

# ASM60

## 60W ULTRAMINIATURE MEDICAL OPEN FRAME SWITCHING POWER SUPPLIES

The Astrodyne TDI ASM60 series of Switching Power Supplies are designed for medical and industrial applications. These products operate over the input voltage range of 90 to 264 VAC and 50/60Hz frequency, producing up to 60 Watts of regulated DC output. They have safety certification to IEC60601 for use across a wide variety of medical applications, including those within the home. They comply with IEC 60601-1-1, 3rd Edition, Amendment 1, and EMI EN55011 Class B.



### HOW TO ORDER

#### ASM60D-15(A)\*

\*NOTE = THE SINGLE OUTPUTS CAN BE ORDERED WITH MOLEX 09-65-20XX, 5273 SERIES I/O CONNECTORS. SIMPLY ADD THE SUFFIX "A" TO THE END OF THE MODEL NUMBER. FOR EXAMPLE, ASM60-5A

VOLTAGE = 0 = 5VDC  
9 = 9VDC  
12 = 12VDC  
15 = 15VDC  
24 = 24VDC  
36 = 36VDC  
48 = 48VDC  
1 = 5/12VDC  
2 = 5/15VDC  
3 = 5/24VDC  
5 = 5/48VDC

SINGLE OUTPUT: [BLANK]  
DUAL OUTPUT: D  
OUTPUT POWER: 60W  
FAMILY: ASM SERIES

### FEATURES & BENEFITS

#### UNIVERSAL AC INPUT

90-264VAC, 50/60Hz

#### PROTECTIONS

Over Voltage Protection: Latching, 130% typ., re-power  
Overpower Protection: 140% +20/-10% nom. I/P Range \*  
Short Circuit Protection: Continuous, self-recovering \*

#### SAFETY APPROVALS

UL/cUL: ANSI/AAMI ES60601-1 3rd ed. CSA C22.2 No. 60601-1 3rd ed.  
UL-EU: EN60601-1 3rd ed.  
CB: IEC60601-1 3rd ed.  
CE: EN60601-1-2

