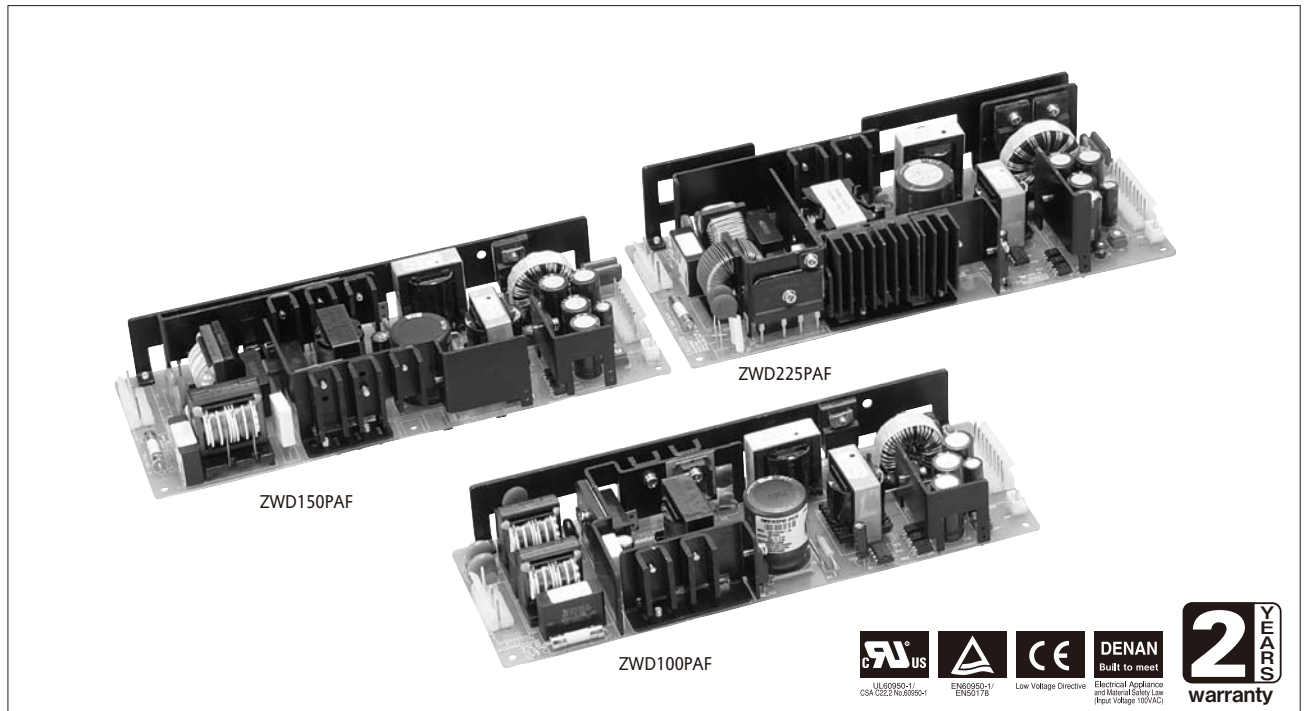


ZWD-PAF SERIES Dual Output 100W - 225W

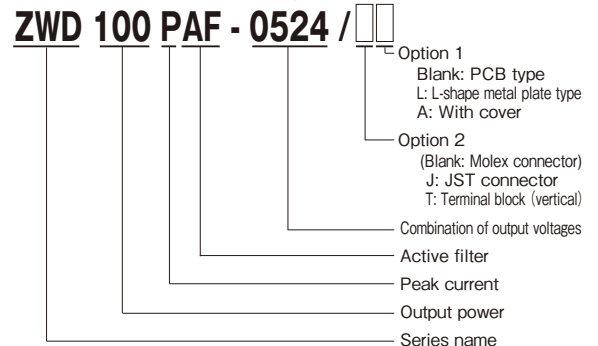


■ Features

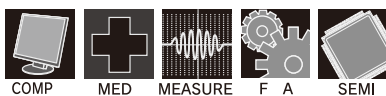
Complies the standard of the harmonics current limiter

