

HDM240 SERIES

AC-DC MEDICAL SWITCHING PSU - 240 WATT



KEY FEATURES

Digital Power's HDM240 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, 15V, 24V and 48V. Featured with compact, low profile footprint, and best-in-class performance, HDM240 Series are optimal for Medical Applications.

Designed with energy saving in mind, Digital Power's HDM240 Series boasts not only high operating efficiency up to 94%, but also high-power density with full input range of 90-264Vac.

HDM240 operates over wide temperature range from -30°C to +70°C with complete protections and certified to UL / IEC / EN 60601 3.1 Edition Safety Approvals.

PRODUCT SPECIFICATION

Enclosed, Open Frame, U Bracket Switching Power Supply

- Cooling by Free Air Convection
- 160 Watts and 240 Watt with 10CFM Forced Air
- 4000VAC Input to Output 2MOPP Insulation
- High Efficiency up to 94%
- With P.F.C. Function >0.9
- $<0.5W$ No Load Input Power
- Built-in 12V / 0.5A Fan Supply
- EMI for Both Class I (with PE) and Class II (without PE) Configuration
- Suitable for BF Application with Appropriate System Consideration
- Safety Approvals: UL / IEC / EN 60601 3.1 Edition & UL / IEC / EN 60950 AM2
- Ultra Compact Size

HDM240O: 4.1 x 2.05 x 1.087 Inches

HDM240U: 4.1 x 2.44 x 1.544 Inches

HDM240E: 4.1 x 2.44 x 1.99 Inches₂

ELECTRICAL SPECIFICATION - HDM2400 SERIES

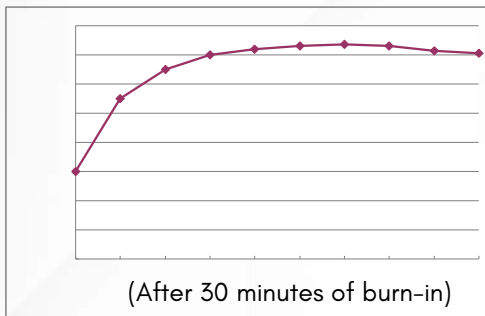
Model No.	HDM2400-112	HDM2400-115	HDM2400-124	HDM2400-148
Max Output Wattage (with 10CFM FAN) (W)	240 W			
Max Output Wattage (Free air Convection) (W)	160 W			
Input	Voltage (Note 4)			
	90-264 VAC			
	Frequency (Hz)			
	47-63 Hz			
	Current (Full load)			
	< 3.0 A max. (115 VAC) / < 1.5 A max. (230 VAC)			
	Inrush Current (<2ms)			
< 45 A max. (115 VAC) / < 90 A max. (230 VAC)				
Output	Leakage Current			
	< 0.1mA / 264 VAC (Touch Current)			
	Power Factor			
	PF>0.9 at Full Load			
	No Load			
	< 0.5W (115 / 230 VAC)			
	Output	Voltage (V.DC.)		
12V		15V	24V	48V
Voltage Adj Range (V.DC.)				
±4% Output Voltage				
Voltage Accuracy				
±2%				
Current (with 10CFM FAN) (A) (max.)				
20		16	10	5
Current (Free air Convection) (A) (max.)				
13.3		10.667	6.66	3.33
Line Regulation				
±1%				
Load Regulation (0-100%)				
±1%				
Minimum Load				
0%				
Maximum Capacitive Load				
8000µF	2000µF	3000µF	470µF	
Ripple & Noise (max.) (Note 1)				
1% Vout				
Efficiency (at 230VAC) (Note 6)				
92.5%	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				
Isolation	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...+70°C (with derating)			
	Storage Temperature			
	-30°C...+85°C			
	Temperature Coefficient			
	±0.05%/°C			
	Altitude During Operation			
	5000m			
	Humidity			
20~90% RH				
Physical	Atmospheric Pressure			
	56 kPa to 106 kPa			
	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			
	Dimensions (L x W x H)			
4.1 x 2.05 x 1.087 Inches (103.9 x 52.0 x 27.6 mm) Tolerance 0.5 mm				
Physical	Weight			
	234 g			
	Cooling Method			
Free convection / 10 CFM FAN				
Safety	Approval			
	Others: UL / IEC / EN 60601 3.1 st Edition & UL / IEC / EN 60950 AM2			
Safety	Approval / Meet			
	115: UL / IEC / EN 60601 3.1 st Edition / UL / IEC / EN 60950 AM2 (meet)			
EMC	Conducted EMI (Note 8)			
	EN55011 Conducted Class B			
	Radiated EMI (Note 8)			
EN55011 Class I class B / Class II class A				
EMS				
EN60601-1-2 4th edition				

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

ELECTRICAL SPECIFICATION - HDM2400 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



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.

