

SPECIFICATIONS (CONVECTION COOLING)

A191-01-01/L-D

ITEMS	MODEL	ZWQ130-5223/L				ZWQ130-5225/L				
		V1	V2	V3	V4	V1	V2	V3	V4	
1	Nominal Output Voltage	V	+5	+12	-12	+3.3	+5	+12	-12	+5
2	Minimum Output Current (Convection) (*1)	A	1.5	0	0	0	1.5	0	0	0
3	Minimum Output Current (Peak Application) (*1)	A	2.1	0	0	0	2.1	0	0	0
4	Maximum Output Current	A	15.0	4.0	4.0	10.0	15.0	4.0	4.0	10.0
5	Total Allowable Output Power (*2)	W				130				
6	Maximum Peak Output Current (*3)	A	19.0	5.0	5.0	12.0	19.0	5.0	5.0	12.0
7	Total Allowable Peak Output Power (*2)	W		149.6				170		
8	Efficiency (Typ) (*4)	%				72				
9	Input Voltage Range (*5)	-				85 - 265VAC (47 - 63Hz) or 120 - 370VDC				
10	Input Current (100/200VAC) (Typ) (*4)	A				2.0/1.0				
11	Inrush Current (Typ) (*6)	-				14A at 100VAC, 28A at 200VAC, Ta=25°C, Cold Start				
12	PFHC	-				Designed to meet IEC61000-3-2				
13	Power Factor (100/200VAC) (Typ) (*4)	-				0.99 / 0.93				
14	Output Voltage Range	V	5.0-5.25	+12/+15	-12/-15	2.0-3.63	5.0-5.25	+12/+15	-12/-15	2.0-5.25
15	Output Voltage Accuracy	-	-	±5%	±5%	-	-	±5%	±5%	-
16	Maximum Ripple & Noise (*7)	0°C ≤ Ta ≤ +60°C -10°C ≤ Ta < 0°C	mV	120	150	150	120	120	150	150
17	Maximum Line Regulation (*7,8)	mV	20	48	48	20	20	48	48	20
18	Maximum Load Regulation (*7,9)	mV	100	300	300	100	100	300	300	100
19	Temperature Coefficient	-				Less than 0.02% /°C				
20	Over Current Protection (*10)				More than 152W of Total Output Power					More than 173W of Total Output Power
21	Over Voltage Protection (*11)	V	5.7 - 7.0	16.5 - 22.5	-22.5 - -16.5	3.79 - 4.95	5.7 - 7.0	16.5 - 22.5	-22.5 - -16.5	5.7 - 7.0
22	Hold-Up Time (Typ) (*12)	-				20 ms				
23	Leakage Current (*13)	-				0.75mA MAX, 0.2mA(Typ) at 100VAC / 0.44mA(Typ) at 230VAC				
24	Remote ON/OFF Control (*14)					Possible				
25	Parallel Operation	-				-				
26	Series Operation	-				-				
27	Operating Temperature (*15)	-				-10 - +60°C (-10 - +40°C : 100%, +60°C : 50%)				
28	Operating Humidity	-				30 - 90%RH (No Dewdrop)				
29	Storage Temperature	-				-30 - +85°C				
30	Storage Humidity	-				10 - 95%RH (No Dewdrop)				
31	Cooling	-				Convection Cooling				
32	Withstand Voltage					Input - FG : 2kVAC(20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC(100mA), for 1min.				
33	Isolation Resistance	-				More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC				
34	Vibration	-				At no operating, 10-55Hz (Sweep for 1min) 19.6 m/s² Constant, X, Y, Z 1h each.				
35	Shock (In package)	-				Less than 196.1 m/s²				
36	Safety (*16)	-				Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1 Designed to meet DENAN				
37	EMI	-				Designed to meet EN55011/EN55022-B, FCC-ClassB, VCCI-B				
38	Immunity (*17)	-				Designed to meet EN61000-4-2, -3, -4, -5, -6, -8, -11				
39	Weight (Typ)	-				950g				
40	Size (WxHxD)	mm				108 x 38 x 250 (Refer to Outline Drawing)				

*Read instruction manual carefully, before using the power supply unit.

