

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

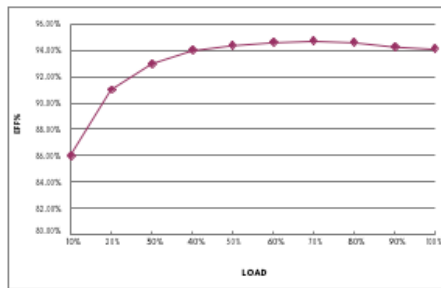
| Model No. | HD2400-112 | HD2400-124 | HD2400-148 |
|---|---|------------|------------|
| Max Output Wattage (with 8CFM FAN) (W) | 240 W | | |
| Max Output Wattage (Conduction Cooling) (W) (Note 12) | 180 W | | |
| Max Output Wattage (Natural Convection) (W) | 160 W | | |
| Input | Voltage (Note 4) | | |
| | 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 | | | |
| 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 | | | |
| 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 | | | |
| 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)

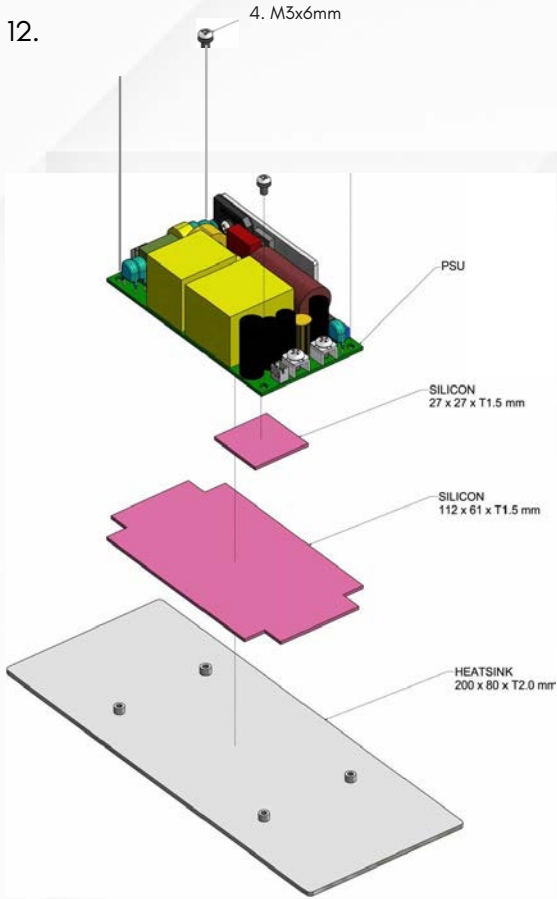
7. The FAN supply is designed to serve as the source of the additive external fan for the cooling of the power supply, enabling the full load delivery and assuring the best life span of the product. Please do not use this FAN supply to drive other devices.

| 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 |

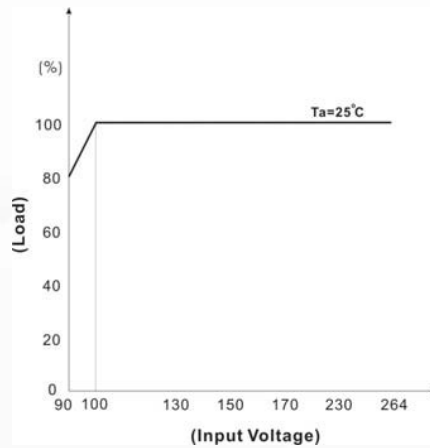
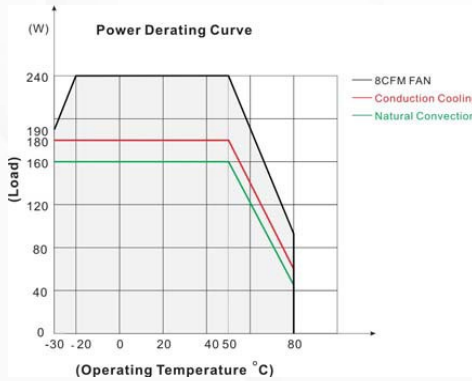
8. Please secure the power supply unit to your metal case by using the four screw holes in the corners for either Class I or Class II equipment.
9. The ambient temperature derating of 3.5 /1000m with fanless models and of 5 /1000m with fan models for operating altitude higher than 2000m(6500ft).
10.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

