

33 to 302W Single Output, High Reliability Power Supplies



LED



Industrial



Test



COMM



Broadcast

The ZWS-BAF industrial grade power supplies are used in a wide range of applications where equipment down-time cannot be tolerated during years of operation. Globally, process control, test and measurement equipment, machinery, semiconductor fabrication, communications and large LED display manufacturers depend upon the ZWS-BAF to provide a reliable source of power. Conservatively rated electrolytic capacitor temperatures offer improved field life-times of up to 10 years. Available in five power levels, 50W, 75W, 100W, 150W and 300W, the series provides a choice of 3.3 to 48V outputs. A variety of mechanical configurations are available, in addition to a double sided board coating option.

Features

- 10 Year Electrolytic Capacitor Lifetimes
- Convection Cooled
- Curve B Radiated and Conducted EMI
- 5 year Warranty

Benefits

- Improved Field Life
- Reduced Dirt and Dust Contamination
- Easier System Compliance
- Low Cost of Ownership

Model Selector

Model	Output Voltage (V)	Adjustment Range (V)	Maximum Current (A)	Maximum Output Power (W)	Maximum Ripple & Noise (mV)	Over Current Protection (A)	Over Voltage Protection (V)	Efficiency (Typ) (%) (100/200Vac)
ZWS50BAF-3	3.3	2.97-3.63	10	33	160	>10.5	3.79-4.95	76 / 78
ZWS75BAF-3	3.3	2.97-3.63	15	49.5	160	>15.7	3.79-4.95	76 / 78
ZWS100BAF-3	3.3	2.97-3.63	20	66	160	>21.0	3.79-4.95	82 / 84
ZWS150BAF-3	3.3	2.97-3.63	30	99	160	>31.5	3.79-4.95	82 / 84
ZWS50BAF-5	5	4.5-5.5	10	50	160	>10.5	5.75-7.0	82 / 84
ZWS75BAF-5	5	4.5-5.5	15	75	160	>15.7	5.75-7.0	82 / 84
ZWS100BAF-5	5	4.5-5.5	20	100	160	>21.0	5.75-7.0	84 / 86
ZWS150BAF-5	5	4.5-5.5	30	150	160	>31.5	5.75-7.0	85 / 87
ZWS50BAF-12	12	10.8-13.2	4.3	51.6	180	>4.51	13.8-16.2	83 / 85
ZWS75BAF-12	12	10.8-13.2	6.3	75.6	180	>6.61	13.8-16.2	83 / 85
ZWS100BAF-12	12	10.8-13.2	8.5	102	180	>8.93	13.8-16.2	86 / 88
ZWS150BAF-12	12	10.8-13.2	12.5	150	180	>13.13	13.8-16.2	85 / 88
ZWS300BAF-12	12	10.8-13.2	25	300	180	>26.25	13.8-16.2	86 / 89
ZWS50BAF-15	15	13.5-16.5	3.5	52.5	180	>3.67	17.3-20.3	83 / 86
ZWS75BAF-15	15	13.5-16.5	5	75	180	>5.25	17.3-20.3	84 / 86
ZWS100BAF-15	15	13.5-16.5	6.7	100.5	180	>7.04	17.3-20.3	86 / 88
ZWS150BAF-15	15	13.5-16.5	10	150	180	>10.5	17.3-20.3	86 / 89
ZWS300BAF-15	15	13.5-16.5	20	300	180	>23.1	17.3-20.3	86 / 89
ZWS50BAF-24	24	21.6-26.4	2.1	50.4	180	>2.2	27.6-32.4	84 / 87
ZWS75BAF-24	24	21.6-26.4	3.2	76.8	180	>3.36	27.6-32.4	84 / 87
ZWS100BAF-24	24	21.6-26.4	4.3	103.2	180	>4.52	27.6-32.4	87 / 89
ZWS150BAF-24	24	21.6-26.4	6.3	151.2	180	>6.62	27.6-32.4	88 / 90
ZWS300BAF-24	24	21.6-26.4	12.5	300	180	>14.7	28.8-33.6	88 / 91
ZWS300BAF-36	36	32.4-39.6	8.4	302.4	300	>9.87	55.2-64.86	88 / 91
ZWS50BAF-48	48	39.5-52.8	1.1	52.8	240	>1.15	55.2-64.86	84 / 86
ZWS75BAF-48	48	39.5-52.8	1.6	76.8	240	>1.68	55.2-64.86	85 / 86
ZWS100BAF-48	48	39.5-52.8	2.1	100.8	240	>2.21	55.2-64.86	88 / 90
ZWS150BAF-48	48	39.5-52.8	3.2	153.6	240	>3.36	55.2-64.86	89 / 91
ZWS300BAF-48	48	39.5-52.8	6.3	302.4	300	>7.35	55.2-64.86	88 / 91

