

HDM120 SERIES

AC-DC MEDICAL SWITCHING PSU - 120 WATT



KEY FEATURES

Digital Power's HDM120 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, HDM120 Series are optimal for Medical Applications.

Designed with energy saving in mind, Digital Power's HDM120 Series boasts not only high operating efficiency up to 91%, but also high-power density with full input range of 90-264Vac.

HDM120 operates over wide temperature range from -30°C to $+70^{\circ}\text{C}$ 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

- Universal Input Range 90-264VAC, 47-63 Hz
- Cooling by Free Air Convection
- 100 Watts and 120 Watt with 10CFM Forced Air
- Ultra Compact Size
 - HDM120O: 3.04 x 2.0 x 1.2 Inches
 - HDM120U: 3.15 x 2.35 x 1.7 Inches
 - HDM120E: 3.15 x 2.35 x 1.7 Inches
- 4000VAC Input to Output 2MOPP Insulation
- High Efficiency up to 91%
- With P.F.C. Function >0.9
- <0.3W No Load Input Power
- 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

ELECTRICAL SPECIFICATION - HDM120O SERIES

Model No.	HDM120O-112	HDM120O-124	HDM120O-148
Max Output Wattage (with 10CFM FAN) (W)	120 W		
Max Output Wattage (Free air Convection) (W)	100 W		
Input	Voltage (Note 3)		
	90-264 VAC		
	Frequency (Hz)		
	47-63 Hz		
	Current (Full load)		
	< 2.0 A max. (115 VAC) / < 1.0 A max. (230 VAC)		
	Inrush Current (<2ms)		
< 40 A max. (115 VAC) / < 70 A max. (230 VAC)			
Output	Leakage Current		
	< 0.1mA / 264 VAC (Touch Current)		
	Power Factor (at 230 VAC)		
	PF>0.9 at Full Load		
	No Load		
	< 0.3W (115 / 230 VAC)		
	Output	Voltage (V.DC.)	
12V		24V	48V
Voltage Adj Range (V.DC.)			
±10% Output Voltage			
Voltage Accuracy			
±2%			
Current (with 10CFM FAN) (A) max			
10		5	2.5
Current (Free air Convection) (A) max			
8.333		4.167	2.083
Line Regulation			
±1%			
Load Regulation (10-100%)			
±1%			
Minimum Load			
0%			
Maximum Capacitive Load			
3000µF	1500µF	500µF	
Ripple & Noise (max.) (Note 1)			
160mV	1% Vout		
Efficiency (at 230VAC)			
90%	90%	91%	
Hold-up Time (at 115 VAC) (Note 2)			
10 ms min.			
Protection	Over Power Protection		
	Auto recovery, Hiccup mode		
	Over Voltage Protection		
	Latch off		
	Overt Temperature Protection		
Latch off			
Isolation	Short Circuit Protection		
	Protection level 1 (nominal) : Continuous, Auto recovery		
	Protection level 2 (instantaneous high current) : Latch		
Isolation	Input-Output		
	4000VAC or 5656VDC		
	Input-FG		
2000VAC or 2828VDC			
Output-FG			
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			
Physical	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)			
Safety	Shock		
	IEC60068-2-27		
	Dimensions (L x W x H)		
3.04 x 2.0 x 1.2 Inches (77.2 x 50.8 x 30.7 mm) Tolerance ±0.5 mm			
EMC	Weight		
	172 g		
	Cooling Method		
Free convection / 10 CFM FAN			
EMC	Approval		
	UL / IEC / EN 60601 3.1rd Edition		
	Conducted EMI (Note 5)		
EN55011 Conducted Class B			
Radiated EMI (Note 5)			
EN55011 Class I class B / Class II class A			

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

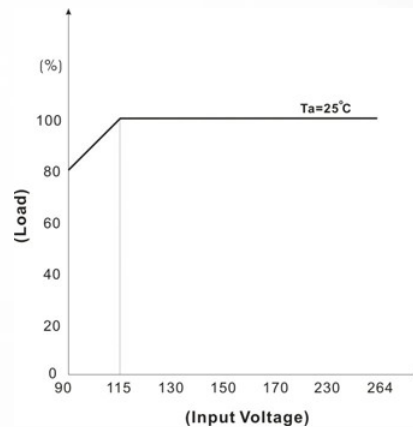
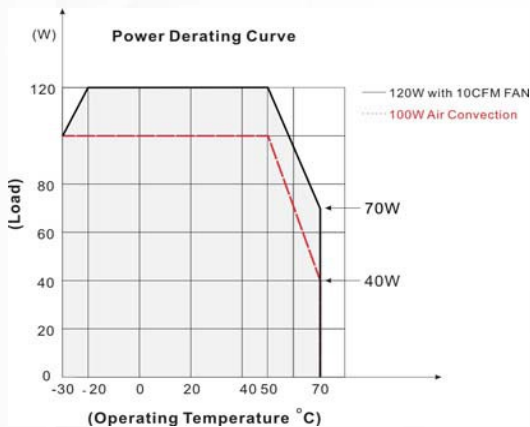
ELECTRICAL SPECIFICATION - HDM1200 SERIES

