Notice 1)		
	Vibration		
	IEC60068-2-6 (10~500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes)		
	Shock		
	IEC60068-2-27		
Physical	Dimensions (L x W x H)		
	4.02 x 2.05 x 1.09 Inches (101.9 x 52.1 x 27.6 mm) Tolerance 0.5 mm		
	Weight		
220 g			
Physical	Cooling Method		
	Natural Convection / Conduction Cooling / 8CFM FAN		
	Safety	Approval	
UL 60950 UL / IEC / EN 62368			
EMC	Conducted EMI (Note 6)		
	EN55032 Class B		
	Radiated EMI (Note 6)		
EN55032 Class I Class B / Class II Class A			
EMC	EMS		
	EN55035		

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

ELECTRICAL SPECIFICATION - HD2400 SERIES

NOTE

1. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.
2. Hold-up Time measured at 90% Vout.
3. Fan Supply=12V/0.5A (max) for driving a 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 Digital Power power supply.
6. Vin at 230 VAC & 48 Vout



(After 30 minutes of burn-in)

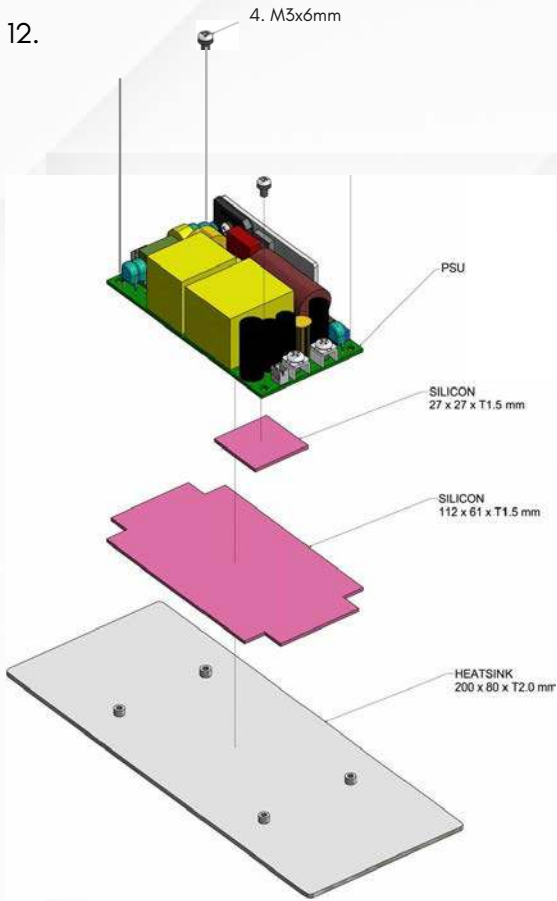
7. The FAN supply is designed to serve as the source of the additive external fan for the cooling of the power supply, enabling the full load delivery and assuring the best life span of the product. Please do not use this FAN supply to drive other devices.

For 112, 124, 148			
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

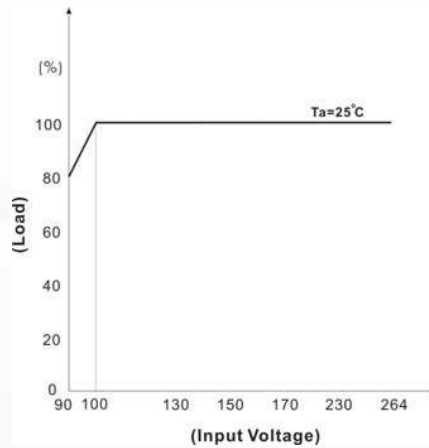
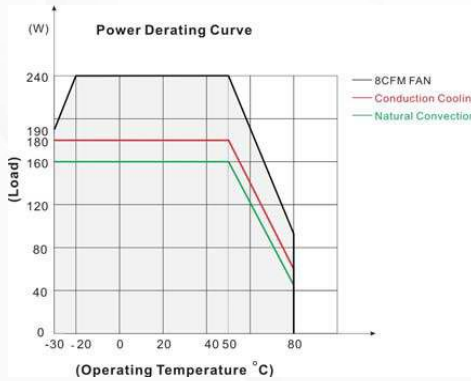
8. Please secure the power supply unit to your metal case by using the four screw holes in the corners for either Class I or Class II equipment.
9. The ambient temperature derating of 3.5 /1000m with fanless models and of 5 /1000m with fan models for operating altitude higher than 2000m(6500ft).
10. 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.
11. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

NOTE

12.

