

# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

The Astrodyne TDI ASM550/BSM550 series power supplies are high-power density, medical-grade designs for both medical and industrial applications. Both the ASM550 series with Class I protection and the BSM550 series with Class II protection have 2 MOPP isolation and BF leakage current, crucial for patient safety. These power supplies operate over the input voltage range of 80 to 275 VAC at 50-60Hz frequency and deliver up to 550 Watts of regulated DC output power in a low-profile form factor that is 1U height compatible. These power supplies are compliant with DoE Level VI efficiency requirements and the RoHS directive.



### HOW TO ORDER

ASM550-150-BEH-S00

BEH = ENCLOSED W/ HEADERS  
BNH = OPEN FRAME W/HEADERS  
BUH = U-CHANNEL W/HEADERS  
BET = ENCLOSED W/TERMINAL BLOCKS  
BUT = U-CHANNEL W/TERMINAL BLOCKS

VOLTAGE = 120 = 12VDC  
150 = 15VDC  
180 = 18VDC  
240 = 24VDC  
280 = 28VDC  
360 = 36VDC  
480 = 48VDC  
540 = 54VDC

OUTPUT POWER: 550W

FAMILY: ASM SERIES

### FEATURES

#### UNIVERSAL AC INPUT

80-275 VAC Input, 50/60 Hz

#### OPERATING TEMPERATURE

-20 to +50°C at full load, up to +75°C at reduced load  
See the derating chart for detail

#### SAFETY APPROVALS

Medical IEC 60601-1 3rd Edition Safety  
EN 60601-1-2 4th Edition EMC  
EMI: EN 55011 (CISPR11) Class B Emissions

BF leakage current, 2 MOPP isolation

Class II option available for home medical applications (BSM550 Models)

5V and 12V auxiliary outputs

Current sharing capability enables parallel operation for higher power needs

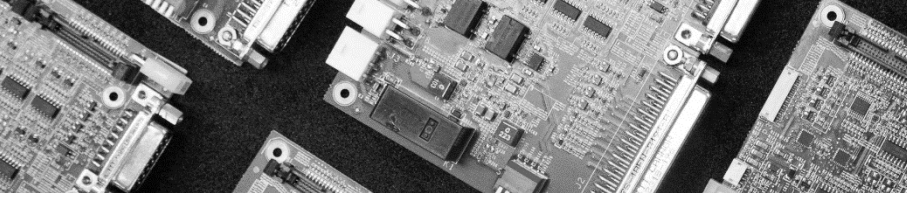
Remote output enable and power good signal

Remote sense input

High efficiency, up to 92% at 230 VAC

Variable speed fan for low load noise reduction

Available in open frame, U-channel, and enclosed with fan configurations



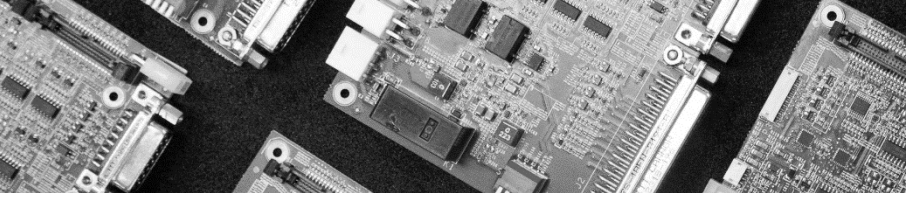
# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### PARAMETERS

### A(B)SM550

AC Input Voltage Range	100-240 VAC nominal 80-275 VAC tested
Input Frequency	47-63 Hz (50/60 Hz nominal)
DC Input Voltage Range	110-380 VDC
Input Current	7.0A max at 100VAC, 60Hz 3.5A max at 240VAC, 50Hz
Inrush Current	30A max at 100VAC, 60Hz 60A max at 240VAC, 50Hz
Power Factor	0.95 min at 230VAC, 50Hz
Earth Leakage Current	300uA max at 264VAC
Touch Leakage Current	60uA typ, 100uA max at 264VAC (BF Rating)
Input Fuse	10A on both ACL and ACN
Output Voltage	see Product Model charts
Output Power	550W max – see derating
Minimum Load	No minimum load required
Set Point Accuracy	±1% max
Load Regulation	±1% max, no load to full load
Line Regulation	±0.5% max, 90-264 VAC
Efficiency	see Product Model charts
Standby Power	0.5W max
Hold-up Time	16ms typ., full load, 115VAC
Ripple and Noise	1% pk-pk max, 20MHz BW, measured with 47uF Alum and 0.1uF Ceramic at output
Input to Output	4000 VAC, 2 MOPP
Input to Earth (Class I)	1500 VAC, 1 MOPP
Output to Earth (Class I)	500 VAC
Over Current *	105 to 135% Rated Current
Short Circuit *	Hiccup Mode, Automatic recovery
Over Voltage *	130% Vo max, Latching; Recycle Input to Reset
Over Temperature *	Automatic recovery
<i>All specifications are typical at nominal input, full load, 25°C unless specified otherwise.</i>	



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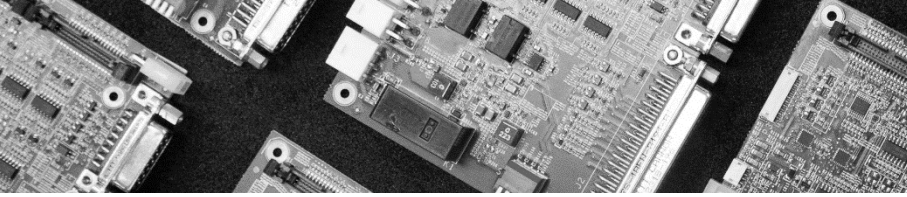
### PARAMETERS

