EIRE300

DATASHEET

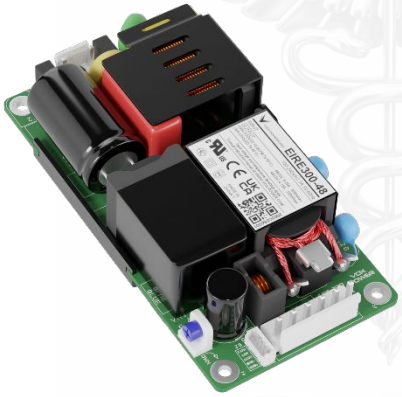
Single Output Open Frame AC/DC Power Series

4" x 2" x 1"
Low profile

300W
Fan cooled

200W
Convection cooled (115V_{AC})

BF Rated
Medical



Superior convection cooling, unlimited applications.

The EIRE300 series of open frame power supplies deliver 300 Watts of power in a miniature 4 x 2 x 1 inch package. The EIRE300 series is the ultimate solution for medical, home healthcare, industrial, household appliance or laboratory applications which require a high efficiency, BF rated, leading edge technology power solution with Class I or II installation capability. The EIRE300 series is designed to be a high reliability power solution which are produced in redundant minimum touch manufacturing locations. Standard output voltages of 12V, 15V, 18V, 24V, 28V, 36V, 48V and 54V are available, all of which have a wide adjustment range. The series includes internal dual line fusing, remote sensing, AC_OK signal, a 0.5A auxiliary fan supply, and protections against over-voltage, over-current, short circuit and over-temperature as standard. The series is approved to the latest medical (IEC/UL60601-1 edition 3.2) and industrial (IEC/UL62368-1 edition 3) standards and is designed to meet the requirements of IEC60335-1:2020 (Household appliances), IEC61558-1:2019 (Safety of Power Transformers) and IEC61010-1:2010 (Measurement, Control, and Laboratory). EMC emissions and immunity exceed the requirements of EN55035 and EN55032 class B and IEC/EN/UL60601-1-2 Edition 4.

MAIN FEATURES & BENEFITS

MEDICAL · INDUSTRIAL · COMM · LAB & ANALYSIS · HOUSEHOLD · 3 YEAR WARRANTY

- 4" x 2" x 1" footprint
- 300 Watts continuous output power
- 125% peak power (1 second)
- Up to 200 Watts convection cooled (115V_{AC})
- Wide input voltage range (85V_{AC} – 264V_{AC})
- Standard output voltages 12V,15V,18V,24V,28V,36V,48V & 54V
- Wide output voltage adjust range
- High efficiency (Up to 95%)
- Low standby power (0.25W typical)
- Low leakage & touch current (<100uA)
- Convection or forced air cooled
- Class I or II installation
- Remote sensing
- AC_OK signal
- 0.5A auxiliary fan supply
- Wide operating temperature range (-40°C to +70°C, Deratings apply)
- Holdup (8mS 300W, 14mS 180W)
- Start into large capacitive load
- Operating altitude up to 5000m
- BF rated output
- Low EMC emissions (EN55032:2020 Class B)
- IEC/EN/UL60601-1-2 Edition 4 EMC
- IEC/EN/UL62368-1:2018 (Industrial Safety)
- IEC/EN/UL60601-1:2006 (Medical Safety)
- CE compliant
- RoHS2 & REACH compliant
- High reliability design
- 3 year warranty
- World class engineering support
- Market leading technology

SAFETY UL COMPLIANT · SAFETY CE COMPLIANT · ENVIRONMENTAL Conflict Minerals COMPLIANT · ENVIRONMENTAL Proposition 65 COMPLIANT · ENVIRONMENTAL REACH COMPLIANT · ENVIRONMENTAL RoHS Directive (EU) 2015/863 COMPLIANT · ENVIRONMENTAL SCIP COMPLIANT · ENVIRONMENTAL TSCA COMPLIANT · ENVIRONMENTAL GreenSoft Technology, Inc. VERIFIED

MODEL SELECTION & ORDERING

Model	V_{NOM} (V)	V_{MIN} (V)	V_{MAX} (V)	I_{RATED}[1] (A)	P_{RATED}[2] (W)	P_{PEAK}[3] (W)	V_{OVP} ($\%V_{NOM}$)	I_{OCP} ($\%I_{RATED}$)	Efficiency[4] (%)
EIRE300-12	12	11.7	14	25	300	375	135	>130	93
EIRE300-15	15	14.5	17	20	300	375	135	>130	94
EIRE300-18	18	17	20	16.67	300	375	135	>130	94
EIRE300-24	24	21.5	25	12.5	300	375	135	>130	95
EIRE300-28	28	26	30	10.7	300	375	135	>130	95
EIRE300-36	36	33.5	40	8.33	300	375	135	>130	95
EIRE300-48	48	42	50	6.25	300	375	135	>130	95
EIRE300-54	54	50	60	5.55	300	375	135	>130	95