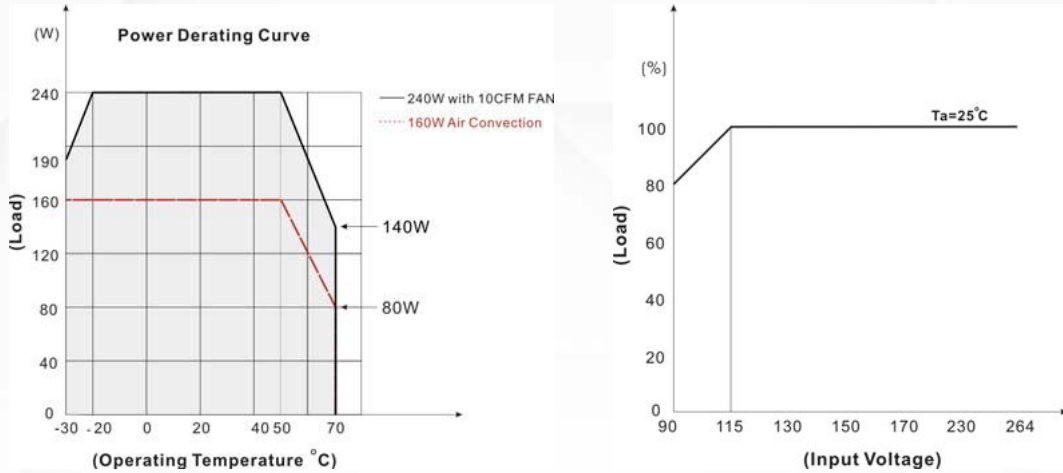
For 112, 124, 148			
Main Output Power	FAN Voltage (at 0.1A)	FAN Voltage (at 0.25A)	FAN Voltage (at 0.5A)
25%	12.1V	11.8V	11.5V
50%	12.2V	11.9V	11.7V
75%	12.3V	12.0V	11.8V
100%	12.5V	12.2V	11.9V

For 115			
Main Output Power	FAN Voltage (at 0.1A)	FAN Voltage (at 0.25A)	FAN Voltage (at 0.5A)
25%	10.8V	10.2V	9.3V
50%	10.9V	10.3V	9.4V
75%	10.9V	10.4V	9.5V
100%	11.0V	10.4V	9.5V

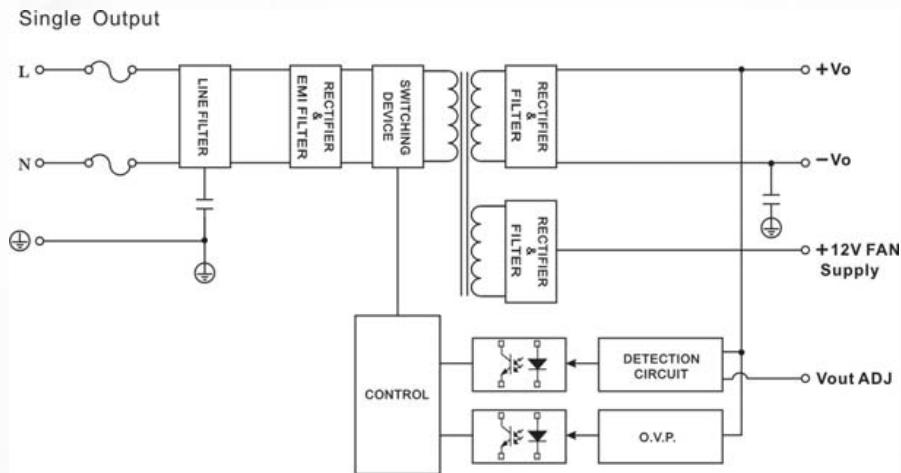
8. Please secure the power supply unit to your metal case by using the four screw holes in the corners for either Class I or Class II equipment
9. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