NOTE

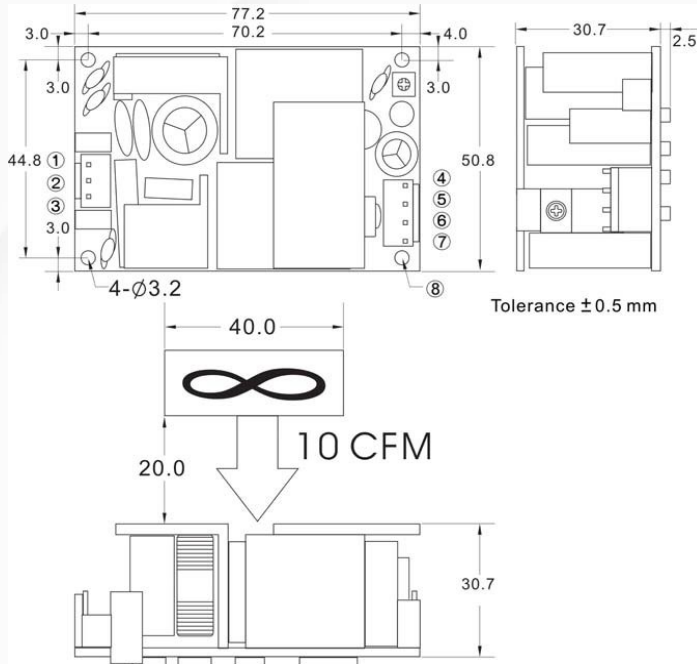
1. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.
2. Hold-up Time measured at 90% Vout.
3. Please check the derating curve for more details.
4. Strongly recommend to conduct this test with AC Voltage. If customer wishes to test with DC Voltage, please disconnect all Y-Capacitors from Digital Power power supply.
5. 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
6. 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.

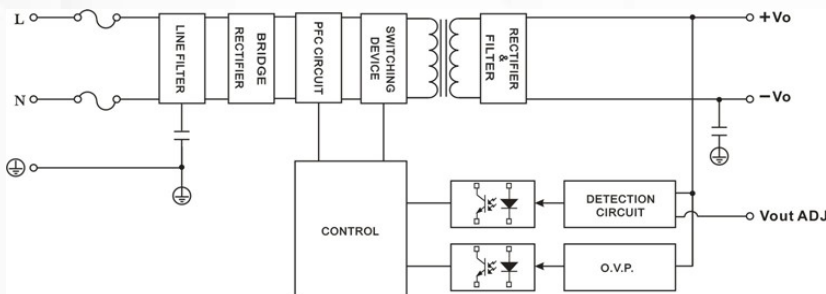


MECHANICAL DIMENSIONS- HDM120O SERIES



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)				
4~5	+DC OUT	9396-4	96T series	VHR-4N	SVH-41T-P1.1
6~7	-DC OUT				
8	P E	-	-	-	-