#### EMI/EMC

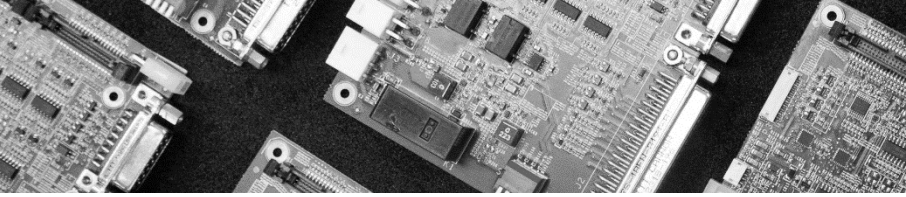
EN55011 Class B

Single and Dual Outputs from 5VDC to 48VDC

High Efficiency up to 86%

4000VAC Isolation

1U Compatible Height



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## 60W ULTRAMINIATURE MEDICAL OPEN FRAME SWITCHING POWER SUPPLIES

### PARAMETERS

### ASM40

Input Voltage Range	90-264 VAC (115-240VAC nom.)
Frequency Range	47-63 Hz
Inrush Current, typ:	30A @ 115VAC Input * 60A @ 230VAC Input *
Leakage Current	BF <100uA @ 240VAC, 50Hz
Voltage and Current	See Selection Chart
Load Regulation (20%-FL)	Single O/P: $\pm 1\%$ Dual O/P (V1/V2): $\pm 3/5\%$ max
Line Regulation (LL-HL)	Single O/P: $\pm 1\%$ max Dual O/P (V1/V2): $\pm 1/2\%$ max
Cross Regulation (Dual Outputs)	(100-20% L w. other O/P at 60%) $\pm 5/7\%$ max
Preset Accuracy	Single Output: 1% max. Dual Outputs (V1/V2): $\pm 7/-9\%$ max.
DC Voltage Adjust (typ)	$\pm 6\%$ of FS (Primary)
Temperature Coefficient	$\pm 0.05\%/^{\circ}\text{C}$
Ripple/Noise, 20Mhz BW	See Selection. Chart Measured by paralleling 47uF/EC and 0.1uF ceramic capacitors on the output at a 20MHz bandwidth.
Over Voltage Protection	Latching, 130% typ, re-power
Overpower Protection	140% +20/-10% nom. I/P Range *
Short Circuit Protection	Continuous, self-recovering *
Hold Up Time (115V / 60Hz)	10 mS, min.
Isolation	Input-Output: 4000VAC Input-GND: 1500VAC Output-GND: 500VAC
Efficiency	See Selection Chart
Switching Frequency	65Khz, (fixed, typical)
Safety	UL/cUL: ANSI/AAMI ES60601-1 3rd ed. CSA C22.2 No. 60601-1 3rd ed.
UL-EU:	EN60601-1 3rd ed.
CB:	IEC60601-1 3rd ed.
CE:	EN60601-1-2
Size	2" x 4" x 1.244" 50.8 x 101.6 x 31.6mm
Construction	Open Frame
Weight	5.61oz (159g)
Oper. Temperature	-10 to +70°C(FL) , See Derate, Pg 5
Storage Temperature	-40 to +85°C *
Relative Humidity	0 to + 95%, non-cond *
EMI	EN55011 Class B
MTBF (Mil Std 217, 25°C)	185,000 Hrs

*All specifications are typical at nominal input, full load, and 25°C unless otherwise noted*

*\* These are stress ratings. Exposure of the devices to any of these conditions may adversely affect long-term reliability. Proper operation under conditions other than the standard operating conditions is neither warranted nor implied.*

# ASM60

## 60W ULTRAMINIATURE MEDICAL OPEN FRAME SWITCHING POWER SUPPLIES

### MECHANICAL DIMENSIONS WITH JST CONNECTORS - STANDARD

#### Connectors and Mating Connectors

**Input Connector:** JST B3P-VH or Molex 41791 Series (3 Position)

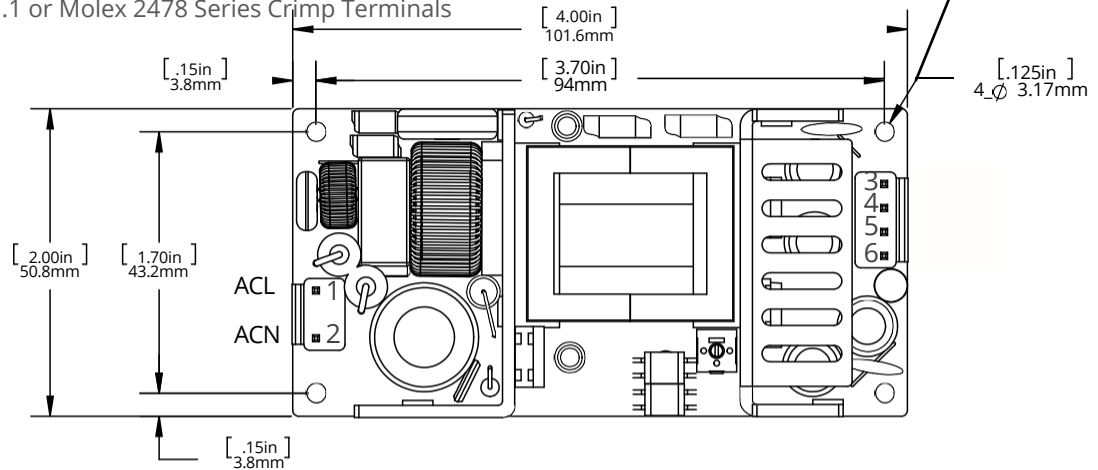
**Input Mating Connector:** JST VHR-3N or Molex 41695 Series (3 Position)