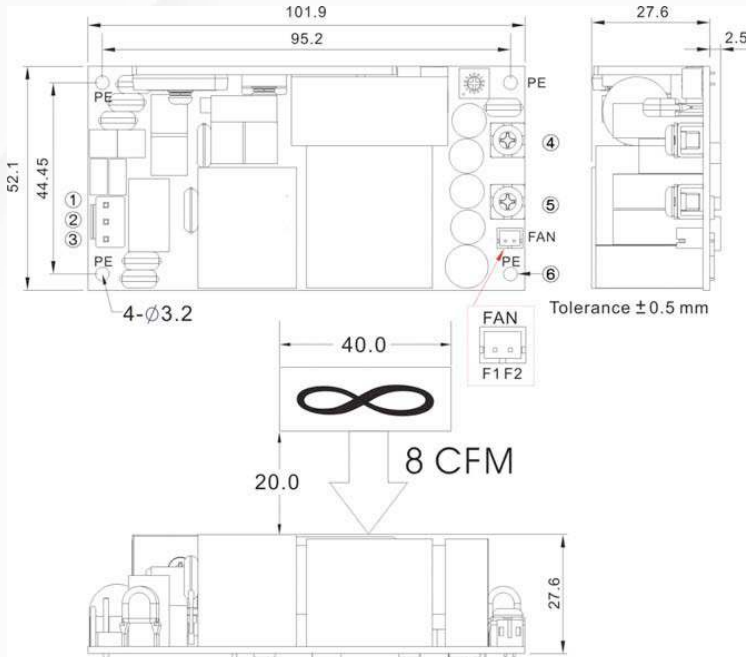


DERATING



MECHANICAL DIMENSIONS - HD2400 SERIES

Standard



Standard



Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.



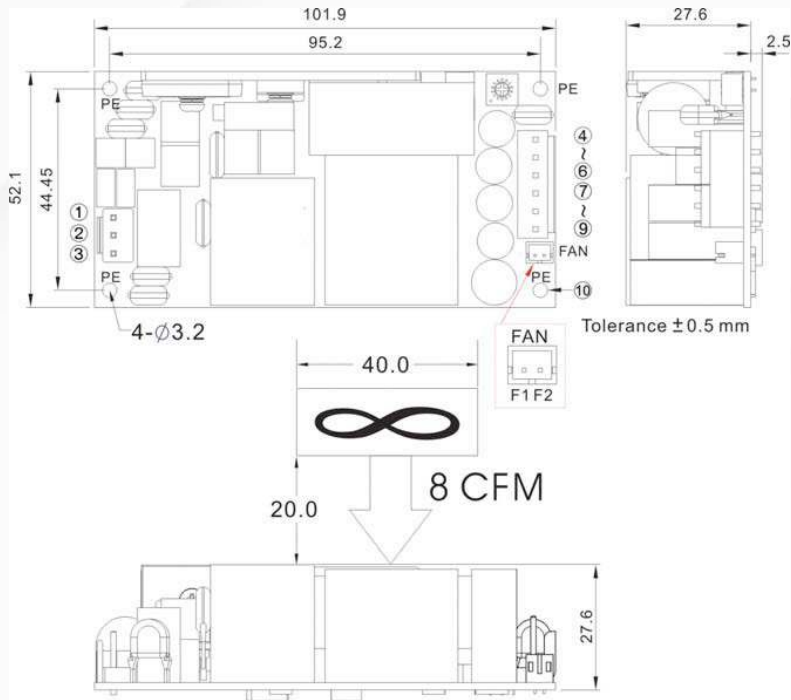
Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			
5	-DC OUT				
6	PE	—	—	—	—

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				

MECHANICAL DIMENSIONS - HD2400 SERIES

A Type



A Type



Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.