Notes
1. Maximum continuous current. Do not exceed even when output voltage setting is below nominal.
2. Fan cooled rating. Refer to graphs for appropriate deratings.
3. 1 second. 25% Duty. Average power <= P_{RATED} (Mains voltage and thermal deratings apply where appropriate).
4. Vin = $230V_{AC}$, Vo = V_{NOM}, 100% load.

PART NUMBERING SYSTEM

SERIES	EIRE300	-	12	-	0	0	0	Factory use

Standard nominal output voltage
12/15/18/24/28/36/48/54

Contact your Distributor or Vox Power representative for information regarding non-standard requirements

SPECIFICATIONS

All specifications are measured @ T_A= 25°C, rated input & rated load unless otherwise stated)

SPECIFICATIONS					
Parameter	Details	Min	Typical	Max	Units
AC Input Voltage	Nominal range is $100V_{RMS}$ to $240V_{RMS}$. DC voltage not allowed	85		264	V_{RMS}
AC Input Frequency			50-60		Hz
Input Current	300Watts output at 115 V_{RMS} input			3	Amps
Input Current Limit			5		Amps
Inrush Current	$230V_{RMS}$, 25°C (cold start).		65		Amps
Fusing	Live and Neutral lines fused (T4A/250V)			4	Amps
Efficiency	See graphs in user manual		94		%
Power Factor	$230V_{RMS}$, 150W		0.99		
Holdup	300Watts, nominal output voltage at $115V_{RMS}$ input 180Watts, nominal output voltage at $115V_{RMS}$ input	8 14	10 16		mS mS
Standby power consumption	$230V_{RMS}$. Compliant with ErP Lot 6 Standby mode		0.25	0.4	Watts
Continuous output power	De-rate linearly from 300Watts at $115V_{RMS}$ to 210Watts at $85V_{RMS}$			300	Watts
Peak output power	1 Second			375	Watts
Output Voltage	All Models. Initial Setting	-1		1	$\%V_O$
Load & Line Regulation	All Models. Measured at sense lines.	-50		50	mV
Ripple & Noise[2]	All Models. 20MHz BW, V_{PKPK}			1	$\%V_O$
Minimum Load	All Models			0	Watts
Transient Response	25% to 75% I_{RATED}, 1A/uS Recovery to within 10% of V_O			6 1.5	$\%V_O$ mS
Turn on Rise Time	All Models. 10% to 70% of V_O		3		mS
Turn on Delay	All Models, All V_{IN}, All loads		500		mS
Temperature Coefficient	All Models	-0.02		0.02	$\%V_O$/°C
Over Current Protection	All Models. Hiccup mode		130		$\%I_{RATED}$
Over Voltage Protection	All Models. Auto Restart		135		$\%V_{NOM}$
Over Temperature Protection	All Models. Auto Restart. Various component temperatures		125		°C
Fan Supply[3]	Voltage (12V) Voltage (18V,28V,36V,48V,54V) Voltage (15V, 24V) Current (All Models) – Fan cooled Current (All Models) – Convection cooled	10 8 12 0 0		13.8 11 16 0.5 0.2	V V V A A
AC_OK Signal	Voltage (Applied) Current (Sink only) Warning time (300W)	 2		12 0.5 	V mA mS
Remote Sense	Compensation voltage (positive and negative) Internal resistance to terminals Offset to terminals (positive and negative combined)			0.75 100 100	V Ω mV
Reliability[1]	All Models		1.1		FPMH
Warranty	$T_{AMBIENT}$ <=45°C, 10.2 CFM. Standard terms and conditions apply			3	Years
Size	101.3 (L) x 50.8 (W) x 25.4 (H). See diagram for tolerance details				mm
Weight	200				Grams

Notes
1. 30°C ambient, 100% load, Fan cooled. SR332 Issue 2 Method I, Case 3, Ground, Fixed, Controlled
   To ensure reliability, component temperatures must be maintained below recommended levels in the end application.
2. Up to 2% in burst mode with no external capacitance.
3. Main output loaded >10%

