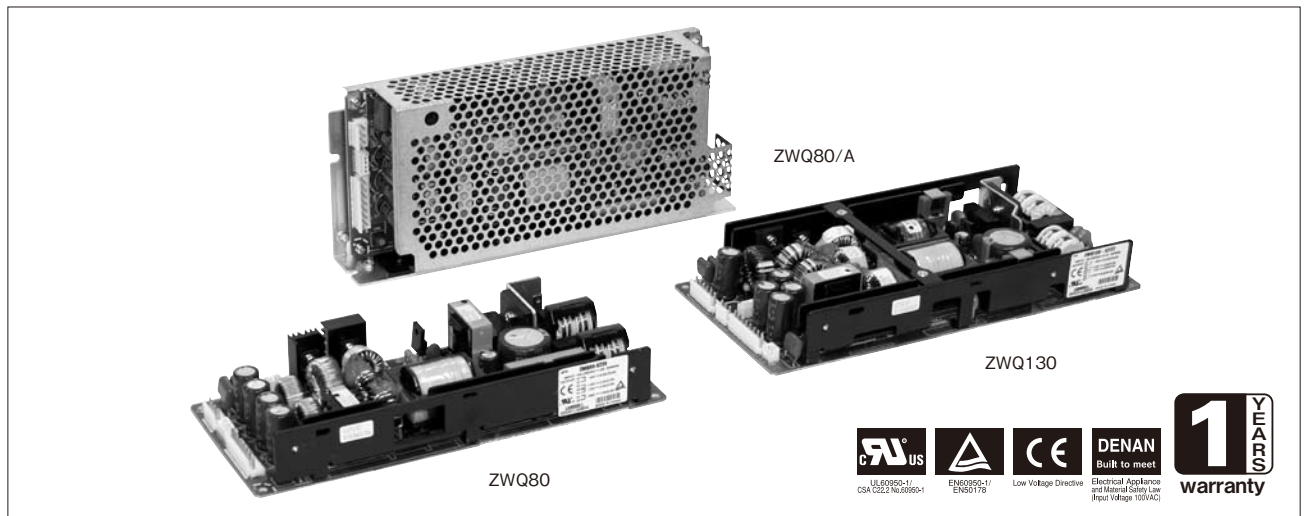


ZWQ SERIES

Quad Output 80W - 130W



■ Features



Complies the standard of the harmonics current limiter (EN61000-3-2) with built-in active filter

- Compact / Slim / On board type power supply with 4 outputs
- Broad output voltage range
V2/V3 output: Switchable between $\pm 12V$ and $\pm 15V$
24V (30V) output is possible by series connection.
- V4 output: 5V output covers 2V/3.3V/5V.
- Remote On/Off control available (except for with cover option)
- Worldwide input voltage range: 85-265VAC

■ Applications



■ Model naming method

ZWQ 80 – 5525 /

- Option
- Blank : PCB type
- L: L-shape metal plate type
- A: With cover
- Output voltage
- Output power
- Series name

■ Conformity to RoHS Directive

This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

■ Product Line up

| Output Voltage | 80W(Peak88.7W) | | 80W(Peak104W) | | 80W(Peak104W) | | 80W(Peak104W) | |
|----------------|----------------------------|------------|----------------------------|------------|----------------------------|------------|----------------------------|------------|
| | Output Current(Peak)/Model | | Output Current(Peak)/Model | | Output Current(Peak)/Model | | Output Current(Peak)/Model | |
| 3.3V | 7.0A (9.0A) | ZWQ80-5223 | — | ZWQ80-5225 | — | ZWQ80-5222 | — | ZWQ80-5224 |
| 5V | 8.0A (10.0A) | | 8.0A (10.0A) | | 8.0A (10.0A) | | 8.0A (10.0A) | |
| 5V | — | | 7.0A (9.0A) | | — | | — | |
| 12V | — | | — | | 3.0A (4.0A) | | — | |
| 12V (15V) | 2.0A (2.5A) | | 2.0A (2.5A) | | 2.0A (2.5A) | | 2.0A (2.5A) | |
| -12V (-15V) | 2.0A (2.5A) | | 2.0A (2.5A) | | 2.0A (2.5A) | | 2.0A (2.5A) | |
| 24V | — | | — | | — | | 1.5A (2.0A) | |

| Output Current | 130W(Peak149.6W) | | 130W(Peak170W) | | 130W(Peak170W) | | 130W(Peak170W) | |
|----------------|----------------------------|-------------|----------------------------|-------------|----------------------------|-------------|----------------------------|-------------|
| | Output Current(Peak)/Model | | Output Current(Peak)/Model | | Output Current(Peak)/Model | | Output Current(Peak)/Model | |
| 3.3V | 10.0A (12.0A) | ZWQ130-5223 | — | ZWQ130-5225 | — | ZWQ130-5222 | — | ZWQ130-5224 |
| 5V | 15.0A (19.0A) | | 15A (19.0A) | | 15.0A (19.0A) | | 15.0A (19.0A) | |
| 5V | — | | 10.0A (12.0A) | | — | | — | |
| 12V | — | | — | | 4.0A (5.0A) | | — | |
| 12V (15V) | 4.0A (5.0A) | | 4.0A (5.0A) | | 4.0A (5.0A) | | 4.0A (5.0A) | |
| -12V (-15V) | 4.0A (5.0A) | | 4.0A (5.0A) | | 4.0A (5.0A) | | 4.0A (5.0A) | |
| 24V | — | | — | | — | | 2.0A (2.5A) | |

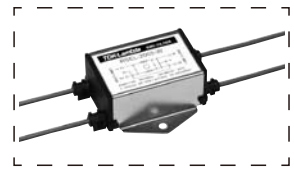
ZWQ

ZWQ80 (Convection Cooling) Specifications

| ITEMS/UNITS | | MODEL | ZWQ80-5225 | | | | ZWQ80-5222 | | | | ZWQ80-5224 | | | | ZWQ80-5223 | | | |
|-----------------------|------------------------------------------|------------------------------------------------------|---------------------------------------------------------------------------------------------------|-----------|-----------|-----------|------------|-----------|-----------|-----------|------------|-----------|-----------|-------------|------------|---------|---------------------------------------|----------|
| | | CH | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Input | Voltage Range (*3) | V | AC85 - 265 or DC120 - 370 | | | | | | | | | | | | | | | |
| | Frequency (*3) | Hz | 47 - 63 | | | | | | | | | | | | | | | |
| | Power Factor (100/200VAC)(typ) (*2) | | 0.99 / 0.93 | | | | | | | | | | | | | | | |
| | Efficiency (typ) (*2) | % | 72 | | | | | | | | | | | | | | | |
| | Current (100/200VAC)(typ) (*2) | A | 1.2 / 0.6 | | | | | | | | | | | | | | | |
| | Inrush Current (100/200VAC)(typ) (*4) | A | 14 / 28, Ta=25°C, cold start | | | | | | | | | | | | | | | |
| Leakage Current (*11) | mA | 0.75 MAX, 0.2 (typ) at 100VAC / 0.44 (typ) at 230VAC | | | | | | | | | | | | | | | | |
| Output | Nominal Voltage | VDC | +5 | +12 | -12 | +5 | +5 | +12 | -12 | +5 | +12 | -12 | +24 | +5 | +12 | -12 | +3.3 | |
| | Minimum Current (Convection) (*1) | A | 0.9 | 0 | | | 0.9 | 0 | | | 0.9 | 0 | | | 0.9 | 0 | | |
| | Minimum Current (Peak Application) (*1) | A | 1.4 | 0 | | | 1.4 | 0 | | | 1.4 | 0 | | | 1.4 | 0 | | |
| | Maximum Current | A | 8.0 | 2.0 | 7.0 | 8.0 | 2.0 | 3.0 | 8.0 | 2.0 | 1.5 | 8.0 | 2.0 | 7.0 | | | | |
| | Maximum Peak Current (*17) | A | 10.0 | 2.5 | 9.0 | 10.0 | 2.5 | 4.0 | 10.0 | 2.5 | 2.0 | 10.0 | 2.5 | 9.0 | | | | |
| | Total Allowable Power (*16) | W | 80 | | | | 80 | | | | 80 | | | | 80 | | | |
| | Total Allowable Peak Power (*16) | W | 104 | | | | 104 | | | | 104 | | | | 88.7 | | | |
| | Voltage Setting Accuracy | % | - | +5% | - | - | +5% | - | - | +5% | - | - | +5% | - | - | +5% | - | |
| | Maximum Line Regulation (*5)(*6) | mV | 20 | 48 | | | 20 | 48 | | | 20 | 48 | 96 | 20 | 48 | 20 | | |
| | Maximum Load Regulation (*5)(*7) | mV | 100 | 300 | | | 100 | 300 | | | 100 | 300 | 400 | 100 | 300 | 100 | | |
| | Temperature Coefficient | | Less than 0.02% /°C | | | | | | | | | | | | | | | |
| | Maximum Ripple & Noise (0≤Ta≤+60°C) (*5) | mVp-p | 120 | 150 | | | 120 | 150 | | | 120 | 150 | 200 | 120 | 150 | 120 | | |
| | Maximum Ripple & Noise (-10≤Ta<0°C) (*5) | mVp-p | 160 | 180 | | | 160 | 180 | | | 160 | 180 | 200 | 160 | 180 | 160 | | |
| | Hold-up Time (typ) (*10) | ms | 20 | | | | | | | | | | | | | | | |
| | Voltage Adjustable Range | VDC | 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 | 5.0-5.25 | +12/+15 | -12/-15 | 2.0-3.63 |
| Function | Over Current Protection (*8) | | More than 109.2W of total output power | | | | | | | | | | | | | | More than 93.1W of total output power | |
| | Over Voltage Protection (*9) | VDC | 5.7 - 7.0 | 16.5-22.5 | 5.7 - 7.0 | 5.7 - 7.0 | 16.5-22.5 | 13.8-16.2 | 5.7 - 7.0 | 16.5-22.5 | 27.6-32.4 | 5.7 - 7.0 | 16.5-22.5 | 3.79 - 4.95 | | | | |
| | Remote ON/OFF Control (*14) | | Possible | | | | | | | | | | | | | | | |
| | Parallel Operation | | - | | | | | | | | | | | | | | | |
| Series Operation | | - | | | | | | | | | | | | | | | | |
| Environment | Operating Temperature (*12) | °C | -10 to +60 (-10 to +40 : 100%, +60 : 50%) | | | | | | | | | | | | | | | |
| | Storage Temperature | °C | -30 to +85 | | | | | | | | | | | | | | | |
| | Operating Humidity | %RH | 30 - 90 (No Dewdrop) | | | | | | | | | | | | | | | |
| | Storage Humidity | %RH | 10 - 95 (No Dewdrop) | | | | | | | | | | | | | | | |
| | Vibration | | At no operating, 10-55Hz (sweep for 1min) 19.6 m/s ² constant, X, Y, Z 1hour each. | | | | | | | | | | | | | | | |
| | Shock (In package) | | Less than 196.1 m/s ² | | | | | | | | | | | | | | | |
| | Cooling | | Convection cooling | | | | | | | | | | | | | | | |
| Isolation | Withstand Voltage | | Input - FG : 2kVAC(20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC(100mA), for 1min. | | | | | | | | | | | | | | | |
| | Isolation Resistance | | More than 100MΩ at 25oC and 70%RH Output - FG : 500VDC | | | | | | | | | | | | | | | |
| Standards | Safety Standards (*13) | | Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1 Built to meet DENAN | | | | | | | | | | | | | | | |
| | PFHC | | Built to meet IEC61000-3-2 | | | | | | | | | | | | | | | |
| | EMI | | Built to meet EN55011/EN55022-B, FCC-ClassB, VCCI-B | | | | | | | | | | | | | | | |
| Mechanical | Immunity (*15) | | Built to meet EN61000-4-2, -3, -4, -5, -6, -8, -11 | | | | | | | | | | | | | | | |
| | Weight (typ) | g | 550 | | | | | | | | | | | | | | | |
| | Size (W x H x D) | mm | 93.5 x 35 x 210 (Refer to outline drawing) | | | | | | | | | | | | | | | |

(*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 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.
 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 DENAN (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.
 (*13) As for DENAN, built to meet at 100VAC.
 (*14) For using, refer to note.
 (*15) Refer to test data.
 (*16) Allowable output power is changed according to V4 voltage (only ZWQ-5225), refer to derating table.
 (*17) Operating period at peak current is less than 10sec. (Duty<0.35)

● Recommended EMC Filter



RSEL-2002W
 Please refer to "TDK-Lambda EMC Filters" catalog.

