ZWQ80

A190-01-01-A

	ITEMS \ MODEL			ZWQ80-5225				ZWQ80-5222				ZWQ80-5224			
				V1	V2	V3	V4	V1	V2	V3	V4	V1	V2	V3	V4
1	Nominal Output Voltage		V	+5	+12	-12	+5	+5	+12	-12	+12	+5	+12	-12	+24
2	Minimum Output Current (Convection)	(*1)	A	0.9	0	0	0	0.9	0	0	0	0.9	0	0	0
3	Minimum Output Current (Peak Application)	(*1)	A	1.4	0	0	0	1.4	0	0	0	1.4	0	0	0
4	Maximum Output Current		A	8.0	2.0	2.0	7.0	8.0	2.0	2.0	3.0	8.0	2.0	2.0	1.5
5	Total Allowable Output Power	(*16)	W	80				80				80			
6	Maximum Peak Output Current	(*17)	A	10.0	2.5	2.5	9.0	10.0	2.5	2.5	4.0	10.0	2.5	2.5	2.0
7	Total Allowable Peak Output Power	(*16)	W	104				104				104			
8	Efficiency (Typ)	(*2)	%	72											
9	Input Voltage Range	(*3)	-	85 ~ 265VAC (47 ~ 63Hz) or 120 ~ 370VDC											
10	Input Current (100/200VAC) (Typ)	(*2)	A	1.2 / 0.6											
11	Inrush Current (Typ)	(*4)	-	14A at 100VAC, 28A at 200VAC, Ta=25°C, Cold Start											
12	PFHC		-	Built to meet IEC61000-3-2											
13	Power Factor (100/200VAC) (Typ)	(*2)	-	0.99 / 0.93											
14	Output Voltage Range		V	5.0-5.25	+12/+15	-12/-15	2.0-5.25	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%	-	-	±5%	±5%	-
16	Maximum Ripple & Noise	0 ≤ Ta ≤ +60°C	mV	120	150	150	120	120	150	150	150	120	150	150	200
		(*5) -10 ≤ Ta < 0°C	mV	160	180	180	160	160	180	180	180	160	180	180	200
17	Maximum Line Regulation	(*5,6)	mV	20	48	48	20	20	48	48	48	20	48	48	96
18	Maximum Load Regulation	(*5,7)	mV	100	300	300	100	100	300	300	300	100	300	300	400
19	Temperature Coefficient		-	Less than 0.02% /°C											
20	Over Current Protection	(*8)	-	more than 105%											
21	Over Voltage Protection	(*9)	V	5.7 - 7.0	16.5-22.5	16.5-22.5	5.7 - 7.0	5.7 - 7.0	16.5-22.5	16.5-22.5	13.8-16.2	5.7 - 7.0	16.5-22.5	16.5-22.5	27.6-32.4
22	Hold-Up Time (Typ)	(*10)	-	20 ms											
23	Leakage Current	(*11)	-	0.75mA MAX,0.2mA(Typ) at 100VAC / 0.44mA(Typ) at 230VAC											
25	Remote ON/OFF Control	(*14)		Possible											
26	Parallel Operation		-	-											
27	Series Operation		-	-											
28	Operating Temperature	(*12)	-	-10 ~ +60°C (-10 ~+40°C : 100%, +60°C : 50%)											
29	Operating Humidity		-	30 ~ 90%RH (No Dewdrop)											
30	Storage Temperature		-	-30 ~ +85°C											
31	Storage Humidity		-	10 ~ 95%RH (No Dewdrop)											
32	Cooling		-	Convection Cooling											
33	Withstand Voltage			Input - FG : 2kVAC(20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC(100mA), for 1min.											
34	Isolation Resistance		-	More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC											
35	Vibration		-	At no operating, 10-55Hz (Sweep for 1min) 19.6 m/s^2 Constant, X, Y, Z 1hour each.											
36	Shock (In package)		-	Less than 196.1 m/s^2											
37	Safety	(*13)	-	Approved by UL1950, CSA950, EN60950, VDE0160 Built to meet DENTORI											
38	EMI		-	Built to meet EN55011/EN55022-B, FCC-ClassB, VCCI-B											
39	Immunity	(*15)	-	Built to meet EN61000-4-2, -3, -4, -5, -6, -8, -11											
40	Weight (Typ)		g	550											
41	Size (W x H x D)		mm	93.5 × 35 × 210 (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 and above of V1.