ZWS	50	-BAF	-	3	/	
Nominal power: 50, 75, 100, 150, 300		Output voltage: 3 (3.3V), 5, 12, 15, 24, 36, 48				
				Blank	Open frame	ZWS50 - 300
				/A	L-bracket & cover	ZWS50 - 300
				/L	L-bracket	ZWS50 - 300
				/CO2	Double sided PCB coating	ZWS50 - 300
				/R	Remote on/off	ZWS100 - 300
				/T	Screw terminal connections	ZWS300
				/TA	Screw terminals, L bracket & cover	ZWS300

Specifications						
Model		ZWS50BAF	ZWS75BAF	ZWS100BAF	ZWS150BAF	ZWS300BAF
Input						
Input Voltage Range (Operating) ⁽¹⁾	Vac	85 - 265				
Nominal Input Voltage Range	Vac	100 - 240 (Note: Safety certified for 90-264Vac only)				
Input Frequency	Hz	47 - 63 (Note: Safety certified for 50/60Hz only)				
DC Input Voltage Range	Vdc	120 - 370 (Note: Safety certified for AC input only)				
Input Current (100/200Vac)	A	3.3V: 0.45/0.25 5-48V: 0.65/0.35	3.3V: 0.7/0.35 5-48V: 0.95/0.5	3.3V: 0.9/0.45 5-48V: 1.3/0.65	3.3V: 1.3/0.65 5-48V: 1.9/0.95	12-15V: 3.7/1.9 24-48V: 3.6/1.8
Inrush Current at 230Vac (typ) (Cold Start)	A	28	28	28	28	30
Leakage Current	mA	<0.5				
Power Factor (100/200Vac)	-	3.3V: 0.96/0.85 5-48V: 0.97/0.91		3.3V: 0.96/0.89 5-48V: 0.98/0.93		0.97/0.93
Harmonic Compliance	-	Meets IEC61000-3-2				
Hold Up Time (typ) at 100Vac, 100% load	ms	20				18 (80% load)
Efficiency	-	See Model Selector Table				
Conducted & Radiated EMI	-	EN55011 / EN55032-B, FCC-B, VCCI-B				
Immunity	-	IEC61000-6-2, EN61000-4-2 , -3, -4, -5, -6, -8, -11				
Insulation Class	-	Class I				
Safety Certifications and Markings	-	IEC/UL/CSA/EN62368-1, 60950-1, EN50178 (OVC II), CE Mark and UKCA Mark				

Immunity				
Test	Standard	Test Level	Criteria	Notes
ESD	EN61000-4-2	Air ± 8kV and contact ± 4kV	A	See IEC61000 immunity test report on website
Radiated Susceptibility	EN61000-4-3	80M -1GHz: 10V/m 1.4 - 2.0GHz: 3V/m 2.0 - 2.7GHz: 1V/m	A	
Electrical Fast Transient Burst	EN61000-4-4	± 2kV	A	
Surge	EN61000-4-5	Normal ± 2kV Common ± 4kV	A	
Conducted Susceptibility	EN61000-4-6	10Vrms	A	
Magnetic Fields	EN61000-4-8	30A/m	A	
Voltage Dips	EN61000-4-11	30% 500ms 60% 200ms 100% 20ms 100% 5000ms	B B B B	
SEMI F47 Line Dip	SEMI F47	-	-	At input voltages > 200Vac