### A(B)SM550

<b>Safety Approvals</b>	IEC 60601-1 3 <sup>rd</sup> Ed, Amend 1: TUV, CB/CE, CSA C22.2
<b>EMC Overall</b>	EN60601-1-2, 4 <sup>th</sup> Ed, Class B
<b>Conducted and Radiated Emissions</b>	EN 55011 (CISPR11), Class B;
<b>Harmonic Current</b>	EN 61000-3-2, Class A
<b>Voltage Fluctuations</b>	EN 61000-3-3
<b>ESD Immunity</b>	EN 61000-4-2, Level 4
<b>RF Field Immunity</b>	EN 61000-4-3, Level 3
<b>EFT Burst Immunity</b>	EN 61000-4-4, Level 3
<b>Surge Immunity</b>	EN 61000-4-5, Level 3
<b>Conducted Immunity</b>	EN 61000-4-6, Level 3
<b>Magnet Field Immunity</b>	EN 61000-4-8, Level 4
<b>Voltage Dips and Interruptions</b>	EN 61000-4-11
<b>Operating Temperature (120VAC, 45 CFM air flow; see derate charts for other input and airflow conditions)</b>	-20 to +50°C at full load, up to +75°C at reduced load See derating chart for detail
<b>Cooling</b>	Forced air or free air convection
<b>Storage Temperature*</b>	-40 to +85°C
<b>Operating Humidity*</b>	0% to 95%, non-condensing
<b>Operating Altitude</b>	0-3000m / 0-10,000 ft
<b>Vibration</b>	2G rms, 5-500Hz, 3 axes, 30min.
<b>Size **</b>	3.7" x 7.0" x 1.32" 94.0 x 177.8 x 33.6 mm
<b>Weight</b>	1.37 lbs / 620 g
<b>Connectors</b>	see Outline Drawings

**\*\* Open frame size only; for U-channel and enclosed, refer to Outline Drawings**

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



# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### OPERATION GUIDE AND APPLICATION INFORMATION

**PS\_ON: Power Supply Control** – Enables/disables the main output and the 12V aux output

- ✓ Connect the PS\_ON signal (CN4, pin 6) to 5V\_AUX\_RTN (CN4, pin 1) to enable the main and 12V aux outputs. Disconnect to disable.
- ✓ Note that the 5V aux output is always on when applied AC input.

**PWR\_OK: Power Good Indicator** – Indicates when the main output is in regulation

- ✓ The PWR\_OK connection (CN4, pin 4) is open-collector logic; the signal goes high (3.3V to 5V range) approximately 160ms after the main output has achieved regulation. Logic low is less than 1V.

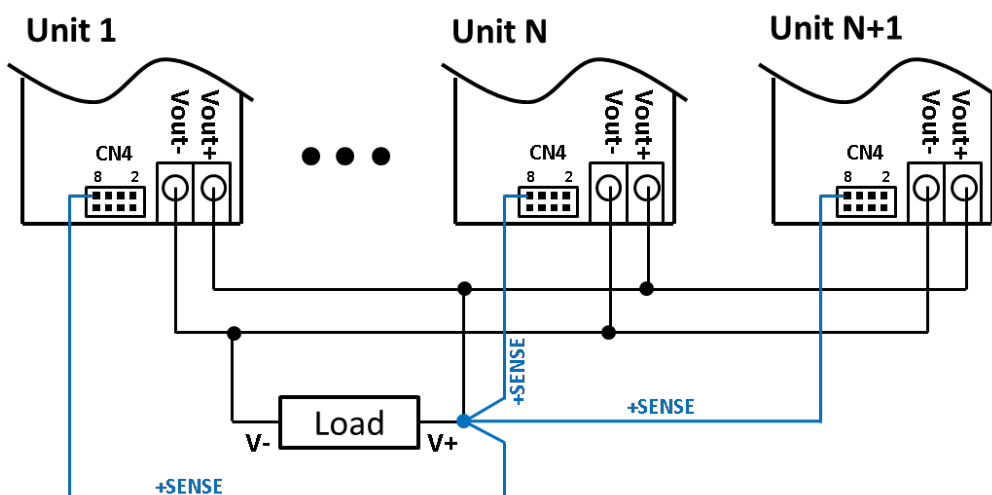
**REMOTE\_SENSE: Output Voltage Compensation** – Uses a separate connection to measure the output voltage at the load and automatically adjusts the voltage at the output terminals to compensate for line voltage drops.

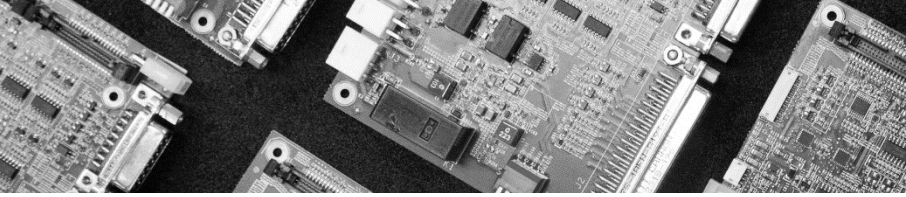
- ✓ Connect the REMOTE\_SENSE input (CN4, pin 8) to a separate wire that terminates at the point of load on the positive side.

#### Parallel Operation of Multiple Units for N+1 Redundancy or High Output Power Applications up to 3kW

- ✓ Up to six ASM550 or BSM550 units may be connected in parallel, to support N+1 redundancy or high output power applications up to 3 kiloWatts.
- ✓ Each unit has an embedded ORing device, which eliminates the need for additional external components.
- ✓ A voltage droop method is used to balance load current sharing.
- ✓ Each unit's REMOTE\_SENSE signal (CN4, pin 8) should be connected separately to the load point.