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

*3. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50/60Hz).

*4. Not applicable for the inrush current to Noise Filter for less than 0.2ms.

*5. Refer to output measuring (A190-01-05_) for line & load regulation and ripple voltage.

*6. 85 - 265VAC , constant load.

*7. Minimum load - Full load, constant input voltage.

*8. Constant current limit with automatic recovery. Refer to test data (A190-53-01_). Not operate at over load or dead short condition for more than 30 seconds.

*9. OVP circuit will shut down all outputs, manual reset (Line recycle).

*10. At 100/200VAC, nominal output voltage and total allowable output power.

*11. Measured by the each method of UL, CSA, EN and DENTORI (at 60Hz), Ta=25°C.

*12. 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 (A190-01-03_).

*13. As for DENTORI, built to meet at 100VAC.

*14. For using, refer to note (A190-01-05_).

*15. Refer to test data (A190-58-01_).

*16. Allowable output power is changed according to V4 voltage(Only ZWQ-5225), refer to derating table(A190-01-03_).

*17. Operating period at peak current is less than 10sec.. (Duty≤0.35)

ZWQ80

A190-01-02-A

	MODEL / ITEMS			ZWQ80-5225				ZWQ80-5222				ZWQ80-5224			
				V1	V2	V3	V4	V1	V2	V3	V4	V1	V2	V3	V4
1	Nominal Output Voltage		V	+5	+12	-12	+5	+5	+12	-12	+12	+5	+12	-12	+24
2	Minimum Output Current	(*1)	A	1.4	0	0	0	1.4	0	0	0	1.4	0	0	0
3	Maximum Output Current		A	10.0	2.5	2.5	9.0	10.0	2.5	2.5	4.0	10.0	2.5	2.5	2.0
4	Total Allowable Output Power	(*2)	W	104				104				104			
5	Input Current (100/200VAC) (Typ)	(*3)	A	1.6 / 0.8											
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 (A190-01-01_).

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

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

*2. Allowable output power is changed according to V4 voltage(Only ZWQ-5225), refer to derating table (A190-01-04_).

*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 (A190-01-04_).

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

OUTPUT DERATING (CONVECTION COOLING)

A190-01-03-A

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

Allowable output power

5225

A	B	C
5V	104W	80W
3V	86W	80W
2V	77W	77W

5223

A	B	C
3.3V	88.7W	80W
3V	86W	80W
2V	77W	77W

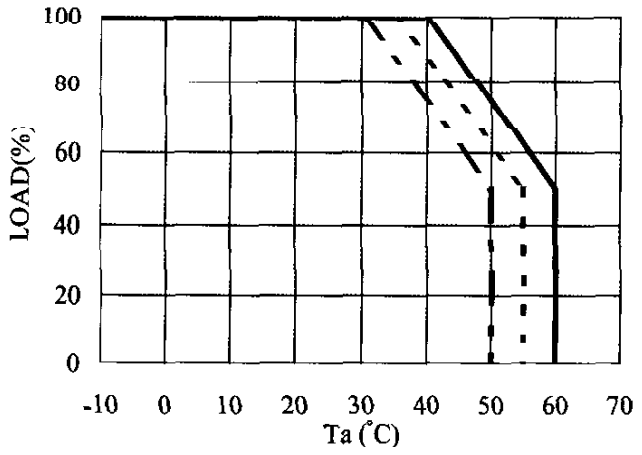
A : V4 setting voltage

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 ≤ 0.35)
For peak current application, refer to note (A190-01-05_).

OUTPUT DERATING CURVE FOR CONVECTION COOLING

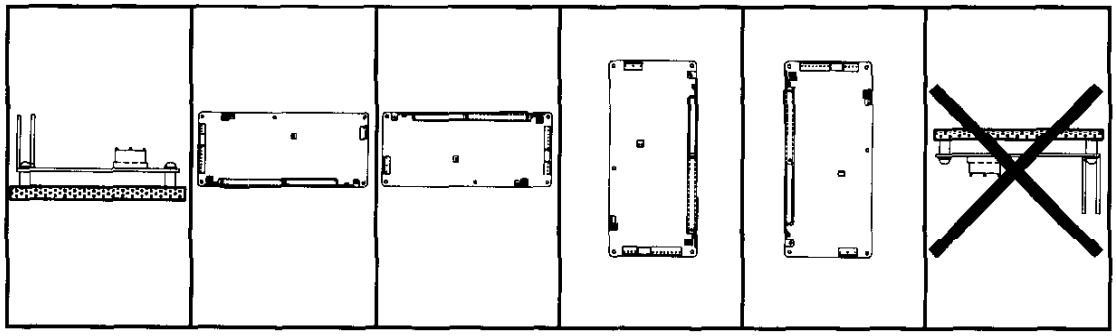


Please refer to Instruction manual.