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

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				

ELECTRICAL SPECIFICATION - HD240U SERIES

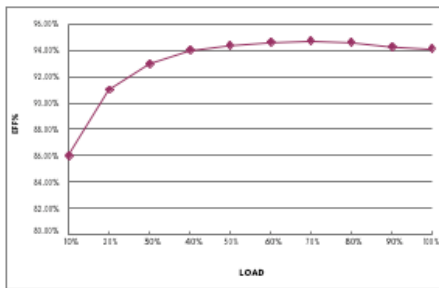
Model No.		HD240U-112	HD240U-124	HD240U-148	
Max Output Wattage (with 8CFM FAN) (W)		240 W			
Max Output Wattage (Conduction Cooling) (W)(Note 6)		240 W			
Max Output Wattage (Natural Convection) (W)		210 W (100 VAC) / 234 W (230 VAC)	215 W (100 VAC) / 240 W (230 VAC)		
Input	Voltage(Note 3)	90-264 VAC			
	Frequency (Hz)	47-63 Hz			
	Current (Full load)	< 3.0 A max. (115 VAC) / < 1.5 A max. (230 VAC)			
	Inrush Current (<2ms)	< 45 A max. (115 VAC) / < 90 A max. (230 VAC)			
	Power Factor	PF>0.9 at Full Load			
	No Load	< 0.5W (115 / 230 VAC)			
Output	Voltage (V.DC.)	12V	24V	48V	
	Voltage Adj Range (V.DC.)	±5% Output Voltage			
	Voltage Accuracy	±2%			
	Current (with 8CFM FAN) (A) (max.)	20	10	5	
	Current (Conduction Cooling) (A) (max.)	20	10	5	
	Current (Natural Convection) (A) (max.)	at 100 VAC	17.5	8.96	4.48
		at 230 VAC	19.5	10	5
	Line Regulation	±1%			
	Load Regulation (0-100%)	±1%			
	Minimum Load	0%			
	Maximum Capacitive Load	8000µF	3000µF	470µF	
	Ripple & Noise (max.)(Note 1)	1% Vout			
	Efficiency (at 230VAC)(Note 5)	92.5%	93%	94%	
Hold-up Time (at 115 VAC)(Note 2)	10 ms min.				
Protection	Over Power Protection	Auto recovery, Hiccup mode			
	Over Voltage Protection	Auto recovery			
	Overt Temperature Protection	Auto recovery			
	Short Circuit Protection	Protection level 1 (nominal) : Continuous, Auto recovery			
Protection level 2 (instantaneous high current) : Latch					
Isolation	Input-Output(Note 4)	4000VAC or 5656VDC			
	Input-PE(Note 4)	2000VAC or 2828VDC			
	Output-PE(Note 4)	1500VAC or 2121VDC			
Environment	Operating Temperature	-30°C...+80°C (with derating)			
	Storage Temperature	-30°C...+80°C			
	Temperature Coefficient	±0.05%/°C			
	Altitude During Operation	5000m			
	Humidity	20~90% RH			
	MTBF	>250,000 h @ 25°C (MIL-HDBK-217F, Notice 1)			
	Vibration	IEC60068-2-6 (10~500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes)			
Shock	IEC60068-2-27				
Physical	Dimensions (L x W x H)	4.1 x 2.46 x 1.54 Inches (104.0 x 62.5 x 39.2 mm) Tolerance ±0.5 mm			
	Weight	350 g			
	Cooling Method	Natural Convection / Conduction Cooling / 8CFM FAN			
Safety	Approval	UL 60950 UL / IEC / EN 62368			
EMC	Conducted EMI(Note 7)	EN55032 Class B			
	Radiated EMI(Note 7)	EN55032 Class I Class B / Class II Class A			
	EMS	EN55035			

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

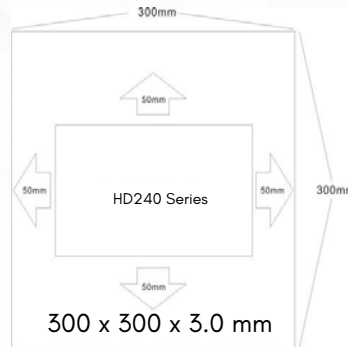
ELECTRICAL SPECIFICATION - HD240U SERIES