**Output Connector:** JST B4P-VH or Molex 41791 Series (4 Position)

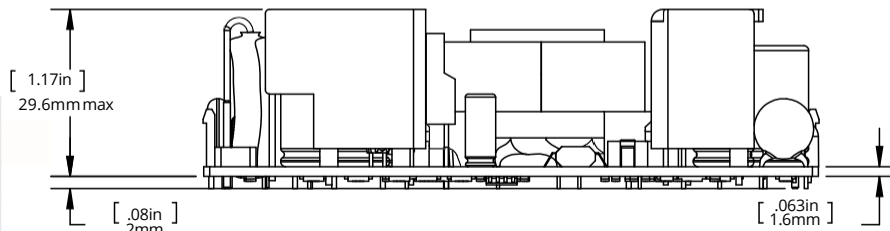
**Output Mating Connector:** JST VHR-4N or Molex 41695 Series (4 Position)

Use with JST # SVH-21T-P1.1 or Molex 2478 Series Crimp Terminals

All 4 corner holes need to be bonded according to the end product PE (Protective Earth) path.



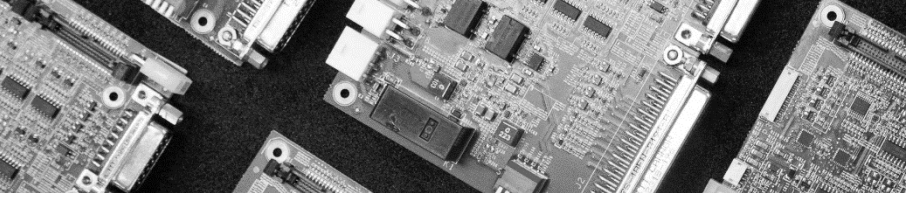
Pin#1	Single Outputs	Dual Outputs
1	AC Line	AC Line
2	AC Neutral	AC Neutral
3	+ Output	+ Output 2
4	GND	GND
5	GND	GND
6	+ Output	+ Output 1



Length, Width tolerance:  $\pm 0.1\text{mm}$  (0.004in)

Input connector: JST/VH series or equivalent  
Output connector: JST/VH series or equivalent

MODEL	OUTPUT VOLTAGE	MAX. O/P AMPS	MIN. O/P AMPS	EFFICIENCY @ 230VAC	R&N P-P
<b>Single Output</b>					
ASM60-5	5VDC	9	0	80%	300mV
ASM60-9	9VDC	5	0	82%	250mV
ASM60-12	12VDC	5	0	84%	250mV
ASM60-15	15VDC	4	0	84%	250mV
ASM60-24	24VDC	2.5	0	86%	250mV
ASM60-36	36VDC	1.66	0	85%	250mV
ASM60-48	48VDC	1.25	0	86%	250mV