* 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)

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

Allowable output power

5225

A	B
5V	104W
3V	86W
2V	77W

5223

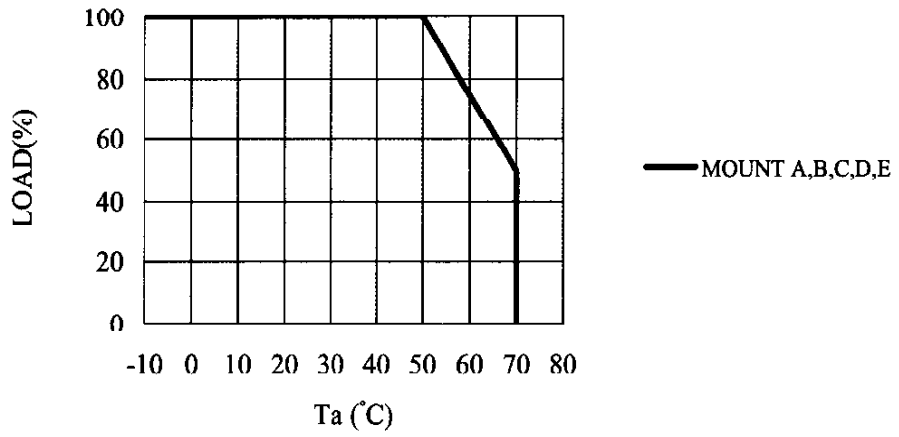
A	B
3.3V	88.7W
3V	86W
2V	77W

A : V4 setting voltage

B : Total Allowable Output Power

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

OUTPUT DERATING CURVE FOR CONVECTION COOLING

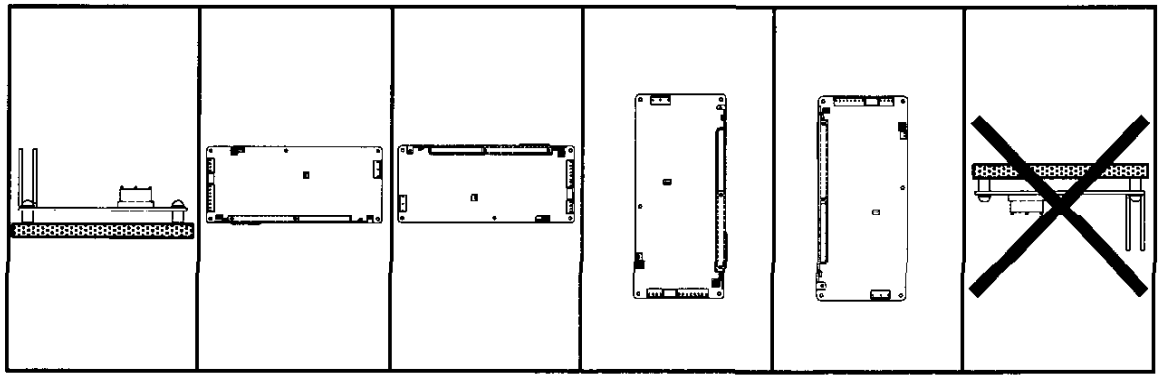


Please refer to Instraction manual.