- Worldwide input: 85-265VAC
- Peak load accommodatable double power: Approximately twice the value of average output current
- Operating ambient temperature range (-10C to +50C: 100%)
- Output voltage adjusting trimmer
- Low leakage current
- Complies with EMI / immunity standards
- Safety standard approved: CE(LVD)/UL/CSA/EN
- A wide variety of types: input/output (connector/terminal block), with L angle, with cover

■ Model naming method



■ Applications



■ 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

ZWD-PAF (Dual Output, Peak Current)

Output Voltage	100W (Peak186W)		150W (Peak294W)		225W (Peak440W)	
	Output Current (Peak) / Model		Output Current (Peak) / Model		Output Current (Peak) / Model	
5V	5A (-)	ZWD100PAF-0524/J	5A (-)	ZWD150PAF-0524/J	5A (-)	ZWD225PAF-0524/J
24V	4A (8A)		5A (12A)		9A (18A)	

ZWD-PAF

ZWD150PAF Specifications

ITEMS/UNITS		MODEL	ZWD150PAF-0524		
		CH	1	2	
Input	Voltage Range (*3)	V	AC85 - 265 or DC120 - 370		
	Frequency (*3)	Hz	47-63		
	Power Factor (100/200VAC)(typ)(*2)		0.99 / 0.95		
	Efficiency (100/200VAC)(typ) (*2)	%	80 / 82		
	Current (100/200VAC)(typ) (*2)	A	1.90 / 0.97		
	Inrush Current (100/200VAC)(typ)(*4)	A	15 / 30 at, Ta=25°C, cold start		
	Leakage Current (*10)	mA	0.75 max (Low leakage current option available --> /FG. Refer to application note).		
Output	Nominal Voltage	VDC	5	24	
	Maximum Current	A	5	6	
	Maximum Peak Current (100/200VAC)(*1)	A	—	10 / 12	
	Maximum Peak Power (*1)	W	—	240 / 288	
	Total Average Power	W	150		
	Total Allowable Peak Power (100/200VAC)(*1)	W	246 / 294		
	Voltage Setting Accuracy (*2)		4.9 - 5.1V	23.52 - 24.48V	
	Maximum Line Regulation (*5)(*6)	mV	20	96	
	Maximum Load Regulation (*5)(*7)	mV	40	150	
	Temperature Coefficient		0.02%/°C		
	Maximum Ripple & Noise (0≤Ta≤70°C) (*5)	mVp-p	120	150	
	Maximum Ripple & Noise (-10≤Ta<0°C)(*5)	mVp-p	160	180	
	Hold-up Time (typ) (*2)	ms	40	20	
Function	Voltage Adjustable Range	VDC	4.5 - 5.5	22.8 - 27.6	
	Over Current Protection (*8)		> 105%	> 205%	
	Over Voltage Protection (*9)	VDC	120 - 145		
	Remote ON/OFF Control		-	Possible	
	Parallel Operation		Not possible		
	Series Operation		Not possible		
	Environment	Operating Temperature (*11)	°C	- 10 to + 70 Convection: -10 to +50 : 100%, +60 : 50%, +70 : 0%	
		Storage Temperature	°C	- 30 to +85	
		Operating Humidity	%RH	20 - 90 (No dewdrop)	
		Storage Humidity	%RH	10 - 95 (No dewdrop)	
Vibration (Non-operating)			10 - 55Hz (sweep for 1min) Less than 19.6m/s ² constant, X, Y, Z 1hour each		
Shock (In package)			Less than 196.1m/s ²		
Cooling			Convection cooling		
Isolation	Withstand Voltage		Input - Output : 3.0kVAC (20mA), Input - FG : 2.0kVAC (20mA) Output - FG : 500VAC (100mA) for 1min.		
	Isolation Resistance		More than 100MΩ at Ta=25°C and 70%RH, Output - FG : 500VDC		
Standards	Safety Standards		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		Complies with FCC-B, CISPR22-B, EN55022-B, VCCI-B		
Mechanical	Immunity		Built to meet EN61000-4-2,-3,-4,-5,-6,-8,-11		
	Weight (typ)	g	530		
	Size (W x H x D)	mm	85 x 40 x 222 (Refer to outline drawing)		

(*1) Operating period at peak output current (i) 6~10A: less than 10 sec; Duty ≤ 0.35 (ii) 10~12A: less than 5 sec; Duty ≤ 0.20. (Average output power and current is less than maximum output power and current.)
For peak load derating method, please refer to instruction manual for details.