### PARALLEL AND N+1 OPERATION CONNECTION DIAGRAM





# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### THERMAL PERFORMANCE

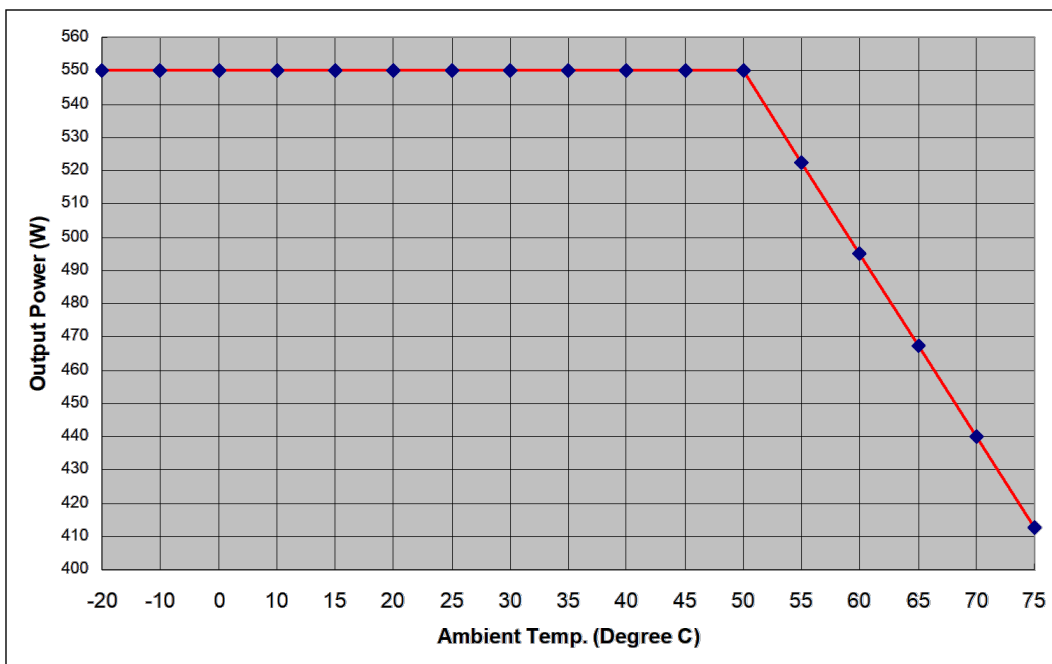
Jumper J6 defines the Over Current Protection threshold and is factory-installed for operation to a 550-watt load rating with forced air cooling. For a natural convection cooling application with an AC input voltage in the range of 90~120VAC, it is recommended to remove jumper J6 and limit operation to a maximum 300-watt load. Refer to the Outline Drawings for the location of jumper J6.

### JUMPER J6 SETTINGS

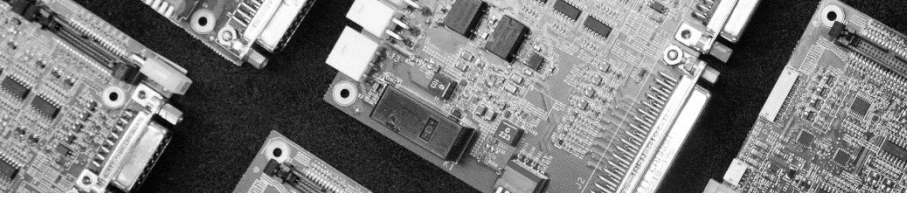
J6 Setting	Maximum Load Power	Application
Installed	550 Watts	Cooled by forced air (either using an embedded fan or by providing up to 80 CFM airflow)
Removed	300 Watts	Cooled by free air convection *

\* On models with a DC output voltage of 24V to 54V, a nominal 230VAC input will support an output load power up to 380 Watts under free air convection. For such operation, jumper J6 must be installed. Note that operating the product in this manner at load powers above 380 Watts will degrade operating life.