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

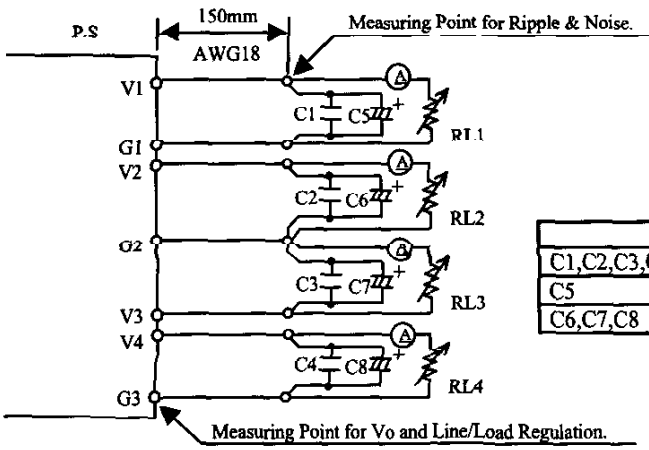
MOUNTING A | MOUNTING B | MOUNTING C | MOUNTING D | MOUNTING E | PROHIBIT

(STANDARD MOUNTING)



NOTE

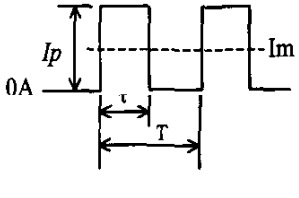
Output Measuring



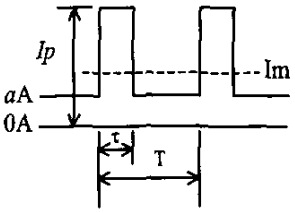
Measure with EIAJ RC-9131 probe.
Bandwidth of scope : 100MHz

		Capacitance
C1,C2,C3,C4	: Film Cap.	0.1 μF
C5	: Elec. Cap.	1000 μF
C6,C7,C8	: Elec. Cap.	100 μF

Peak Output Current (Convection Cooling)



$$Iav \geq \mathrm{Im} = \frac{Ip \times \tau}{T}$$



$$Iav \geq \mathrm{Im} = \frac{(Ip - a) \times \tau}{T} + a$$

Ip : Peak output current (A)
Iav : Average output current (A)
(Maximum output current (Convection) in Spec.)
Im : Average output current (A)
τ : Pulse width of peak output current (sec)
(Operating time at peak output)
T : Period (sec) : more than 10ms

* The period of peak current at Convection Cooling is limited less than 10sec.. (Duty ≤ 0.35)
* Take V1 minmum output current more than 1.4A.

Remote ON/OFF Control

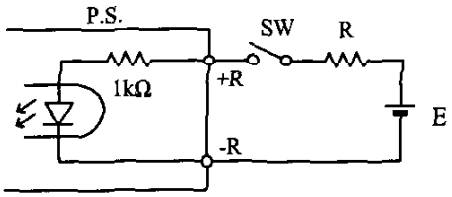
Primary side

Terminal condition	Output
Connector(CN2) Short	ON
Connector(CN2) Open	OFF

A connector(CN2) for ON/OFF control is provided in the Primary Circuit. When using CN2, safety standard requirements should be considered in application design or choice of switch, relay or connector.
In particular:-

(1) Basic insulation must be provided between the ON/OFF control circuit and earth.
(2) Reinforced insulation must be provided between the ON/OFF control circuit and any secondary circuit or accessible part.
(3) Wiring must be drawn to avoid damage to the insulation of the wire or sleeving.

Secondary side (Must be opened CN2)



+R&-R terminal condition	Output
SW ON(Higher than 4.5V)	ON
SW OFF(Lower than 0.8V)	OFF

External voltage level : E	External resistance : R
4.5~12.5VDC	No required
12.5~24.5VDC	1.5kΩ