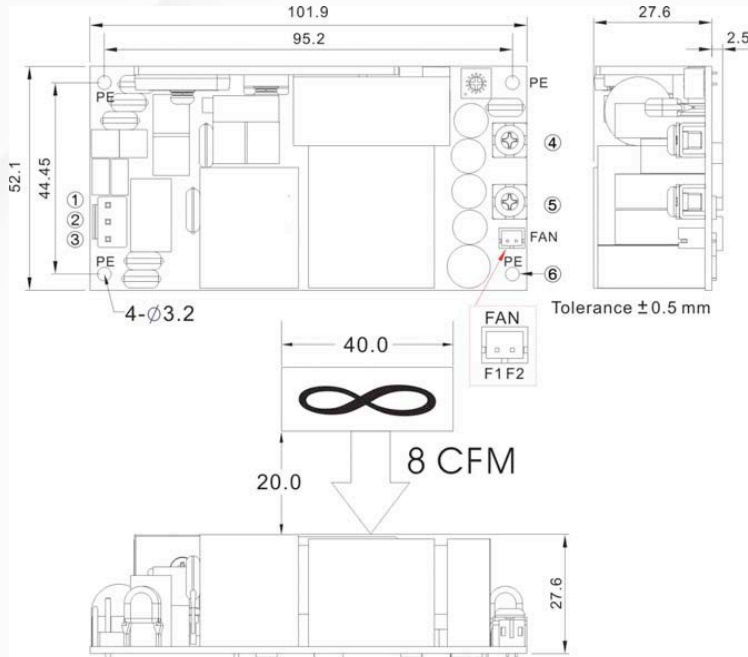


DERATING



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.



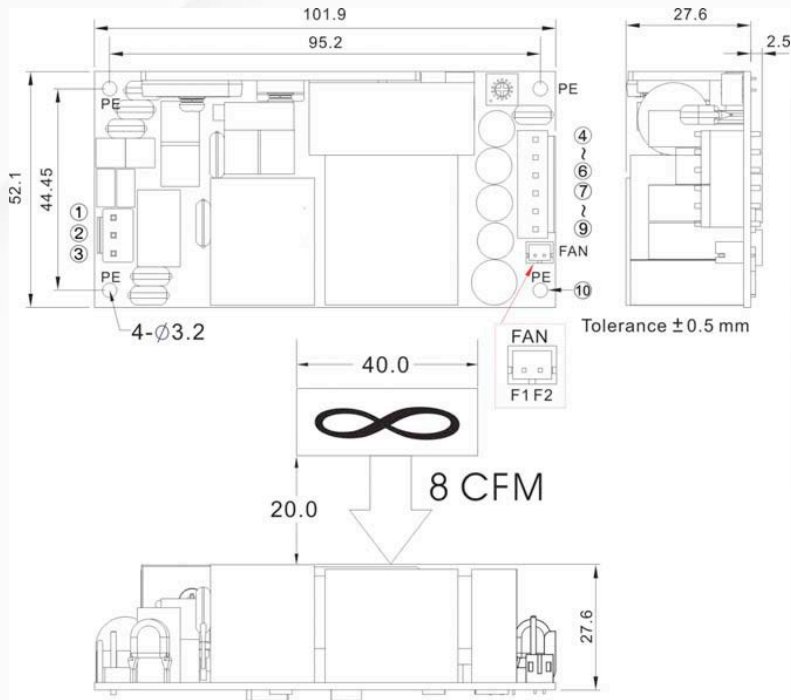
| Brands | | Alex | | JST | |
|--------|-----------|---|------------|----------------|--------------|
| PIN# | Single | Mating Housing | Terminal | Mating Housing | Terminal |
| 1 | AC IN (N) | 9396-3 | 96T series | VHR-3N | SVH-41T-P1.1 |
| 2 | NO PIN | | | | |
| 3 | AC IN (L) | | | | |
| 4 | +DC OUT | 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

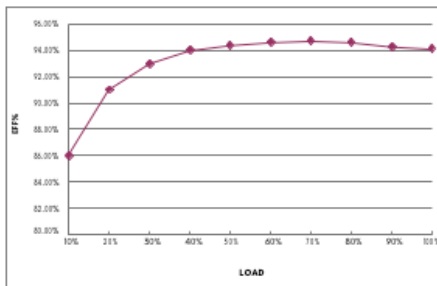
| Model No. | | HD240U-112 | HD240U-124 | HD240U-148 | |
|---|---|---|-----------------------------------|------------|------|
| Max Output Wattage (with 8CFM FAN) (W) | | 240 W | | | |
| Max Output Wattage (Conduction Cooling) (W)(Note 6) | | 240 W | | | |
| Max Output Wattage (Natural Convection) (W) | | 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.