Specifications						
Model		ZWS50BAF	ZWS75BAF	ZWS100BAF	ZWS150BAF	ZWS300BAF
Output						
Output Voltage Adjustment		See Model Selector Table				
Switching Frequency (Main converter)	kHz	100	100	120	120	120
Line Regulation	mV	3.3-5V: 20, 12V: 48, 15V: 60, 24V: 96, 36V: 144, 48V: 192				
Load Regulation	mV	3.3-5V: 40, 12V: 96, 15V: 120, 24V: 150, 36-48V: 240				
External Load Capacitance	uF	3.3-5V: 10,000, 12-15V: 5,000, 24V: 2,000, 48V: 500		3.3-5V: 15,000, 12-48V: No specification		No specification
Ripple & Noise	mV	See Model Selector Table				
Temperature Coefficient	%/°C	0.02				
Minimum Load	-	No minimum load required				
Overcurrent Protection	-	See Model Selector Table				
Overvoltage Protection	V	See Model Selector Table				
Remote Sense	-	-				
Remote On/Off	-	Optional on ZWS100BAF, ZWS150BAF and ZWS300BAF. See part numbering scheme				
Parallel Operation	-	Not possible				
Environmental						
Operating Temperature ⁽²⁾ (Convection Cooling)	°C	ZWS50-150BAF: -10 to +70, derate linearly from 100% to 50% load from 50 to 70 ZWS300BAF-12 to -15: -10 to +70, derate linearly from 100% to 40% load from 40 to 70 ZWS300BAF-24 to -48: -10 to +70, derate linearly from 100% to 40% load from 45 to 70				
Operating Temperature ⁽²⁾ (Forced Air Cooling)	°C	ZWS50-150BAF: -10 to +70, derate linearly from 100% to 70% load from 60 to 70 ZWS300BAF-12 to -15: -10 to +70, derate linearly from 100% to 60% load from 50 to 70 ZWS300BAF-24 to -48: -10 to +70, derate linearly from 100% to 70% load from 60 to 70				
Storage Temperature	°C	-30 to +75				
Humidity (non condensing)	%RH	30 - 90 Operating, 10 - 90 storage				
Cooling	-	Convection. (Forced air will reduce derating at high ambient temperatures)				
Altitude	m	3,000				
Withstand Voltage (For 1 minute)	Vac	Input to Ground 2,000, Input to Output 3,000, Output to Ground 500 for 1 minute				
Isolation Resistance	MΩ	>100 at 25°C, 70%RH & 500VDC				
Vibration (Non operating)	-	10-55Hz (Sweep for 1min.) 19.6m/s² Constant X,Y,Z 1 hour each				
Shock (Non operating)	-	Less than 196m/s²				
Other						
Weight (Typ) (Open frame models)	g	165	230	290	390	540
Size (LxWxH) (Open frame models)	mm	132 x 50 x 26	150 x 50 x 33	155 x 62 x 33	160 x 75 x 37	180 x 84 x 42
Size (LxWxH) (Open frame models)	Inches	5.2 x 1.97 x 1.02	5.91 x 1.97 x 1.3	6.1 x 2.44 x 1.3	6.3 x 2.95 x 1.46	7.09 x 3.31 x 1.65
Connectors	-	JST or optional screw terminals for ZWS300BAF, see part numbering scheme				
MTBF - JEITA RCR-9102B ⁽³⁾	Hours	227,860	216,524	227,177	209,078	235,840
Warranty	Years	5				

Notes:

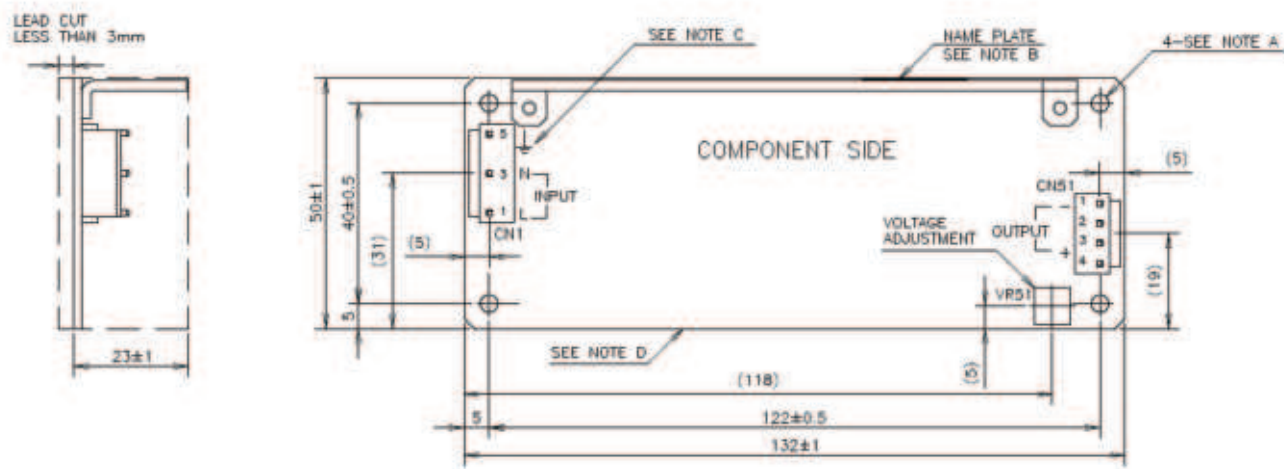
See website for detailed specifications, test methods and installation manual