ELECTRICAL SPECIFICATION - HDM240O SERIES

DERATING

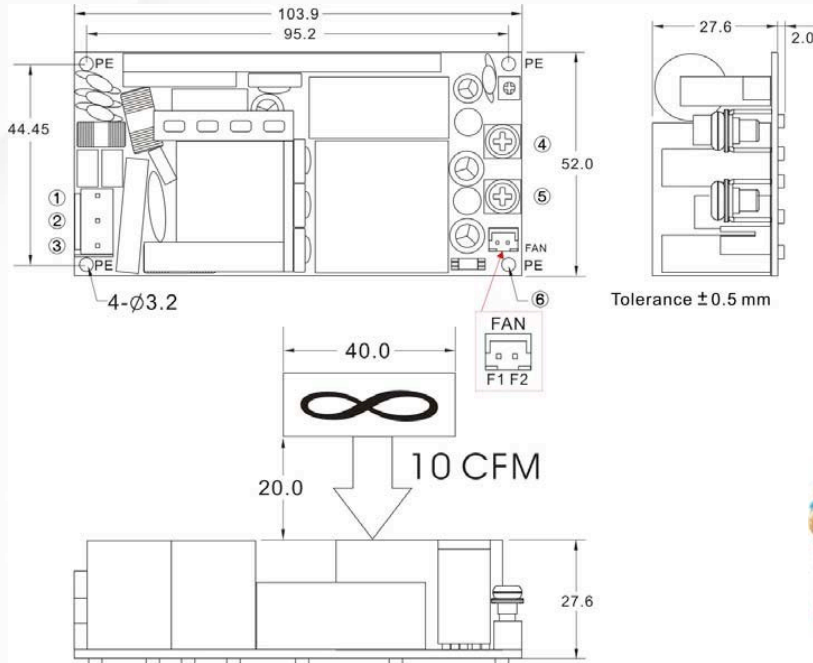


BLOCK DIAGRAM



MECHANICAL DIMENSIONS - HDM240O SERIES

Standard



Standard



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



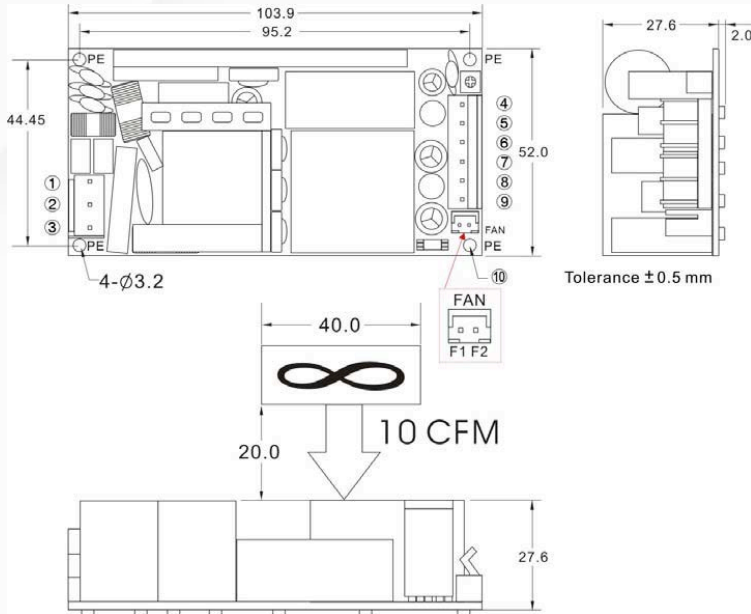
Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-4IT-P1.1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			
5	-DC OUT				
6	PE	—	—	—	—

Connector Pin (FAN)

Brands		Cherng Weei		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+AUX OUT	CX-H250-02	CX-T2501	XHP-2	SXH-002T-P0.6
F2	-AUX OUT				

MECHANICAL DIMENSIONS - HDM240O 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-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	—	—	—	—

Connector Pin (FAN)					
Brands		Cheng Weei		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+AUX OUT	CX-H250-02	CX-T2501	XHP-2	SXH-002T-P0.6
F2	-AUX OUT				