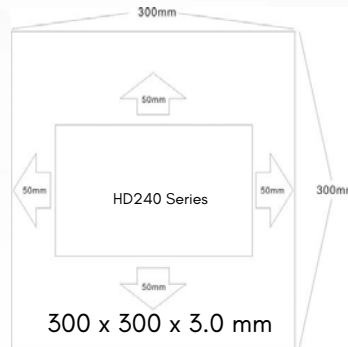
ELECTRICAL SPECIFICATION - HD240U SERIES

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

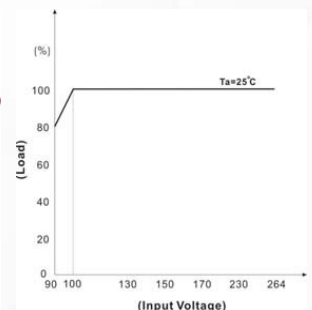
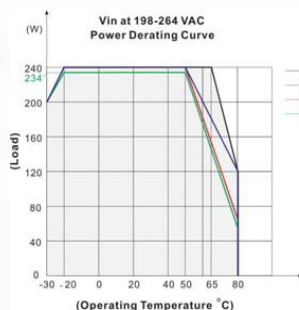
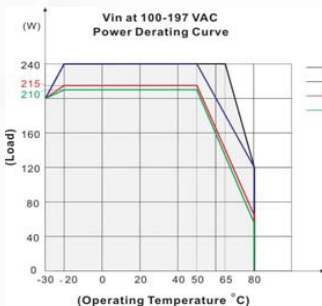


(After 30 minutes of burn-in)



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.

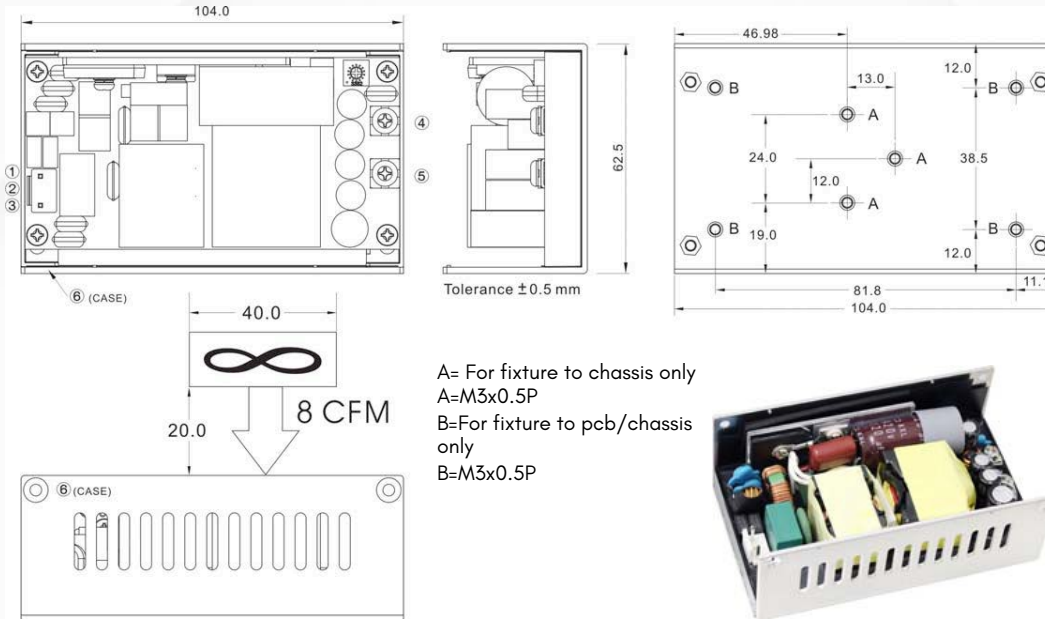
DERATING



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



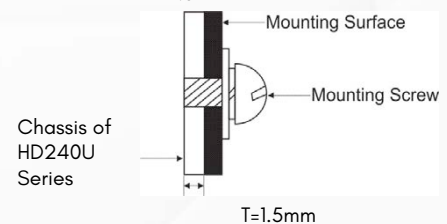
| Brands | | Alex | | JST | |
|--------|-----------|---|------------|----------------|-------------|
| PIN# | Single | Mating Housing | Terminal | Mating Housing | Terminal |
| 1 | AC IN (N) | 9396-3 | 96T series | VHR-3N | SVH-4IT-PL1 |
| 2 | NO PIN | | | | |
| 3 | AC IN (L) | | | | |
| 4 | +DC OUT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