### OUTPUT POWER DERATING – ENCLOSED MODELS (ALL RATED INPUT VOLTAGES)





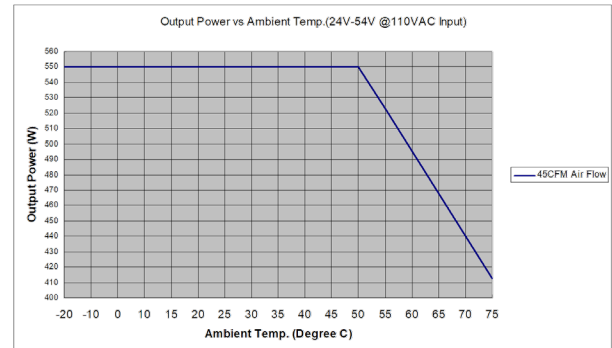
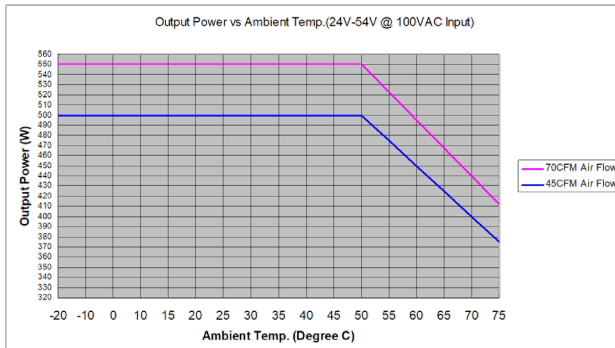
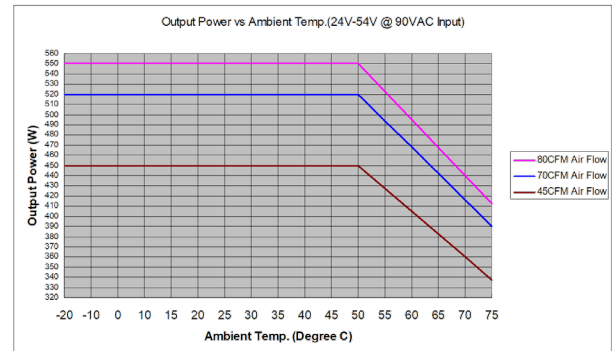
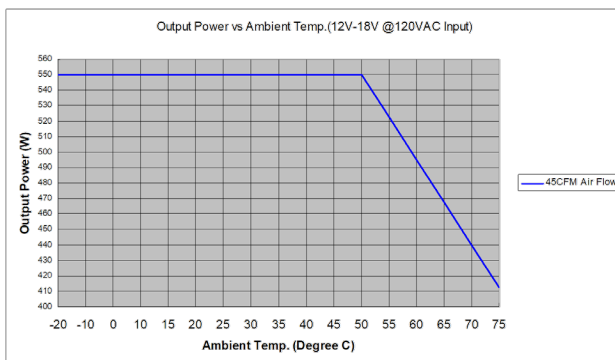
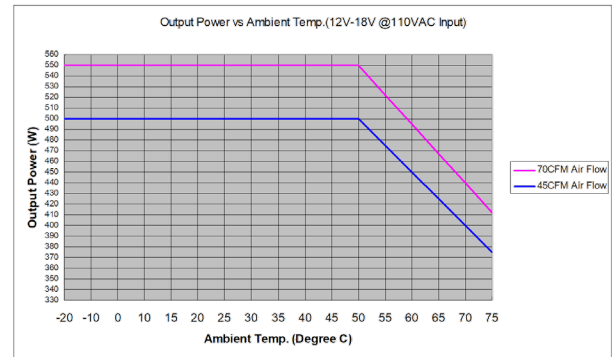
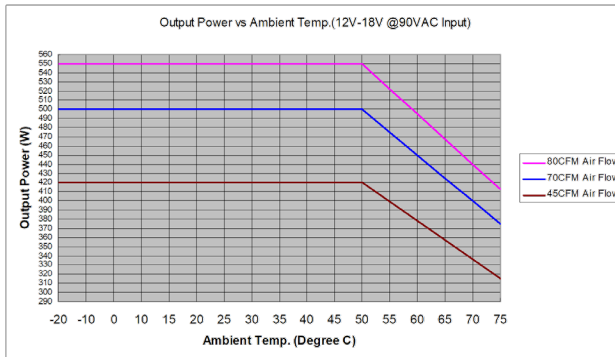
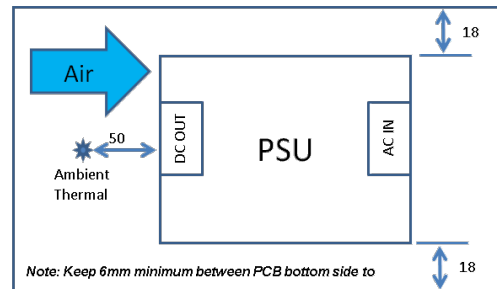


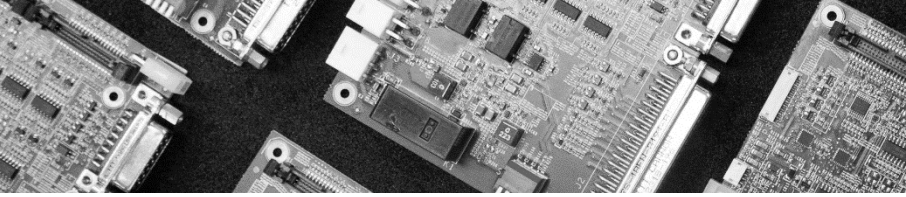
# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### OUTPUT POWER DERATING – FORCED AIR COOLING FOR OPEN FRAME AND U-CHANNEL MODELS

*Thermal Considerations for Open Frame and U-Channel Models:*



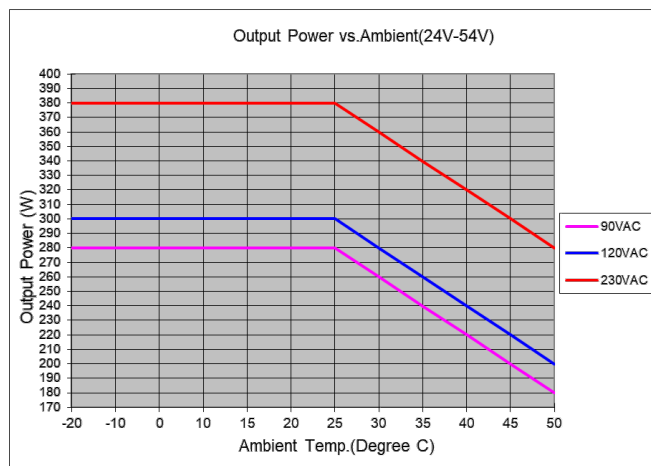
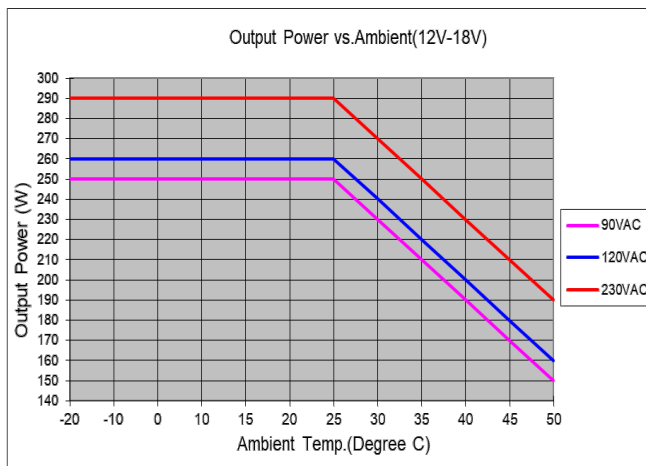
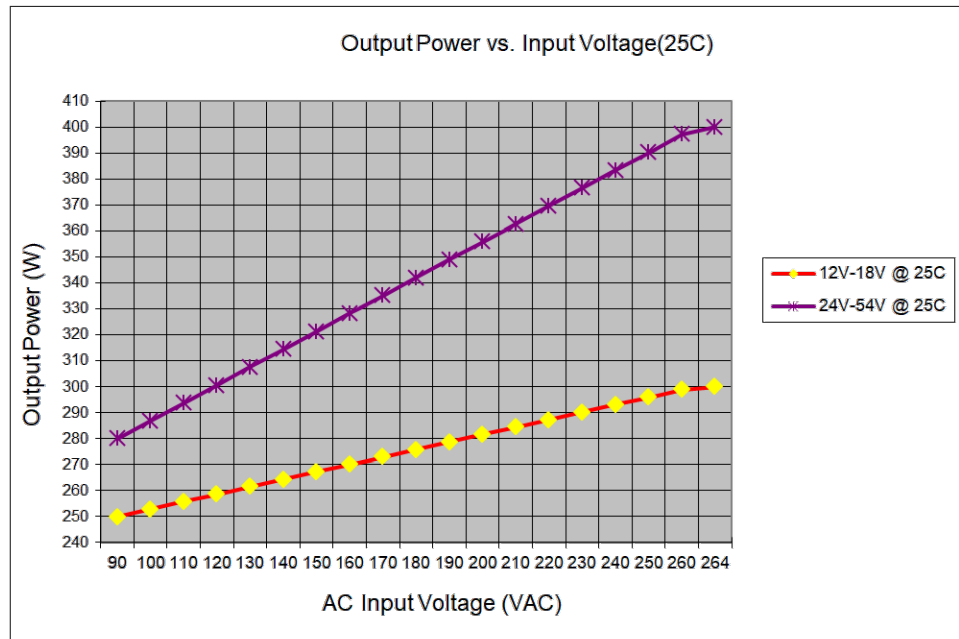


# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### OUTPUT POWER DERATING – FREE AIR CONVECTION COOLING FOR OPEN FRAME AND U-CHANNEL MODELS

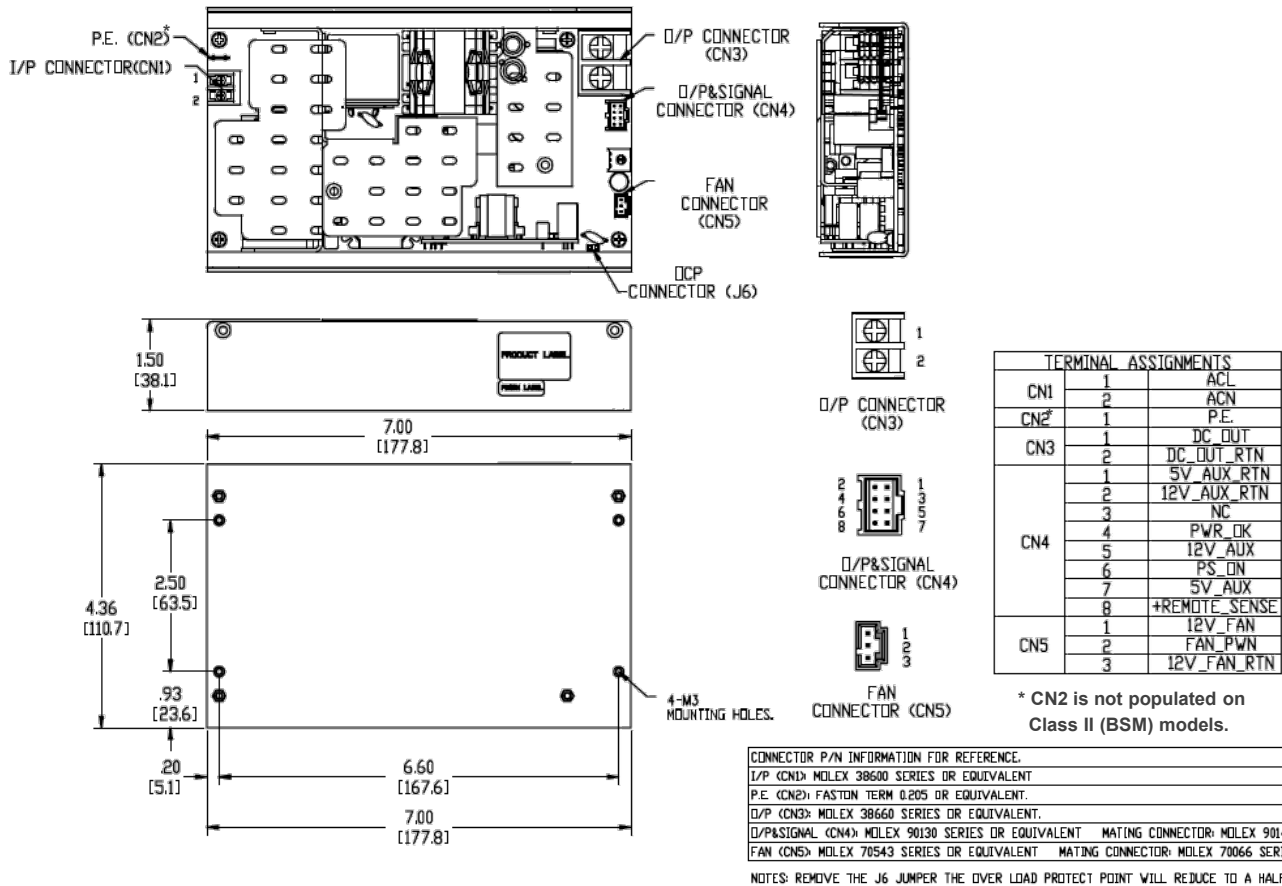
**Note:** It is recommended that jumper J6 be removed for applications cooled by free air convection. Refer to Jumper J6 details, listed above.