=NOTES=

- *1. For V2, V3,V4 stability, require minimum output current of V1.
- *2. Allowable output power is changed according to V4 voltage
refer to derating table (A191-01-05/L-).
- *3. Operating period at peak current is less than 10sec. (Duty≤0.35)
- *4. At 100/200VAC, Ta=25°C and total allowable output power.
- *5. For cases where conformance to various safety specs (UL, CSA, EN) are required,
to be described as 100 - 240VAC(50/60Hz).
- *6. Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- *7. Refer to output measuring (A191-01-07_) for line & load regulation
and ripple voltage.
- *8. 85 - 265VAC , constant load.
- *9. Minimum load - Full load, constant input voltage.
- *10. Constant current limit with automatic recovery. Refer to test data (A191-53-01_).
Not operate at over load or dead short condition for more than 30 seconds.
- *11. OVP circuit will shut down all outputs, manual reset (Line recycle).
- *12. At 100/200VAC, nominal output voltage and total allowable output power.
- *13. Measured by the each method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.
- *14. For using, refer to note (A191-01-07_).
- *15. At standard mounting.
 - Load (%) is percent of total allowable output power or
each maximum output current, whichever is greater.
 - For other mountings, refer to derating curve (A191-01-05/L-).
- *16. As for DENAN, designed to meet at 100VAC.
- *17. Refer to test data(A191-58-01_).

ZWO130/L**SPECIFICATIONS (FORCED AIR COOLING)**

A191-01-02/L-D

ITEMS	MODEL		ZWQ130-5223/L				ZWQ130-5225/L			
			V1	V2	V3	V4	V1	V2	V3	V4
1	Nominal Output Voltage	V	+5	+12	-12	+3.3	+5	+12	-12	+5
2	Minimum Output Current (*1)	A	2.1	0	0	0	2.1	0	0	0
3	Maximum Output Current	A	19.0	5.0	5.0	12.0	19.0	5.0	5.0	12.0
4	Total Allowable Output Power (*2)	W	149.6				170			
5	Input Current (100/200VAC) (Typ) (*3)	A					2.6/1.3			
6	Operating Temperature (*4)	-	-10 ~ +70°C (-10 ~ +50°C : 100%, +70°C : 50%)							
7	Cooling (*5)	-					Forced Air Cooling			

*Read instruction manual carefully, before using the power supply unit

=NOTES=

*For other items, refer to convection cooling specifications (A191-01-01/L-).

*1. For V2, V3, V4 stability, require minimum output current of V1.

When it is using under condition of forced air cooling, V1 minimum output current is same as convection cooling.

*2. Allowable output power is changed according to V4 voltage, refer to derating table (A191-01-06/L-).

*3. At 100/200VAC, Ta=25°C total allowable output power

*4. At standard mounting.

- Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.

For other mountings, refer to derating curve (A191-01-06/L-).

*5. Air flow $\geq 0.85 \text{m}^3/\text{min}$ (30cfm)

SPECIFICATIONS (CONVECTION COOLING)