Standard



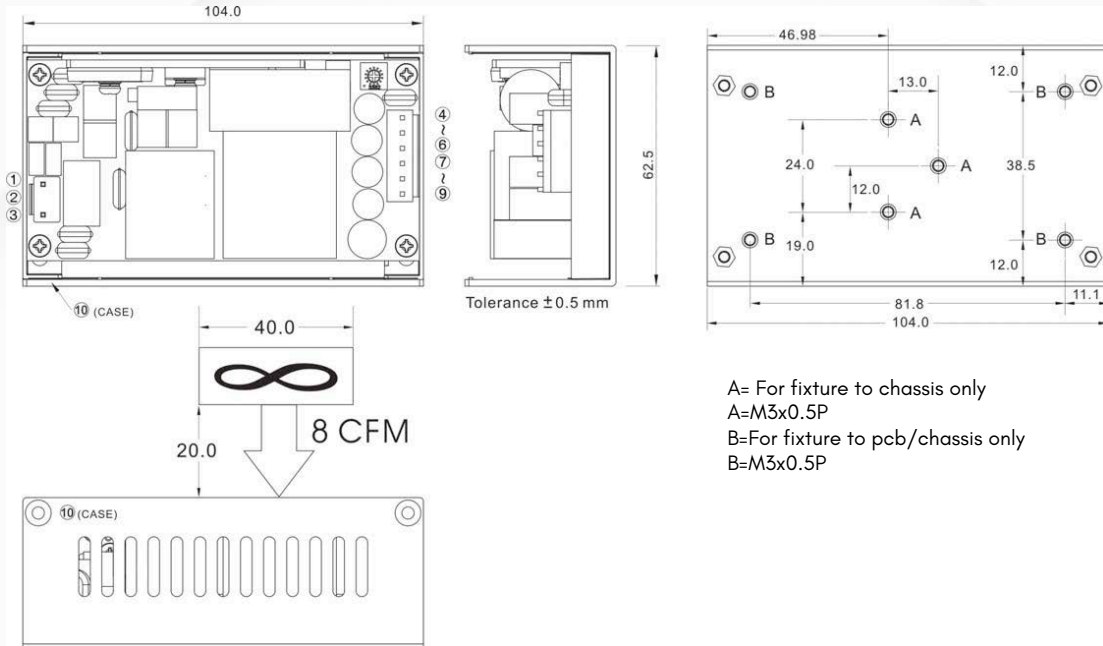
Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.

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



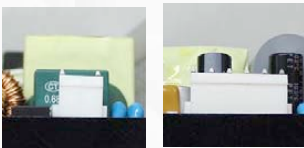
MECHANICAL DIMENSIONS - HD240U SERIES

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

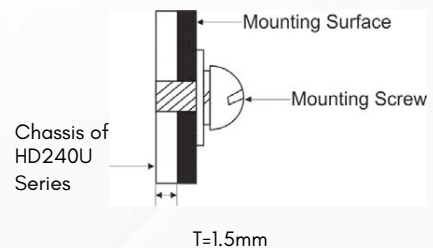


Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.

ASSEMBLY INSTRUCTIONS

U Case T=1.5mm

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



ELECTRICAL SPECIFICATION - HD240E SERIES

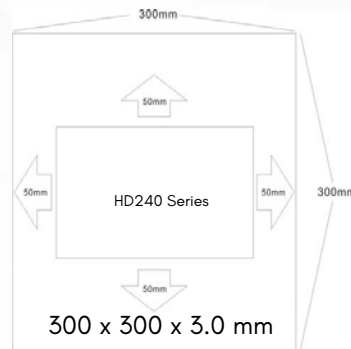
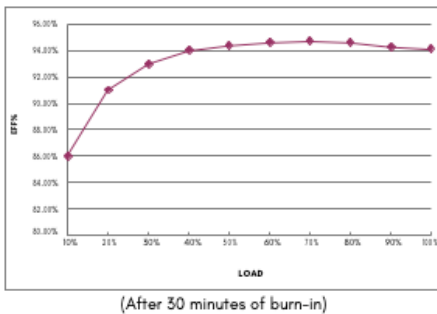
| | | | | | |
|--|---|---|------------|-----------------------------------|------|
| Model No. | | HD240E-112 | HD240E-124 | HD240E-148 | |
| Max Output Wattage (with 8CFM FAN) (W) | | 240 W | | | |
| Max Output Wattage (Conduction Cooling) (W) (Note 6) | | 240 W | | | |
| Max Output Wattage (Natural 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) | | | |
| | 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 | | | |
| | 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 (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 | 365 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 - HD240E SERIES

