ASM200
BSM200 series

200W High Power Density Medical Grade Open Frame Power Supplies

- Medical Safety Approval – 60601-1 3rd Edition – 2 MOPP
- Class I and Class II medical applications
- 200 Watts in miniature 3”x 5”x 1.4” footprint
- High Efficiency, up to 94% @ 230Vac
- Universal 90-264 Vac Input, 50/60 Hz
- Convection Cooled
- 100% Full Load Burn-in
- 3 Year Warranty



ORDERING INFORMATION

Class I Model	Class II Model	Output Voltage	Output Current	Efficiency typ. 230/115VAC
ASM200S-12-(XX)*	BSM200S-12-(XX)*	12 VDC	16.7 Amps	94/92%
ASM200S-15-(XX)*	BSM200S-15-(XX)*	15 VDC	13.4 Amps	94/92%
ASM200S-19-(XX)*	BSM200S-19-(XX)*	19.6 VDC	10.2 Amps	94/92%
ASM200S-24-(XX)*	BSM200S-24-(XX)*	24 VDC	8.4 Amps	94/92%
ASM200S-28-(XX)*	BSM200S-28-(XX)*	28 VDC	7.15 Amps	94/92%
ASM200S-36-(XX)*	BSM200S-36-(XX)*	36 VDC	5.6 Amps	94/92%
ASM200S-48-(XX)*	BSM200S-48-(XX)*	48 VDC	4.2 Amps	94/92%
ASM200S-54-(XX)*	BSM200S-54-(XX)*	54 VDC	3.7 Amps	94/92%

*Denotes Auxiliary output options. See OPTIONAL OUTPUTS section on Page 2 and PART NUMBERING INFORMATION Chart on Page 4

PRODUCT DESCRIPTION

The Astrodyne ASM200 and BSM200 Series are high density, medium power miniature open frame power supplies designed for medical applications. These products are rated for natural convection cooling.

The ASM200 (Class 1 input) and BSM200 (Class 2 input) have 2 MOPP (means of patient protection) input to output isolation and BF leakage current compliance at the DC output, and have been certified by Underwriters Laboratories for compliance with the latest edition of the international medical safety standard, IEC 60601-1 3rd Edition, using the CB reporting scheme. They are also certified to be compliant with the collateral standard 60601-1-2 for EMC and bear the UL Recognized component marks for North America and the EU, as well as the CE mark.

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INPUT SPECIFICATIONS

Input Voltage Range	90-264 VAC
Range of Nominal Input Voltages	100-240 VAC
Input Frequency	47-63 Hz (50/60 Hz Nom.)
Input Current	2.2A Max at 115VAC 1.1A Max at 230VAC
Inrush Current	30A Max at 115VAC, 60 Hz 60A Max at 230VAC, 50 Hz
Patient Leakage Current	100uA Max at 264VAC, 60Hz BF rating
Input Fusing	8A fuse in both L and N Lines

MAIN OUTPUT SPECIFICATIONS

Voltage and Current	See Ordering Information Pg 1
Output Power	200W Continuous
	See temp. derating curve
Minimum Load	No minimum load required
Load Regulation	± 1% Max, 0 to Full Load
Line Regulation	± 0.1% Max, 90 to 264 VAC
Temp. Drift	0.025 %/°C
Transient Response Excursion	Less than ± 5% 50 to 100% Load Step 1A/us Slew Rate
Transient Response Recovery Time	2ms Max 50 to 100% Load Step 1A/us Slew Rate
Ripple and Noise	1% pk-pk Max. 20MHz BW Measured with 47uF Alum and 0.1uF Ceramic at output

OPTIONAL OUTPUTS (See Part Numbering Chart Pg 4)

5V Aux. Output	1Amp
12V Fan Output	0.5 Amp

ISOLATION SPECIFICATIONS

Input to Output	4000VAC, 2 MOPP
Input to Earth	1500VAC, 1 MOPP
Output to Earth	500VAC

OVERALL SPECIFICATIONS

Efficiency	92%/94% typ. 120/230VAC
No Load Power	2W max, 90-264V
Start-up Delay	2S maximum
Start-up Rise Time	50ms maximum
Hold-up Time	32ms typ. Full Load
Power Density	9.5 W/in³
Switching Frequency	200 KHz typ.
MTBF to MIL-STD-217GB 40°C	220K Hrs

OUTPUT PROTECTIONS

Over Current Inception	115% Typ Rated Current
Short Circuit	Hiccup Mode, Automatic recovery
Over Over Voltage Protection	130% Vo max. Latching, Recycle Input to Reset
Over Temperature Protection	Automatic recovery