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

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

(*4) Not applicable for the in-rush current to noise filter for less than 0.2ms.

(*5) Please refer to Fig A for measurement of line & load regulation and output ripple voltage. (Measure with normal probe.)

(*6) 85 - 132VAC and 170 - 265VAC, constant load.

(*7) No load - full load, constant input voltage.

(*8) Current limiting with automatic recovery. Avoid to operate at overload or dead short for more than 30 seconds.

(*9) OVP circuit will shutdown output, manual reset. (line recycle) (OVP for V1, V1 & V2 shutdown, OVP for V2, only V2 shutdown)

(*10) Measured by each measuring method of UL, CSA, EN and DENAN (at 60Hz).

(*11) At standard mounting method, Fig B.

- Load(%) is percent of maximum output load (Item 2 and 4), do not exceed derating in both maximum output current and power.
-For other mountings, refer to derating curve.
-When forced air cooling, refer to derating curve.

ZWD-PAF

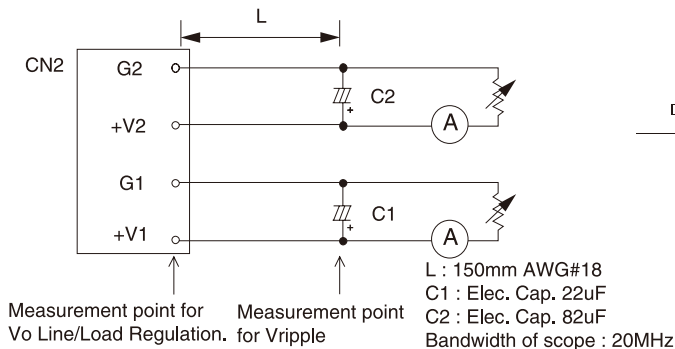
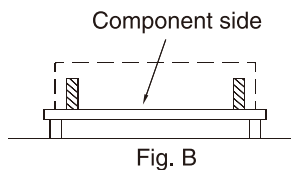
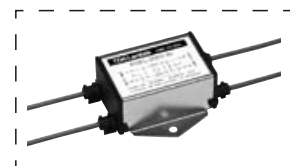


Fig. A



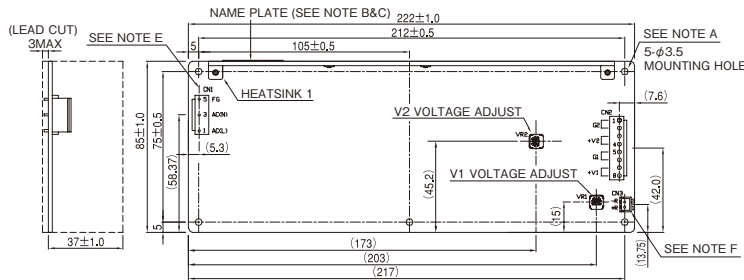
● Recommended EMC Filter



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

Outline Drawing

[ZWD150PAF (/J : JST connector)]



- NOTE
- A. THE 5-φ3.5 HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING HOLE. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
 - B. MODEL NAME, INPUT VOLTAGE RANGE, AVERAGE OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT AND PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
 - C. COUNTRY OF MANUFACTURER WILL BE SHOWN HERE.
 - D. TO KEEP ACE MORE THAN 4.5mm FROM PC-BOARD EDGE, LEAD CUT AND COMPONENT HEIGHT TO CUSTOMER'S CHASSIS.
 - E. FG IS FOR SAFETY GROUND CONNECTION.
 - F. CN3 IS NORMALLY SHORTED BY JM-2W-96(JST). IF USING REMOTE ON/OFF, REMOVE JM-2W-96 AND REFER TO THE TABLE FOR RECOMMENDED HOUSING AND TERMINAL PIN.