SAFETY SPECIFICATIONS					
Parameter	Details	Min	Typical	Max	Units
Isolation Voltages	Input to Output (2 MOPP) [1] Input to Functional Earth (1 MOPP) Output to Functional Earth (1 MOPP)			4000 2000 1500	V_{AC} V_{AC} V_{AC}
Insulation resistance ($500V_{DC}$)	Input to Output, Input to Functional Earth, Output to Functional Earth	50			MΩ
Earth Leakage Current (Input to Functional Earth)	NC/SFC (Class I), 264Vac, 63Hz, 25°C		230/400		µA
Touch Leakage Current (Input to Functional Earth)	NC (Class I/Class II), 264Vac, 63Hz, 25°C SFC (Class I/Class II), 264Vac, 63Hz, 25°C		40/160 160/290		µA
Patient Leakage Current (Output to Earth)	NC (Class I/Class II), 264Vac, 63Hz, 25°C SFC (Class I/Class II), 264Vac, 63Hz, 25°C		0/50 50/76		µA

Notes
1. Use DC equivalent voltage to test assembled unit.
2. NC = Normal Condition, SFC = Single Fault condition

INSTALLATION SPECIFICATIONS			
Parameter	Details	Parameter	Details
Equipment class	I or II [1]	Flammability Rating	94V-2
Overvoltage category	II	Ingress protection rating	IP10
Material Group	IIIb (indoor use only)	Intended usage environment	Home Healthcare/Industrial/Home Appliance/Laboratory
Pollution degree	2		

1. Conditions of acceptability may apply. See UL report.

ENVIRONMENTAL						
Parameter	Details	Non-Operational		Operational		Units
		Min	Max	Min	Max	
Air Temperature	Operational limits subject to appropriate de-ratings	-40	+85	-40[1]	70	°C
Humidity	Relative, non-condensing	5	95	5	95	%
Altitude		-200	5000	-200	5000[2]	m
Shock	IEC60068-2-27: Half sine, 3 axes, 3 positive & 3 negative.		50, 11		30,18	g, mS
Vibration	IEC60068-2-6: Sine,10 – 500 Hz, 3 axes, 1 oct/min., 10 cycles each axis IEC60068-2-64: Random, 5 – 500 Hz, 3 axes, 30 min.		 0.02,2.56		2 0.0122,1	g g^2/Hz, g_{RMS}

Notes
1. Some specifications may not be met below -20°C.
2. Additional power derating may be necessary at high altitudes to ensure component temperatures remain within specification.

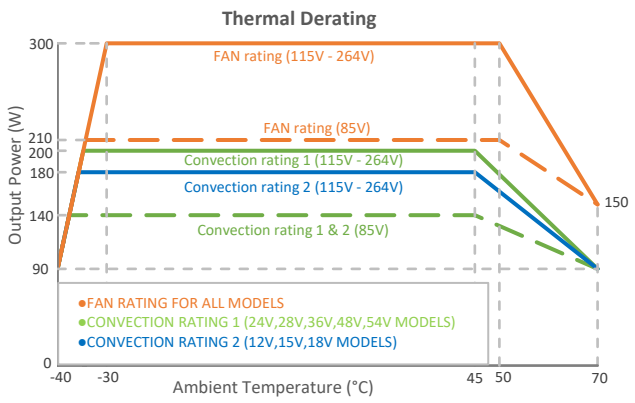
ELECTROMAGNETIC COMPLIANCE – EMISSIONS		
Phenomenon	Basic EMC Standard	Test Details
Radiated emissions, electric field	EN55011/32	Class B compliant
Conducted emissions	EN55011/32, CISPR 32/11	Class B compliant
Harmonic Distortion	IEC61000-3-2	Compliant
Flicker & Fluctuation	IEC61000-3-3	Compliant