ZWQ80 (Forced Air Cooling) Specifications

| ITEMS/UNITS | | MODEL | ZWQ80-5225 | | | | ZWQ80-5222 | | | | ZWQ80-5224 | | | | ZWQ80-5223 | | | |
|----------------------------|---------------------------------|-------|------------------------------------------|-----|-----|-----|------------|-----|-----|-----|------------|-----|-----|-----|------------|-----|-----|------|
| | | CH | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Input | Current (100/200VAC) (typ) (*3) | A | 1.6 / 0.8 | | | | | | | | | | | | | | | |
| | Nominal Voltage | V | +5 | +12 | -12 | +5 | +5 | +12 | -12 | +12 | +5 | +12 | -12 | +24 | +5 | +12 | -12 | +3.3 |
| Output | Minimum Current (*1) | A | 1.4 | 0 | 0 | 0 | 1.4 | 0 | 0 | 0 | 1.4 | 0 | 0 | 0 | 1.4 | 0 | 0 | 9.0 |
| | Maximum 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 | 10.0 | 2.5 | 2.5 | 9.0 |
| Total Allowable Power (*2) | | W | 104 | | | | 104 | | | | 104 | | | | 88.7 | | | |
| Environment | Operating Temperature (*4) | | -10 to +70 (-10 to+50 : 100%, +70 : 50%) | | | | | | | | | | | | | | | |
| | Cooling (*5) | | Forced air cooling | | | | | | | | | | | | | | | |

(*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.

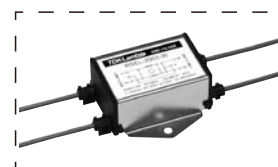
(*2) Allowable output power is changed according to V4 voltage (ZWQ-5225 and -5223 only), refer to derating table.

(*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.

(*5) Air flow > 0.85m³/min (30cfm)

● Recommended EMC Filter



RSEL-2003W

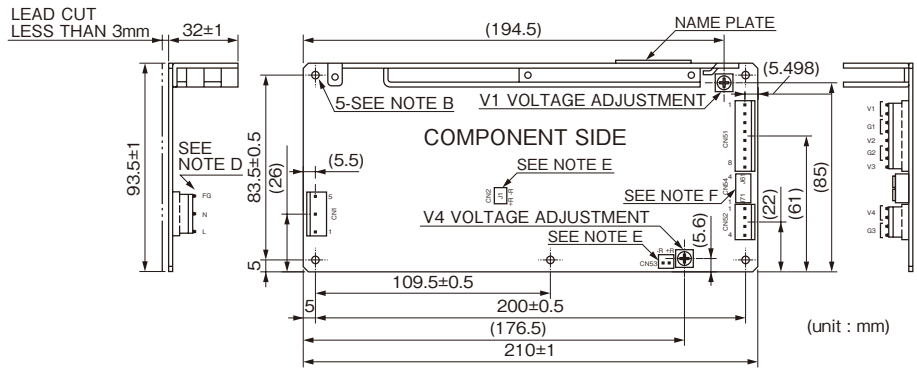
Please refer to "TDK-Lambda EMC Filters" catalog.

Outline Drawing

[ZWQ80]

= NOTES =

- A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- B: 5-φ3.5 HOLES FOR CUSTOMER'S CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- C: KEEP THE DISTANCE MORE THAN 4mm BETWEEN PCB EDGE AND CUSTOMER'S CHASSIS.
- D: FG IS FOR SAFETY GROUND CONNECTION.
- E: REMOTE ON/OFF CONTROL CONNECTOR (CN2, 53)
: B2B-XH-AM (J.S.T.)
MATCHING HOUSING : XHP-2 (J.S.T.)
MATCHING TERMINAL : BXH-001T-P0.6 (J.S.T.) OR SXH-001T-P0.6 (J.S.T.)
*CN2 IS NORMALLY SHORTED BY JM-2W-96 (J.S.T.)
- F: CONNECTOR TO CHANGE V2,V3 OUTPUT VOLTAGE (CN54) : B4B-XH-AM (J.S.T.)
J61 SHORT : V2 OUTPUT VOLTAGE IS +12V.(*)
J61 OPEN : V2 OUTPUT VOLTAGE IS +15V.
J71 SHORT : V3 OUTPUT VOLTAGE IS -12V.(*)
J71 OPEN : V3 OUTPUT VOLTAGE IS -15V.
*J61 AND J71 ARE NORMALLY SHORTED BY JM-2W-96 (J.S.T.)



CONNECTORS USED:

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1) | B3P-5-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN51) | B8P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN52) | B4P-VH | J.S.T. | 1 |

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

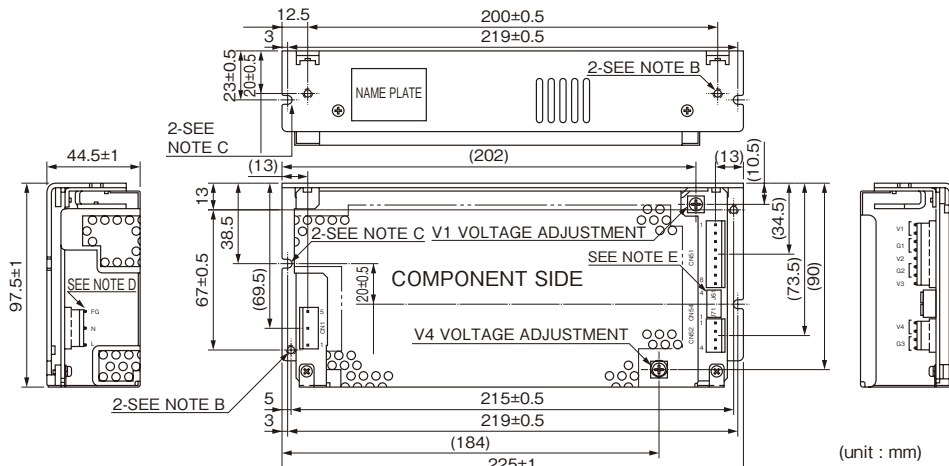
| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-----------------------------|--------------|-----------|-----|
| SOCKET HOUSING (CN1) | VHR-5N | J.S.T. | 1 |
| SOCKET HOUSING (CN51) | VHR-8N | J.S.T. | 1 |
| SOCKET HOUSING (CN52) | VHR-4N | J.S.T. | 1 |
| TERMINAL PINS (CN1, 51, 52) | SVH-21T-P1.1 | J.S.T. | 15 |

*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A. HAND CRIMPING TOOL: YC-160R MANUFACT. : J.S.T.

[ZWQ80/A]

= NOTES =

- A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- B: M4 EMBOSSED, TAPPED AND COUNTERSUNK HOLES (4) FOR CUSTOMER'S CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
- C: φ4.5 HOLE FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW.)
- D: FG IS FOR SAFETY GROUND CONNECTION.
- E: CONNECTOR TO CHANGE V2,V3 OUTPUT VOLTAGE (CN54) : B4B-XH-AM (J.S.T.)
J61 SHORT : V2 OUTPUT VOLTAGE IS +12V.(*)
J61 OPEN : V2 OUTPUT VOLTAGE IS +15V.
J71 SHORT : V3 OUTPUT VOLTAGE IS -12V.(*)
J71 OPEN : V3 OUTPUT VOLTAGE IS -15V.
*J61 AND J71 ARE NORMALLY SHORTED BY JM-2W-96(J.S.T.)



CONNECTORS USED:

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1) | B3P-5-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN51) | B8P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN52) | B4P-VH | J.S.T. | 1 |

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

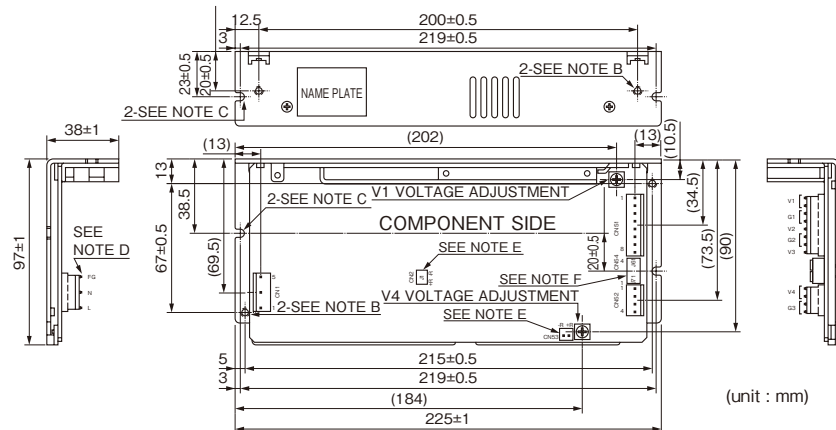
| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-----------------------------|--------------|-----------|-----|
| SOCKET HOUSING (CN1) | VHR-5N | J.S.T. | 1 |
| SOCKET HOUSING (CN51) | VHR-8N | J.S.T. | 1 |
| SOCKET HOUSING (CN52) | VHR-4N | J.S.T. | 1 |
| TERMINAL PINS (CN1, 51, 52) | SVH-21T-P1.1 | J.S.T. | 15 |

*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A. HAND CRIMPING TOOL: YC-160R MANUFACT. : J.S.T.

[ZWQ80/L]

= NOTES =

- A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- B: M4 EMBOSSED, TAPPED AND COUNTERSUNK HOLES (4) FOR CUSTOMER'S CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
- C: φ4.5 HOLE FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW. TIGHTENING TORQUE IS 1.08N·m (11kgf·cm).)
- D: FG IS FOR SAFETY GROUND CONNECTION.
- E: REMOTE ON/OFF CONTROL CONNECTOR (CN2,53) : B2B-XH-AM (J.S.T.)
MATCHING HOUSING : XHP-2 (J.S.T.)
MATCHING TERMINAL : BXH-001T-P0.6 (J.S.T.) OR SXH-001T-P0.6 (J.S.T.)
*CN2 IS NORMALLY SHORTED BY JM-2W-96 (J.S.T.)
*HAND CRIMPING TOOL: YC-110R OR YSR-110 (J.S.T.)
- F: CONNECTOR TO CHANGE V2, V3 OUTPUT VOLTAGE (CN54) : B4B-XH-AM (J.S.T.)
J61 SHORT : V2 OUTPUT VOLTAGE IS +12V.(*)
J61 OPEN : V2 OUTPUT VOLTAGE IS +15V.
J71 SHORT : V3 OUTPUT VOLTAGE IS -12V.(*)
J71 OPEN : V3 OUTPUT VOLTAGE IS -15V.
*J61 AND J71 ARE NORMALLY SHORTED BY JM-2W-96(J.S.T.)



CONNECTORS USED:

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1) | B3P-5-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN51) | B8P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN52) | B4P-VH | J.S.T. | 1 |

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

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-----------------------------|--------------|-----------|-----|
| SOCKET HOUSING (CN1) | VHR-5N | J.S.T. | 1 |
| SOCKET HOUSING (CN51) | VHR-8N | J.S.T. | 1 |
| SOCKET HOUSING (CN52) | VHR-4N | J.S.T. | 1 |
| TERMINAL PINS (CN1, 51, 52) | SVH-21T-P1.1 | J.S.T. | 15 |

*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A. HAND CRIMPING TOOL: YC-160R MANUFACT. : J.S.T.