NOTE

1. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.
2. Hold-up Time measured at 90% Vout.
3. Please check the derating curve for more details.
4. Strongly recommend to conduct this test with DC Voltage. If customer wishes to test with AC Voltage, please disconnect all Y-Capacitors from Digital Power power supply.
5. Vin at 230 VAC & 48 Vout

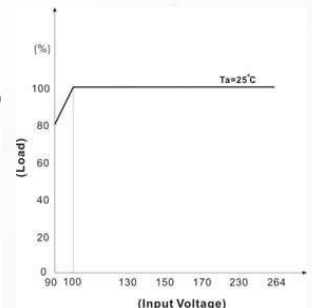
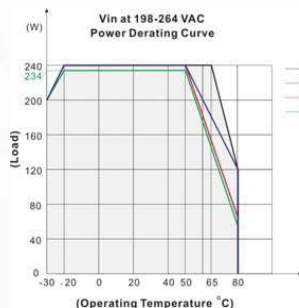
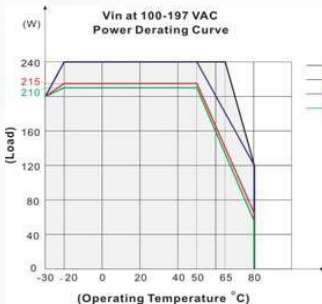


(After 30 minutes of burn-in)



6. The size of the suggested aluminum plate is shown as below. And for optimizing thermal performance, the aluminum plate must have an even and smooth surface (or coated with thermal grease), and HD240 series must be firmly mounted at the center of the aluminum plate.
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. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

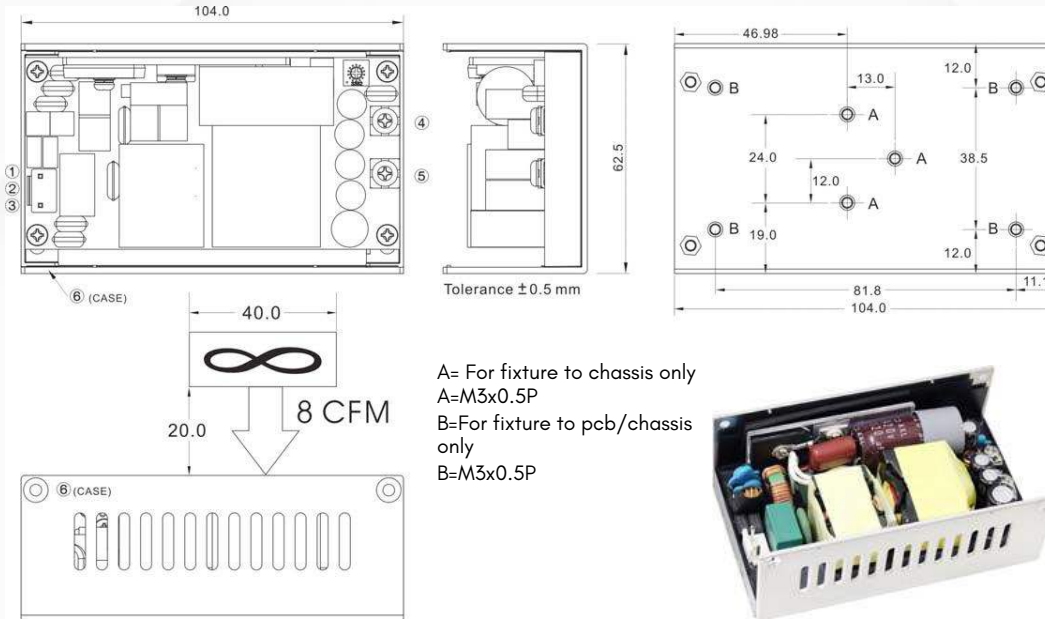
DERATING



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

MECHANICAL DIMENSIONS - HD240U SERIES

Standard



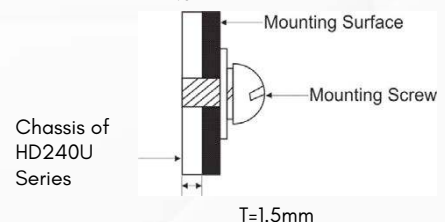
Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-4IT-PL1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			
5	-DC OUT				
6	PE	—	—	—	—