A191-01-03/L-C

ITEMS	MODEL	ZWQ130-5222/L				ZWQ130-5224/L				
		V1	V2	V3	V4	V1	V2	V3	V4	
1	Nominal Output Voltage	V	+5	+12	-12	+12	+5	+12	-12	+24
2	Minimum Output Current (Convection) (*1)	A	1.5	0	0	0	1.5	0	0	0
3	Minimum Output Current (Peak Applicat)	A	2.1	0	0	0	2.1	0	0	0
4	Maximum Output Current	A	15.0	4.0	4.0	4.0	15.0	4.0	4.0	2.0
5	Total Allowable Output Power	W				130				
6	Maximum Peak Output Current (*2)	A	19.0	5.0	5.0	5.0	19.0	5.0	5.0	2.5
7	Total Allowable Peak Output Power	W				170				
8	Efficiency (Typ) (*3)	%				72				
9	Input Voltage Range (*4)	-				85 - 265VAC (47 - 63Hz) or 120 - 370VDC				
10	Input Current (100/200VAC) (Typ) (*3)	A				2.0 / 1.0				
11	Inrush Current (Typ) (*5)	-				14A at 100VAC, 28A at 200VAC, Ta=25°C, Cold Start.				
12	PFHC	-				Designed to meet IEC61000-3-2				
13	Power Factor (100/200VAC) (Typ) (*3)	-				0.99 / 0.93				
14	Output Voltage Range	-	5.0-5.25	+12/+15	-12/-15	11.4-12.6	5.0-5.25	+12/+15	-12/-15	22.8-25.2
15	Output Voltage Accuracy	-	-	±5%	±5%	-	-	±5%	±5%	-
16	Maximum Ripple & Noise (*6)	$0^{\circ}\text{C} \leq \text{Ta} \leq +60^{\circ}\text{C}$ $-10^{\circ}\text{C} \leq \text{Ta} < 0^{\circ}\text{C}$	mV	120	150	150	120	150	150	200
17	Maximum Line Regulation (*6,7)	mV	20	48	48	48	20	48	48	96
18	Maximum Load Regulation (*6,8)	mV	100	300	300	300	100	300	300	400
19	Temperature Coefficient	-				Less than 0.02% / °C				
20	Over Current Protection (*9)					More than 173W of Total Output Power				
21	Over Voltage Protection (*10)	V	5.7 - 7.0	16.5 - 22.5	-22.5 - -16.5	13.8 - 16.2	5.7 - 7.0	16.5 - 22.5	-22.5 - -16.5	27.6 - 32.4
22	Hold-Up Time (Typ) (*11)	-				20 ms				
23	Leakage Current (*12)	-				0.75mA MAX, 0.2mA(Typ) at 100VAC / 0.44mA(Typ) at 230VAC				
24	Remote ON/OFF Control (*13)					Possible				
25	Parallel Operation	-				-				
26	Series Operation	-				-				
27	Operating Temperature (*14)	-				-10 - +60°C (-10 - +40°C :100%, +60°C :50%)				
28	Operating Humidity	-				30 - 90%RH (No Dewdrop)				
29	Storage Temperature	-				-30 - +85°C				
30	Storage Humidity	-				10 - 95%RH (No Dewdrop)				
31	Cooling	-				Convection Cooling				
32	Withstand Voltage					Input - FG:2kVAC(20mA), Input - Output:3kVAC (20mA) Output - FG:500VAC(100mA), for 1min.				
33	Isolation Resistance	-				More than 100MΩ at 25°C and 70%RH Output - FG:500VDC				
34	Vibration	-				At no operating, 10-55Hz (Sweep for 1min) 19.6 m/s ² Constant, X, Y, Z 1h each.				
35	Shock (In package)	-				Less than 196.1 m/s ²				
36	Safety (*15)	-				Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1 Designed to meet DENAN				
37	EMI	-				Designed to meet EN55011/EN55022-B, FCC-ClassB, VCCI-B				
38	Immunity (*16)	-				Designed to meet EN61000-4-2, -3, -4, -5, -6, -8, -11				
39	Weight (Typ)	-				950g				
40	Size (WxHxD)	mm				108 x 38 x 250 (Refer to Outline Drawing)				

*Read instruction manual carefully, before using the power supply unit.

=NOTES=

- *1. For V2, V3,V4 stability, require minimum output current of V1.
- *2. Operating period at peak current is less than 10sec. (Duty \leq 0.35)
- *3. At 100/200VAC, Ta=25°C and total allowable output power.
- *4. For cases where conformance to various safety specs (UL, CSA, EN) are required. to be described as 100 - 240VAC(50/60Hz).
- *5. Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- *6. Refer to output measuring (A191-01-07_) for line & load regulation and ripple voltage.
- *7. 85 - 265VAC , constant load.
- *8. Minimum load - Full load, constant input voltage.
- *9. Constant current limit with automatic recovery. Refer to test data (A191-53-01_). Not operate at over load or dead short condition for more than 30 seconds.
- *10. OVP circuit will shut down all outputs, manual reset (Line recycle).
- *11. At 100/200VAC, nominal output voltage and total allowable output power.
- *12. Measured by the each method of UL, CSA, EN and DENAN (at 60Hz), Ta=25°C.
- *13. For using, refer to note (A191-01-07_).
- *14. At standard mounting.
 - Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.
 - For other mountings, refer to derating curve (A191-01-05/L-).
- *15. As for DENAN, designed to meet at 100VAC.
- *16. Refer to test data(A191-58-01_).

ZWO130/L

SPECIFICATIONS (FORCED AIR COOLING)

A191-01-04/L-C

ITEMS	MODEL		ZWQ130-5222/L				ZWQ130-5224/L			
			V1	V2	V3	V4	V1	V2	V3	V4
1	Nominal Output Voltage	V	+5	+12	-12	+12	+5	+12	-12	+24
2	Minimum Output Current (*1)	A	2.1	0	0	0	2.1	0	0	0
3	Maximum Output Current	A	19.0	5.0	5.0	5.0	19.0	5.0	5.0	2.5
4	Total Allowable Output Power	W				170				
5	Input Current (100/200VAC) (Typ) (*2)	A				2.6/1.3				
6	Operating Temperature (*3)	-				-10 ~ +70°C (-10 ~+50°C : 100%, +70°C : 50%)				
7	Cooling (*4)	-				Forced Air Cooling				

*Read instruction manual carefully, before using the power supply unit.