MECHANICAL SPECIFICATIONS

Size	3.0” x 5.0” x 1.40”
Weight	0.88lbs. (400g)
Input Connector	TE 641937-1
Input Mating Connector	Housing TE 770476-2 Terminal TE 770476-2 (18-24 AWG)
Output Connector	TE 640445-6
Output Mating Connector	Housing TE 770476-2 Terminal TE 770476-2 (18-24 AWG)

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ENVIRONMENTAL SPECIFICATIONS

Oper. Temperature Range	-20 to +40°C at Full Load
Storage Temperature Range	-40 to +85°C
Humidity	0 to 95%, non-condensing
Altitude	0 to 10,000 ft., 0 to 3048 m
Shock	30G pk. Half sine, 6 axis
Vibration	2 G RMS, 5 Hz to 500 Hz 3 axis, 30 min

SAFETY CERTIFICATIONS

UL/cUL	ANSI/AAMI ES60601-1 3rd Edition
UL EU	IEC 60601-1 3rd Edition CB Reporting Scheme

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

EMC CERTIFICATIONS

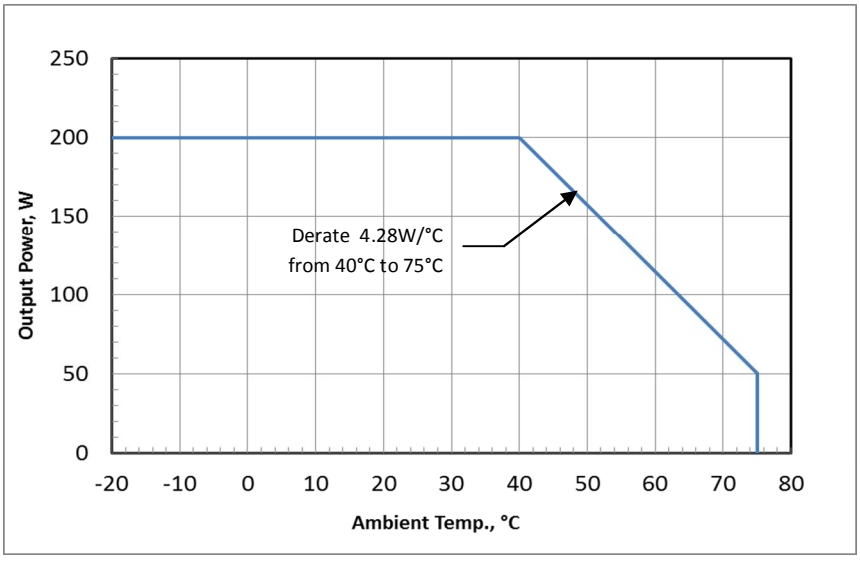
Conducted Emissions	EN60601-1-2 Class B EN55011 Class B
Radiated Emissions	EN60601-1-2 Class B EN55011 Class B
ESD Susceptibility Air Discharge	EN61000-4-2 Criteria A Level 3
ESD Susceptibility Contact Discharge	EN61000-4-2 Criteria A Level 2
Radiated Susceptibility	EN61000-4-3 Criteria A Level 2
EFT/Burst	EN61000-4-4 Criteria A Level 3
Surge	EN61000-4-5 Criteria A Level 2
Conducted Susceptibility	EN61000-4-6 Criteria A Level 2

EMC Certification Notes:

1) Emissions compliance at both 115V and 230V
2) For full EMC compliance, 4 mounting holes should be attached to an electrically conductive surface.

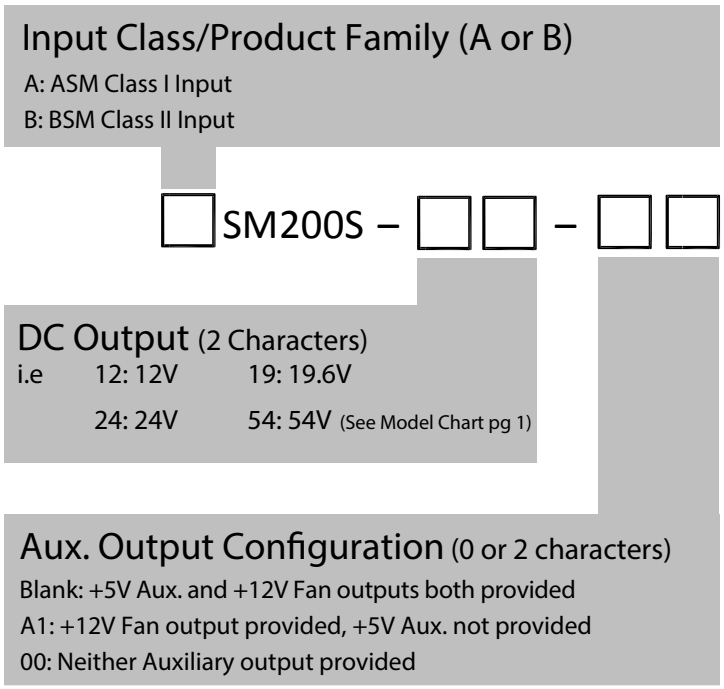
OUTPUT POWER DERATING vs. AMBIENT TEMPERATURE