(1) ZWS300BAF: derate linearly to 80% load from 90 to 85Vac input

(2) See Instruction manual for further details and mounting orientations

(3) Component count method, ground fixed. Note the JEITA RCR-9102B calculation method produces figures significantly lower than Telcordia

Outline Drawing ZWS50BAF (Open Frame)



CONNECTORS USED:

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
PIN HEADER (INPUT SIDE CN1)	B3PS-VH	J.S.T.	1
PIN HEADER (OUTPUT SIDE CN51)	B4P-VH	J.S.T.	1

*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
SOCKET HOUSING (CN1)	VHR-5N	J.S.T.	1
SOCKET HOUSING (CN51)	VHR-4N	J.S.T.	1
TERMINAL PINS	SVH-21T-P1.1	J.S.T.	7
	BVH-21T-P1.1	J.S.T.	7
HAND CRIMPING TOOL	YC-160R	J.S.T.	-

NOTES

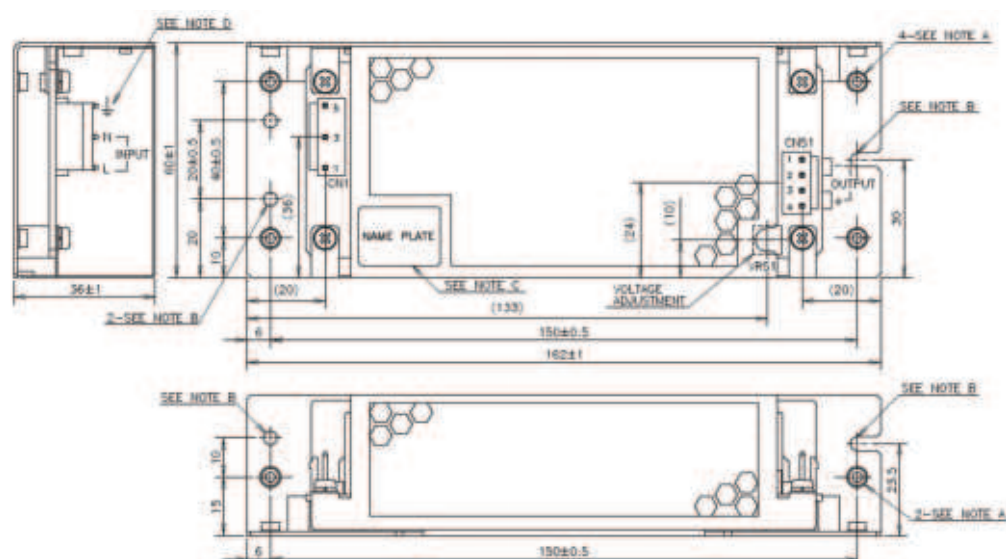
A: 4- ϕ 3.5 HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.

B: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, AND MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY MARKING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

C: $\downarrow$ IS PROTECTIVE BONDING TERMINAL.

D: TO KEEP THE DISTANCE MORE THAN 4mm BETWEEN PCB EDGE AND CUSTOMER'S CHASSIS.