CONNECTOR USED :

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P5-VH	JST	1
PIN HEADER (OUTPUT SIDE CN2)	B8P-VH	JST	1
PIN HEADER (OUTPUT SIDE CN3)	B2B-XH-A	JST	1

* CURRENT OF THE CN2 CONNECTOR PIN MUST BE LESS THAN 5A (7A AT PEAK LOAD)

RECOMMENDED HOUSING & TERMINAL PIN :

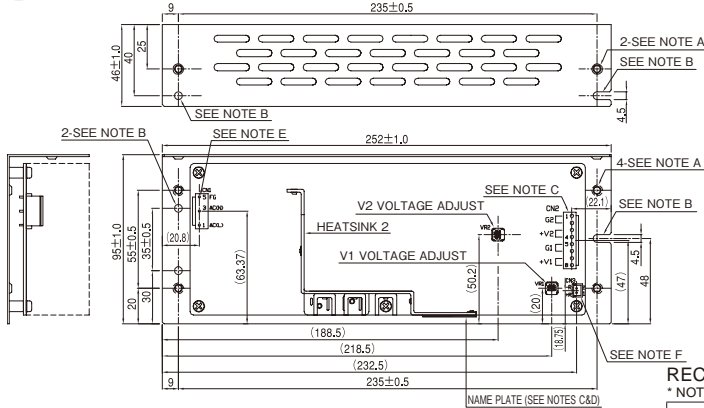
* NOT INCLUDED WITH THE PRODUCT.

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN1)	VHR-5N	JST	1
SOCKET HOUSING (CN2)	VHR-8N	JST	1
SOCKET HOUSING (CN3)*1	XHP-2	JST	1
TERMINAL PINS (CN1, CN2)	SVH-21T-P1.1	JST	11
TERMINAL PINS (CN3)*1	BXH-001T-P0.6 OR SXH-001T-P0.6	JST	2

HAND CRIMPING TOOL : YC-160R CN1, CN2 MANUFACTURER : JST
 HAND CRIMPING TOOL : YC-110R OR YRS-110 CN3 MANUFACTURER : JST
 *1 APPLICABLE ONLY WHEN USING REMOTE ON/OFF

(unit : mm)

[ZWD150PAF (/JL : With L-shape metal plate, JST connector)]



- NOTE
- A. M4 EMBOSSED TAPPED & COUNTERSUNK HOLES (6) ARE FOR CUSTOMER'S CHASSIS MOUNTING. SCREW MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
 - B. φ4.5 HOLES (3) AND R2.25 SLOT HOLES (2) ARE FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW)
 - C. MODEL NAME, INPUT VOLTAGE RANGE, AVERAGE OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT AND PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
 - D. COUNTRY OF MANUFACTURER WILL BE SHOWN HERE.
 - E. FG IS FOR SAFETY GROUND CONNECTION.
 - F. CN3 IS NORMALLY SHORTED BY JM-2W-96(JST). IF USING REMOTE ON/OFF, REMOVE JM-2W-96 AND REFER TO THE TABLE FOR RECOMMENDED HOUSING AND TERMINAL PIN.