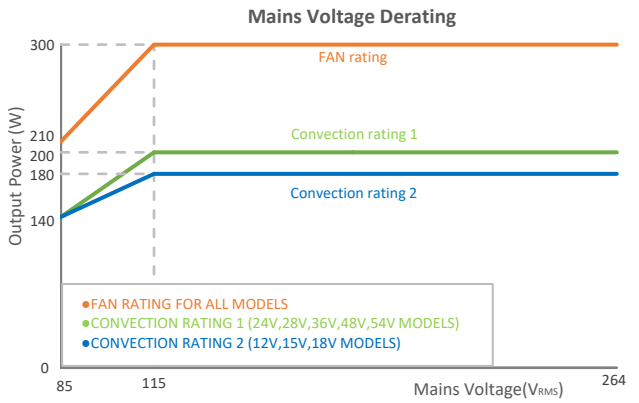
ELECTROMAGNETIC COMPLIANCE – IMMUNITY		
Phenomenon	Basic EMC Standard	Test Details
Electrostatic discharge	IEC61000-4-2	Test level 4: 15kV air, 8kV contact
Radiated RF EM fields	IEC61000-4-3	Test Level 3: (10V/m, 80MHz-2.7GHz) sine wave AM 80% 1kHz
Proximity fields from RF wireless communications equipment	IEC61000-4-3	Test levels as per IEC60601-1-2:2014 Table 9
Electrical Fast Transients/bursts	IEC61000-4-4	Test Level 3: (2kV Power, 1kV I/O) 5kHz(ed3) & 100kHz(ed4)
Surges	IEC61000-4-5	Test Level 3: 1kV L-N, 2kV L-E
Conducted disturbances induced by RF fields	IEC61000-4-6	Test Level 3: 10V, 0.15 to 80MHz sine wave AM 80% 1kHz
Power Frequency Magnetic Fields	IEC61000-4-8	Test level 4: 30A/m 50Hz
Voltage Dips	IEC61000-4-11[2]	0% 10ms (Criterion A), 0% 20ms (Criterion B [3]) 70% 0.5s, 40% 0.2s (Criterion A at 240V and Criterion B at 100V)
Voltage interruptions	IEC61000-4-11	0% 250/300 cycle as per IEC60601-1-2:2014 (Criterion B)
Voltage Sag Immunity	SEMI-F47-0706[2]	0% 20mS (Criterion B [3]) 80% 1s,80% 10s,90% continuous (Criterion A) 70% 0.5s, 50% 0.2s (Criterion A at 240V and Criterion B at 100V [4])

Notes:
1. Criterion A = No degradation of performance or loss of function.
Criterion B = Temporary degradation of performance or loss of function is allowed, provided the function is self-recoverable.
Criterion C = Temporary loss of function is allowed but requires operator intervention to recover.
2. Tested at nominal range (100V to 240V). Line deratings applied where appropriate.
3. Criterion A is achieved for all input voltages when Pout <= 280W
4. Criterion A is achieved for full power when Vin >=160V or at all input voltages when Pout <= 200W

AGENCY APPROVALS		
Standard	Details	File
UL62368-1 IEC62368-1 CSA C22.22 No. 62368-1:19	Edition 3 2021 - Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements Edition 3 2018 - Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements Edition 3 2021 - Audio/Video, Information and Communication Technology Equipment - Part 1: Safety Requirements	UL: E316486
IEC 60601-1:2005+A1:2012+A2:2020 CAN/CSA-C22.2 No.60601-1:08, CAN/CSA-C22.2 No.60601-1:14+A1+A2:2022	Edition 3.2 - Medical electrical equipment— Part 1: General requirements for basic safety and essential performance	
AAMI ES60601-1:2005+ AMD1:2012+AMD2:2021	Medical electrical equipment— Part 1: General requirements for basic safety and essential performance	
CE MARK	LVD 2014/35/EU, EMC 2014/30/EU, RoHs 2011/65/EU	
Approval certificates available at www.vox-power.com		