Outline Drawing ZWS50BAF /A



CONNECTORS USED:

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
PIN HEADER (INPUT SIDE CN1)	B3PS-VH	J.S.T.	1
PIN HEADER (OUTPUT SIDE CN51)	B4P-VH	J.S.T.	1

*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
SOCKET HOUSING (CN1)	VHR-5N	J.S.T.	1
SOCKET HOUSING (CN51)	VHR-4N	J.S.T.	1
TERMINAL PINS	SVH-21T-P1.1	J.S.T.	7
	BVH-21T-P1.1	J.S.T.	7
HAND CRIMPING TOOL	YC-160R	J.S.T.	-

NOTES

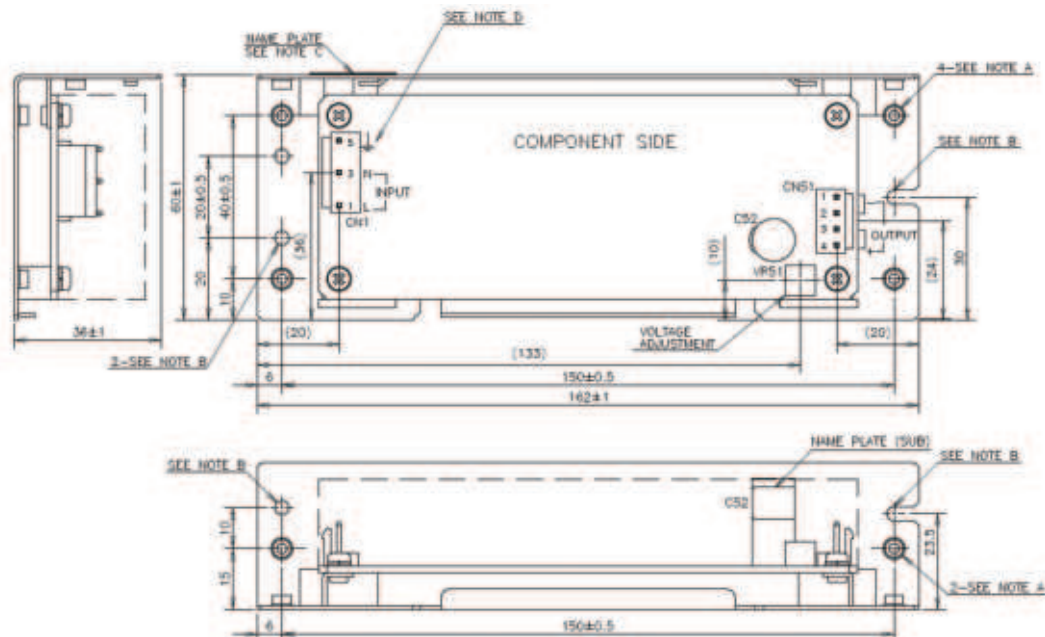
A: M3 EMBOSSED TAPPED & COUNTERBORN HOLES (6) ARE FOR CUSTOMER'S CHASSIS MOUNTING. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION/EMS SPEC.

B: ϕ 3.5 HOLES (3) AND R1.75 SLOT HOLES (2) ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLES.

C: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY MARKING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.

D: $\downarrow$ IS PROTECTIVE BONDING TERMINAL.

Outline Drawing ZWS50BAF/L



CONNECTORS USED:

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
PIN HEADER (INPUT SIDE CN1)	B3PS-VH	J.S.T.	1
PIN HEADER (OUTPUT SIDE CN51)	B4P-VH	J.S.T.	1

*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

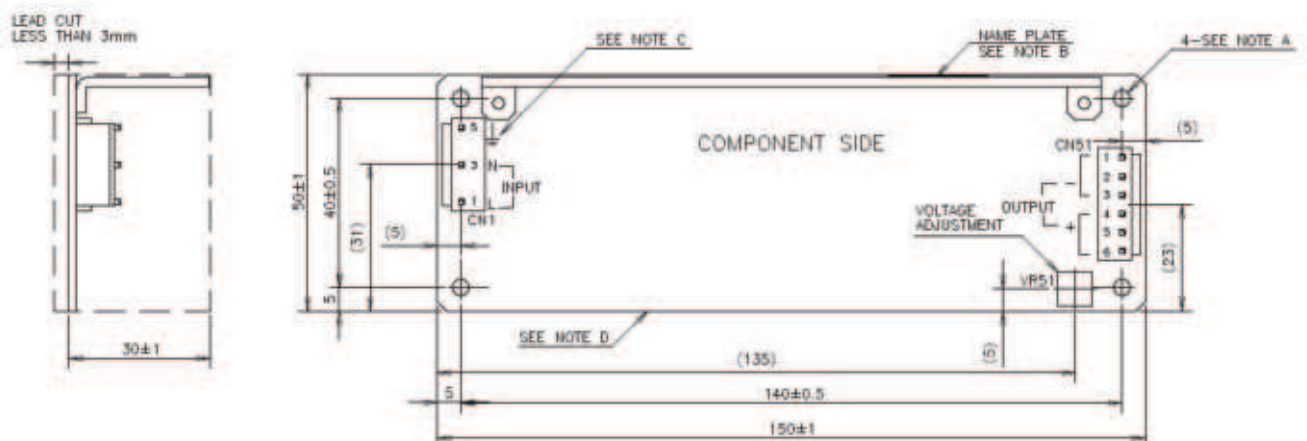
MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
SOCKET HOUSING (CN1)	VHR-5H	J.S.T.	1
SOCKET HOUSING (CN51)	VHR-4H	J.S.T.	1
TERMINAL PINS	SVH-21T-P1.1	J.S.T.	7
	BVH-21T-P1.1	J.S.T.	7
HAND CRIMPING TOOL	YC-160R	J.S.T.	-