ELECTRICAL SPECIFICATION - HDM240U SERIES

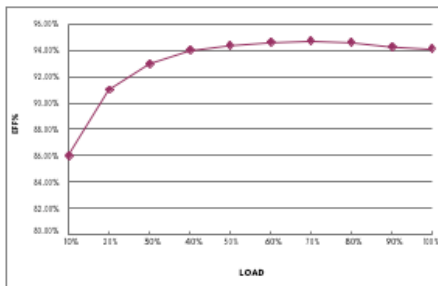
Model No.		HDM240U-112	HDM240U-115	HDM240U-124	HDM240U-148
Max Output Wattage (with 10CFM FAN) (W)		240 W			
Max Output Wattage (Free air Convection) (W)		160 W			
Input	Voltage (Note 4)	90-264 VAC			
	Frequency (Hz)	47-63 Hz			
	Current (Full load)	< 3.0 A max. (115 VAC) / < 1.5 A max. (230 VAC)			
	Inrush Current (<2ms)	< 45 A max. (115 VAC) / < 90 A max. (230 VAC)			
	Leakage Current	< 0.1mA / 264 VAC (Touch Current)			
	Power Factor	PF>0.9 at Full Load			
	No Load	< 0.5W (115 / 230 VAC)			
Output	Voltage (V.DC.)	12V	15V	24V	48V
	Voltage Adj Range (V.DC.)	±4% Output Voltage			
	Voltage Accuracy	±2%			
	Current (with 10CFM FAN) (A) (max.)	20	16	10	5
	Current (Free air Convection) (A) (max.)	13.3	10.667	6.66	3.33
	Line Regulation	±1%			
	Load Regulation (0-100%)	±1%			
	Minimum Load	0%			
	Maximum Capacitive Load	8000µF	2000µF	3000µF	470µF
	Ripple & Noise (max.) (Note 1)	1% Vout			
	Efficiency (at 230VAC) (Note 6)	92.5%	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 5)	4000VAC or 5656VDC			
	Input-PE (Note 5)	2000VAC or 2828VDC			
	Output-PE (Note 5)	1500VAC or 2121VDC			
Environment	Operating Temperature	-30°C...+70°C (with derating)			
	Storage Temperature	-30°C...+85°C			
	Temperature Coefficient	±0.05%/°C			
	Altitude During Operation	5000m			
	Humidity	20~90% RH			
	Atmospheric Pressure	56 kPa to 106 kPa			
	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)			
Physical	Shock	IEC60068-2-27			
	Dimensions (L x W x H)	4.1 x 2.44 x 1.544 Inches (104.0 x 62.0 x 39.2 mm) Tolerance 0.5 mm			
	Weight	297 g			
Safety	Cooling Method	Free convection / 10 CFM FAN			
	Approval	Others: UL / IEC / EN 60601 3.1 st Edition & UL / IEC / EN 60950 AM2			
	Approval / Meet	115: UL / IEC / EN 60601 3.1 st Edition / UL / IEC / EN 60950 AM2 (meet)			
EMC	Conducted EMI (Note 8)	EN55011 Conducted Class B			
	Radiated EMI (Note 8)	EN55011 Class I class B / Class II class A			
	EMS	EN60601-1-2 4th edition			

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

ELECTRICAL SPECIFICATION - HDM240U 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)

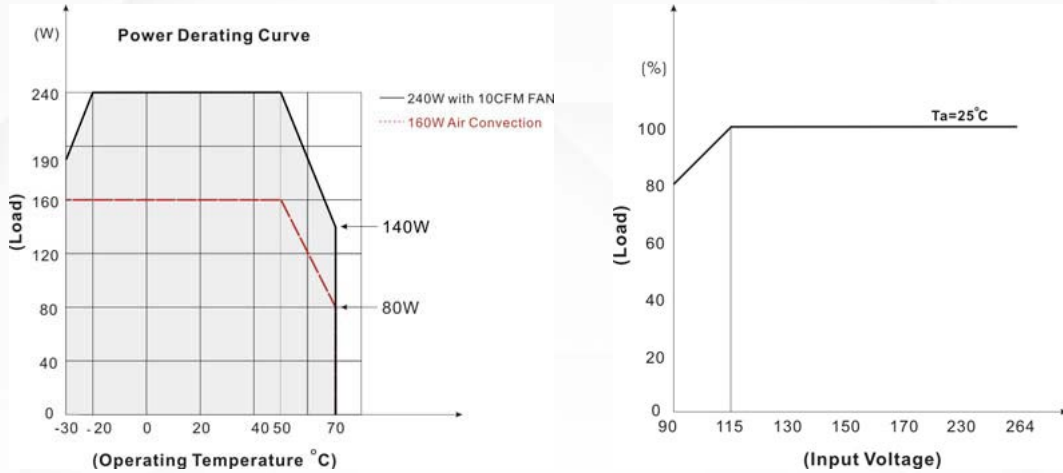
7. The FAN supply is designed to serve as the source of the additive external fan for the cooling of the power supply, enabling the full load delivery and assuring the best life span of the product. Please do not use this FAN supply to drive other devices.

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

For 115			
Main Output Power	FAN Voltage (at 0.1A)	FAN Voltage (at 0.25A)	FAN Voltage (at 0.5A)
25%	10.8V	10.2V	9.3V
50%	10.9V	10.3V	9.4V
75%	10.9V	10.4V	9.5V
100%	11.0V	10.4V	9.5V

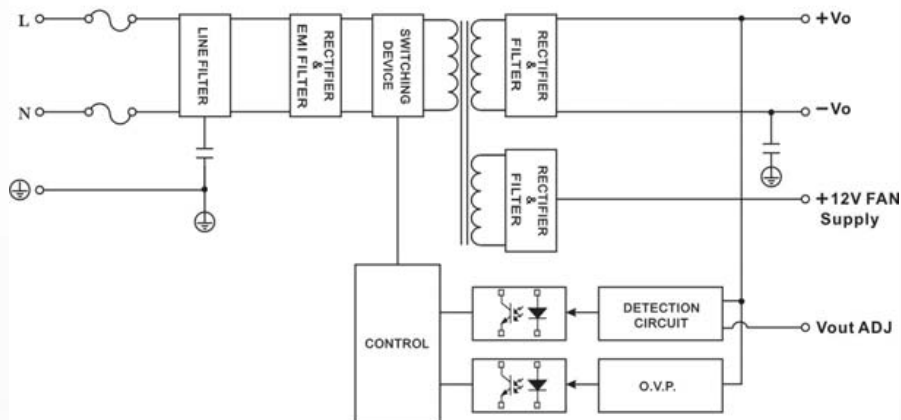
8. Please secure the power supply unit to your metal case by using the four screw holes in the corners for either Class I or Class II equipment
9. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