CONNECTOR USED :

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P5-VH	JST	1
PIN HEADER (OUTPUT SIDE CN2)	B8P-VH	JST	1
PIN HEADER (OUTPUT SIDE CN3)	B2B-XH-A	JST	1

* CURRENT OF THE CN2 CONNECTOR PIN MUST BE LESS THAN 5A (7A AT PEAK LOAD)

RECOMMENDED HOUSING & TERMINAL PIN :

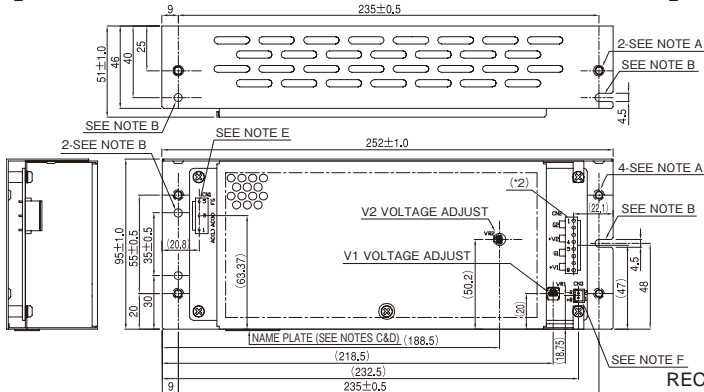
* NOT INCLUDED WITH THE PRODUCT.

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN1)	VHR-5N	JST	1
SOCKET HOUSING (CN2)	VHR-8N	JST	1
SOCKET HOUSING (CN3)*1	XHP-2	JST	1
TERMINAL PINS (CN1, CN2)	SVH-21T-P1.1	JST	11
TERMINAL PINS (CN3)*1	BXH-001T-P0.6 OR SXH-001T-P0.6	JST	2

HAND CRIMPING TOOL : YC-160R CN1, CN2 MANUFACTURER : JST
 HAND CRIMPING TOOL : YC-110R OR YRS-110 CN3 MANUFACTURER : JST
 *1 APPLICABLE ONLY WHEN USING REMOTE ON/OFF

(unit : mm)

[ZWD150PAF (/JA : With cover, JST connector)]



- NOTE
- A. M4 EMBOSSED TAPPED & COUNTERSUNK HOLES (6) ARE FOR CUSTOMER'S CHASSIS MOUNTING. SCREW MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
 - B. φ4.5 HOLES (3) AND R2.25 SLOT HOLES (2) ARE FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW)
 - C. MODEL NAME, INPUT VOLTAGE RANGE, AVERAGE OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT AND PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
 - D. COUNTRY OF MANUFACTURER WILL BE SHOWN HERE.
 - E. FG IS FOR SAFETY GROUND CONNECTION.
 - F. CN3 IS NORMALLY SHORTED BY JM-2W-96(JST). IF USING REMOTE ON/OFF, REMOVE JM-2W-96 AND REFER TO THE TABLE FOR RECOMMENDED HOUSING AND TERMINAL PIN.

CONNECTOR USED :

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P5-VH	JST	1
PIN HEADER (OUTPUT SIDE CN2)	B8P-VH	JST	1
PIN HEADER (OUTPUT SIDE CN3)	B2B-XH-A	JST	1

* CURRENT OF THE CN2 CONNECTOR PIN MUST BE LESS THAN 5A (7A AT PEAK LOAD)

RECOMMENDED HOUSING & TERMINAL PIN :

* NOT INCLUDED WITH THE PRODUCT.

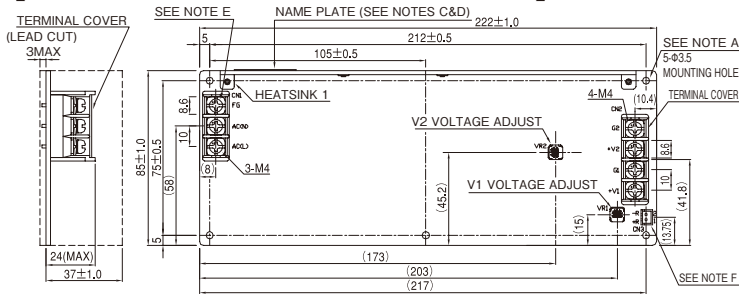
PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN1)	VHR-5N	JST	1
SOCKET HOUSING (CN2)	VHR-8N	JST	1
SOCKET HOUSING (CN3)*1	XHP-2	JST	1
TERMINAL PINS (CN1, CN2)	SVH-21T-P1.1	JST	11
TERMINAL PINS (CN3)*1	BXH-001T-P0.6 OR SXH-001T-P0.6	JST	2