ZWQ

Output Derating

ZWQ80
OUTPUT DERATING (CONVECTION COOLING)

| Ta(°C) | LOAD (%) | | |
|-----------|----------|-------------|---------|
| | MOUNT A | MOUNT B,C,D | MOUNT E |
| -10 to+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

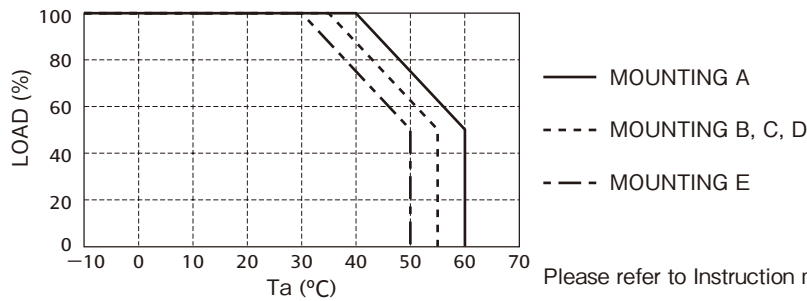
| A | B | C |
|----|------|-----|
| 5V | 104W | 80W |
| 3V | 86W | 80W |
| 2V | 77W | 77W |

5223

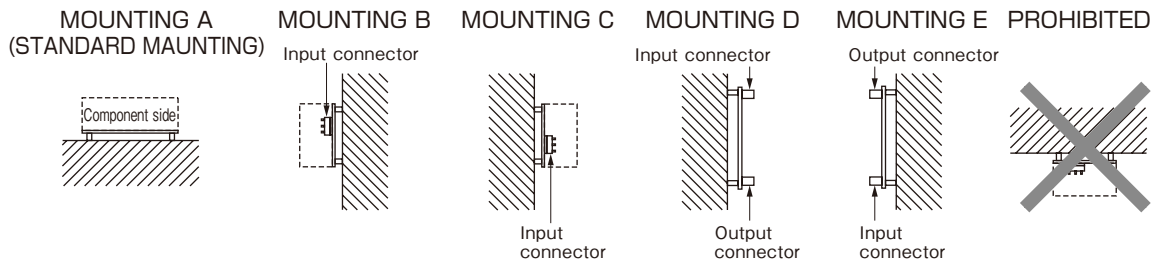
| A | B | C |
|------|-------|-----|
| 3.3V | 88.7W | 80W |
| 3V | 86W | 80W |
| 2V | 77W | 77W |

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

OUTPUT DERATING CURVE FOR CONVECTION COOLING



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



Output Derating

ZWQ80

OUTPUT DERATING (FORCED AIR COOLING)

| Ta(°C) | LOAD (%) | |
|-----------|---------------------|--|
| | MOUNT A, B, C, D, E | |
| -10 to+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 |

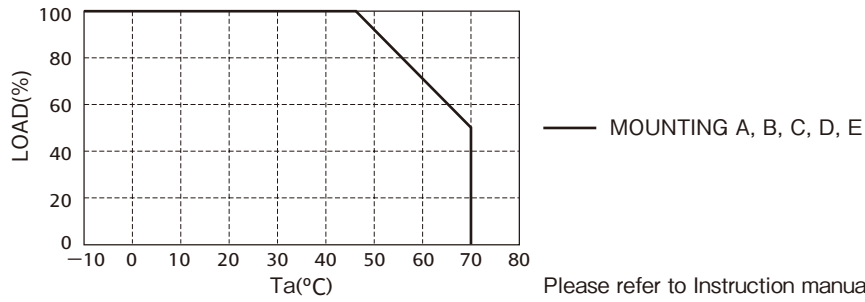
A: V4 setting voltage

B: Total Allowable Output Power

* Air flow > 0.85m³/min(30cfm)

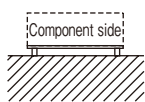
Air must flow through component side.

OUTPUT DERATING CURVE FOR CONVECTION COOLING

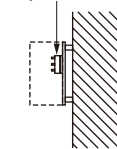


* Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.

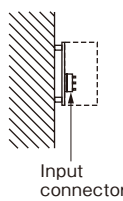
MOUNTING A (STANDARD MAUNTING)



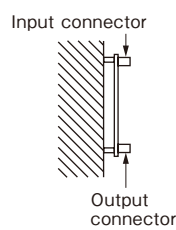
MOUNTING B



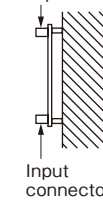
MOUNTING C



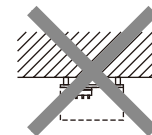
MOUNTING D



MOUNTING E



PROHIBITED

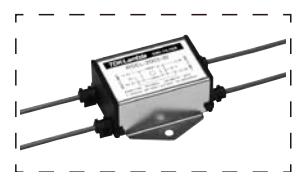


ZWQ130 (Convection Cooling) Specifications

| ITEMS/UNITS | | MODEL | ZWQ130-5225 | | | | ZWQ130-5222 | | | | ZWQ130-5224 | | | | ZWQ130-5223 | | | |
|-------------------------------|-------------------------------------------|--------------------------------------|---------------------------------------------------------------------------------------------------|-----------|-----------|--------------------------------------|-------------|-----------|-----------|-----------|-------------|-----------|-----------|-----------|-------------|-----------|---------|-----------|
| | | CH | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Input | Voltage Range (*5) | V | AC85 - 265 or DC120 - 370 | | | | | | | | | | | | | | | |
| | Frequency (*5) | Hz | 47 - 63 | | | | | | | | | | | | | | | |
| | Power Factor (100/200VAC)(typ)(*4) | | 0.99 / 0.93 | | | | | | | | | | | | | | | |
| | Efficiency (typ) (*4) | % | 72 | | | | | | | | | | | | | | | |
| | Current (100/200VAC)(typ) (*4) | A | 2.0 / 1.0 | | | | | | | | | | | | | | | |
| | Inrush Current (100/200VAC)(typ)(*6) | A | 14 / 28 at Ta=25°C, cold start | | | | | | | | | | | | | | | |
| | Leakage Current (*13) | mA | 0.75 MAX, 0.2 (typ) at 100VAC / 0.44 (typ) at 230VAC | | | | | | | | | | | | | | | |
| Output | Nominal Voltage | VDC | +5 | +12 | -12 | +3.3 | +5 | +12 | -12 | +5 | +5 | +12 | -12 | +12 | +5 | +12 | -12 | +24 |
| | Minimum Current (Convection) (*1) | A | 1.5 | 0 | | | 1.5 | 0 | | | 1.5 | 0 | | | 1.5 | 0 | | |
| | Minimum Current (Peak Application)(*1) | A | 2.1 | 0 | | | 2.1 | 0 | | | 2.1 | 0 | | | 2.1 | 0 | | |
| | Maximum Current | A | 15 | 4 | | 10 | 15 | 4 | | 10 | 15 | 4 | | 15 | 4 | | 2 | |
| | Maximum Peak Current (*3) | A | 19.0 | 5.0 | 12.0 | 19.0 | 5.0 | 12.0 | 19.0 | 5.0 | 12.0 | 19.0 | 5.0 | 12.0 | 19.0 | 5.0 | 12.0 | 2.5 |
| | Total Allowable Power (*2) | W | 130 | | | | 130 | | | | 130 | | | | 130 | | | |
| | Total Allowable Peak Power (*2) | W | 149.6 | | | | 170 | | | | 170 | | | | 170 | | | |
| | Voltage Setting Accuracy | % | - | ±5% | | - | - | ±5% | | - | - | ±5% | | - | - | ±5% | | - |
| | Maximum Line Regulation (*7)(*8) | mV | 20 | 48 | | 20 | 20 | 48 | | 20 | 20 | 48 | | 20 | 48 | 96 | | |
| | Maximum Load Regulation (*7)(*9) | mV | 100 | 300 | 100 | 100 | 300 | 100 | 100 | 300 | 100 | 300 | 100 | 300 | 100 | 300 | 400 | |
| | Temperature Coefficient (%) | | Less than 0.02% /°C | | | | | | | | | | | | | | | |
| | Maximum Ripple & Noise (0°C≤Ta≤+60°C)(*7) | mVp-p | 120 | 150 | 120 | 120 | 150 | 120 | 120 | 150 | 120 | 120 | 150 | 120 | 150 | 200 | | |
| | Maximum Ripple & Noise (-10°C≤Ta<0°C)(*7) | mVp-p | 160 | 180 | 160 | 160 | 180 | 160 | 160 | 180 | 160 | 160 | 180 | 160 | 180 | 200 | | |
| | Hold-up Time (typ) (*12) | ms | 20 | | | | | | | | | | | | | | | |
| | Voltage Adjustable Range | VDC | 5.0-5.25 | +12/+15 | -12/-15 | 2.0-3.63 | 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 |
| Over Current Protection (*10) | | More than 152W of Total Output Power | | | | More than 173W of Total Output Power | | | | | | | | | | | | |
| Over Voltage Protection (*11) | VDC | 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 | 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 | | |
| Remote ON/OFF Control (*14) | | Possible | | | | | | | | | | | | | | | | |
| Parallel Operation | | - | | | | | | | | | | | | | | | | |
| Series Operation | | - | | | | | | | | | | | | | | | | |
| Environment | Operating Temperature (*15) | °C | -10 to +60 (-10 to +40 : 100%, +60 : 50%) | | | | | | | | | | | | | | | |
| | Storage Temperature | °C | -30 to +85 | | | | | | | | | | | | | | | |
| | Operating Humidity | %RH | 30 - 90 (No dewdrop) | | | | | | | | | | | | | | | |
| | Storage Humidity | %RH | 10 - 95 (No dewdrop) | | | | | | | | | | | | | | | |
| | Vibration | | At no operating, 10-55Hz (sweep for 1min) 19.6 m/s ² constant, X, Y, Z 1hour each. | | | | | | | | | | | | | | | |
| | Shock(In package) | | Less than 196.1 m/s ² | | | | | | | | | | | | | | | |
| | Cooling | | Convection cooling | | | | | | | | | | | | | | | |
| Isolation | Withstand Voltage | | Input - FG: 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG: 500VAC (100mA), for 1min. | | | | | | | | | | | | | | | |
| | Isolation Resistance | | More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC | | | | | | | | | | | | | | | |
| Standards | Safety Standards (*16) | | Approved by UL60950-1, CSA C22.2 No 60950-1, EN60950-1, EN50178 Built to meet DENAN | | | | | | | | | | | | | | | |
| | PFHC | | Built to meet IEC61000-3-2 | | | | | | | | | | | | | | | |
| | EMI | | Built to meet EN55011/EN55022-B, FCC-ClassB, VCCI-B | | | | | | | | | | | | | | | |
| Mechanical | Immunity (*17) | | Built to meet EN61000-4-2, -3, -4, -5, -6, -8, -11 | | | | | | | | | | | | | | | |
| | Weight (typ) | g | 730 | | | | | | | | | | | | | | | |
| | Size (W x H x D) | mm | 106 x 35 x 225 (Refer to outline drawing) | | | | | | | | | | | | | | | |

- (*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.
- (*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 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.
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.
- (*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.
- (*16) As for DENAN, built to meet at 100VAC.
- (*17) Refer to test data.

● Recommended EMC Filter



RSEL-2003W
Please refer to "TDK-Lambda EMC Filters" catalog.

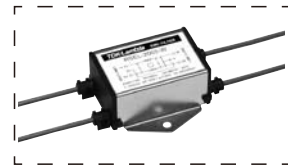
ZWQ

ZWQ130(Forced Air Cooling) Specifications

| ITEMS/UNITS | | MODEL | ZWQ130-5223 | | | | ZWQ130-5225 | | | | ZWQ130-5222 | | | | ZWQ130-5224 | | | |
|-------------|---------------------------------|-------|------------------------------------------|-----|-----|------|-------------|-----|-----|------|-------------|-----|-----|-----|-------------|-----|-----|-----|
| | | CH | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| Input | Current (100/200VAC) (typ) (*3) | A | 2.6 / 1.3 | | | | | | | | | | | | | | | |
| | Nominal Voltage | V | +5 | +12 | -12 | +3.3 | +5 | +12 | -12 | +5 | +5 | +12 | -12 | +12 | +5 | +12 | -12 | +24 |
| Output | Minimum Current (*1) | A | 2.1 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0 | 2.1 | 0 | 0 | 0 |
| | Maximum Current | A | 19.0 | 5.0 | 5.0 | 12.0 | 19.1 | 5.0 | 5.0 | 12.0 | 19.0 | 5.0 | 5.0 | 5.0 | 19.0 | 5.0 | 5.0 | 2.5 |
| | Total Allowable Power (*2) | W | 149.6 | | | | | | | | 170 | | | | | | | |
| Environment | Operating Temperature (*4) | | -10 to +70 (-10 to+50 : 100%, +70 : 50%) | | | | | | | | | | | | | | | |
| | Cooling (*5) | | Forced air cooling | | | | | | | | | | | | | | | |

- (*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.
- (*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.
- (*5) Air flow > 0.85m³/min (30cfm).

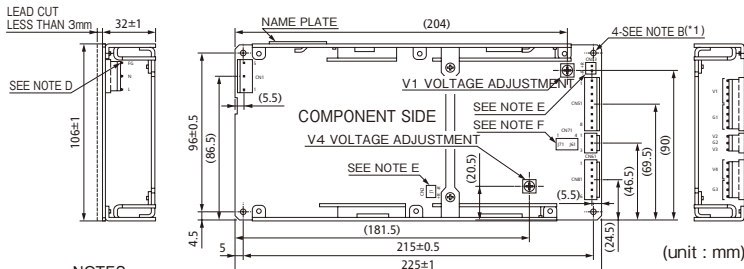
●Recommended EMC Filter



RSEL-2003W
Please refer to "TDK-Lambda EMC Filters" catalog.