Standard



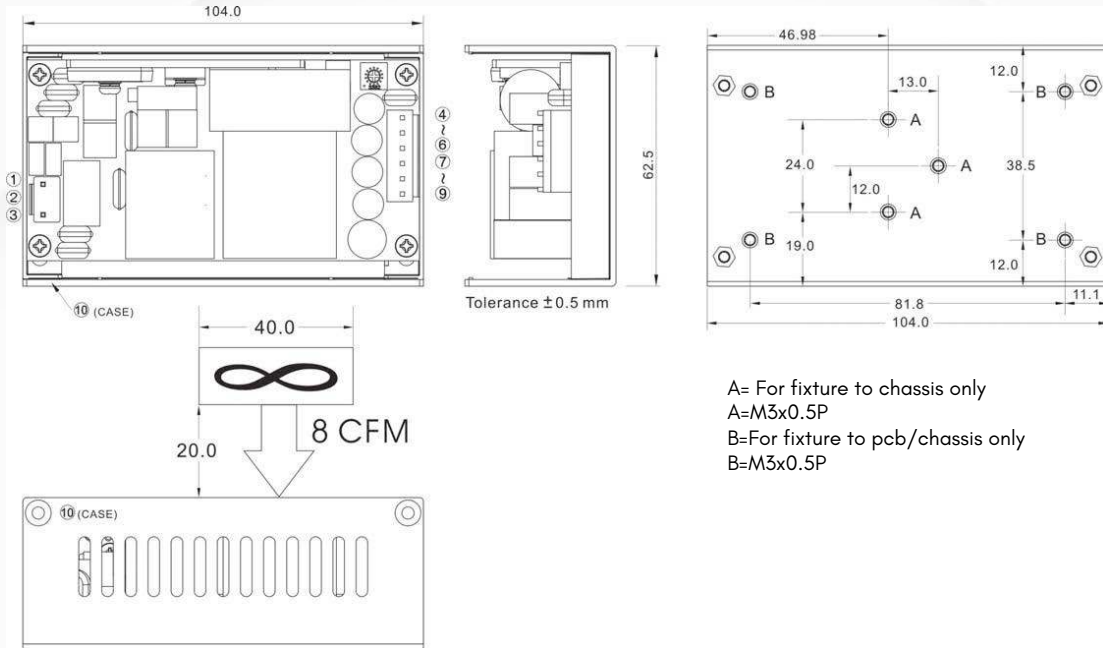
Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.

ASSEMBLY INSTRUCTIONS
U Case T=1.5mm
Customer is advised to screw into the threads no more than 1.5mm



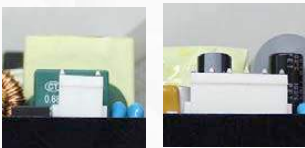
MECHANICAL DIMENSIONS - HD240U SERIES

A Type



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

A Type

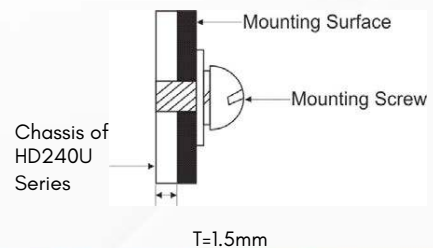


Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.