BLOCK DIAGRAM



ELECTRICAL SPECIFICATION – HDM120U SERIES

Model No.	HDM120U-112	HDM120U-124	HDM120U-148
Max Output Wattage (with 10CFM FAN) (W)	120 W		
Max Output Wattage (Free air Convection) (W)	90 W		
Input	Voltage (Note 3)		
	90-264 VAC		
	Frequency (Hz)		
	47-63 Hz		
	Current (Full load)		
	< 2.0 A max. (115 VAC) / < 1.0 A max. (230 VAC)		
	Inrush Current (<2ms)		
< 40 A max. (115 VAC) / < 70 A max. (230 VAC)			
Leakage Current			
< 0.1mA / 264 VAC (Touch Current)			
Power Factor (at 230 VAC)			
PF>0.9 at Full Load			
No Load			
< 0.3W (115 / 230 VAC)			
Output	Voltage (V.DC.)		
	12V	24V	48V
	Voltage Adj Range (V.DC.)		
	±10% Output Voltage		
	Voltage Accuracy		
	±2%		
	Current (with 10CFM FAN) (A) max		
	10	5	2.5
	Current (Free air Convection) (A) max		
	7.5	3.75	1.875
	Line Regulation		
	±1%		
Load Regulation (10-100%)			
±1%			
Minimum Load			
0%			
Maximum Capacitive Load			
3000µF	1500µF	500µF	
Ripple & Noise (max.) (Note 1)			
160mV	1% Vout		
Efficiency (at 230VAC)			
90%	90%	91%	
Hold-up Time (at 115 VAC (Note 2))			
10 ms min.			
Protection	Over Power Protection		
	Auto recovery, Hiccup mode		
	Over Voltage Protection		
	Latch off		
Over Temperature Protection			
Latch off			
Short Circuit Protection			
Protection level 1 (nominal) : Continuous, Auto recovery			
Protection level 2 (instantaneous high current) : Latch			
Isolation	Input-Output		
	4000VAC or 5656VDC		
	Input-FG		
2000VAC or 2828VDC			
Output-FG			
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)		3.15 x 2.35 x 1.5 Inches (80.0 x 59.7 x 38.0 mm) Tolerance 0.5 mm
	Weight		246 g
	Cooling Method		Free convection / 10 CFM FAN
Safety	Approval		UL / IEC / EN 60601 3.1rd Edition
EMC	Conducted EMI (Note 5)		EN55011 Conducted Class B
	Radiated EMI (Note 5)		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.

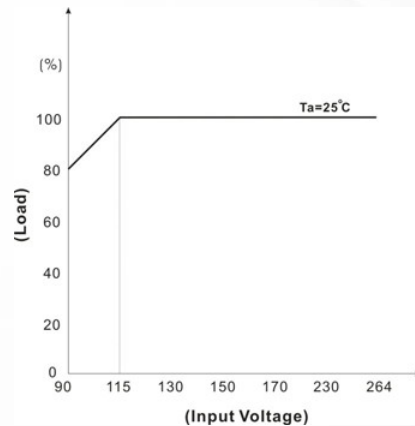
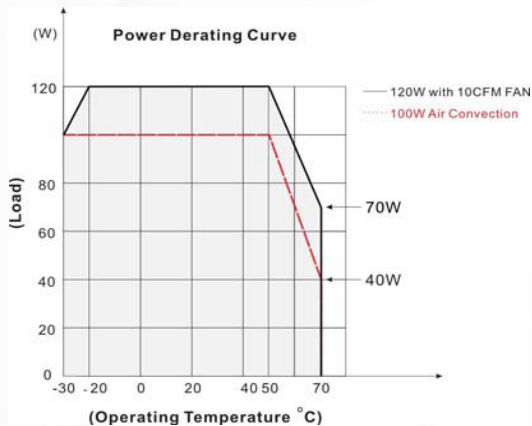
ELECTRICAL SPECIFICATION - HDM120U SERIES

NOTE

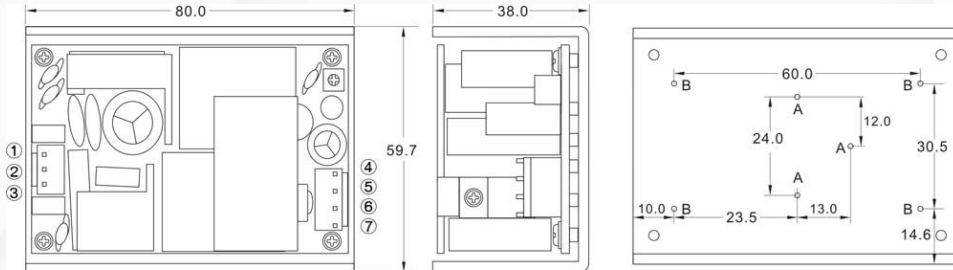
1. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.
2. Hold-up Time measured at 90% Vout.
3. Please check the derating curve for more details.
4. Strongly recommend to conduct this test with AC Voltage. If customer wishes to test with DC Voltage, please disconnect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

DERATING

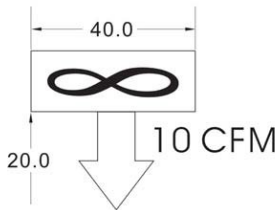
If the input voltage is below 99VAC, the product can be used only in an environment where temperature is higher than -10 degrees Celsius.