HAND CRIMPING TOOL : YC-160R CN1, CN2 MANUFACTURER : JST
 HAND CRIMPING TOOL : YC-110R OR YRS-110 CN3 MANUFACTURER : JST
 *1 APPLICABLE ONLY WHEN USING REMOTE ON/OFF

(unit : mm)

Outline Drawing

[ZWD150PAF (/T : Vertical terminal)]



- NOTE
- A. THE 5- ϕ 3.5 HOLES ARE FOR CUSTOMER'S CHASSIS MOUNTING G HOLE. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
 - B. MODEL NAME, INPUT VOLTAGE RANGE, AVERAGE OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT AND PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
 - C. COUNTRY OF MANUFACTURER WILL BE SHOWN HERE.
 - D. TO KEEP A DISTANCE MORE THAN 4.5mm FROM PC-BOARD EDGE, LEAD CUT AND COMPONENT HEIGHT TO CUSTOMER'S CHASSIS.
 - E. FG IS FOR SAFETY GROUND CONNECTION.
 - F. CN3 IS NORMALLY SHORTED BY JM-2W-96(JST). IF USING REMOTE ON/OFF, REMOVE JM-2W-96 AND REFER TO THE TABLE FOR RECOMMENDED HOUSING AND TERMINAL PIN.

CONNECTOR USED:

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (OUTPUT SIDE CN3)	B2B-XH-A	JST	1

RECOMMENDED HOUSING & TERMINAL PIN:

* NOT INCLUDED WITH THE PRODUCT.

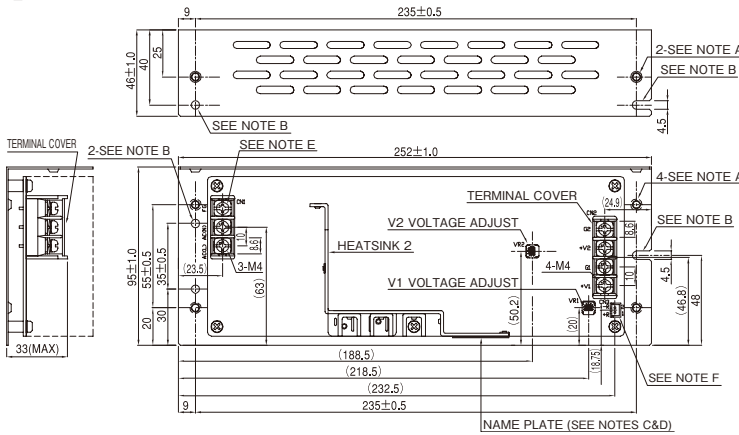
PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN3)*1	XHP-2	JST	1
TERMINAL PINS (CN3)*1	BXH-001T-P0.6 OR SXH-001T-P0.6	JST	2

HAND CRIMPING TOOL : YC-110R OR YRS-110 CN3 MANUFACTURER : JST

*1 APPLICABLE ONLY WHEN USING REMOTE ON/OFF

(unit : mm)

[ZWD150PAF (/TL : Vertical terminal, with L-shape metal plate)]



- NOTE
- A. M4 EMBOSSED TAPPED & COUNTERSUNK HOLES (6) ARE FOR CUSTOMER'S CHASSIS MOUNTING. SCREW MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
 - B. ϕ 4.5 HOLES (3) AND R2.25 SLOT HOLES (2) ARE FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW)
 - C. MODEL NAME, INPUT VOLTAGE RANGE, AVERAGE OUTPUT POWER, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT AND PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
 - D. COUNTRY OF MANUFACTURER WILL BE SHOWN HERE.
 - E. FG IS FOR SAFETY GROUND CONNECTION.
 - F. CN3 IS NORMALLY SHORTED BY JM-2W-96(JST). IF USING REMOTE ON/OFF, REMOVE JM-2W-96 AND REFER TO THE TABLE FOR RECOMMENDED HOUSING AND TERMINAL PIN.