NOTES:

- M3 EMBOSSED TAPPED & COUNTERSINK HOLES (6) ARE FOR CUSTOMER'S CHASSIS MOUNTING. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION/EMI SPEC.
- #3.5 HOLES (3) AND R1.75 SLOT HOLES (2) ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLES.
- MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY WARNING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- ⏚ IS PROTECTIVE BONDING TERMINAL.

Outline Drawing ZWS75BAF (Open Frame)



CONNECTORS USED:

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
PIN HEADER (INPUT SIDE CN1)	B3PS-VH	J.S.T.	1
PIN HEADER (OUTPUT SIDE CN51)	B6P-VH	J.S.T.	1

*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

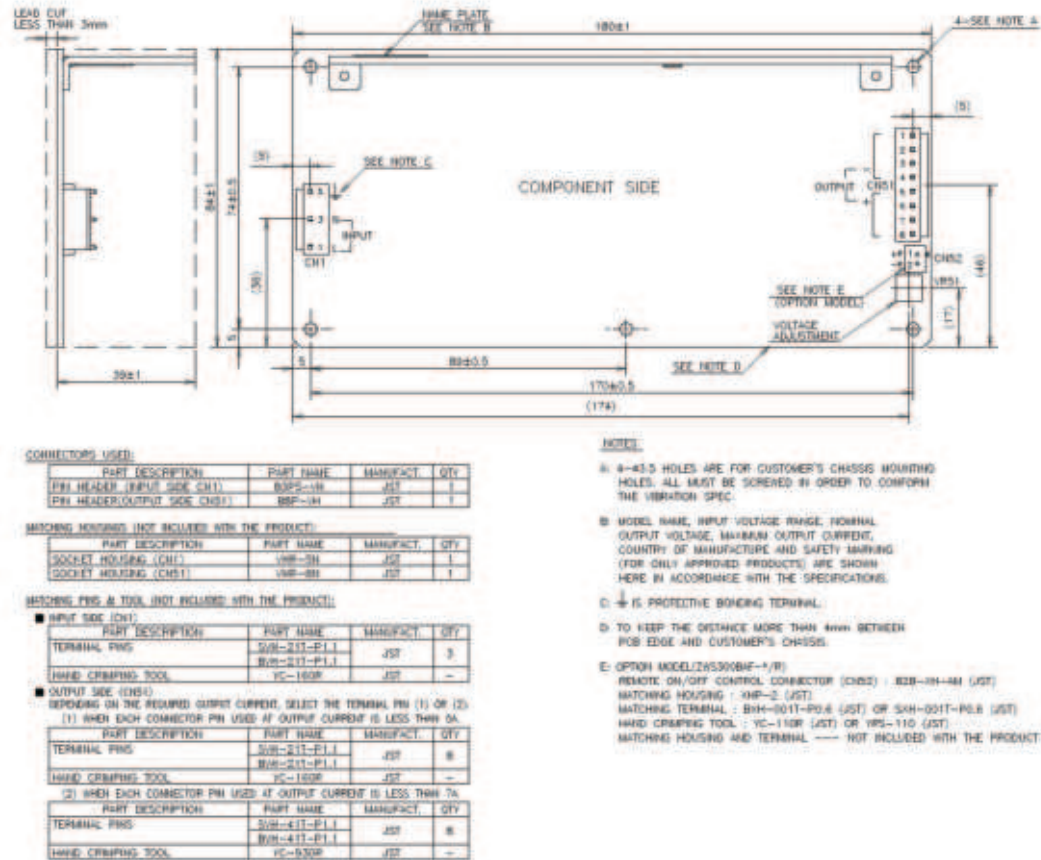
MATCHING HOUSINGS, PINS & TOOL (NOT INCLUDED WITH THE PRODUCT):