Outline Drawing

[ZWQ130]



=NOTES=

- A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- B: 4-φ3.5 HOLES FOR CUSTOMER'S CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- C: KEEP THE DISTANCE MORE THAN 4mm BETWEEN POWER SUPPLY EDGE AND CUSTOMER'S CHASSIS.
- D: FG IS FOR SAFETY GROUND CONNECTION.
- E: REMOTE ON/OFF CONTROL CONNECTOR (CN2,53) : B2B-XH-AM (J.S.T.)
MATCHING HOUSING : XHP-2 (J.S.T.)
MATCHING TERMINAL : BXH-001T-P0.6 (J.S.T.) OR SXH-001T-P0.6 (J.S.T.)
*CN2 IS NORMALLY SHORTED BY JM-2W-96(J.S.T.)
- F: CONNECTOR TO CHANGE V2,V3 OUTPUT VOLTAGE (CN71) : B4B-XH-AM (J.S.T.)
J61 SHORT : V2 OUTPUT VOLTAGE IS +12V.(*)
J61 OPEN : V2 OUTPUT VOLTAGE IS +15V.
J71 SHORT : V3 OUTPUT VOLTAGE IS -12V.(*)
J71 OPEN : V3 OUTPUT VOLTAGE IS -15V.
*J61 AND J71 ARE NORMALLY SHORTED BY JM-2W-96 (J.S.T.)

CONNECTORS USED:

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1) | B3P-5-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN51) | B8P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN61) | B3P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN81) | B6P-VH | J.S.T. | 1 |

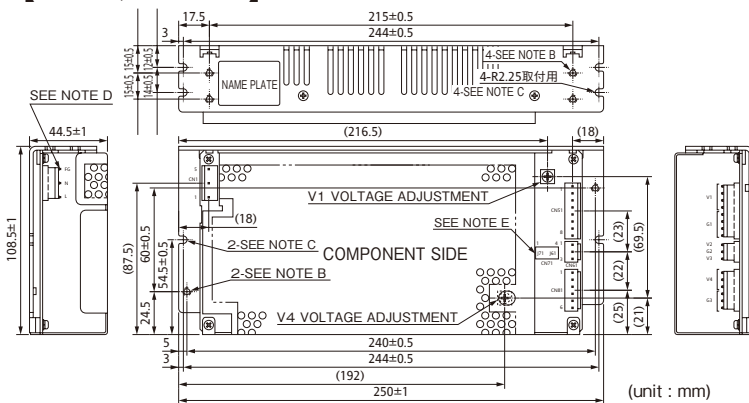
*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

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

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-----------------------|-----------|-----------|-----|
| SOCKET HOUSING (CN1) | VHR-5N | J.S.T. | 1 |
| SOCKET HOUSING (CN51) | VHR-8N | J.S.T. | 1 |
| SOCKET HOUSING (CN61) | VHR-3N | J.S.T. | 1 |
| SOCKET HOUSING (CN81) | VHR-6N | J.S.T. | 1 |

HAND CRIMPING TOOL : YC-160R MANUFACT. : J.S.T.

[ZWQ130/A]



=NOTES=

- A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- B: M4 EMBOSSED, TAPPED AND COUNTERSUNK HOLES (6) FOR CUSTOMER'S CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
- C: φ4.5 HOLES (6) FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW.)
- D: FG IS FOR SAFETY GROUND CONNECTION.
- E: CONNECTOR TO CHANGE V2, V3 OUTPUT VOLTAGE (CN71) : B4B-XH-AM (J.S.T.)
J61 SHORT : V2 OUTPUT VOLTAGE IS +12V.(*)
J61 OPEN : V2 OUTPUT VOLTAGE IS +15V.
J71 SHORT : V3 OUTPUT VOLTAGE IS -12V.(*)
J71 OPEN : V3 OUTPUT VOLTAGE IS -15V.

CONNECTORS USED:

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1) | B3P-5-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN51) | B8P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN61) | B3P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN81) | B6P-VH | J.S.T. | 1 |

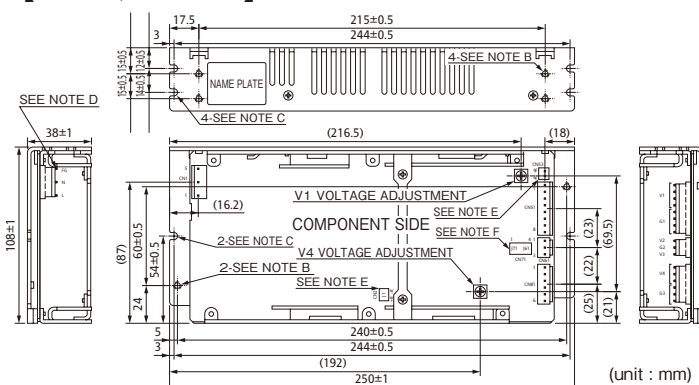
*OUTPUT CURRENT OF EACH CONNECTOR PIN MUST BE LESS THAN 5A.

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

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|------------------------------|--------------|-----------|-----|
| SOCKET HOUSING (CN1) | VHR-5N | J.S.T. | 1 |
| SOCKET HOUSING (CN51) | VHR-8N | J.S.T. | 1 |
| SOCKET HOUSING (CN61) | VHR-3N | J.S.T. | 1 |
| SOCKET HOUSING (CN81) | VHR-6N | J.S.T. | 1 |
| TERMINAL PINS (CN1,51,61,81) | SVH-21T-P1.1 | J.S.T. | 20 |

HAND CRIMPING TOOL : YC-160R MANUFACT. : J.S.T.

[ZWQ130/L]



=NOTES=

- A: MODEL NAME, INPUT VOLTAGE RANGE, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT AND COUNTRY OF MANUFACTURE ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- B: M4 EMBOSSED, TAPPED AND COUNTERSUNK HOLES (6) FOR CUSTOMER'S CHASSIS MOUNTING. SCREWS MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
- C: φ4.5 HOLES (6) FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW.)
- D: FG IS FOR SAFETY GROUND CONNECTION.
- E : REMOTE ON/OFF CONTROL CONNECTOR (CN2, 53) : B2B-XH-AM (J.S.T.)
MATCHING HOUSING : XHP-2 (J.S.T.)
MATCHING TERMINAL : BXH-001T-P0.6 (J.S.T.) OR SXH-001T-P0.6 (J.S.T.)
*CN2 IS NORMALLY SHORTED BY JM-2W-96 (J.S.T.)
*HAND CRIMPING TOOL : YC-110R or YSR-110 (J.S.T.)
- F: CONNECTOR TO CHANGE V2, V3 OUTPUT VOLTAGE (CN71) : B4B-XH-AM (J.S.T.)
J61 SHORT : V2 OUTPUT VOLTAGE IS +12V.(*)
J61 OPEN : V2 OUTPUT VOLTAGE IS +15V.
J71 SHORT : V3 OUTPUT VOLTAGE IS -12V.(*)
J71 OPEN : V3 OUTPUT VOLTAGE IS -15V.
*J61 AND J71 ARE NORMALLY SHORTED BY JM-2W-96 (J.S.T.)

CONNECTORS USED:

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|-------------------------------|-----------|-----------|-----|
| PIN HEADER (INPUT SIDE CN1) | B3P-5-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN51) | B8P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN61) | B3P-VH | J.S.T. | 1 |
| PIN HEADER (OUTPUT SIDE CN81) | B6P-VH | J.S.T. | 1 |

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

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

| PART DESCRIPTION | PART NAME | MANUFACT. | QTY |
|---------------------------------|--------------|-----------|-----|
| SOCKET HOUSING (CN1) | VHR-5N | J.S.T. | 1 |
| SOCKET HOUSING (CN51) | VHR-8N | J.S.T. | 1 |
| SOCKET HOUSING (CN61) | VHR-3N | J.S.T. | 1 |
| SOCKET HOUSING (CN81) | VHR-6N | J.S.T. | 1 |
| TERMINAL PINS (CN1, 51, 61, 81) | SVH-21T-P1.1 | J.S.T. | 20 |

HAND CRIMPING TOOL : YC-160R MANUFACT. : J.S.T.

Output Derating

ZWQ130

OUTPUT DERATING (CONVECTION COOLING)

| Ta(°C) | LOAD (%) | | |
|-----------|------------|------------------|------------|
| | MOUNTING A | MOUNTING B, C, D | MOUNTING E |
| -10 to+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

| A | B | C |
|----|------|------|
| 5V | 170W | 130W |
| 3V | 146W | 130W |
| 2V | 134W | 130W |

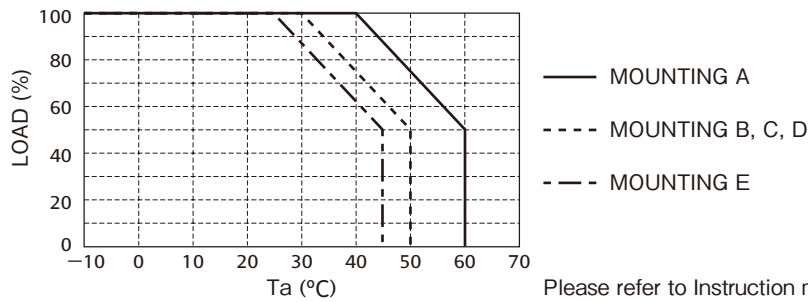
5223

| A | B | C |
|------|--------|------|
| 3.3V | 149.6W | 130W |
| 3V | 146W | 130W |
| 2V | 134W | 130W |

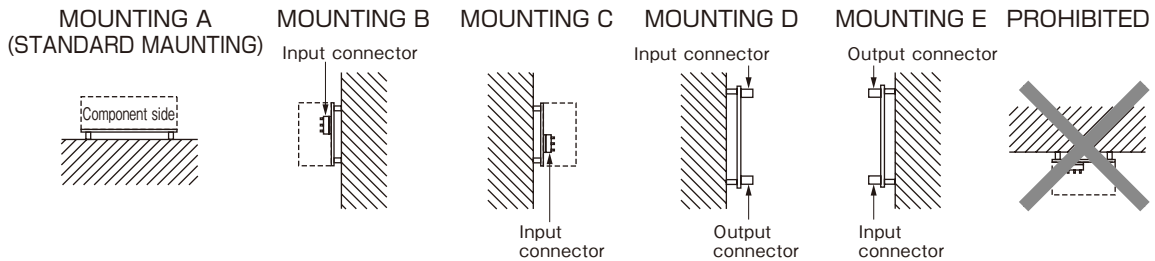
A: V4 setting voltage
 B: Total Allowable Peak Output Power
 C: Total Allowable Output Power

* The period of peak current at convection cooling is limited less than 10 sec. (Duty ≤ 0.35)
 For peak current application, refer to note.