ASSEMBLY INSTRUCTIONS

U Case T=1.5mm

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



ELECTRICAL SPECIFICATION - HD240E SERIES

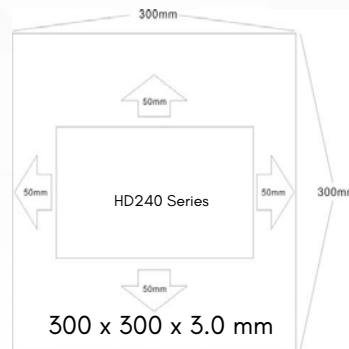
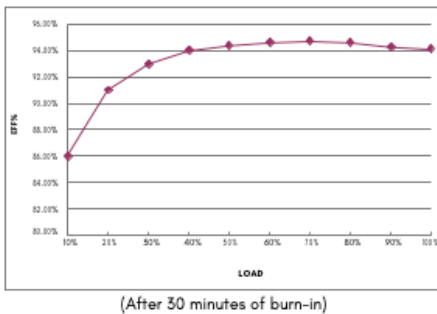
Model No.	HD240E-112	HD240E-124	HD240E-148	
Max Output Wattage (with 8CFM FAN) (W)	240 W			
Max Output Wattage (Conduction Cooling) (W) (Note 6)	240 W			
Max Output Wattage (Natural Convection) (W)	210 W (100 VAC) / 234 W (230 VAC)	215 W (100 VAC) / 240 W (230 VAC)		
Input	Voltage(Note 3)			
	90-264 VAC			
	Frequency (Hz)			
	47-65 Hz			
	Current (Full load)			
	< 3.0 A max. (115 VAC) / < 1.5 A max. (230 VAC)			
Input	Inrush Current (<2ms)			
	< 45 A max. (115 VAC) / < 90 A max. (230 VAC)			
	Power Factor			
	PF>0.9 at Full Load			
	No Load			
	< 0.5W (115 / 230 VAC)			
Output	Voltage (V.DC.)			
	12V	24V	48V	
	Voltage Adj Range (V.DC.)			
	±5% Output Voltage			
	Voltage Accuracy			
	±2%			
	Current (with 8CFM FAN) (A) (max.)			
	20	10	5	
	Current (Conduction Cooling) (A) (max.)			
	20	10	5	
	Current (Natural Convection) (A) (max.)	at 100 VAC	17.5	8.96
		at 230 VAC	19.5	10
	Line Regulation			
±1%				
Load Regulation (0-100%)				
±1%				
Minimum Load				
0%				
Maximum Capacitive Load				
8000µF	3000µF	470µF		
Ripple & Noise (max.) (Note 1)				
1% Vout				
Efficiency (at 230VAC) (Note 5)				
92.5%	93%	94%		
Hold-up Time (at 115 VAC) (Note 2)				
10 ms min.				
Protection	Over Power Protection			
	Auto recovery, Hiccup mode			
	Over Voltage Protection			
	Auto recovery			
Protection	Over Temperature Protection			
	Auto recovery			
Isolation	Short Circuit Protection			
	Protection level 1 (nominal) : Continuous, Auto recovery			
	Protection level 2 (instantaneous high current) : Latch			
Isolation	Input-Output (Note 4)			
	4000VAC or 5656VDC			
	Input-PE (Note 4)			
2000VAC or 2828VDC				
Isolation	Output-PE (Note 4)			
	1500VAC or 2121VDC			
	Operating Temperature			
-30°C...+80°C (with derating)				
Environment	Storage Temperature			
	-30°C...+80°C			
	Temperature Coefficient			
	±0.05%/°C			
	Altitude During Operation			
	5000m			
	Humidity			
	20~90% RH			
MTBF				
>250,000 h @ 25°C (MIL-HDBK-217F, Notice 1)				
Environment	Vibration			
	IEC60068-2-6 (10~500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes)			
Physical	Shock			
	IEC60068-2-27			
Physical	Dimensions (L x W x H)			
	4.1 x 2.46 x 1.54 Inches (104.0 x 62.5 x 39.2 mm) Tolerance 0.5 mm			
	Weight			
365 g				
Safety	Cooling Method			
	Natural Convection / Conduction Cooling / 8CFM FAN			
EMC	Approval			
	UL 60950 UL / IEC / EN 62368			
	Conducted EMI (Note 7)			
	EN55032 Class B			
EMC	Radiated EMI (Note 7)			
	EN55032 Class I Class B / Class II Class A			
EMS				
EN55035				

All specifications valid at normal input voltage, full load and +25°C after warm-up time unless otherwise stated.