CONNECTOR USED:

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (OUTPUT SIDE CN3)	B2B-XH-A	JST	1

RECOMMENDED HOUSING & TERMINAL PIN:

* NOT INCLUDED WITH THE PRODUCT.

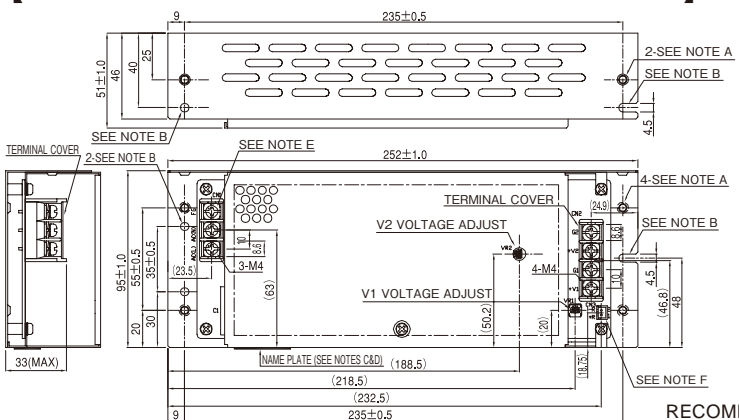
PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN3)*1	XHP-2	JST	1
TERMINAL PINS (CN3)*1	BXH-001T-P0.6 OR SXH-001T-P0.6	JST	2

HAND CRIMPING TOOL : YC-110R OR YRS-110 CN3 MANUFACTURER : JST

*1 APPLICABLE ONLY WHEN USING REMOTE ON/OFF

(unit : mm)

[ZWD150PAF (/TA : Vertical terminal, with cover)]



- NOTE
- A. M4 EMBOSSED TAPPED & COUNTERSUNK HOLES (6) ARE FOR CUSTOMER'S CHASSIS MOUNTING. SCREW MUST NOT PROTRUDE INTO POWER SUPPLY BY MORE THAN 6mm.
 - B. ϕ 4.5 HOLES (3) AND R2.25 SLOT HOLES (2) ARE FOR CUSTOMER'S CHASSIS MOUNTING. (USE M4 MOUNTING SCREW)
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 - D. COUNTRY OF MANUFACTURER WILL BE SHOWN HERE.
 - E. FG IS FOR SAFETY GROUND CONNECTION.
 - F. CN3 IS NORMALLY SHORTED BY JM-2W-96(JST). IF USING REMOTE ON/OFF, REMOVE JM-2W-96 AND REFER TO THE TABLE FOR RECOMMENDED HOUSING AND TERMINAL PIN.

CONNECTOR USED:

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (OUTPUT SIDE CN3)	B2B-XH-A	JST	1

RECOMMENDED HOUSING & TERMINAL PIN:

* NOT INCLUDED WITH THE PRODUCT.

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN3)*1	XHP-2	JST	1
TERMINAL PINS (CN3)*1	BXH-001T-P0.6 OR SXH-001T-P0.6	JST	2

HAND CRIMPING TOOL : YC-110R OR YRS-110 CN3 MANUFACTURER : JST

*1 APPLICABLE ONLY WHEN USING REMOTE ON/OFF

(unit : mm)

Output Derating

[ZWD150PAF]

Recommended standard mounting method is (A).

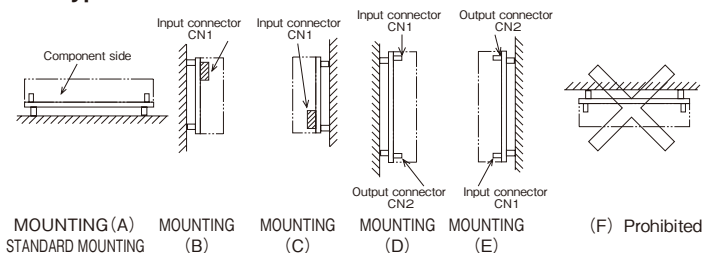
(B), (C), (D) and (E) are also possible. Mounting (F), (G), (H) and (I) are prohibited.