=NOTES=

*For other items, refer to convection cooling specifications (A191-01-01/L-).

*1. For V2, V3,V4 stability, require minimum output current of V1.

When it is using under condition of forced air cooling, V1 minimum output current is same as convection cooling.

*2. At 100/200VAC, Ta=25°C total allowable output power.

*3. At standard mounting.

- Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.

For other mountings, refer to derating curve (A191-01-06/L-).

*4. Air flow $\geq 0.85\text{m}^3/\text{min}$ (30cfm)

ZWO130/L**OUTPUT DERATING (CONVECTION COOLING)**

A191-01-05/L

Ta(°C)	LOAD (%)		
	MOUNTING A	MOUNTING B,C,D	MOUNTING E
-10 ~+25	100	100	100
30	100	100	87
35	100	87	75
40	100	75	62
45	87	62	50
50	75	50	
55	62		
60	50		

Allowable output power

5225/L		
A	B	C
5V	170W	130W
3V	146W	130W
2V	134W	130W

5223/L		
A	B	C
3.3V	149.6W	130W
3V	146W	130W
2V	134W	130W

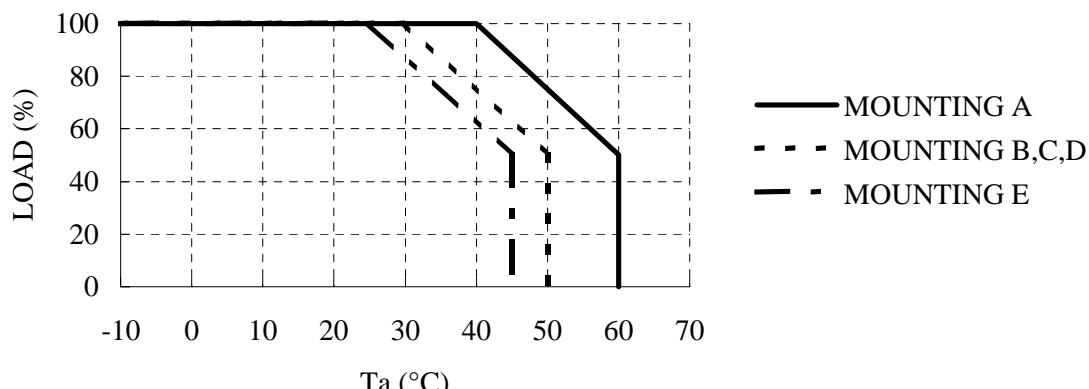
A : V4 setting voltage

B : Total Allowable Peak Output Power

C : Total Allowable Output Power

* The period of peak current at Convection Cooling is limited less than 10sec. (Duty \leq 0.35)

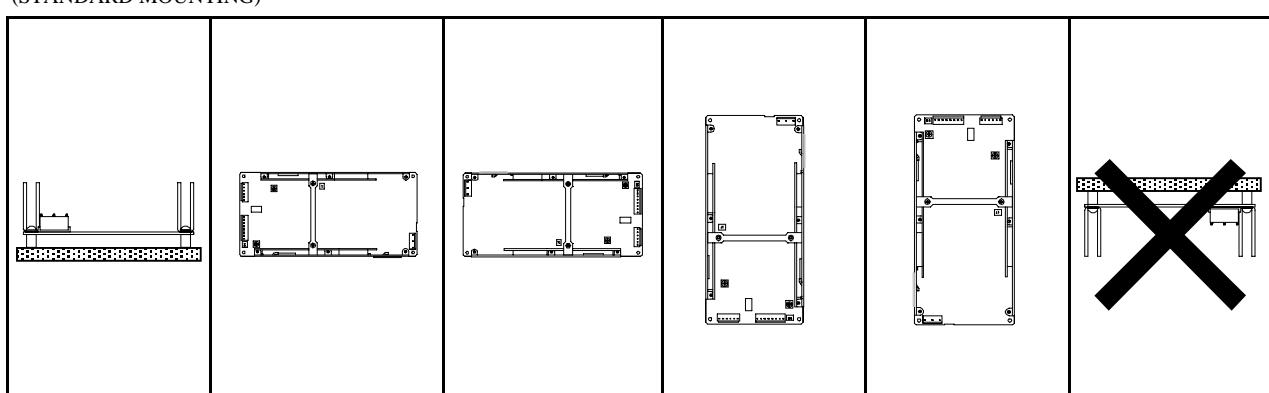
For peak current application, refer to note (A191-01-07).