ELECTRICAL SPECIFICATION - HD240E SERIES

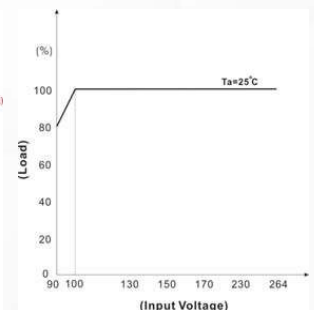
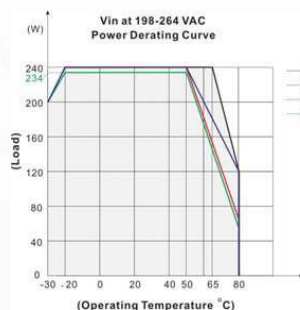
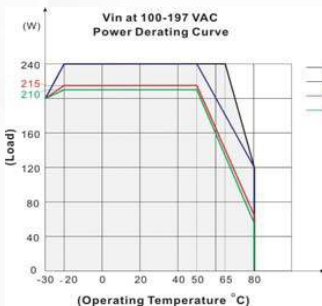
NOTE

1. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.
2. Hold-up Time measured at 90% Vout.
3. Please check the derating curve for more details.
4. Strongly recommend to conduct this test with DC Voltage. If customer wishes to test with AC Voltage, please disconnect all Y-Capacitors from Digital Power power supply.
5. Vin at 230 VAC & 48 Vout



6. The size of the suggested aluminum plate is shown as below. And for optimizing thermal performance, the aluminum plate must have an even and smooth surface (or coated with thermal grease), and HD240 series must be firmly mounted at the center of the aluminum plate.
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. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

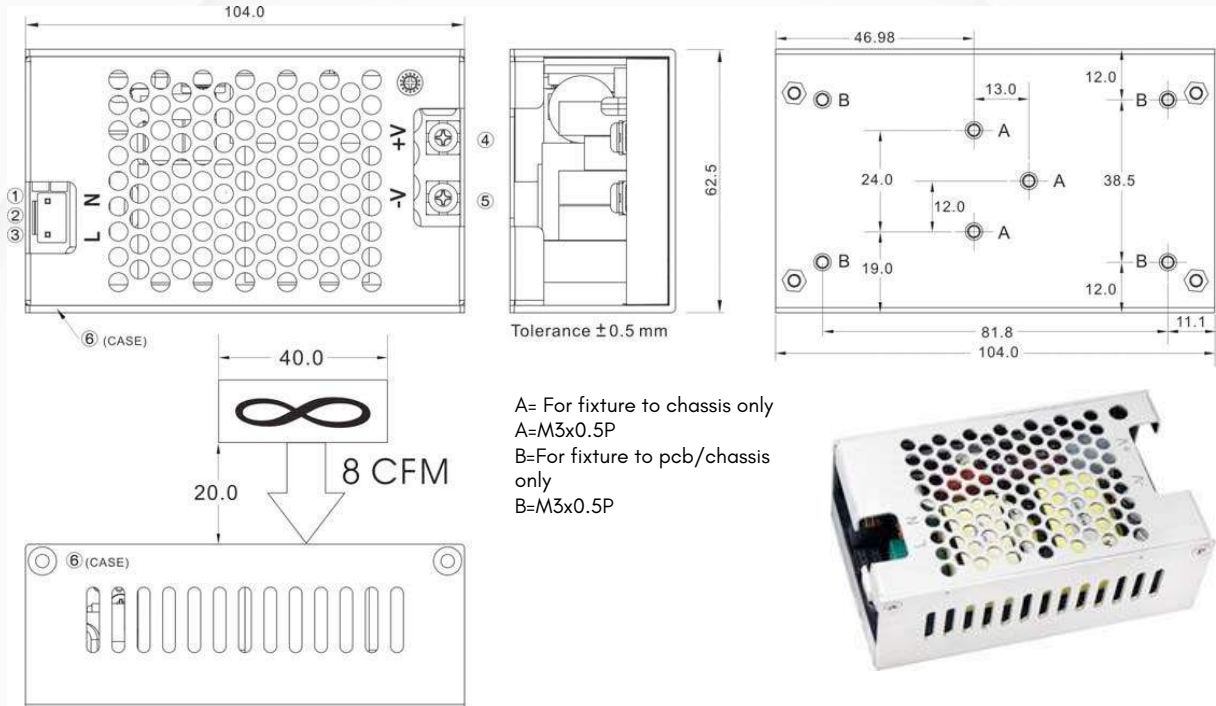
DERATING



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

MECHANICAL DIMENSIONS - HD240E SERIES

Standard

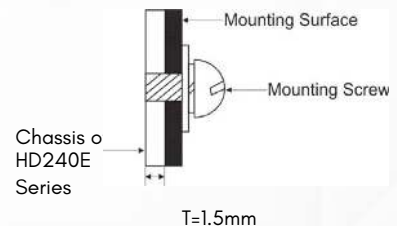


Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M3.5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			
5	-DC OUT				
6	PE	—	—	—	—