# ASM60

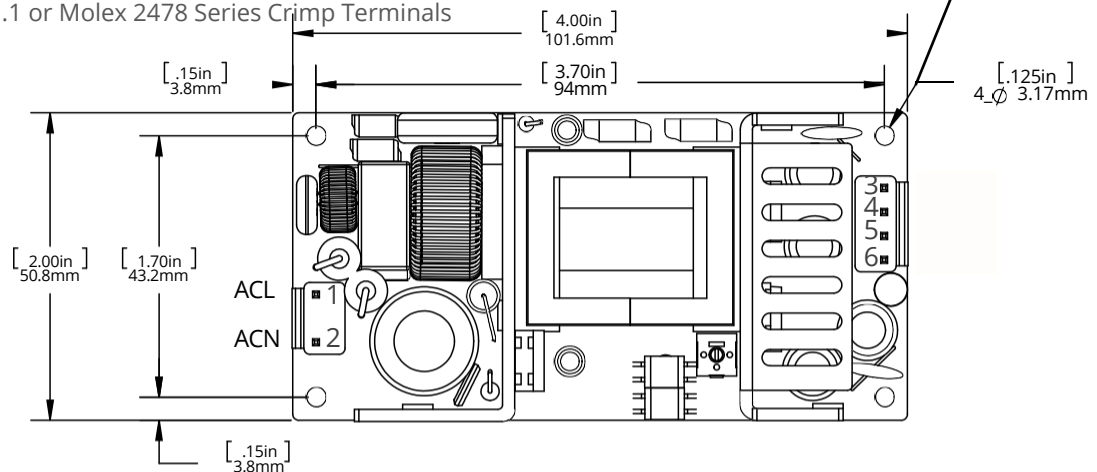
## 60W ULTRAMINIATURE MEDICAL OPEN FRAME SWITCHING POWER SUPPLIES

### MECHANICAL DIMENSIONS WITH JST CONNECTORS - STANDARD

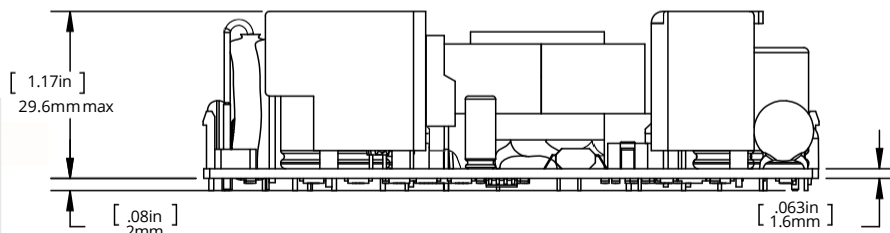
#### Connectors and Mating Connectors

- Input Connector:** JST B3P-VH or Molex 41791 Series (3 Position)  
**Input Mating Connector:** JST VHR-3N or Molex 41695 Series (3 Position)  
**Output Connector:** JST B4P-VH or Molex 41791 Series (4 Position)  
**Output Mating Connector:** JST VHR-4N or Molex 41695 Series (4 Position)  
Use with JST # SVH-21T-P1.1 or Molex 2478 Series Crimp Terminals

All 4 corner holes need to be bonded according to the end product PE (Protective Earth) path.



Pin#1	Single Outputs	Dual Outputs
1	AC Line	AC Line
2	AC Neutral	AC Neutral
3	+ Output	+ Output 2
4	GND	GND
5	GND	GND
6	+ Output	+ Output 1



Input connector: JST/VH series or equivalent  
Output connector: JST/VH series or equivalent

Length, Width tolerance:  $\pm 0.1\text{mm}$  (0.004in)

MODEL	OUTPUT VOLTAGE	MAX. O/P AMPS	MIN. O/P AMPS	EFFICIENCY @ 230VAC	R&N P-P
Dual Output	(V1/V2)	(I1/I2)			
ASM60D-1	5/12VDC	5/3	1/0.60	81%	100/120mV
ASM60D-2	5/15VDC	5/2.4	1/0.48	82%	100/150mV
ASM60D-3	5/24VDC	5/1.5	1/0.30	82%	100/240mV
ASM60D-5	5/48VDC	5/0.73	1/0.15	82%	100/400mV