DERATING



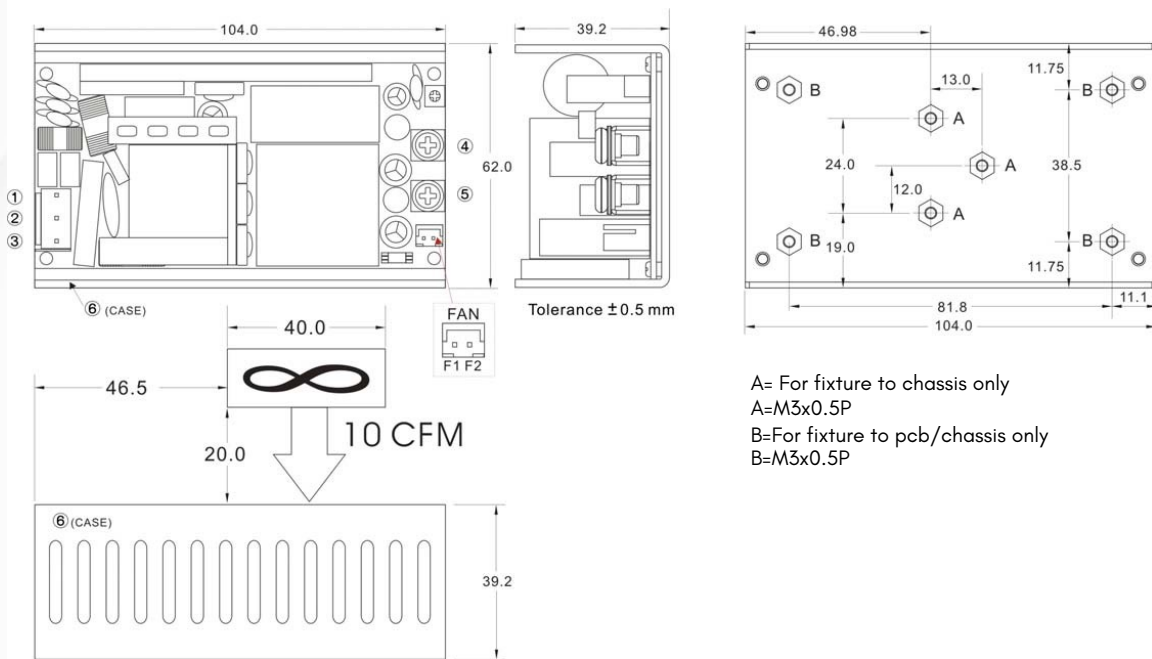
BLOCK DIAGRAM

Single Output



MECHANICAL DIMENSIONS - HDM240U SERIES

Standard



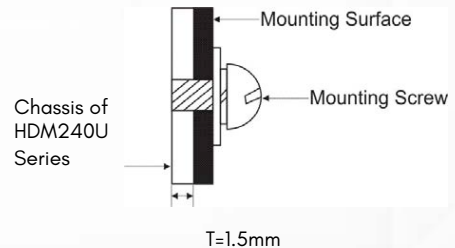
A= For fixture to chassis only
A=M3x0.5P
B=For fixture to pcb/chassis only
B=M3x0.5P

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	+DC OUT	Terminal : M5 Pan HD screw in 2 positions			
5	-DC OUT	Torque to 8 lbs-in(90 cNm) max.			
6	PE	-	-	-	-