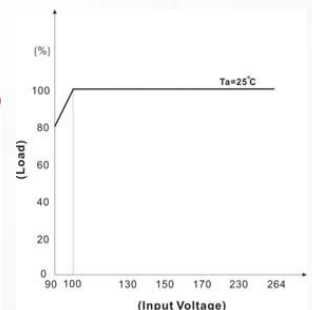
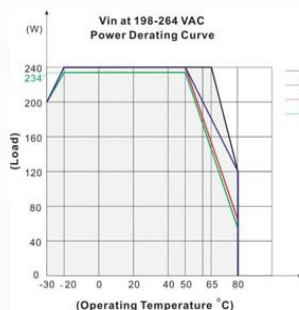
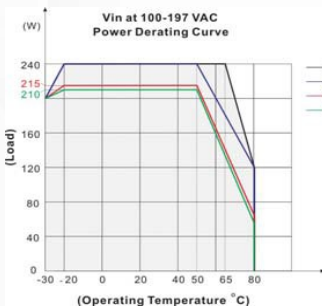
NOTE

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.

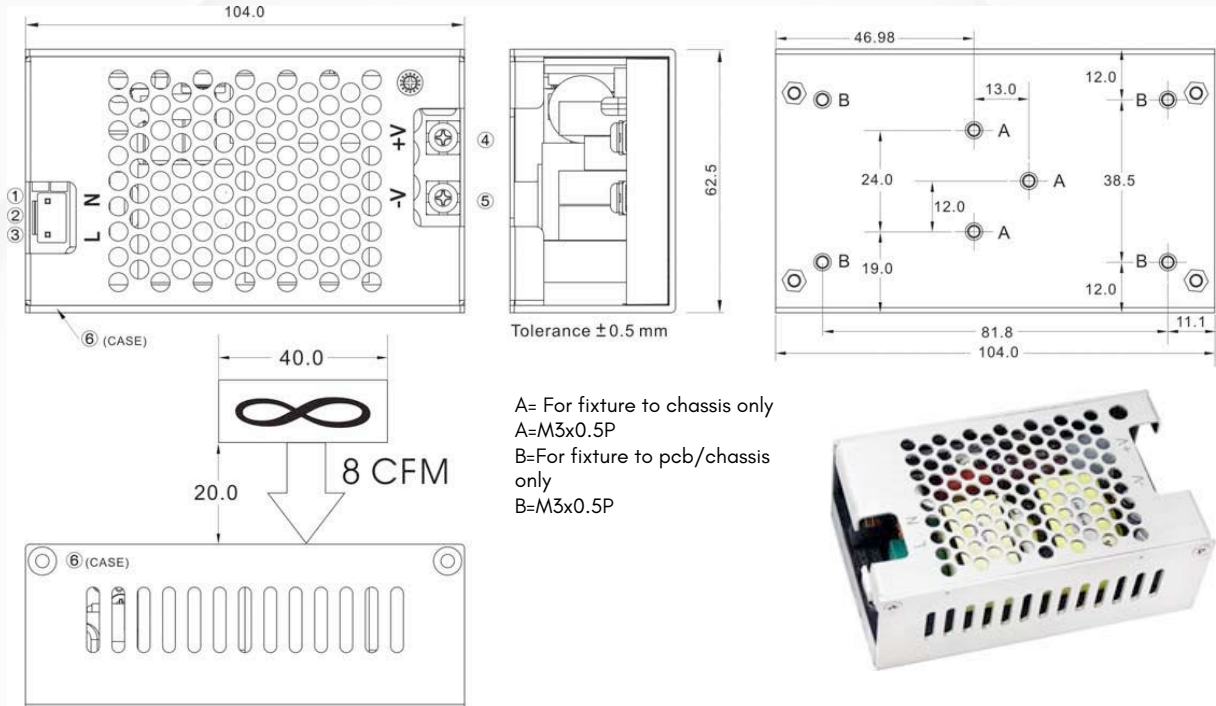
DERATING



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

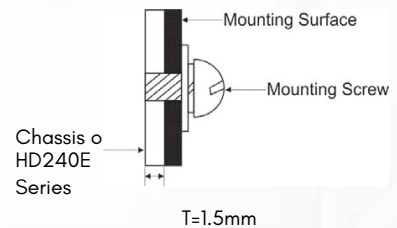


| Brands | | Alex | | JST | |
|--------|-----------|---|------------|----------------|--------------|
| PIN# | Single | Mating Housing | Terminal | Mating Housing | Terminal |
| 1 | AC IN (N) | 9396-3 | 96T series | VHR-3N | SVH-41T-P1.1 |
| 2 | NO PIN | | | | |
| 3 | AC IN (L) | | | | |