OUTPUT DERATING CURVE FOR CONVECTION COOLING



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



Output Derating

ZWQ130

OUTPUT DERATING (FORCED AIR COOLING)

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

Allowable output power

5225

| A | B |
|----|------|
| 5V | 170W |
| 3V | 146W |
| 2V | 134W |

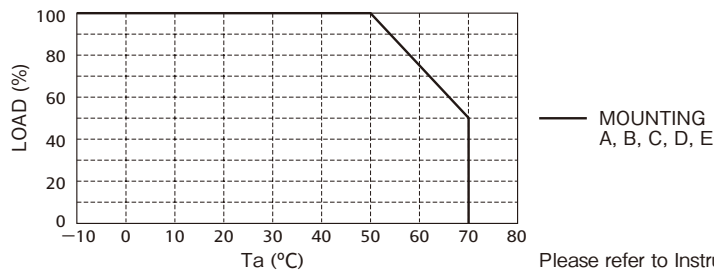
5223

| A | B |
|------|--------|
| 3.3V | 149.6W |
| 3V | 146W |
| 2V | 134W |

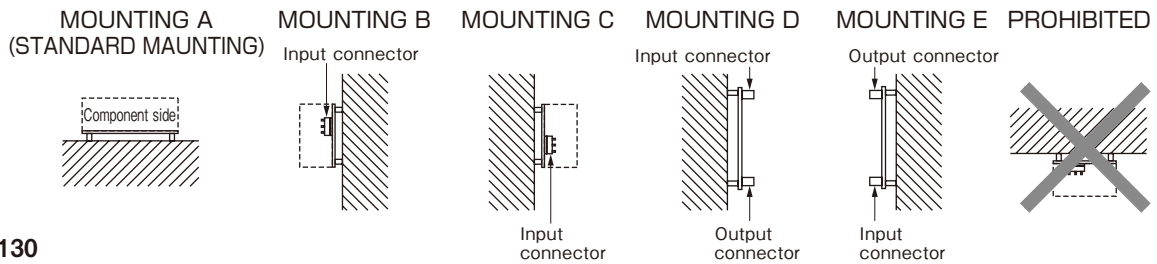
A: V4 setting voltage
B: Total allowable output power

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

OUTPUT DERATING CURVE FOR FORCED AIR COOLING



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

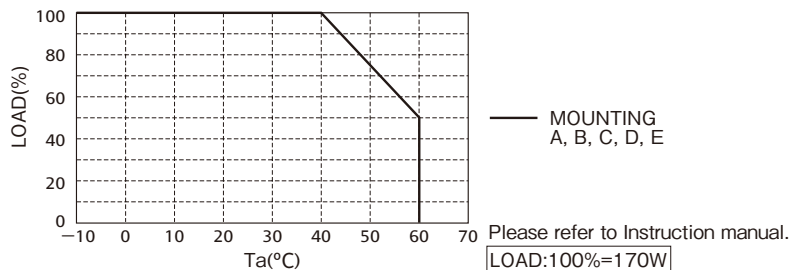


ZWQ130

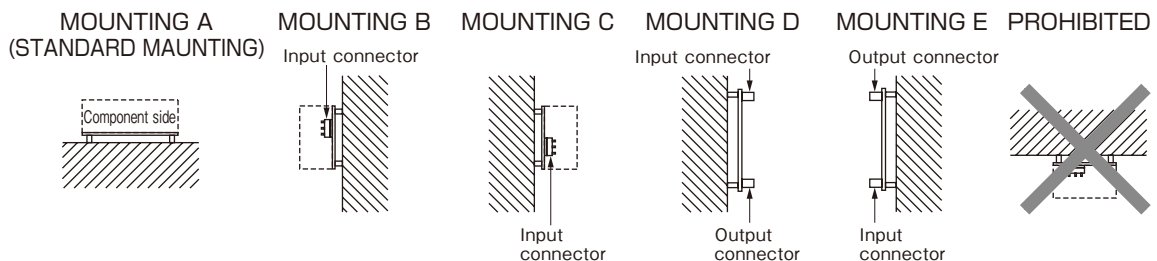
OUTPUT DERATING

| Ta(°C) | LOAD (%) |
|-----------|-----------------|
| | MOUNT A,B,C,D,E |
| -10 ~ +20 | 100 |
| 30 | 100 |
| 35 | 100 |
| 40 | 100 |
| 45 | 87 |
| 50 | 75 |
| 55 | 62 |
| 60 | 50 |

OUTPUT DERATING CURVE FOR FORCED AIR COOLING



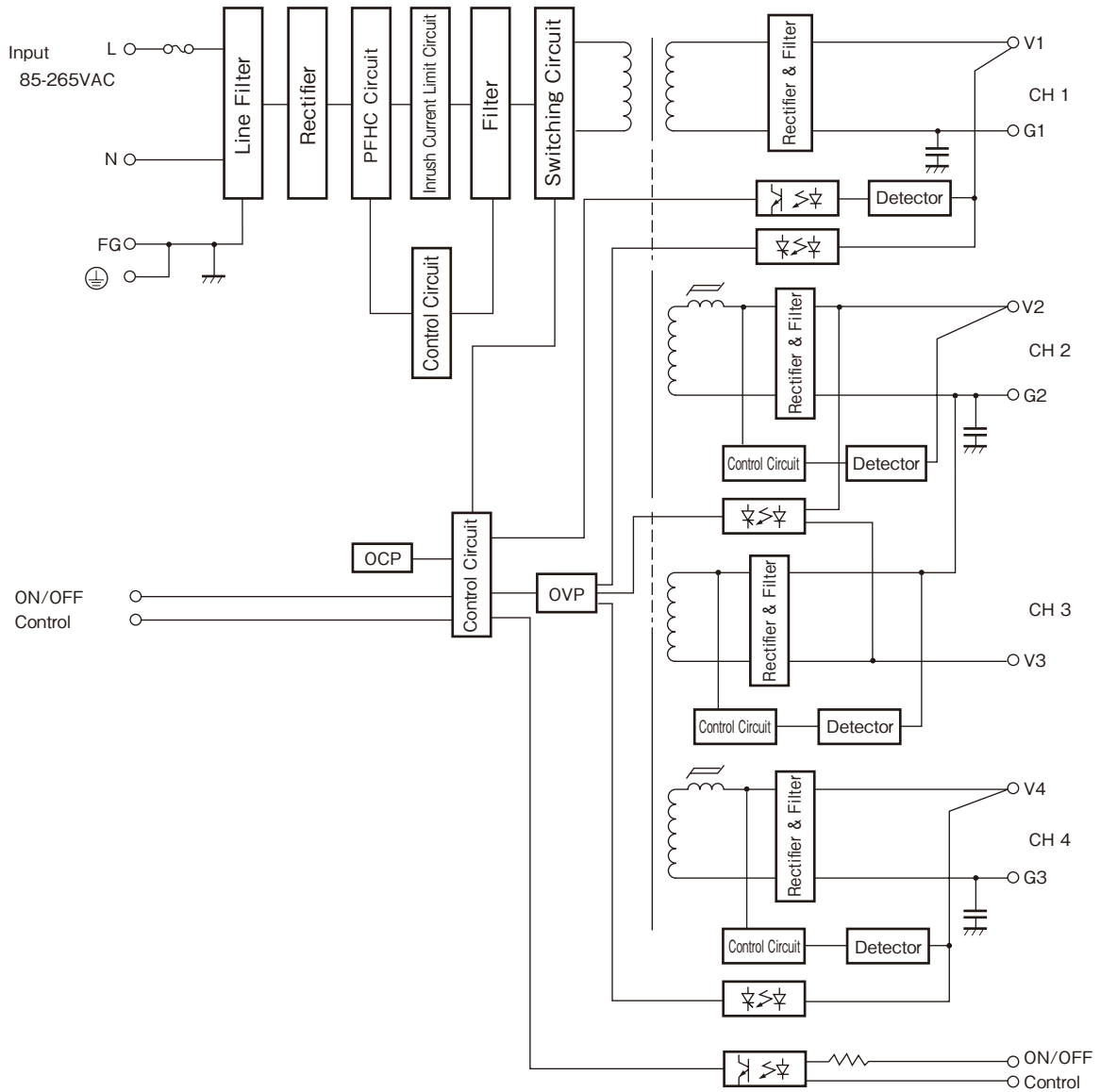
* Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.



ZWQ

Block Diagram

[ZWQ80, ZWQ130]



- Circuit mode and switching frequency
 Switching circuit : Single - ended forward topology (130kHz)
 PFHC circuit : Active filter (90kHz)

- Fuse rating ZWQ 80 : 3.15A, ZWQ130 : 5A

ZWQ Series Instruction Manual

BEFORE USING THE POWER SUPPLY UNIT

Pay attention to all warnings and cautions before using the unit. Incorrect usage could lead to an electric shock, damage to the unit or a fire hazard.

⚠ WARNING and CAUTION

- Do not modify.
- Do not touch the internal components, they may have high voltage or high temperature. You may get electric shock or burned.
- When the unit is operating, keep your hands and face away from it, you may get injured by an accident.
- This power supply is primarily designed and manufactured to be used and enclosed in other equipment. Stick the WARNING label for users on the system equipment and describe the notice in the instruction manual.
- Never operate the unit under over current or shorted conditions for 30 seconds or more and except input voltage range in specification which could result in damage or insulation failure or smoking or burning.

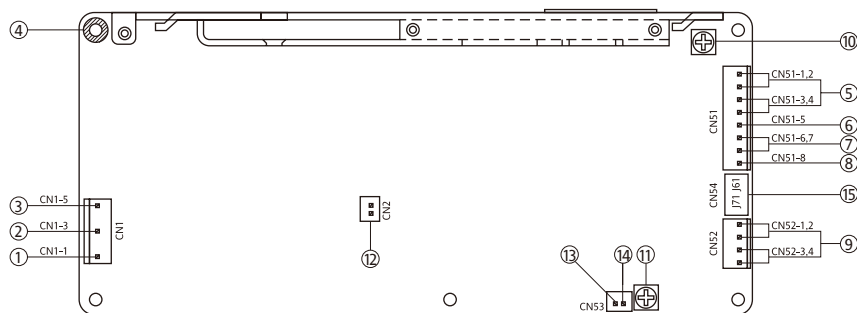
- Confirm connections to input/output terminals are correct as indicated in the instruction manual.
- This power supply is PC board type unit. Please hold the board edge while mouting, and do not touch the component side. In using the apparatus, please lift the power supply with a metal spacer.
- Do not drop or apply shock to power supply unit.

Note : CE MARKING

CE Marking, when applied to a product covered by this handbook, indicates compliance with the low voltage directive (73/23/EEC) as modified by the CE Marking Directive (93/68/EEC) which complies with EN60950.

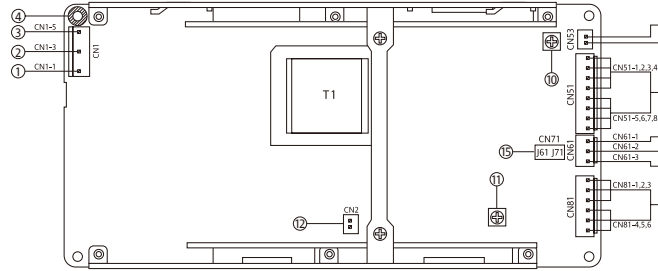
1. Terminal Explanation

1 ZWQ80



- ① L; AC Input terminal Live line (Fuse in line)
CN1 - 1
 - ② N; AC Input terminal Neutral line
CN1 - 3
 - ③ FG; Input terminal FG (Safety earth : ⊕)
CN1 - 5
Connect to safety ground of apparatus or equipment.
 - ④ FG; Frame Ground
Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers. The mounting surface of the spacer should be within MAX 8mm.
 - ⑤ V1 (5A max./pin)
CN51-1, 2: V1 +Output pin
CN51-3, 4: V1 Ground
 - ⑥ V2 (5A max./pin)
CN51-5: V2 +Output pin
 - ⑦ V2, V3 (5A max./pin)
CN51-6,7: V2, V3 Common Ground
 - ⑧ V3 (5A max./pin)
CN51-8: V3 -Output pin
 - ⑨ V4 (5A max./pin)
CN52-1, 2: V4 +Output pin
CN52-3, 4: V4 Ground
 - ⑩ VR51; Output voltage of V1 adjustment trimmer
 - ⑪ VR81; Output voltage of V4 adjustment trimmer
The output voltage rises when a trimmer is turned clockwise.
 - ⑫ CN2; Remote ON/OFF control at primary
 - ⑬ CN53; Remote ON/OFF control at secondary: - R
 - ⑭ CN53; Remote ON/OFF control at secondary: + R
- Can not use Remote ON/OFF control at with Cover type (/A).
- ⑮ Select jumper
J61 Short: V2 Output voltage is +12V.
J61 Open: V2 Output voltage is +15V.
J71 Short: V3 Output voltage is -12V.
J71 Open: V3 Output voltage is -15V.

ZWQ130

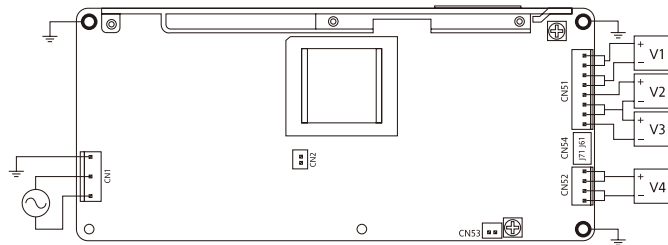


- ① L; AC Input terminal Live line (Fuse in line)
CN1-1
- ② N; AC Input terminal Neutral line
CN1-3
- ③ FG; Input terminal FG (Safety earth: ⊕)
CN1-5
Connect to safety ground of apparatus or equipment.
- ④ FG; Frame Ground
Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacer. The mounting surface of the spacer should be within MAX 8mm.
- ⑤ V1 (5A max./pin)
CN51-1, 2, 3, 4: V1 +Output pin
CN51-5, 6, 7, 8: V1 Ground
- ⑥ V2 (5A max./pin)
CN61-1: V2 +Output pin
- ⑦ V2, V3 (5A max./pin)
CN61-2: V2, V3 Common Ground
- ⑧ V3 (5A max./pin)
CN61-3: V3 -Output pin
- ⑨ V4 (5A max./pin)
CN52-1, 2, 3: V4 +Output pin
CN52-4, 5, 6: V4 Ground
- ⑩ VR51; Output voltage of V1 adjustment trimmer
- ⑪ VR81; Output voltage of V4 adjustment trimmer
The output voltage rises when a trimmer is turned clockwise.
- ⑫ CN2; Remote ON/OFF control at primary
- ⑬ CN53; Remote ON/OFF control at secondary: +R
- ⑭ CN53; Remote ON/OFF control at secondary: -R
Can not use remote ON/OFF control at with cover type (/A).
- ⑮ Select jumper
J61 Short: V2 Output voltage is +12V.
J61 Open: V2 Output voltage is +15V.
J71 Short: V3 Output voltage is -12V.
J71 Open: V3 Output voltage is -15V.