ASSEMBLY INSTRUCTIONS

U Case T=1.5mm

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



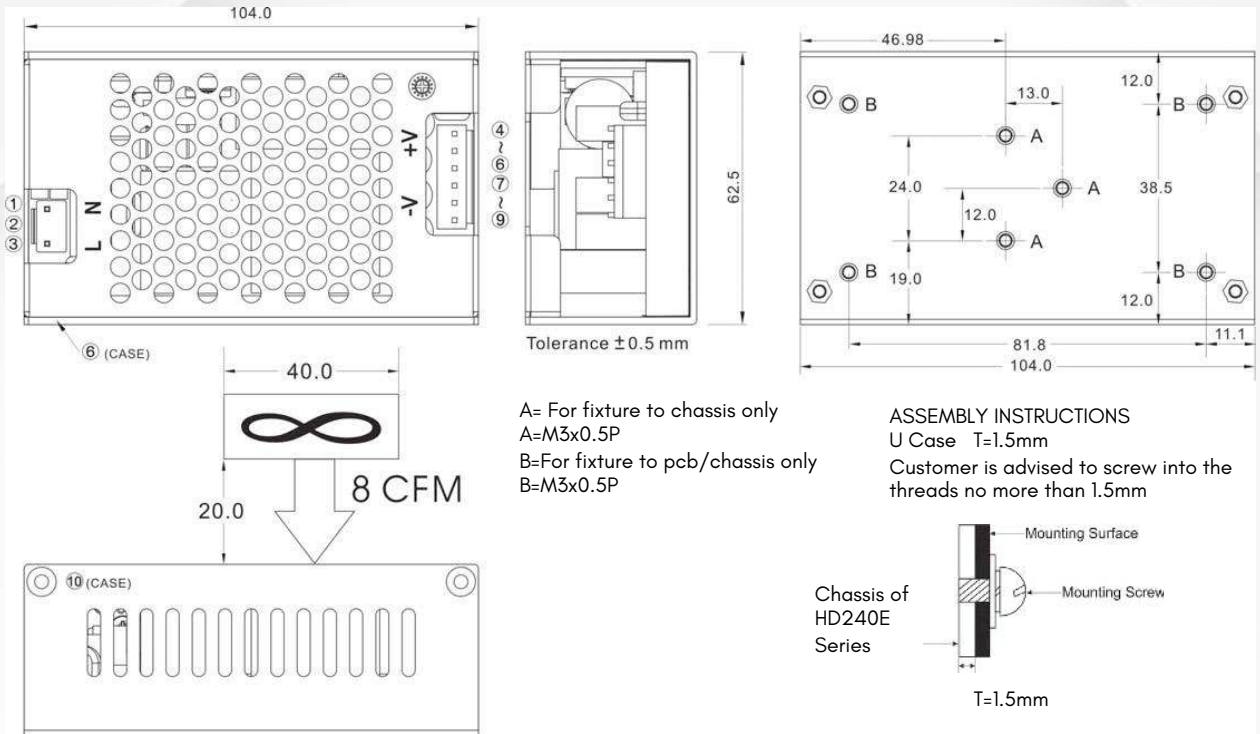
Standard



Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.

MECHANICAL DIMENSIONS - HD240E SERIES

A Type

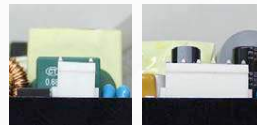


A= For fixture to chassis only
 A=M3x0.5P
 B=For fixture to pcb/chassis only
 B=M3x0.5P

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-4IT-P1.1
2	NO PIN				
3	AC IN (L)				
4~6	+DC OUT	9396-6	96T series	VHR-6N	SVH-4IT-P1.1
7~9	-DC OUT				
10	PE	—	—	—	—

A Type



Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.

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 Flexible Power Solutions
 A COOLISYS COMPANY
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