Output Power vs. Ambient Temperature, 90-264 VAC, Natural Convection



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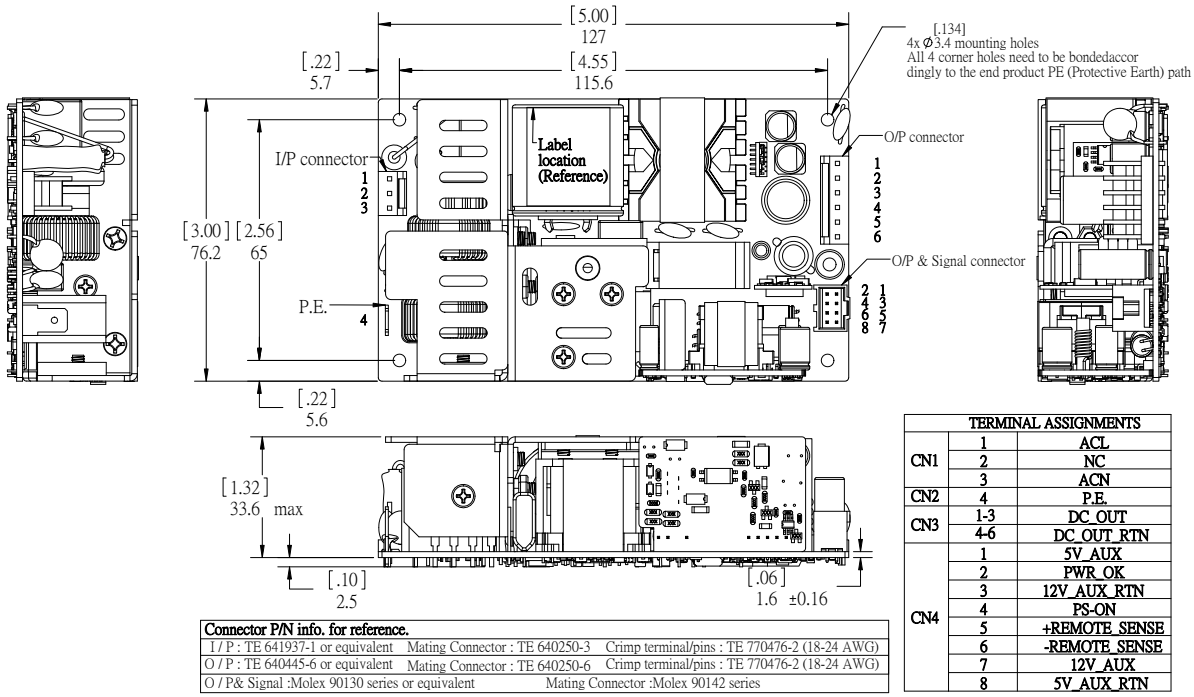
PART NUMBERING INFORMATION



Note:

1. **PS-ON, PWR-OK and Remote Sense (RS) are not provided on 00 configuration.**
2. **PS-ON: This signal must connect to DC_OUT_RTN to turn on the main and FAN output; The 5V_AUX output is on when AC is applied.**
3. **PWR_OK: Open collector logic goes to high 160ms (typ.) after main output is in regulation.**

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TERMINAL ASSIGNMENTS		
CN1	1	ACL
	2	NC
	3	ACN
CN2	4	P.E.
CN3	1-3	DC_OUT
	4-6	DC_OUT_RTN
CN4	1	5V_AUX
	2	PWR_OK
	3	12V_AUX_RTN
	4	PS-ON
	5	+REMOTE_SENSE
	6	-REMOTE_SENSE
	7	12V_AUX
	8	5V_AUX_RTN

Connector P/N info. for reference.		
I / P : TE 641937-1 or equivalent	Mating Connector : TE 640250-3	Crimp terminal/pins : TE 770476-2 (18-24 AWG)
O / P : TE 640445-6 or equivalent	Mating Connector : TE 640250-6	Crimp terminal/pins : TE 770476-2 (18-24 AWG)
O / P& Signal :Molex 90130 series or equivalent	Mating Connector :Molex 90142 series	

Notes:

1. Drawing is 3rd angle projection
2. All dimensions in mm [in.]
3. Length and width tolerance is ± 0.2 [0.008]
4. Maximum height 36.1 [1.42]
5. For full EMC compliance, bond 4 mounting holes to an electrically conductive surface.

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