MECHANICAL DIMENSIONS – HDM120U SERIES

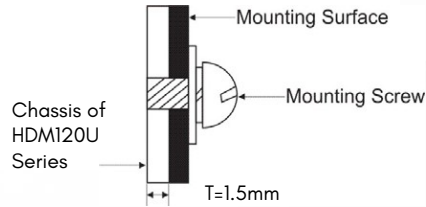
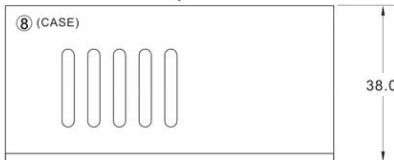


Tolerance ± 0.5 mm



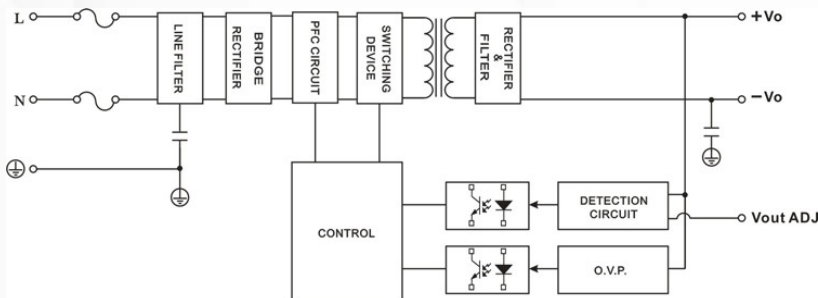
A= For fixture to chassis only
A=M3x0.5P
B=For fixture to pcb/chassis only
B=M3x0.5P

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)				
4~5	+DC OUT	9396-4	96T series	VHR-4N	SVH-4IT-P1.1
6~7	-DC OUT				
8	PE	-	-	-	-

BLOCK DIAGRAM



ELECTRICAL SPECIFICATION – HDM120E SERIES

Model No.	HDM120E-112		HDM120E-124	HDM120E-148
Max Output Wattage (with 10CFM FAN) (W)	120 W			
Max Output Wattage (Free air Convection) (W)	85 W			
Input	Voltage (Note 3)	90-264 VAC		
	Frequency (Hz)	47-63 Hz		
	Current (Full load)	< 2.0 A max. (115 VAC) / < 1.0 A max. (230 VAC)		
	Inrush Current (<2ms)	< 40 A max. (115 VAC) / < 70 A max. (230 VAC)		
	Leakage Current	< 0.1mA / 264 VAC (Touch Current)		
	Power Factor (at 230 VAC)	PF>0.9 at Full Load		
	No Load	< 0.3W (115 / 230 VAC)		
Output	Voltage (V.DC.)	12V	24V	48V
	Voltage Adj Range (V.DC.)	±10% Output Voltage		
	Voltage Accuracy	±2%		
	Current (with 10CFM FAN) (A) max	10	5	2.5
	Current (Free air Convection) (A) max	7.083	3.542	1.771
	Line Regulation	±1%		
	Load Regulation (10-100%)	±1%		
	Minimum Load	0%		
	Maximum Capacitive Load	3000µF	1500µF	500µF
	Ripple & Noise (max.) (Note 1)	160mV	1% Vout	
	Efficiency (at 230VAC)	90%	90%	91%
Hold-up Time (at 115 VAC (Note 2))	10 ms min.			
Protection	Over Power Protection	Auto recovery, Hiccup mode		
	Over Voltage Protection	Latch off		
	Overt Temperature Protection	Latch off		
	Short Circuit Protection	Protection level 1 (nominal) : Continuous, Auto recovery Protection level 2 (instantaneous high current) : Latch		
Isolation	Input-Output	4000VAC or 5656VDC		
	Input-FG	2000VAC or 2828VDC		
	Output-FG	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)	3.15 x 2.35 x 1.7 Inches (80.0 x 59.7 x 43.2) Tolerance 0.5 mm		
	Weight	258 g		
Safety	Approval	UL / IEC / EN 60601 3.1 Edition		
EMC	Conducted EMI (Note 5)	EN55011 Conducted Class B		
	Radiated EMI (Note 5)	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.

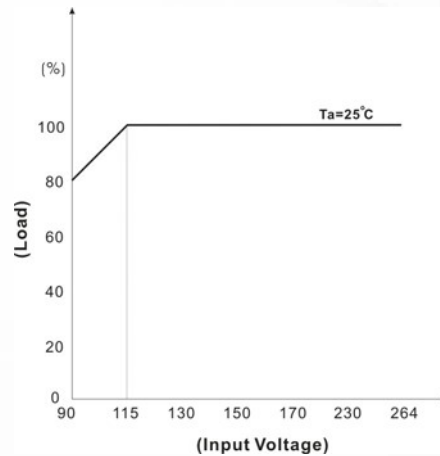
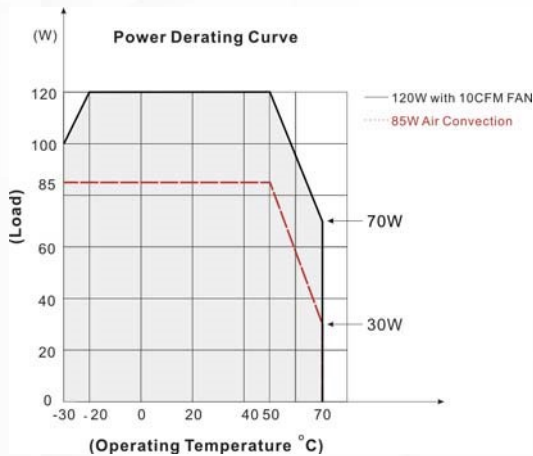
ELECTRICAL SPECIFICATION - HDM120E SERIES