ASSEMBLY INSTRUCTIONS

U Case T=1.5mm

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



Standard

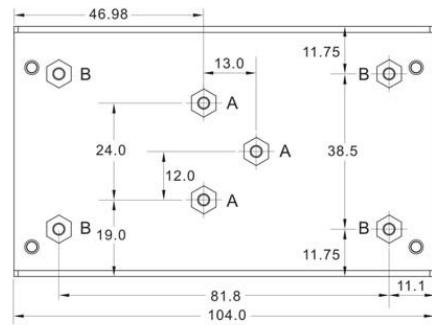
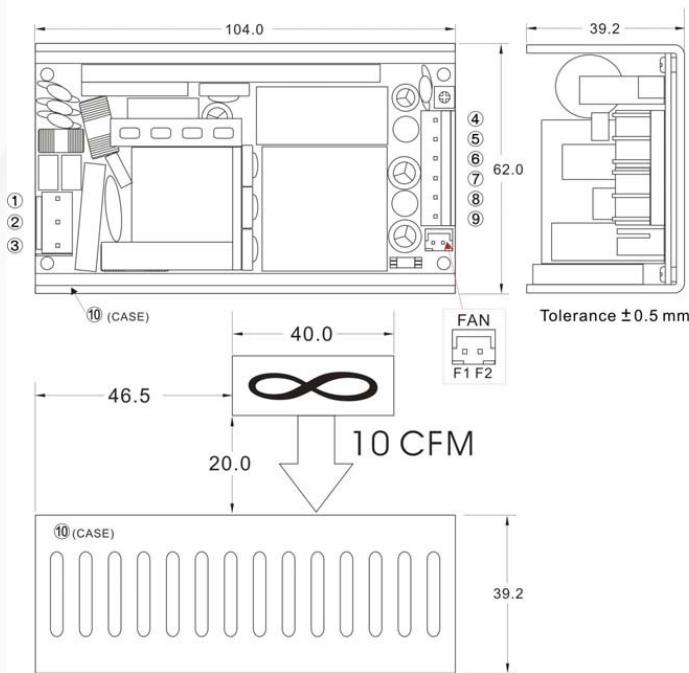


Please refer to the types of terminal block; the pictures shown are for illustration purpose only, actual product may vary.



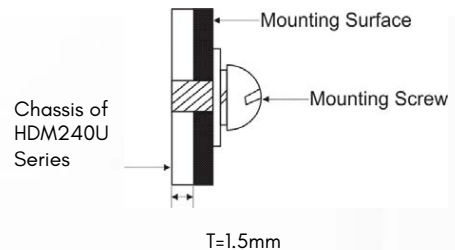
MECHANICAL DIMENSIONS - HDM240U SERIES

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-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				
10	PE	-	-	-	-

Connector Pin (FAN)					
Brands		Cherng Weei		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+AUX OUT	CX-H250-02	CX-T2501	XHP-2	SXH-002T-P0.6
F2	-AUX OUT				

A Type



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

ELECTRICAL SPECIFICATION - HDM240E SERIES

Model No.	HDM240E-112	HDM240E-115	HDM240E-124	HDM240E-148	
Max Output Wattage (with 10CFM FAN) (W)	240 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)			
	Inrush Current (<2ms)	< 45 A max. (115 VAC) / < 90 A max. (230 VAC)			
	Leakage Current	< 0.1mA / 264 VAC (Touch Current)			
	Power Factor	PF>0.9 at Full Load			
Output	Voltage (V.DC.)	12V	15 V	24V	48V
	Voltage Adj Range (V.DC.)	±4% Output Voltage			
	Voltage Accuracy	±2%			
	Current (A) (max.)	20	16	10	5
	Line Regulation	±1%			
	Load Regulation (0-100%)	±1%			
	Minimum Load	0%			
	Maximum Capacitive Load	8000µF	2000µF	3000µF	470µF
	Ripple & Noise (max.) (Note 1)	1% Vout			
	Efficiency (at 230VAC) (Note 6)	92%	92%	92.5%	93%
	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 5)	4000VAC or 5656VDC			
	Input-PE (Note 5)	2000VAC or 2828VDC			
	Output-PE (Note 5)	1500VAC or 2121VDC			
Environment	Operating Temperature	-30°C...+70°C (with derating)			
	Storage Temperature	-30°C...+85°C			
	Temperature Coefficient	±0.05%/°C			
	Altitude During Operation	5000m			
	Humidity	20~90% RH			
	Atmospheric Pressure	56 kPa to 106 kPa			
	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 2.44 x 1.99 Inches (104.0 x 62.0 x 50.5 mm) Tolerance 0.5 mm			
	Weight	328 g			
Safety	Approval	Others: UL / IEC / EN 60601 3.1 st Edition & UL / IEC / EN 60950 AM2			
	Approval / Meet	115: UL / IEC / EN 60601 3.1 st Edition / UL / IEC / EN 60950 AM2 (meet)			
EMC	Conducted EMI (Note 7)	EN55011 Conducted Class B			
	Radiated EMI (Note 7)	EN55011 Class I class B / Class II class A			
	EMS	EN60601-1-2 4th edition			

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

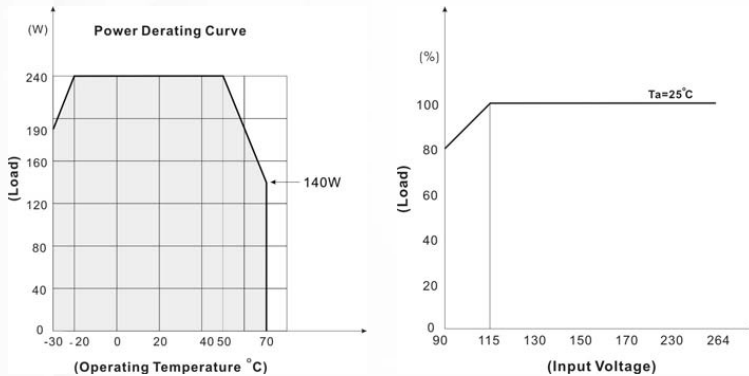
ELECTRICAL SPECIFICATION - HDM240E SERIES

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. Main Vout must be >50% Load, 12V (Aux) / 0.5A.
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. After 30 minutes of burn-in
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. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing.