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## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### U-CHANNEL MODELS WITH TERMINAL BLOCKS



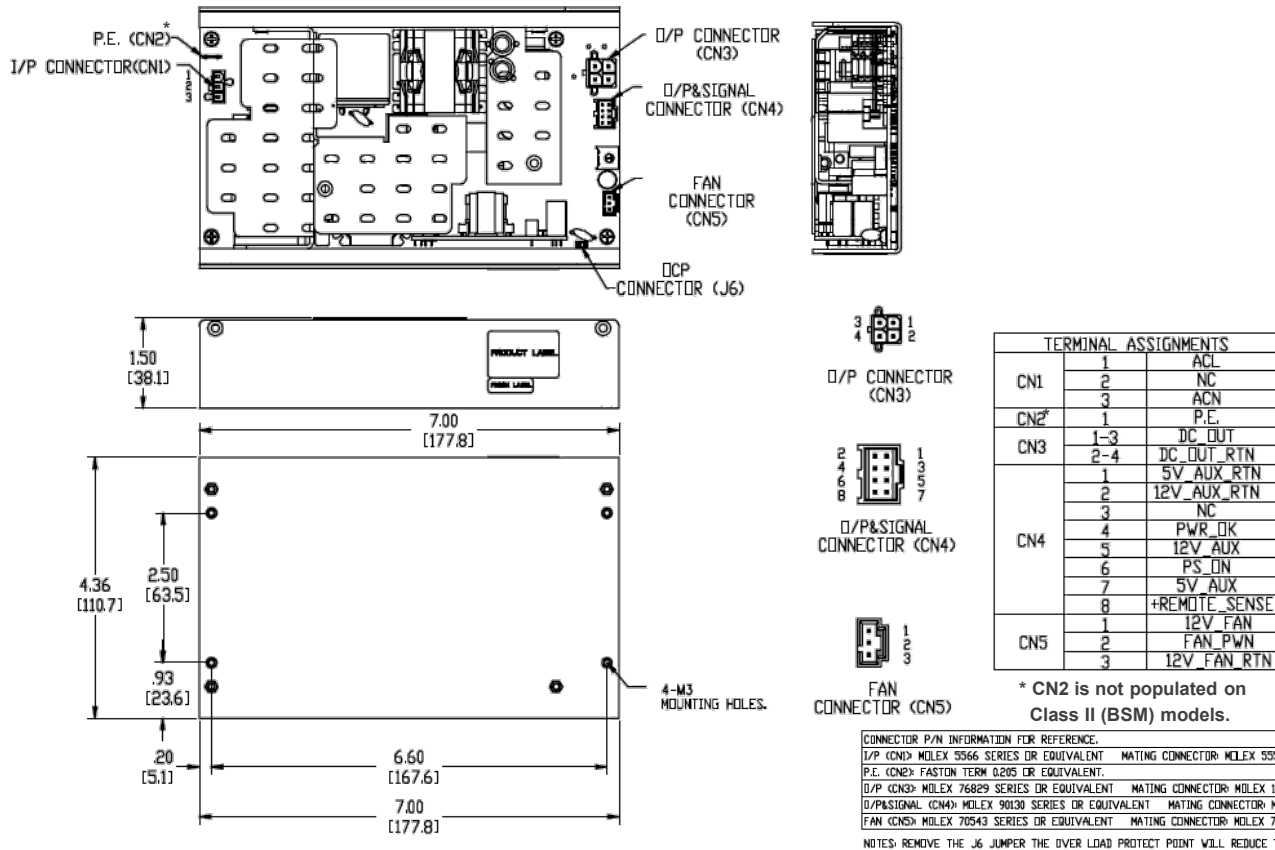
MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	5V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	12V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3,4)</sup>	EFFICIENCY (TYP) 230 / 115 VAC
ASM550-120-BUT-S00	12 VDC	45.0A / N.A.	2A / N.A.	0.5A / N.A.	90% / 88%
ASM550-150-BUT-S00	15 VDC	36.7A / N.A.	2A / N.A.	0.5A / N.A.	90% / 88%
ASM550-180-BUT-S00	18 VDC	30.6A / N.A.	2A / N.A.	0.5A / N.A.	90% / 88%
ASM550-240-BUT-S00	24 VDC	22.9A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-280-BUT-S00	28 VDC	19.6A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-360-BUT-S00	36 VDC	15.3A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-480-BUT-S00	48 VDC	11.5A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-540-BUT-S00	54 VDC	10.5A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%



# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### U-CHANNEL MODELS WITH HEADERS