| 4 | +DC OUT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

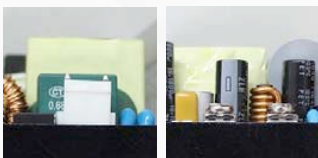
ASSEMBLY INSTRUCTIONS

U Case T=1.5mm

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



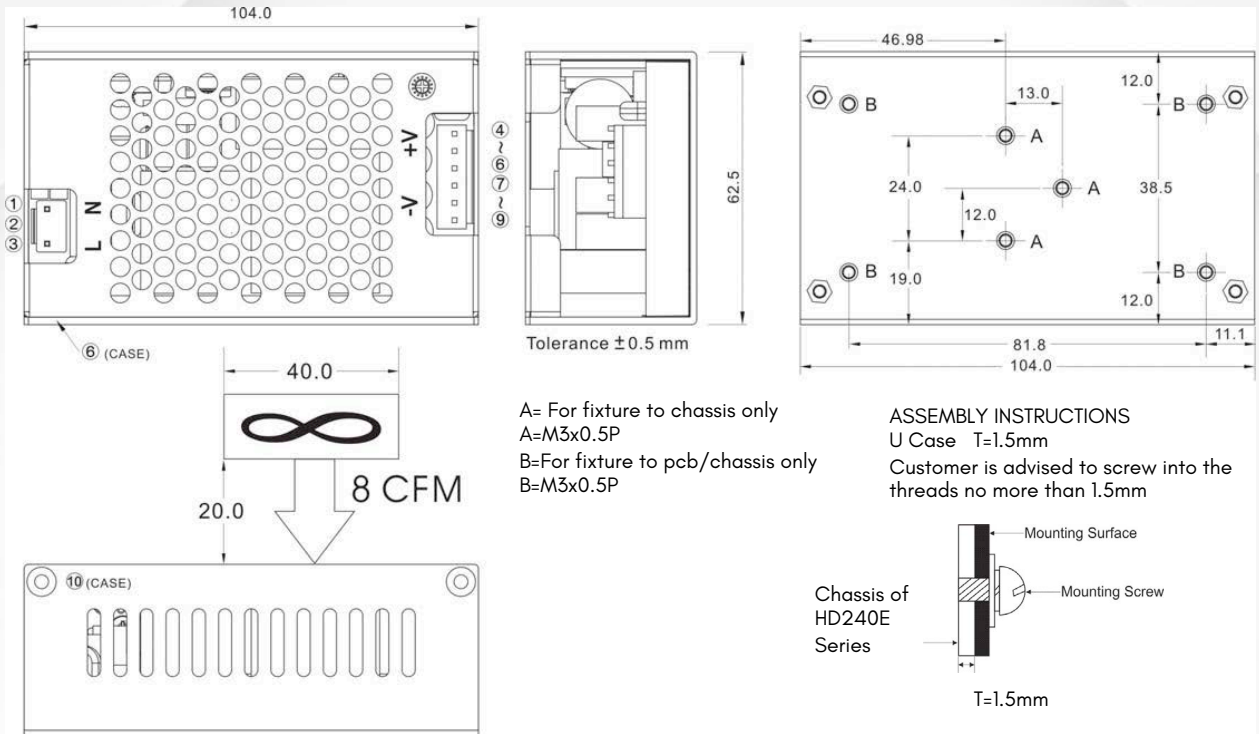
Standard



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



| 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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Digital Power Corporation designs and manufactures full custom, value added and standard comprehensive power solutions for the most demanding applications in the defense, healthcare, telecom, and industrial markets.