Please do not use (F), where the PCB will be on the top side and heat will be trapped inside the unit.

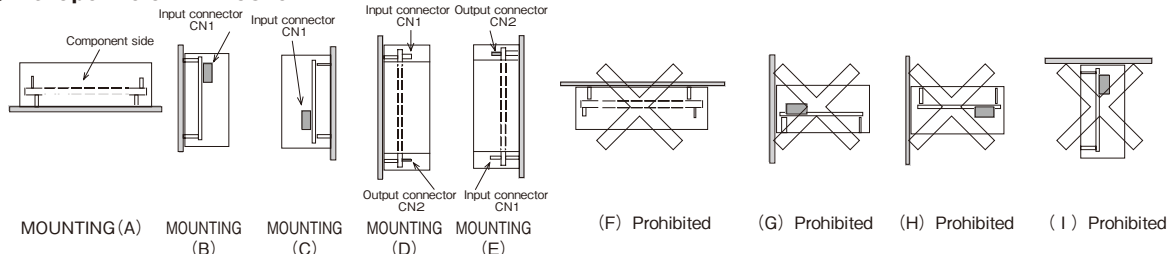
In the following derating curve, average load (%) is percent of maximum output load (both maximum output current and maximum output power in specification.)

Do not exceed the load derating.

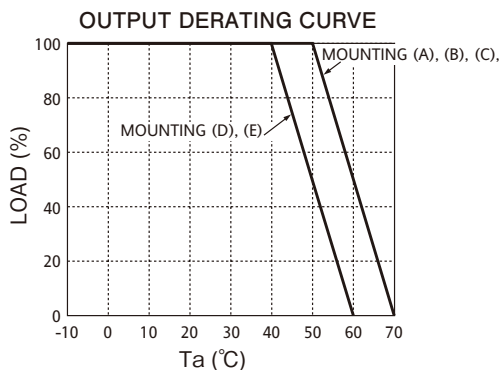
●PCB type



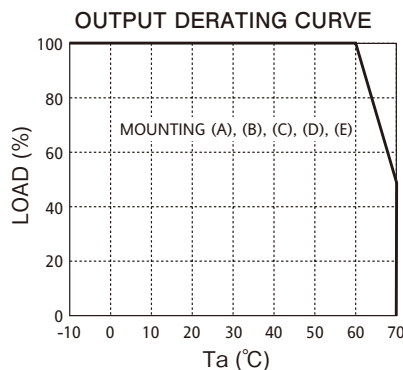
●L-shape metal with cover



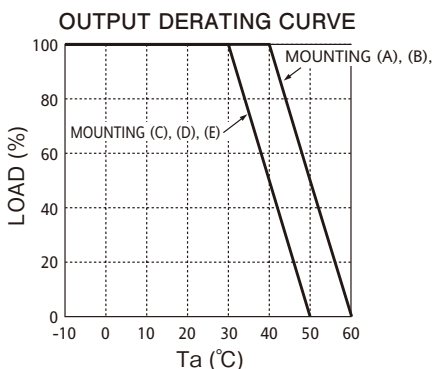
CONVECTION COOLING (PCB type and with chassis type)



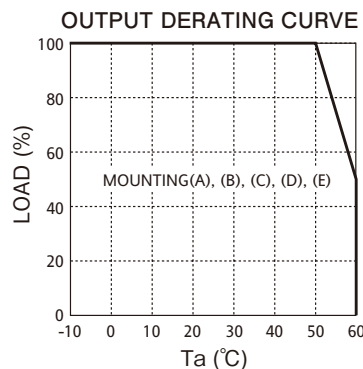
FORCED AIR COOLING (PCB type and with chassis type)



CONVECTION COOLING (With chassis and cover type)



FORCED AIR COOLING (With chassis and cover type)



Recommended minimum air velocity: 0.7m/s (Measured at component side of PCB, air must flow through component side.)