OUTPUT DERATING CURVE FOR CONVECTION COOLING

Please refer to Instruction manual.

* Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.

MOUNTING A MOUNTING B MOUNTING C MOUNTING D MOUNTING E PROHIBIT
(STANDARD MOUNTING)



OUTPUT DERATING (FORCED AIR COOLING)

A191-01-06/L

Ta(°C)	LOAD (%)				
	MOUNTING A,B,C,D,E				
-10 ~+40	100				
45	100				
50	100				
55	87				
60	75				
65	62				
70	50				

Allowable output power

5225/L	
A	B
5V	170W
3V	146W
2V	134W

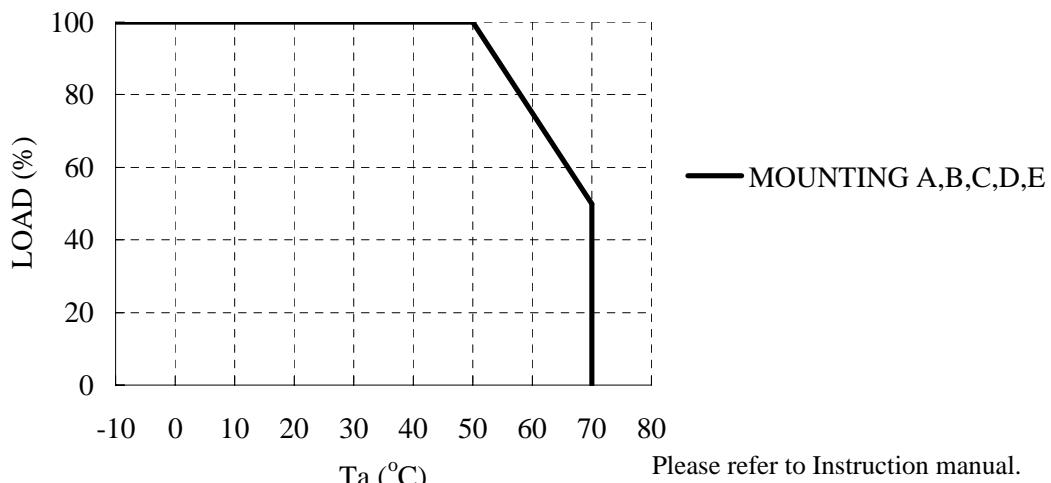
5223/L	
A	B
3.3V	149.6W
3V	146W
2V	134W

A : V4 setting voltage

B : Total Allowable Output Power

* Air flow $\geq 0.85\text{m}^3/\text{min}(30\text{cfm})$
Air must flow through component side.

OUTPUT DERATING CURVE FOR FORCED AIR COOLING



Please refer to Instruction manual.

* Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.

MOUNTING A

MOUNTING B

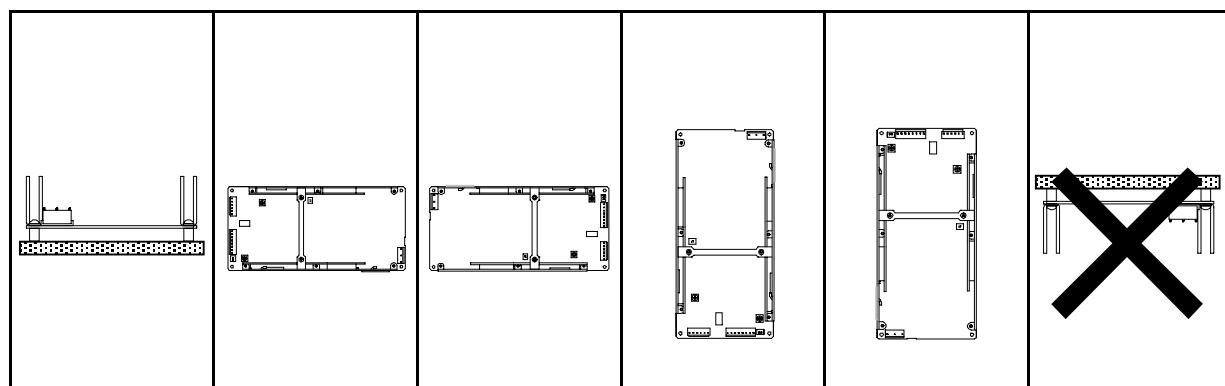
MOUNTING C

MOUNTING D

MOUNTING E

PROHIBIT

(STANDARD MOUNTING)



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