2. Terminal Connecting Method

- Input must be off when making connections.
- Connect FG terminal of input connector and mountable FG to ground terminal of the equipment.
- Output current of each connector pin must be less than 5A.
- The output load line and input line shall be separated and twisted to improve noise sensitivity.
- Remote ON/OFF control lines shall be twisted or use shielded wire.
- When connecting or removing connector, do not apply stress to PCB.
- Use the input/output connector specified in outline drawing. Also, use recommended crimping tool. Connector is not included with this product.

ZWQ80



* Input & output connector (J.S.T.)

| | ZWQ80 | | |
|---------------|-----------|---------|--------------|
| | Connector | Housing | Terminal Pin |
| Input (CN1) | B3P-5-VH | VHR-5N | SVH-21T-P1.1 |
| Output (CN51) | B8P-VH | VHR-8N | SVH-21T-P1.1 |
| Output (CN52) | B4P-VH | VHR-4N | SVH-21T-P1.1 |

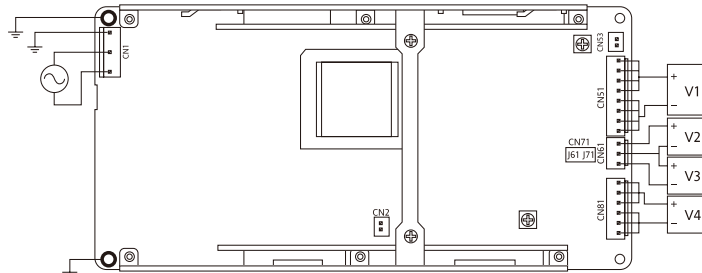
* Output current of each connector pin must be less than 5A.
* Hand crimping tool: YC-160R MANUFACT.: J.S.T.

* Connector (J.S.T.) for remote ON/OFF control

| Connector | Housing | Terminal Pin |
|-----------|---------|-----------------------------------|
| B2B-XH-AM | XHP-2 | BXH-001T-P0.6 or SXH-001T-P0.6 |

* Can not use remote ON/OFF control at with cover type (/A).
* Hand crimping tool: YC-110R or YSR-110 MANUFACT.: J.S.T.
* CN2 is normally shorted by JM-2W-96 MANUFACT. J.S.T.

ZWQ130



* Input & output connector (J.S.T.)

| | ZWQ130 | | |
|---------------|-----------|---------|--------------|
| | Connector | Housing | Terminal Pin |
| Input (CN1) | B3P-5-VH | VHR-5N | SVH-21T-P1.1 |
| Output (CN51) | B8P-VH | VHR-8N | SVH-21T-P1.1 |
| Output (CN61) | B3P-VH | VHR-3N | SVH-21T-P1.1 |
| Output (CN81) | B6P-VH | VHR-6N | SVH-21T-P1.1 |

* Output current of each connector pin must be less than 5A.
* Hand crimping tool: YC-160R MANUFACT.: J.S.T.

* Connector (J.S.T.) for remote ON/OFF control

| Connector | Housing | Terminal Pin |
|-----------|---------|-----------------------------------|
| B2B-XH-AM | XHP-2 | BXH-001T-P0.6 or SXH-001T-P0.6 |

* Can not use remote ON/OFF control at with cover type (/A).
* Hand crimping tool: YC-110R or YSR-110 MANUFACT.: J.S.T.
* CN2 is normally shorted by JM-2W-96 MANUFACT. J.S.T.

3. Explanation of Functions and Precautions

1 Input Voltage Range

Input voltage range is single phase 85-265VAC (47-63Hz) or 120-370VDC. Input voltage which is out of specification may cause unit damage. For cases where conformance to various safety spec (UL, CSA, EN) are required, input voltage range of application for safety 100-240VAC (50/60Hz).

2 Output Voltage Range

V.ADJ trimmer (VR51, VR81) can adjust the output voltage of V1 and V4 within the range. To turn the trimmer clockwise, the output voltage will be increased. Output voltage range of V1 is within 5-5.25V, V4 is following range. Note over voltage protection (OVP) function may trigger if the output voltage is increased excessively.

| V4 Output Voltage Range | |
|-------------------------|-------------|
| 5223: | 2.0V-3.63V |
| 5225: | 2.0V-5.25V |
| 5222: | 11.4V-12.6V |
| 5224: | 22.8V-25.2V |

When output voltage of 5223/5225 model to be varied, please use the unit within the range of total output power below:

● ZWQ80-5223, 5225

| V4 output voltage setting value | Total allowable output power at convection cooling | Total allowable peak output power or total allowable output power at forced air cooling |
|---------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------|
| 5V | 80W | 104W |
| 3.3V | 80W | 88.7W |
| 3V | 80W | 86W |
| 2V | 77W | 77W |

● ZWQ130-5223, 5225

| V4 output voltage setting value | Total allowable output power at convection cooling | Total allowable peak output power or total allowable output power at forced air cooling |
|---------------------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------|
| 5V | 130W | 170W |
| 3.3V | 130W | 149.6W |
| 3V | 130W | 146W |
| 2V | 130W | 134W |

3 Inrush Current

This series has used power thermistor to protect the circuit from inrush current. Please carefully select input switch and fuse in cases of the high temperature and re-input of the power.

4 Wattbox

This series is designed as a WATTBOX. You can flexibly adjust output power of each channel within the limit of the total allowable output power in specification.

$$W_{TOTAL} \geq W_{V1} + W_{V2} + W_{V3} + W_{V4}$$

- W_{V1} : Less than maximum V1 output power.
- W_{V2} : Less than maximum V2 output power.
- W_{V3} : Less than maximum V3 output power.
- W_{V4} : Less than maximum V4 output power.

5 Minimum output Current

The output voltage of all channels is stabilized when mini-

mum output current of V1 is more than 12% of maximum output current. Note all channel may not when V1 has no load.

6 Over Voltage Protection (OVP)

The OVP function (inverter shut down method, manual reset type) built into each channel. (OVP function at V2 and V3 is total voltage detection method.) When OVP of each channel triggers, the all outputs will be shut down. The input shall be removed for a few minutes, and then re-input for recovery of the output to recover. OVP setting shall be fixed and not to be adjusted externally.

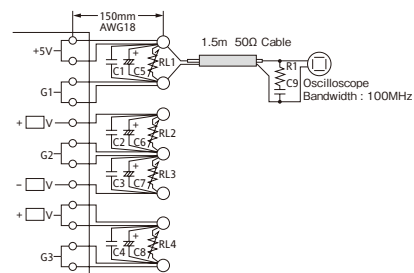
7 Over Current Protection (OCP)

Total & constant current limiting, automatic recovery. OCP function operates when the total maximum output power exceeds 102% of total allowable peak output power on specification. The output will be automatically recovered when the overload condition is canceled. Also, this unit employs total current detection for OCP. Therefore, take note that the unit might be damaged because OCP may not operate even if each channel exceeds each maximum output current specification.

Never operate the unit under over current or shorted conditions over 30 seconds which could result in damage.

8 Output Ripple & Noise

The standard specification for maximum ripple value is measured according to measurement circuit specified by JEITA-RC9131. When load lines are longer, ripple will become larger. In this case, electrolytic capacitor, film capacitor, etc. might be necessary to use across the load terminal. The output ripple cannot be measured accurately if the probe ground lead of oscilloscope is too long.



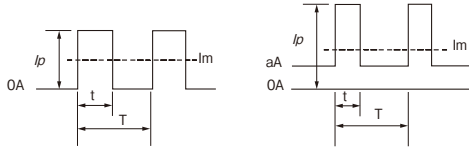
- (※) The number of terminals are different by model.
- (※) Oscilloscope Probe: please use a bayonet adapter or equivalent.

| | Capacitance |
|-----------------|--------------------|
| C1, C2, C3, C4: | Film Cap. 0.1 μF |
| C5: | Elec. Cap. 1000 μF |
| C6, C7, C8: | Elec. Cap. 100 μF |
| C9: | Film Cap. 4700pF |
| R1: | Resistor 50 Ω |

9 Peak Output Current

For ZWQ series, relation between maximum output current (convection cooling) and peak output current must satisfy formulas below. Also operating time at peak output current

(τ) should be less than 10sec, period (T) should be more than 10m sec.
(Duty<0.35)



$$I_{av} \geq I_m = \frac{I_p \times \tau}{T} \quad I_{av} \geq I_m = \frac{(I_p - a) \times t + a}{T}$$

- I_{av} : Maximum output current of specification (convection cooling) (A)
- I_m : Average output current (A)
- τ : Pulse width of peak output current (sec) (Operating time at peak output)
- T: Period (sec)

10 Remote ON/OFF Control

Remote ON/OFF control (CN2, CN52) function is available. Using this function allows the user to turn the all outputs on and off without having to turn the AC input on and off. Remote ON/OFF control can be used by following 2 modes

When shipping, CN2 is installed with a short connector. When use this function, must be put off a short connector. However, for cover & chassis type (ZWQ/A), can not be used.

Primary side

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.

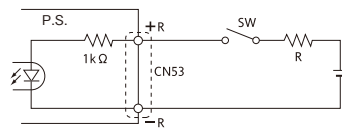
In particular:

- 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.

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

Secondary side

When using Secondary side ON/OFF Control, put off a jumper J1 at CN2. It is controlled by the voltage applied to +R and -R at CN53. This circuit never connect in the Primary (input) side. And this circuit is isolated from the output by a photocoupler.



The control mode is shown below.

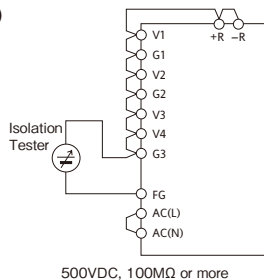
| | |
|---------------------------------------------------------------|------------------------|
| The control mode is shown below. + R & - R terminal condition | Output condition |
| SW ON (Higher than 4.5V) | ON |
| SW OFF (Lower than 0.8V) | OFF |
| External voltage level: E | External resistance: R |
| 4.5-12.5VDC | Not required |
| 12.5-24.5VDC | 1.5kΩ |

4. Installation Test / Withstand voltage

1 Isolation Test

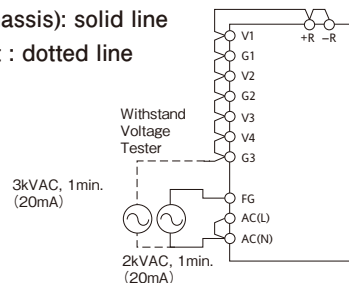
Isolation resistance between output and FG (chassis) shall be more than 100MΩ at 500VDC. For safety operation, voltage setting of DC isolation tester must be done before the test. Ensure that the unit is fully discharged after the test.

Output - FG (chassis)

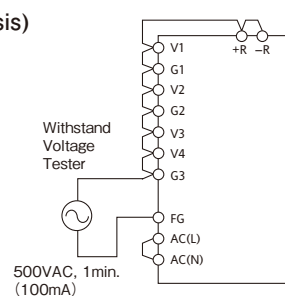


be gradually increased from zero to the testing value and then gradually decreased for shut down. When timer is used, the power supply may be damaged by high impulse voltage at timer switch on and off. Connect input and output as follows.