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## 60W ULTRAMINIATURE MEDICAL OPEN FRAME SWITCHING POWER SUPPLIES

### MECHANICAL DIMENSIONS WITH MOLEX CONNECTORS ("A" VERSIONS SINGLE OUTPUTS ONLY)

#### Connectors and Mating Connectors

**Input Connector:** JST B3P-VH or Molex 5273 Series (3 Position)

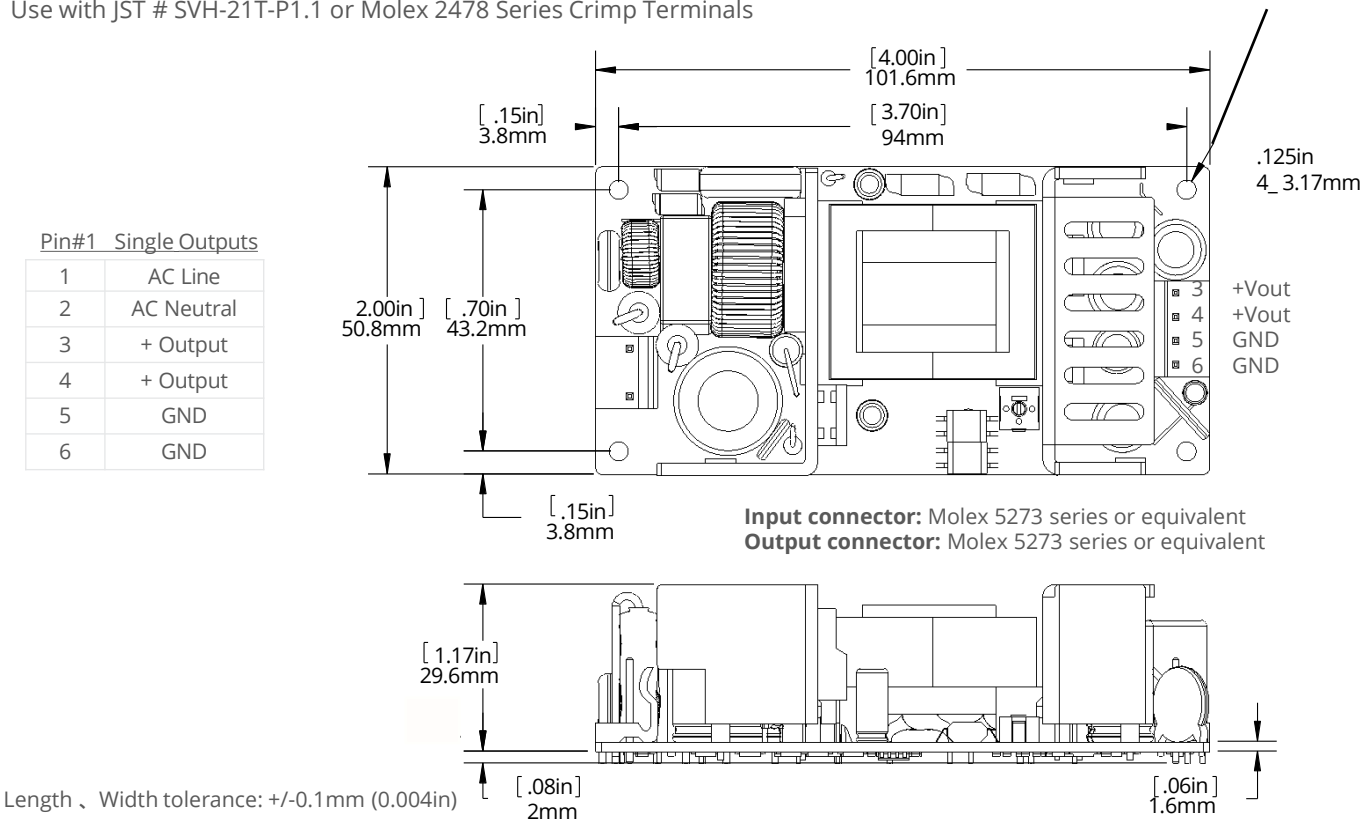
**Input Mating Connector:** JST VHR-3N or Molex 5239 Series (3 Position)