ZWQ80

A190-01-06

	MODEL / ITEMS			ZWQ80-5223			
				V1	V2	V3	V4
1	Nominal Output Voltage		V	+5	+12	-12	+3.3
2	Minimum Output Current (Convection)	(*1)	A	0.9	0	0	0
3	Minimum Output Current (Peak Application)	(*1)	A	1.4	0	0	0
4	Maximum Output Current		A	8.0	2.0	2.0	7.0
5	Total Allowable Output Power	(*16)	W	80			
6	Maximum Peak Output Current	(*17)	A	10.0	2.5	2.5	9.0
7	Total Allowable Peak Output Power	(*16)	W	88.7			
8	Efficiency (Typ)	(*2)	%	72			
9	Input Voltage Range	(*3)	-	85 ~ 265VAC (47 ~ 63Hz) or 120 ~ 370VDC			
10	Input Current (100/200VAC) (Typ)	(*2)	A	1.2 / 0.6			
11	Inrush Current (Typ)	(*4)	-	14A at 100VAC, 28A at 200VAC, Ta=25°C, Cold Start			
12	PFHC		-	Built to meet IEC61000-3-2			
13	Power Factor (100/200VAC) (Typ)	(*2)	-	0.99 / 0.93			
14	Output Voltage Range		V	5.0-5.25	+12/+15	-12/-15	2.0-3.63
15	Output Voltage Accuracy		-	-	±5%	±5%	-
16	Maximum Ripple & Noise	0 ≤ Ta ≤ +60°C	mV	120	150	150	120
	(*5)	-10 ≤ Ta < 0°C	mV	160	180	180	160
17	Maximum Line Regulation	(*5,6)	mV	20	48	48	20
18	Maximum Load Regulation	(*5,7)	mV	100	300	300	100
19	Temperature Coefficient		-	Less than 0.02% /°C			
20	Over Current Protection	(*8)	-	more than 105%			
21	Over Voltage Protection	(*9)	V	5.7 - 7.0	16.5-22.5	16.5-22.5	3.79 - 4.95
22	Hold-Up Time (Typ)	(*10)	-	20 ms			
23	Leakage Current	(*11)	-	0.75mA MAX,0.2mA(Typ) at 100VAC / 0.44mA(Typ) at 230VAC			
25	Remote ON/OFF Control	(*14)		Possible			
26	Parallel Operation		-	-			
27	Series Operation		-	-			
28	Operating Temperature	(*12)	-	-10 ~ +60°C (-10 ~+40°C : 100%, +60°C : 50%)			
29	Operating Humidity		-	30 ~ 90%RH (No Dewdrop)			
30	Storage Temperature		-	-30 ~ +85°C			
31	Storage Humidity		-	10 ~ 95%RH (No Dewdrop)			
32	Cooling		-	Convection Cooling			
33	Withstand Voltage			Input - FG : 2kVAC(20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC(100mA), for 1min.			
34	Isolation Resistance		-	More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC			
35	Vibration		-	At no operating, 10-55Hz (Sweep for 1min) 19.6 m/s^2 Constant, X, Y, Z 1hour each.			
36	Shock (In package)		-	Less than 196.1 m/s^2			
37	Safety	(*13)	-	Approved by UL1950, CSA950, EN60950, VDE0160 Built to meet DENTORI			
38	EMI		-	EN55011/EN55022-B, FCC-ClassB, VCCI-B			
39	Immunity	(*15)	-	Built to meet EN61000-4-2, -3, -4, -5, -6, -8, -11			
40	Weight (Typ)		g	550			
41	Size (W x H x D)		mm	93.5 × 35 × 210 (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 and above of V1.

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

*3. For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50/60Hz).

*4. Not applicable for the inrush current to Noise Filter for less than 0.2ms.

*5. Refer to output measuring (A190-01-05_) for line & load regulation and ripple voltage.

*6. 85 - 265VAC , constant load.

*7. Minimum load - Full load, constant input voltage.

*8. Constant current limit with automatic recovery. Refer to test data (A190-53-01_). Not operate at over load or dead short condition for more than 30 seconds.

*9. OVP circuit will shut down all outputs, manual reset (Line recycle).

*10. At 100/200VAC, nominal output voltage and total allowable output power.

*11. Measured by the each method of UL, CSA, EN and DENTORI (at 60Hz), Ta=25°C.

*12. 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 (A190-01-03_).

*13. As for DENTORI, built to meet at 100VAC.

*14. For using, refer to note (A190-01-05_).

*15. Refer to test data (A190-58-01_).

*16. Allowable output power is changed according to V4 voltage, refer to derating table (A190-01-03_).

*17. Operating period at peak current is less than 10sec.. (Duty≤0.35)

ZWQ80

A190-01-07

	MODEL / ITEMS			ZWQ80-5223			
				V1	V2	V3	V4
1	Nominal Output Voltage		V	+5	+12	-12	+3.3
2	Minimum Output Current	(*1)	A	1.4	0	0	0
3	Maximum Output Current		A	10.0	2.5	2.5	9.0
4	Total Allowable Output Power	(*2)	W	88.7			
5	Input Current (100/200VAC) (Typ)	(*3)	A	1.6 / 0.8			
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 (A190-01-01_).

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

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

*2. Allowable output power is changed according to V4 voltage, refer to derating table (A190-01-04_).

*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 (A190-01-04_).

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