Input - FG (chassis): solid line
Input - Output : dotted line



Output - FG (chassis)



2 Withstand Voltage

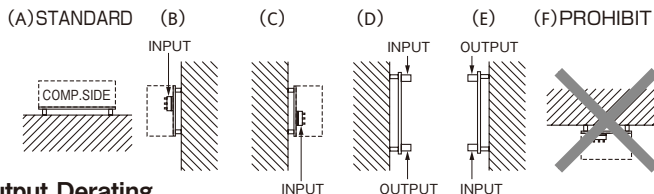
This series is designed to withstand 3.0kVAC between input and output, 2.0kVAC between input and FG (chassis) and 500VAC between output and the FG (chassis) each for 1 minute. When testing withstand voltage, set current limit of the withstand voltage test equipment to 20mA (Output-FG (chassis): 100mA). The applied voltage must

· All specifications are subject to change without notice.

5. Mounting Directions

1 Output Derating according to the Mounting Directions (standard model, with L-shape metal plate model (/L))

Recommended standard mounting is method (A). Method (B), (C), (D), (E) are also possible. Refer to the derating below. Please do not use installation method (F), where the PCB will be on the top side and heat will be trapped inside the unit. In the following derating curve, Load (%) is percent of total allowable output power or each maximum output current, whichever is greater.



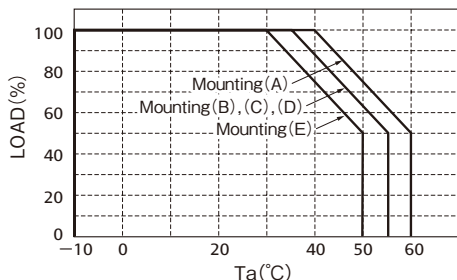
Maximum power when V4 output voltage is varied (5225 and 5223 models)

| V4 output voltage setting value | Total allowable output power at convection cooling | Maximum peak output power at convection cooling or total allowable output power at forced air cooling |
|---------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 5V | 80W | 104W |
| 3.3V | 80W | 88.7W |
| 3V | 80W | 86W |
| 2V | 77W | 77W |

Output Derating

PCB type and with chassis type (Convection cooling)

ZWQ80



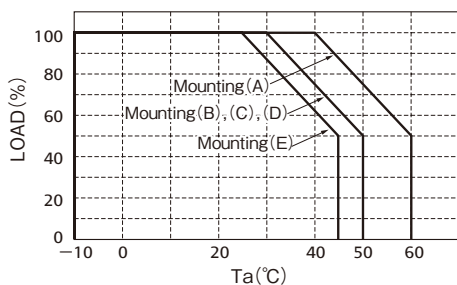
| Ta | LOAD (%) | | | | |
|-------------|------------|------------|------------|------------|------------|
| | Mounting A | Mounting B | Mounting C | Mounting D | Mounting E |
| -10 to 25°C | 100 | 100 | 100 | 100 | 100 |
| 30°C | 100 | 100 | 100 | 100 | 100 |
| 35°C | 100 | 100 | 100 | 100 | 87 |
| 40°C | 100 | 87 | 87 | 87 | 75 |
| 45°C | 87 | 75 | 75 | 75 | 62 |
| 50°C | 75 | 62 | 62 | 62 | 50 |
| 55°C | 62 | 50 | 50 | 50 | |
| 60°C | 50 | | | | |

(Mounting A)

| | Total allowable output power (W) | | |
|-------|----------------------------------|------|------|
| | 40°C | 50°C | 60°C |
| ZWQ80 | 80 | 60 | 40 |

| | CH | Output voltage (V) | Each allowable output power (W) | | | Maximum output current (A) | | |
|------|----|--------------------|---------------------------------|---------|-------|----------------------------|------|------|
| | | | 40°C | 50°C | 60°C | 40°C | 50°C | 60°C |
| 522* | V1 | 5 | 40 | 30 | 20 | 8 | 6 | 4 |
| | V2 | +12/+15 | 24/30 | 18/22.5 | 12/15 | 2 | 1.5 | 1 |
| | V3 | -12/-15 | 24/30 | 18/22.5 | 12/15 | 2 | 1.5 | 1 |
| 5223 | V4 | 3.3 | 23.1 | 17.3 | 11.5 | 7 | 5.2 | 3.5 |
| 5225 | V4 | 5 | 35 | 26.2 | 17.5 | 7 | 5.2 | 3.5 |
| 5222 | V4 | 12 | 36 | 27 | 18 | 3 | 2.2 | 1.5 |
| 5224 | V4 | 24 | 36 | 27 | 18 | 1.5 | 1.1 | 0.7 |

ZWQ130



| Ta | LOAD (%) | | | | |
|-------------|------------|------------|------------|------------|------------|
| | Mounting A | Mounting B | Mounting C | Mounting D | Mounting E |
| -10 to 25°C | 100 | 100 | 100 | 100 | 100 |
| 30°C | 100 | 100 | 100 | 100 | 87 |
| 35°C | 100 | 87 | 87 | 87 | 75 |
| 40°C | 100 | 75 | 75 | 75 | 62 |
| 45°C | 87 | 62 | 62 | 62 | 50 |
| 50°C | 75 | 50 | 50 | 50 | |
| 55°C | 62 | | | | |
| 60°C | 50 | | | | |

(Monoting A)

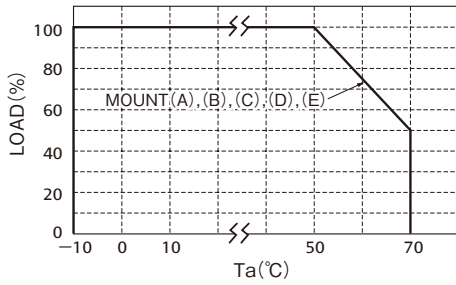
| | Total allowable output power (W) | | |
|--------|----------------------------------|------|------|
| | 40°C | 50°C | 60°C |
| ZWQ130 | 130 | 97.5 | 65 |

| | CH | Output voltage (V) | Each allowable output power (W) | | | Maximum output current (A) | | |
|------|----|--------------------|---------------------------------|-------|-------|----------------------------|------|------|
| | | | 40°C | 50°C | 60°C | 40°C | 50°C | 60°C |
| 522* | V1 | 5 | 75 | 56.2 | 37.5 | 15 | 11.2 | 7.5 |
| | V2 | +12/+15 | 48/60 | 36/45 | 24/30 | 4 | 3 | 2 |
| | V3 | -12/-15 | 48/60 | 36/45 | 24/30 | 4 | 3 | 2 |
| 5223 | V4 | 3.3 | 33 | 24.7 | 16.5 | 10 | 7.5 | 5 |
| 5225 | V4 | 5 | 50 | 26.2 | 25 | 10 | 7.5 | 5 |
| 5222 | V4 | 12 | 48 | 27 | 24 | 4 | 3 | 2 |
| 5224 | V4 | 24 | 48 | 27 | 24 | 2 | 1.5 | 1 |

PCB type, with chassis type (Forced air cooling)

ZWQ80 · ZWQ130

Note: () is value for 5223 model.



| | | LOAD (%) | | | | |
|----------------|-----|----------|-----|-----|-----|--|
| Mounting Ta | | | | | | |
| | A | B | C | D | E | |
| -10 to 40°C | 100 | 100 | 100 | 100 | 100 | |
| 45°C | 100 | 100 | 100 | 100 | 100 | |
| 50°C | 100 | 100 | 100 | 100 | 100 | |
| 55°C | 87 | 87 | 87 | 87 | 87 | |
| 60°C | 75 | 75 | 75 | 75 | 75 | |
| 65°C | 62 | 62 | 62 | 62 | 62 | |
| 70°C | 50 | 50 | 50 | 50 | 50 | |

(Mounting A)

| | Total allowable output power(W) | | |
|--------|---------------------------------|------|------|
| | 50°C | 60°C | 70°C |
| ZWQ80 | 80 | 60 | 40 |
| ZWQ130 | 130 | 97.5 | 65 |

ZWQ80 (Mounting A)

| | CH | Output power (V) | Each allowable output power (W) | | | Maximum output current (A) | | |
|-------|----|---------------------|---------------------------------|-----------|---------|----------------------------|------|------|
| | | | 50°C | 60°C | 70°C | 50°C | 60°C | 70°C |
| 522 * | V1 | 5 | 50 | 37.5 | 25 | 10 | 7.5 | 5 |
| | V2 | +12/+15 | 30/37.5 | 22.5/28.1 | 15/18.7 | 2.5 | 1.8 | 1.2 |
| | V3 | -12/-15 | 30/37.5 | 22.5/28.1 | 15/18.7 | 2.5 | 1.8 | 1.2 |
| 5223 | V4 | 3.3 | 29.7 | 22.2 | 14.8 | 9 | 6.7 | 4.5 |
| 5225 | V4 | 5 | 45 | 33.7 | 22.5 | 9 | 6.7 | 4.5 |
| 5222 | V4 | 12 | 48 | 36 | 24 | 4 | 3 | 2 |
| 5224 | V4 | 24 | 48 | 36 | 24 | 2 | 1.5 | 1 |

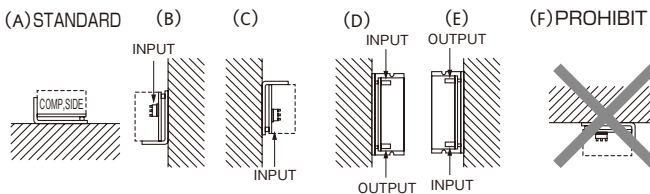
ZWQ130 (Mounting A)

| | CH | Output voltage (V) | Each allowable output power (W) | | | Maximum output power (A) | | |
|-------|----|-----------------------|---------------------------------|---------|---------|--------------------------|------|------|
| | | | 50°C | 60°C | 70°C | 50°C | 60°C | 70°C |
| 522 * | V1 | 5 | 95 | 71.2 | 47.5 | 19 | 14.2 | 9.5 |
| | V2 | +12/+15 | 60/75 | 45/56.2 | 30/37.5 | 5 | 3.7 | 2.5 |
| | V3 | -12/-15 | 60/75 | 45/56.2 | 30/37.5 | 5 | 3.7 | 2.5 |
| 5223 | V4 | 3.3 | 39.6 | 29.7 | 19.8 | 12 | 9 | 6 |
| 5225 | V4 | 5 | 60 | 45 | 30 | 12 | 9 | 6 |
| 5222 | V4 | 12 | 60 | 45 | 30 | 5 | 3.7 | 2.5 |
| 5224 | V4 | 24 | 60 | 45 | 30 | 2.5 | 1.8 | 1.2 |

* Please let air (0.85m³/min (30cfm)) flow into the component side. (Please make air flow to maintain core of T1 temperature 80°C.)

2 Output Derating according to the Mounting Directions for with cover type

ZWQ series has option that with cover type (/A). Recommend standard mounting is method (A). Methods (B), (C), (D), (E) are also possible. Refer to the derating below. Please do not use installation method (F), where the PCB will be on the top side and heat will be trapped inside the unit. In the following derating curve, load (%) is percent of total allowable output power or each maximum output current, whichever is greater.