**Output Connector:** JST B4P-VH or Molex 5273 Series (4 Position)

**Output Mating Connector:** JST VHR-4N or Molex 5239 Series (4 Position)

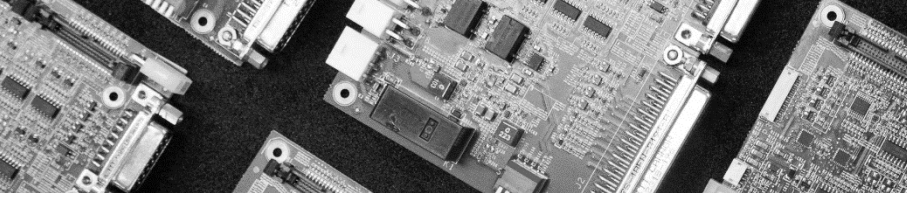
Use with JST # SVH-21T-P1.1 or Molex 2478 Series Crimp Terminals

All 4 corner holes need to be bonded according to the product PE (Protective Earth) path.



MODEL	OUTPUT VOLTAGE	MAX. O/P AMPS	MIN. O/P AMPS	EFFICIENCY @ 230VAC	R&N P-P
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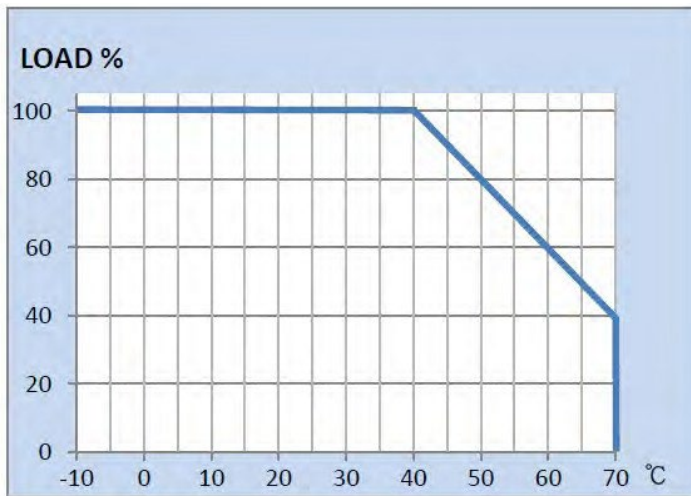
<b>Single Output</b>					
ASM60-5(A)*	5VDC	9	0	80%	300mV
ASM60-9(A)*	9VDC	5	0	82%	250mV
ASM60-12(A)*	12VDC	5	0	84%	250mV
ASM60-15(A)*	15VDC	4	0	84%	250mV
ASM60-24(A)*	24VDC	2.5	0	86%	250mV
ASM60-36(A)*	36VDC	1.66	0	85%	250mV
ASM60-48(A)*	48VDC	1.25	0	86%	250mV



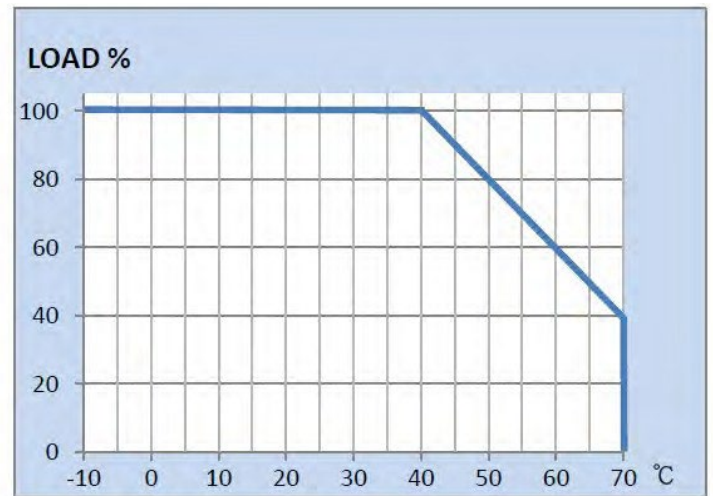
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## 60W ULTRAMINIATURE MEDICAL OPEN FRAME SWITCHING POWER SUPPLIES

### DERATE CURVES



Ambient Temperature



Input VAC