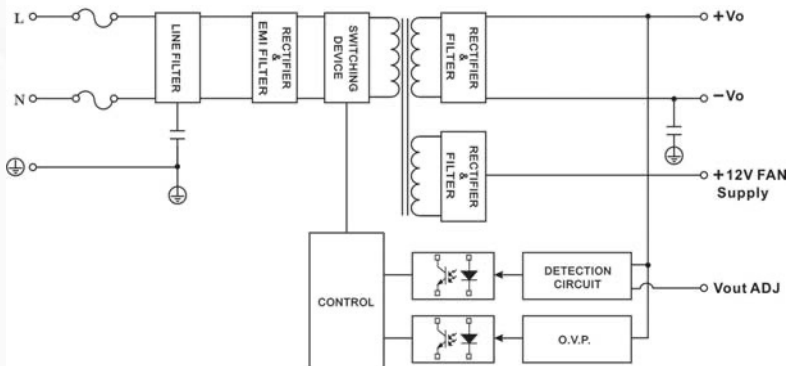
DERATING

If the input voltage is below 99VAC, the product can be used only in an environment where temperature is higher than -10 degrees Celsius.



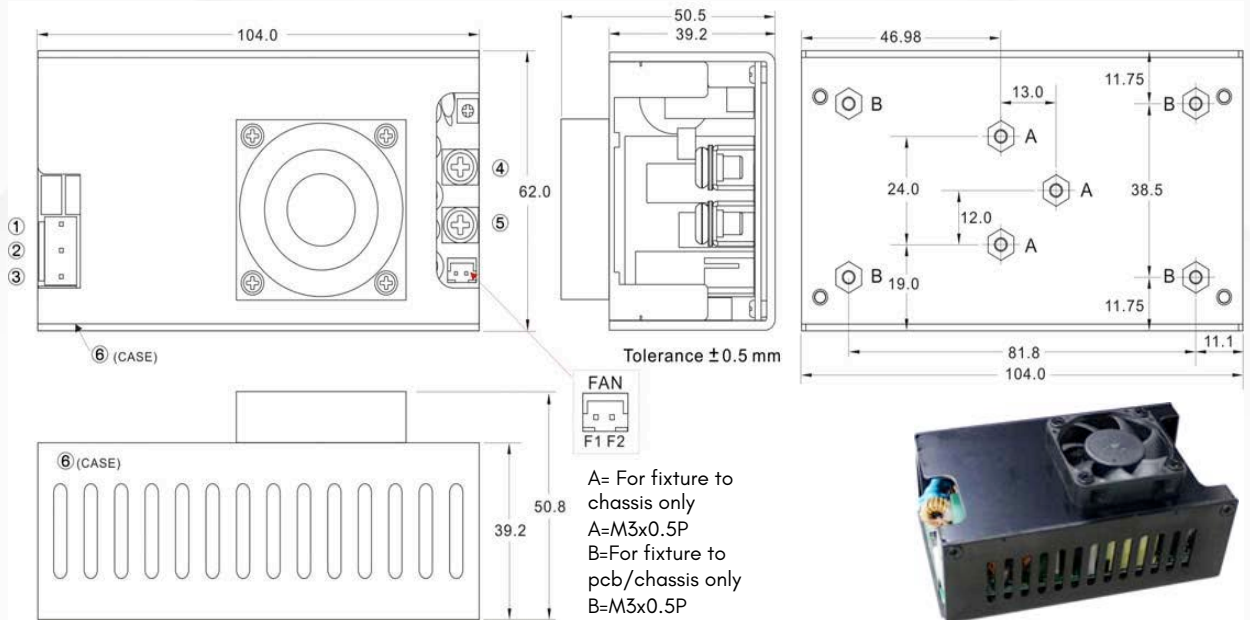
BLOCK DIAGRAM

Single Output



MECHANICAL DIMENSIONS - HDM240E SERIES

Standard



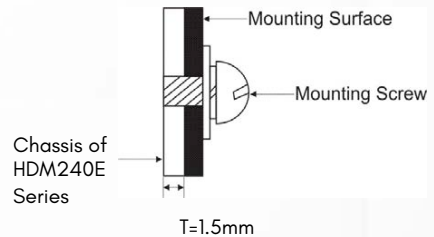
Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-4IT-P1.1
2	NO PIN				
3	AC IN (L)				
4	+DC OUT	Terminal : M5 Pan HD screw in 2 positions Torque to 8 lbs-in(90 cNm) max.			
5	-DC OUT				
6	PE	-	-	-	-