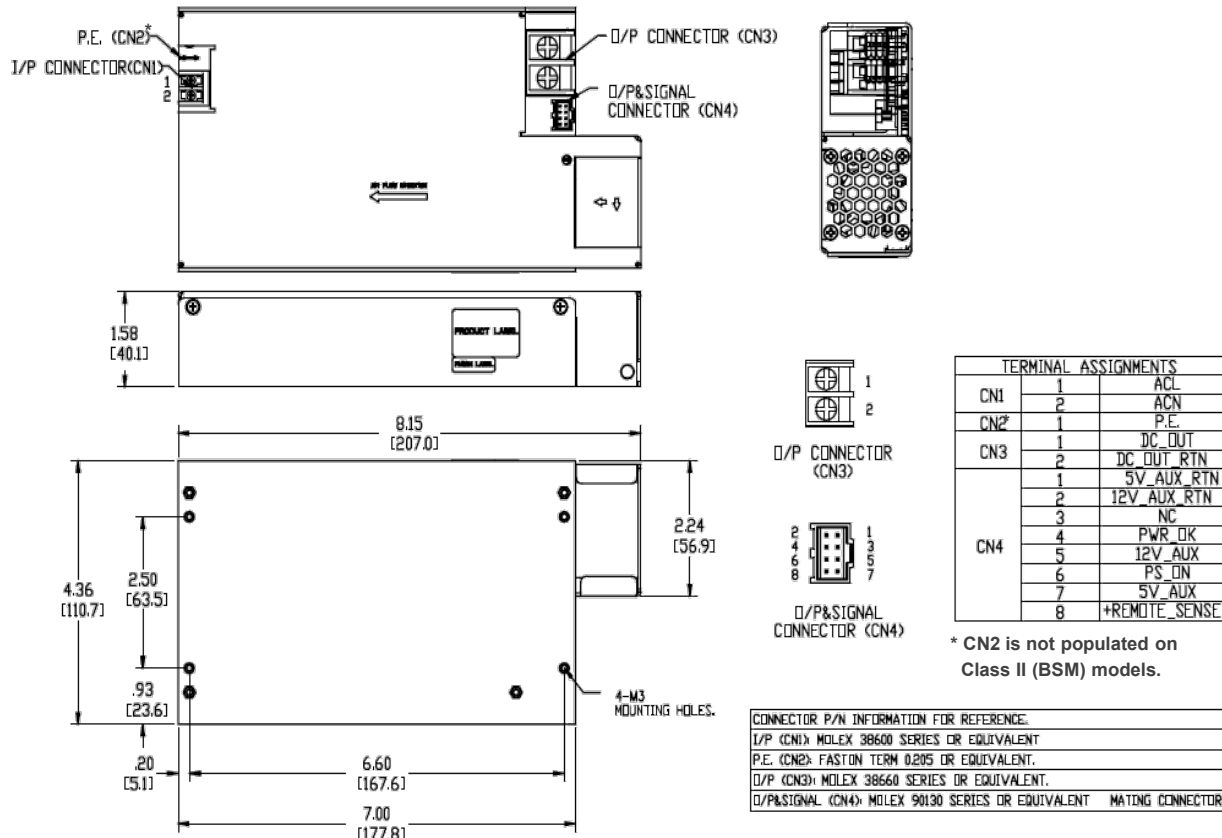


MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	5V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	12V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3,4)</sup>	EFFICIENCY (TYP) 230 /115 VAC
ASM550-120-BUH-S00	12 VDC	45.0A / 20.8A	2A / 1A	1A / 0.5A	90% / 88%
ASM550-150-BUH-S00	15 VDC	36.7A / 16.7A	2A / 1A	1A / 0.5A	90% / 88%
ASM550-180-BUH-S00	18 VDC	30.6A / 13.9A	2A / 1A	1A / 0.5A	90% / 88%
ASM550-240-BUH-S00	24 VDC	22.9A / 11.6A	2A / 1A	1A / 0.5A	92% / 88%
ASM550-280-BUH-S00	28 VDC	19.6A / 10.0A	2A / 1A	1A / 0.5A	92% / 88%
ASM550-360-BUH-S00	36 VDC	15.3A / 7.8A	2A / 1A	1A / 0.5A	92% / 88%
ASM550-480-BUH-S00	48 VDC	11.5A / 5.8A	2A / 1A	1A / 0.5A	92% / 88%
ASM550-540-BUH-S00	54 VDC	10.5A / 5.2A	2A / 1A	1A / 0.5A	92% / 88%

# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### ENCLOSED MODELS (INTEGRATED FAN) WITH TERMINAL BLOCKS

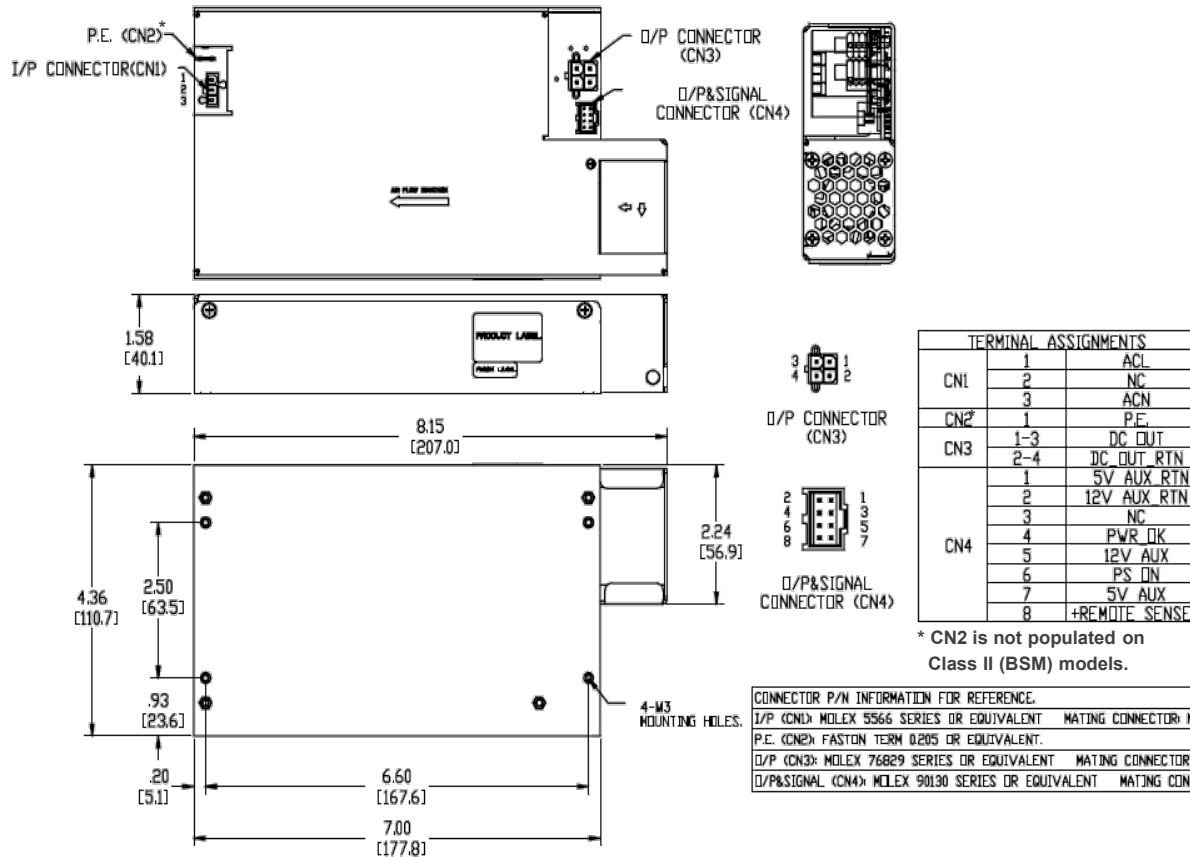


MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	5V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	12V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3,4)</sup>	EFFICIENCY (TYP) 230 / 115 VAC
ASM550-120-BET-S00	12 VDC	45.0A / N.A.	2A / N.A.	0.5A / N.A.	90% / 88%
ASM550-150-BET-S00	15 VDC	36.7A / N.A.	2A / N.A.	0.5A / N.A.	90% / 88%
ASM550-180-BET-S00	18 VDC	30.6A / N.A.	2A / N.A.	0.5A / N.A.	90% / 88%
ASM550-240-BET-S00	24 VDC	22.9A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-280-BET-S00	28 VDC	19.6A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-360-BET-S00	36 VDC	15.3A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-480-BET-S00	48 VDC	11.5A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-540-BET-S00	54 VDC	10.5A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%

# ASM550/BSM550

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

### ENCLOSED MODELS (INTEGRATED FAN) WITH HEADERS



MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	5V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	12V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3,4)</sup>	EFFICIENCY (TYP) 230 / 115 VAC
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ASM550-360-BEH-S00	36 VDC	15.3A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-480-BEH-S00	48 VDC	11.5A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%
ASM550-540-BEH-S00	54 VDC	10.5A / N.A.	2A / N.A.	0.5A / N.A.	92% / 88%

## 550W HIGH POWER DENSITY MEDICAL GRADE POWER SUPPLIES

**Top View Dimensions:**

- Overall Width: 7.00 [177.8]
- Distance from Left Edge to P.E. (CN2): 2.0 [5.1]
- Distance from P.E. (CN2) to I/P Connector (CN1): 2.0 [5.1]
- Distance from I/P Connector (CN1) to Right Edge: 5.75 [146.1]
- Distance from Top Edge to P.E. (CN2): 3.70 [94.0]
- Distance from P.E. (CN2) to Top Edge: 3.30 [83.8]
- Distance from Bottom Edge to I/P Connector (CN1): 6.60 [167.6]
- Scale: 1000

**Labels and Features:**

- PRODUCT LABEL
- P.E. (CN2)
- I/P CONNECTOR (CN1)
- D/P CONNECTOR (CN3)
- D/P & SIGNAL CONNECTOR (CN4)
- FAN CONNECTOR (CN5)
- DQP CONNECTOR (J6)
- 4-Ø3.5(138) MOUNTING HOLES
- ALL 4 CORNER HOLES NEED TO BE BONDED ACCORDING TO THE END PRODUCT PE (PROTECTIVE EARTH) PATH

**Side View Dimensions:**

- Maximum Height: 1.32 MAX. [33.6]
- Maximum Width: .10 MAX. [2.5]
- Distance from Bottom Edge to DQP Connector (J6): .06 [1.6]

**Connector Details:**

- D/P CONNECTOR (CN3):** 3 4 1 2
- D/P & SIGNAL CONNECTOR (CN4):** 2 4 6 8 1 3 5 7
- FAN CONNECTOR (CN5):** 1 2 3 4

CONNECTOR P/N INFORMATION FOR REFERENCE.	
I/P (CN1): MOLEX 5566 SERIES OR EQUIVALENT	MATING CONNECTOR: MOLEX 5557 SERIES.
P.E. (CN2): FASTON TERM .205 SERIES OR EQUIVALENT.	
D/P (CN3): MOLEX 76829 SERIES OR EQUIVALENT	MATING CONNECTOR: MOLEX 171692 OR 170001 SERIES.
D/P & SIGNAL (CN4): MOLEX 90130 SERIES OR EQUIVALENT	MATING CONNECTOR: MOLEX 90142 SERIES.
FAN (CN5): MOLEX 70543 SERIES OR EQUIVALENT	MATING CONNECTOR: MOLEX 70066 SERIES.

NOTES: REMOVE THE J6 JUMPER THE OVER LOAD PROTECT POINT WILL REDUCE TO A HALF OF THE MAX.

TERMINAL ASSIGNMENTS		
CN1	1	ACL
	2	NC
	3	ACN
CN2	*1	P.E.
CN3	1-3	DC OUT
	2-4	DC OUT RTN
CN4	1	5V AUX RTN
	2	12V AUX RTN
	3	NC
	4	PWR OK
	5	12V AUX
	6	PS ON
	7	5V AUX
	8	+REMOTE SENSE
CN5	1	12V FAN
	2	FAN PWN
	3	12V FAN RTN

\* CN2 is not populated on Class II (BSM) models.

MODEL	OUTPUT VOLTAGE	OUTPUT CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	5V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3)</sup>	12V AUX. CURRENT FORCED AIR / CONVECTION <sup>(2,3,4)</sup>	EFFICIENCY (TYP) 230 / 115 VAC
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ASM550-540-BNH-S00	54 VDC	10.5A / 5.2A	2A / 1A	1A / 0.5A	92% / 88%

1. The "ASM" series has Class I protection; use the "BSM" prefix for Class II protection

3. The current ratings for Forced Air are based on the presence of the minimum specified airflow requirements; refer to the derating curves for details with other air flow rates.

4. The embedded fan in the enclosed models consumes 0.5 A of the available current from the 12V Aux. output.