POWER RATINGS

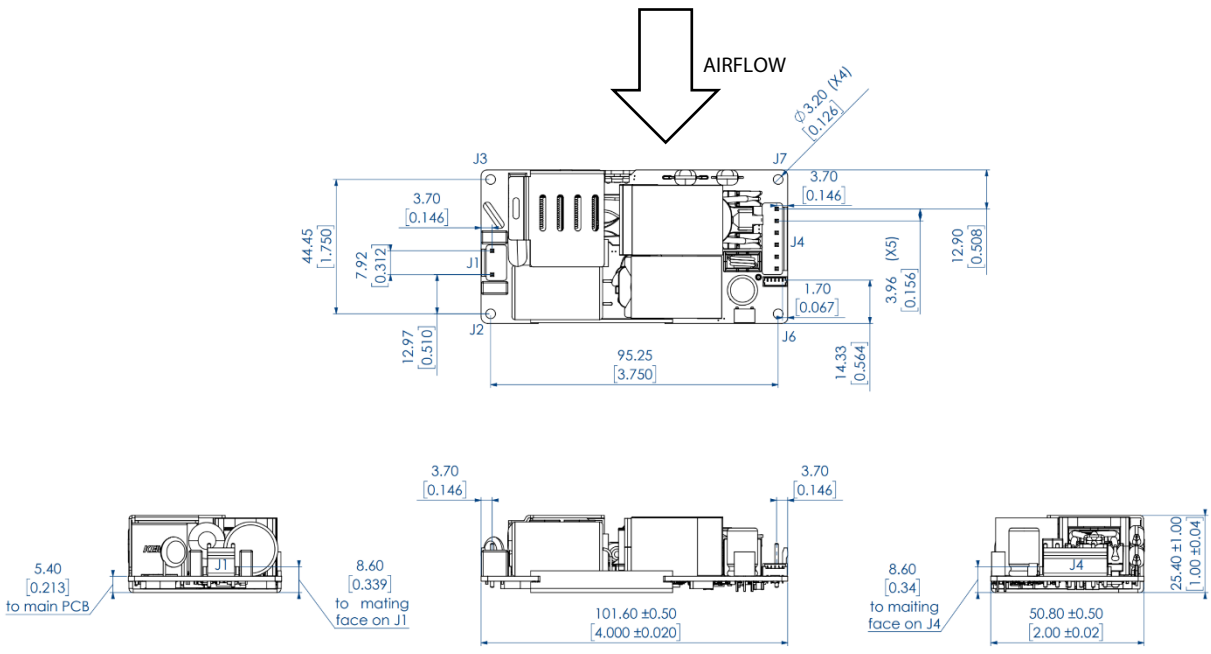




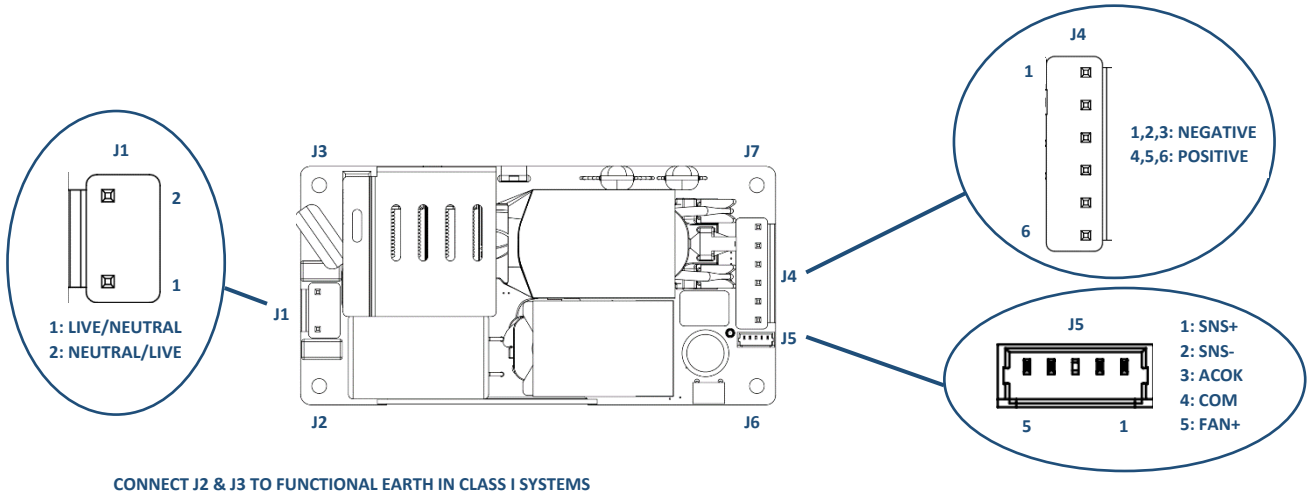
MECHANICAL DIMENSIONS AND MOUNTING

SCREWS

Location	Details	Tightening
Mounting holes (Screw from top side): J2,J3,J6,J7	M3 PAN Screw	0.5NM



CONNECTOR DETAILS



CONNECT J2 & J3 TO FUNCTIONAL EARTH IN CLASS I SYSTEMS

MATING CONNECTORS

Ref.	Details	Manufacturer	Housing	Terminal
J1 - Mains Input	2 Pin, 7A, 250V_{AC}, 7.92mm, with Friction lock, 18-20 AWG [1]	JST	VAR-2	SVA-41T-P1.1
J2 & J3 - Functional Earth	M3 Screw mount	-	-	-
J4 - Output Power	6 Pin, 10A/Pin, 3.96mm, with Friction lock, 16-20 AWG	JST	VHR-6N	SVH-41T-P1.1
J5 - Signals	5 Pin, 1.25mm, with Friction lock, 28-32 AWG	Molex	0510210500	0500588000

Notes
1. Cable 18-20AWG, 300V, >7A, 105°C.
3. Direct equivalents may be used for any connector parts.
4. All cables must be rated 105°C min, equivalent to UL1015