NOTE

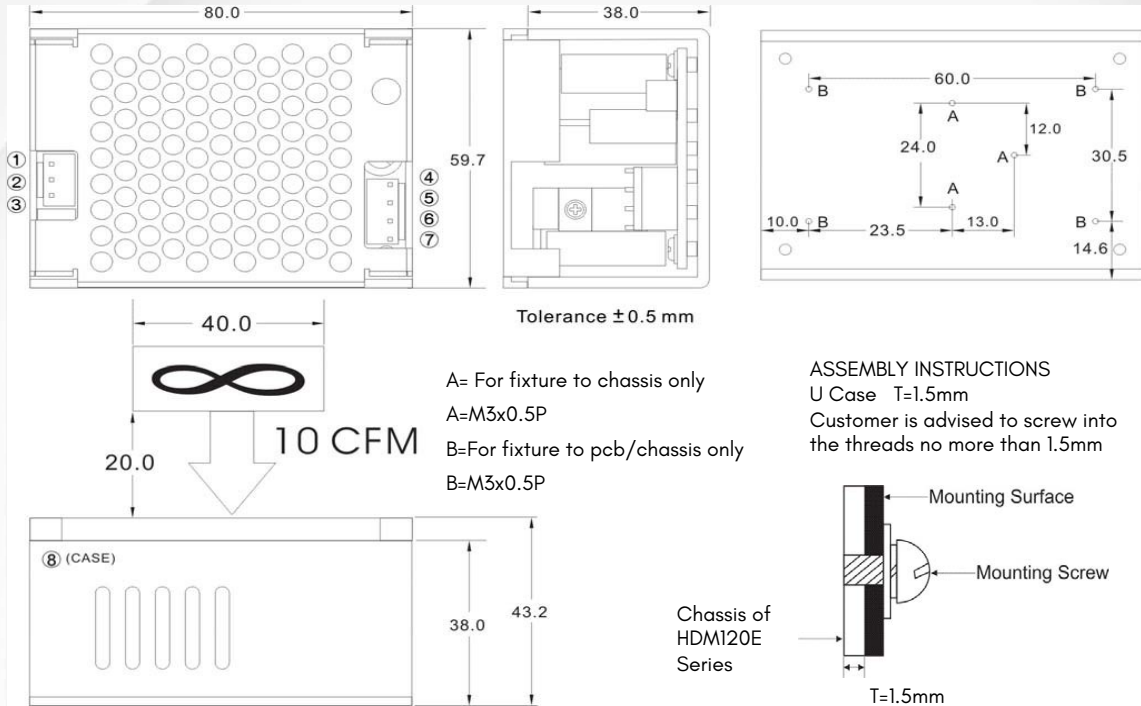
1. Ripple & Noise are measured at 20MHz of bandwidth with 0.1uF & 47uF parallel capacitor.
2. Hold-up Time measured at 90% Vout.
3. Please check the derating curve for more details.
4. Strongly recommend to conduct this test with AC Voltage. If customer wishes to test with DC Voltage, please disconnect all Y-Capacitors from Digital Power power supply.
5. 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
6. 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.

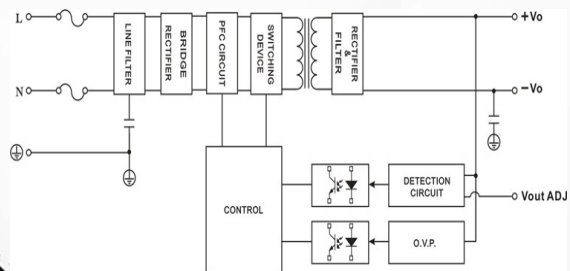


MECHANICAL DIMENSIONS – HDM120E SERIES



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)				
4~5	+DC OUT	9396-4	96T series	VHR-4N	SVH-4IT-P1.1
6~7	-DC OUT				
8	PE	—	—	—	—

BLOCK DIAGRAM



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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.