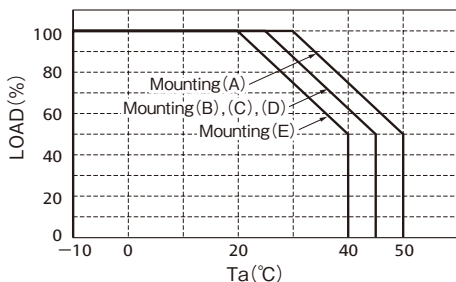


● Maximum power when V4 output voltage is varied (5225 and 5223 models)

| V4 output voltage setting value | Total allowable output power at convection cooling | Maximum peak output power at convection cooling or total allowable output power at forced air cooling |
|---------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 5V | 80W | 104W |
| 3.3V | 80W | 88.7W |
| 3V | 80W | 86W |
| 2V | 77W | 77W |

With Cover (Convection cooling)

ZWQ80/A



| | | LOAD (%) | | | | |
|----------------|-----|----------|-----|-----|-----|--|
| Mounting Ta | | | | | | |
| | A | B | C | D | E | |
| -10 to 15°C | 100 | 100 | 100 | 100 | 100 | |
| 20°C | 100 | 100 | 100 | 100 | 100 | |
| 25°C | 100 | 100 | 100 | 100 | 87 | |
| 30°C | 100 | 87 | 87 | 87 | 75 | |
| 35°C | 87 | 75 | 75 | 75 | 62 | |
| 40°C | 75 | 62 | 62 | 62 | 50 | |
| 45°C | 62 | 50 | 50 | 50 | | |
| 50°C | 50 | | | | | |

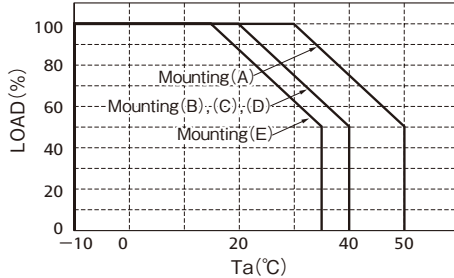
(Mounting A)

| | Total allowable output power(W) | | |
|---------|---------------------------------|------|------|
| | 40°C | 50°C | 60°C |
| ZWQ80/A | 80 | 60 | 40 |

ZWQ

| | CH | Output voltage (V) | Each allowable output power (W) | | | Maximum output current (A) | | |
|------|----|--------------------|---------------------------------|---------|-------|----------------------------|------|------|
| | | | 30°C | 40°C | 50°C | 30°C | 40°C | 50°C |
| 522* | V1 | 5 | 40 | 30 | 20 | 8 | 6 | 4 |
| | V2 | +12/+15 | 24/30 | 18/22.5 | 12/15 | 2 | 1.5 | 1 |
| | V3 | -12/-15 | 24/30 | 18/22.5 | 12/15 | 2 | 1.5 | 1 |
| 5223 | V4 | 3.3 | 23.1 | 17.3 | 11.5 | 7 | 5.2 | 3.5 |
| 5225 | V4 | 5 | 35 | 26.2 | 17.5 | 7 | 5.2 | 3.5 |
| 5222 | V4 | 12 | 36 | 27 | 18 | 3 | 2.2 | 1.5 |
| 5224 | V4 | 24 | 36 | 27 | 18 | 1.5 | 1.1 | 0.7 |

ZWQ130/A



| | | LOAD (%) | | | | |
|------|-------------|----------|-----|-----|-----|-----|
| Ta | Mounting | A | B | C | D | E |
| | -10 to 15°C | 100 | 100 | 100 | 100 | 100 |
| 20°C | | 100 | 100 | 100 | 100 | 87 |
| 25°C | | 100 | 87 | 87 | 87 | 75 |
| 30°C | | 100 | 75 | 75 | 75 | 62 |
| 35°C | | 87 | 62 | 62 | 62 | 50 |
| 40°C | | 75 | 50 | 50 | 50 | |
| 45°C | 62 | | | | | |
| | 50°C | 50 | | | | |

(Mounting A)

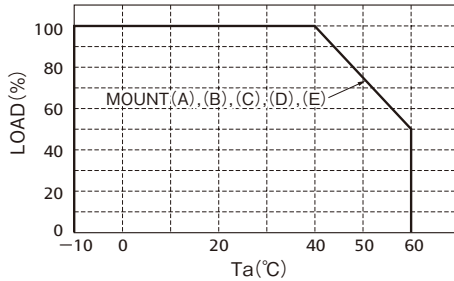
| ZWQ130/A | Total allowable output power(W) | | |
|----------|---------------------------------|------|------|
| | 30°C | 40°C | 50°C |
| | 130 | 97.5 | 65 |

| | CH | Output voltage (V) | Each allowable output power (W) | | | Maximum output current(A) | | |
|------|----|--------------------|---------------------------------|-------|-------|---------------------------|------|------|
| | | | 30°C | 40°C | 50°C | 30°C | 40°C | 50°C |
| 522* | V1 | 5 | 75 | 56.2 | 37.5 | 15 | 11.2 | 7.5 |
| | V2 | +12/+15 | 48/60 | 36/45 | 24/30 | 4 | 3 | 2 |
| | V3 | -12/-15 | 48/60 | 36/45 | 24/30 | 4 | 3 | 2 |
| 5223 | V4 | 3.3 | 33 | 24.7 | 16.5 | 10 | 7.5 | 5 |
| 5225 | V4 | 5 | 50 | 26.2 | 25 | 10 | 7.5 | 5 |
| 5222 | V4 | 12 | 48 | 27 | 24 | 4 | 3 | 2 |
| 5224 | V4 | 24 | 48 | 27 | 24 | 2 | 1.5 | 1 |

With Cover (Forced air cooling)

ZWQ80/A · ZWQ130/A

Note: () is value for 5223 model.



| | | LOAD (%) | | | | |
|------|-------------|----------|-----|-----|-----|-----|
| Ta | Mounting | A | B | C | D | E |
| | -10 to 30°C | 100 | 100 | 100 | 100 | 100 |
| 35°C | | 100 | 100 | 100 | 100 | 100 |
| 40°C | | 100 | 100 | 100 | 100 | 100 |
| 45°C | | 87 | 87 | 87 | 87 | 87 |
| 50°C | | 75 | 75 | 75 | 75 | 75 |
| 55°C | | 62 | 62 | 62 | 62 | 62 |
| 60°C | | 50 | 50 | 50 | 50 | 50 |

(Mounting A)

| ZWQ80/A | Total allowable output power(W) | | |
|----------|---------------------------------|------|------|
| | 40°C | 50°C | 60°C |
| | 80 | 60 | 40 |
| ZWQ130/A | 130 | 97.5 | 65 |

ZWQ80/A (Mounting A)

| | CH | Output voltage (V) | Each allowable output power (W) | | | Maximum output current (A) | | |
|------|----|--------------------|---------------------------------|-----------|---------|----------------------------|------|------|
| | | | 40°C | 50°C | 60°C | 40°C | 50°C | 60°C |
| 522* | V1 | 5 | 50 | 37.5 | 25 | 10 | 7.5 | 5 |
| | V2 | +12/+15 | 30/37.5 | 22.5/28.1 | 15/18.7 | 2.5 | 1.8 | 1.2 |
| | V3 | -12/-15 | 30/37.5 | 22.5/28.1 | 15/18.7 | 2.5 | 1.8 | 1.2 |
| 5223 | V4 | 3.3 | 29.7 | 22.2 | 14.8 | 9 | 6.7 | 4.5 |
| 5225 | V4 | 5 | 45 | 33.7 | 22.5 | 9 | 6.7 | 4.5 |
| 5222 | V4 | 12 | 48 | 36 | 24 | 4 | 3 | 2 |
| 5224 | V4 | 24 | 48 | 36 | 24 | 2 | 1.5 | 1 |

ZWQ130/A (Mounting A)

| | CH | Output voltage (V) | Each allowable output power (W) | | | Maximum output current(A) | | |
|------|----|--------------------|---------------------------------|---------|---------|---------------------------|------|------|
| | | | 40°C | 50°C | 60°C | 40°C | 50°C | 60°C |
| 522* | V1 | 5 | 95 | 71.2 | 47.5 | 19 | 14.2 | 9.5 |
| | V2 | +12/+15 | 60/75 | 45/56.2 | 30/37.5 | 5 | 3.7 | 2.5 |
| | V3 | -12/-15 | 60/75 | 45/56.2 | 30/37.5 | 5 | 3.7 | 2.5 |
| 5223 | V4 | 3.3 | 39.6 | 29.7 | 19.8 | 12 | 9 | 6 |
| 5225 | V4 | 5 | 60 | 45 | 30 | 12 | 9 | 6 |
| 5222 | V4 | 12 | 60 | 45 | 30 | 5 | 3.7 | 2.5 |
| 5224 | V4 | 24 | 60 | 45 | 30 | 2.5 | 1.8 | 1.2 |

*Please let air (0.85m³/min (30cfm)) flow into the component side. (Please make air flow to maintain Core of T1 temperature 80°C.)

· All specifications are subject to change without notice.

4. Mounting Method

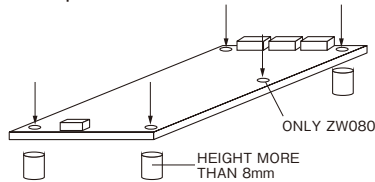
PCB type

Please use the mounting hole as:

ZWQ80: 5 holes of $\phi 3.5$

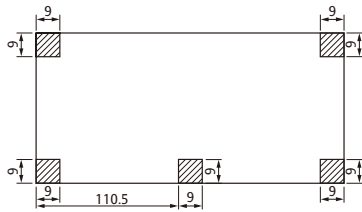
ZWQ130: 4 holes of $\phi 3.5$

and insert the spacer (MAX $\phi 6.0$) of height over 8mm to lift the unit. Also use all mounting holes for the unit installation. The vibration spec is the value when the unit is raised by 8mm spacers.

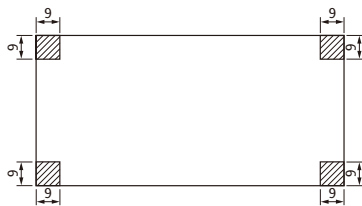


And allowable area by metal pieces is 9mm from each PCB corners. Refer to figure below.

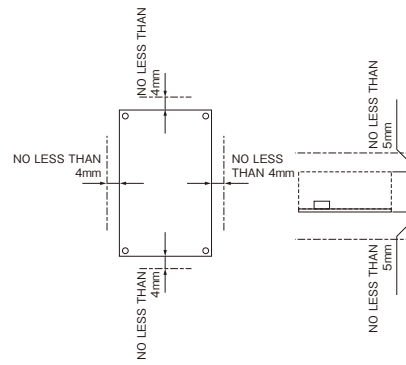
[ZWQ80]



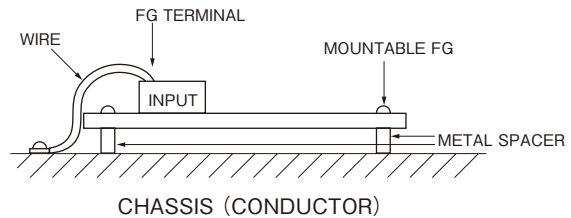
[ZWQ130]



Please leave 5mm space from the surfaces and left 4mm space from the sides of PCB, especially from the solder surface, 8mm space is necessary. If the space is not enough, the specification of insulation and withstand will not be satisfied.



FG should be connected to the earth terminal of the apparatus. If not, the conducted noise and output noise will

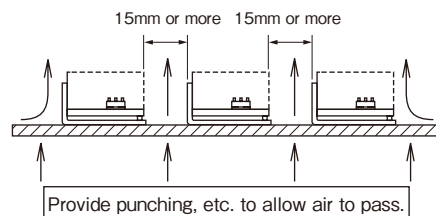
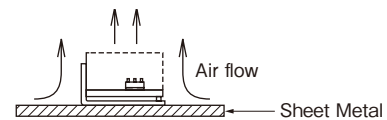


increase.

Hatching area is maximum permissible of metal part for mounting.

With chassis

- (1) In the consideration for the heat radiation and safety when the power supply is used on condition that convection cooling, please take a distance more than 15mm between the power supply and the peripheral parts. When lining up multiple units, please make sure to place them 15mm or more apart from each other.
- (2) The maximum allowable penetration of mounting screws is 6mm.
- (3) Recommended torque for mounting screw.
M4 screw: 1.27 N·m (13.0kgf·cm)



6. Wiring Method

- The output load line and input line shall be separated and twisted to improve noise sensitivity.
- Use all lines as thick and short as possible to make lower impedance.
- Noise can be eliminated by attaching a capacitor to the load terminals.
- For safety and EMI considerations, connect FG terminal

of input connector and mountable FG of ZWQ series to mounting set ground terminal at equipment.

- Select the wire materials to adapt the connector as follow.

INPUT: ZWQ80/130 -- AWG#22 - #18

OUTPUT: ZWQ80/130 -- AWG#22 - #18

7. External Fuse Rating

Refer to the following fuse rating when selecting the external fuses that are to be used on input line. Surge current flows when line turns on. Use slow-blow fuse or time-lag type fuse. Do not use fast-blow fuse. Fuse rating is specified by in-rush current value at line turn-on. Do not select

the fuse according to input current (rms.) values under the actual load condition.

ZVQ80: 3.15A

ZVQ130: 5.0A

8. Before concluding that the unit is at fault...

Before concluding that the unit is at fault, make the following checks.

- Check if the rated input voltage is connected.
- Check if the wiring of input and output is correct.
- Check if the wire material is not too thin.
- Check if the output voltage control (V.ADJ) is properly adjusted.
- If you use function of the Remote ON/OFF control, check if the Remote ON/OFF control connector is not opened.
- Check if the output current and output wattage dose not exceed specification.
- Check if the output current of CH1 is more than 12% of maximum output current.
- Audible noise can be heard during dynamic-load operation.
- Audible noise can be heard when input voltage waveform is not sinusoidal wave.

9. Notes

- 1) Over voltage Category II.
- 2) Radio Interference Suppression Test is not performed.

10. REPAIR

In case of damage or repair of this product, please return to our service center or factory.

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