PART DESCRIPTION	PART NAME	MANUFACT.	QTY
SOCKET HOUSING (CN1)	VHR-5H	J.S.T.	1
SOCKET HOUSING (CN51)	VHR-6H	J.S.T.	1
TERMINAL PINS	SVH-21T-P1.1	J.S.T.	9
	BVH-21T-P1.1	J.S.T.	9
HAND CRIMPING TOOL	YC-160R	J.S.T.	-

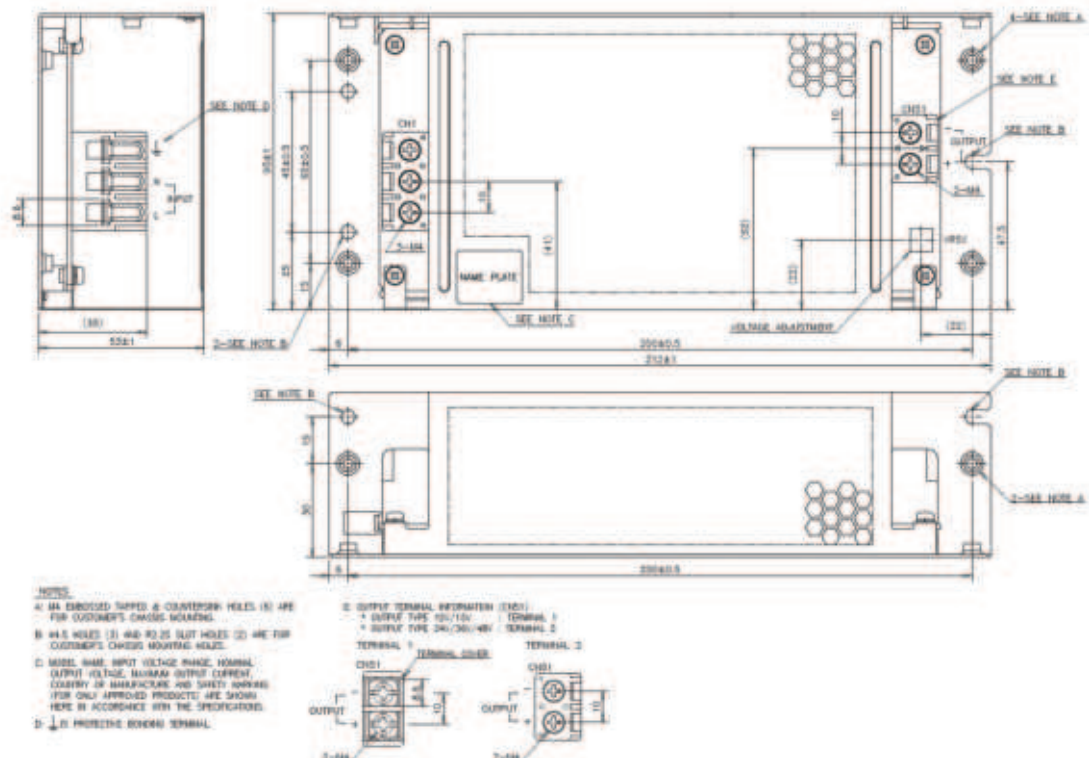
NOTES:

- 4-#3.5 HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT, COUNTRY OF MANUFACTURE AND SAFETY WARNING (FOR ONLY APPROVED PRODUCTS) ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- ⏚ IS PROTECTIVE BONDING TERMINAL.
- TO KEEP THE DISTANCE MORE THAN 4mm BETWEEN PCB EDGE AND CUSTOMER'S CHASSIS.

Outline Drawing ZWS300BAF (Open Frame)



Outline Drawing ZWS300BAF/TA





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