Connector Pin (FAN)					
Brands		Cherng Weei		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+AUX OUT	CX-H250-02	CX-T2501	XHP-2	SXH-002T-P0.6
F2	-AUX OUT				

ASSEMBLY INSTRUCTIONS

U Case T=1.5mm

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



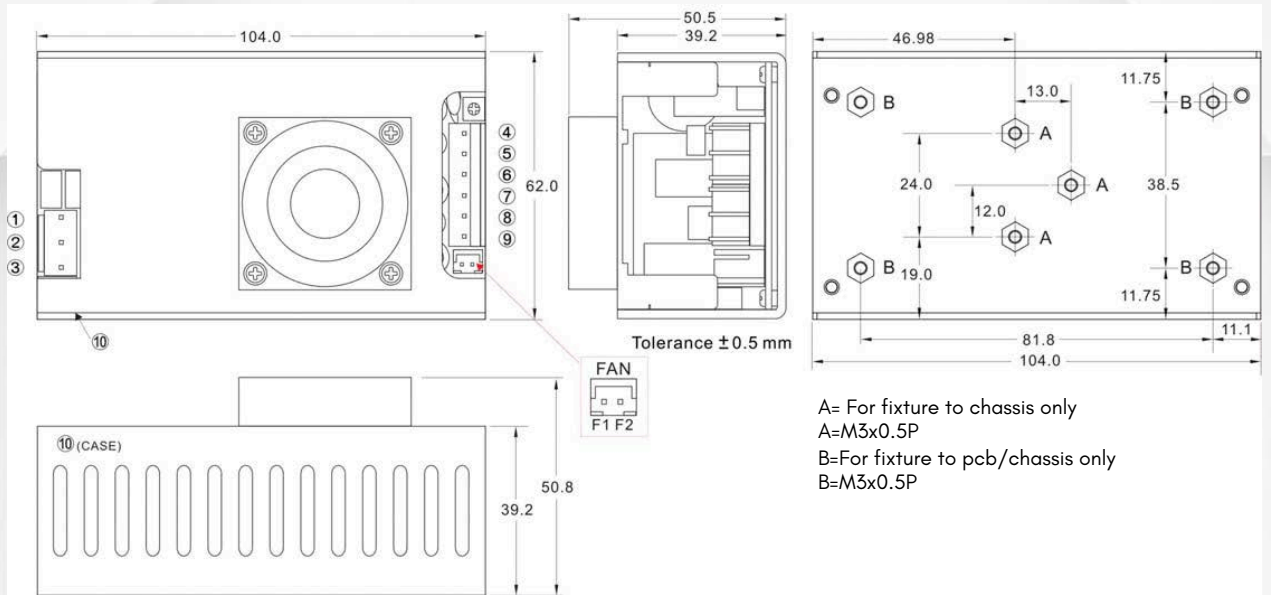
Standard



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

MECHANICAL DIMENSIONS - HDM240E SERIES

A Type

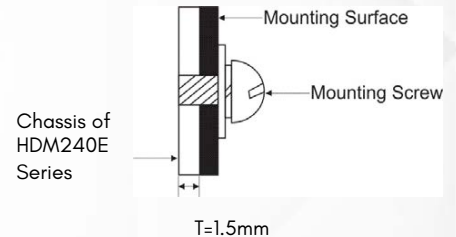


Brands		Alex		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
1	AC IN (N)	9396-3	96T series	VHR-3N	SVH-41T-P1.1
2	NO PIN				
3	AC IN (L)				
4~6	+DC OUT	9396-6	96T series	VHR-6N	SVH-41T-P1.1
7~9	-DC OUT				
10	PE	-	-	-	-

ASSEMBLY INSTRUCTIONS

U Case T=1.5mm

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



Connector Pin (FAN)					
Brands		Cherng Weei		JST	
PIN#	Single	Mating Housing	Terminal	Mating Housing	Terminal
F1	+AUX OUT	CX-H250-02	CX-T2501	XHP-2	SXH-002T-P0.6
F2	-AUX OUT				

DP Digital Power
Flexible Power Solutions
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Technologies Corp.

Digital Power Corporation

1635 S Main Street.
Milpitas, CA 95035 USA

T: (877) 634-0982 sales@digipwr.com
F: (510) 657-6634 www.digipwr.com

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A Type



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