

Single Output Power Supply OZ-060 series

Various outputs (+3.3V,+5V,+12V,+15V, and +24V) with 60W lined up



Structure and In/Out connector	Model	Output voltage	Output current	Output power	Stock
Open frame type/ Nylon connector	OZ-060-3R3-J00	+3.3V	12A	39.6W	Standard Stock
	OZ-060-5-J00	+5V	12A	60W	Standard Stock
	OZ-060-12-J00	+12V	5A	60W	Standard Stock
	OZ-060-15-J00	+15V	4A	60W	Standard Stock
	OZ-060-24-J00	+24V	2.5A	60W	Standard Stock
Structure	Description				Stock
W/T Chassis	'-C' is added after Open frame model name (Ex. OZ-060-3R3-J00-C)				10 days before delivery
W/T Chassis & Cover	'-K' is added after Open frame model name (Ex. OZ-060-3R3-J00-K)				10 days before delivery
Input/Output connector	Description				Stock
European terminal type	'E' from 'J' of nylon connector model (Ex. OZ-060-3R3-E00)				10 days before delivery

■ Model name coding		① Series name	③ 3R3:+3.3V output	④ Input/Output connector	⑦ Optional specification
OZ	060	**	*	00	**
①	②	③	④	⑤	⑥
		② Output power	5: +5V output 12: +12V output 15: +15V output 24: +24V output	J: Nylon connector E: European terminal ⑤ Backup function NOT available ⑥ Modification No.	Blank: Open frame type -C: W/T Chassis -K: W/T Chassis and Cover

Features

- Double sided PWBs with through holes suitable for Industrial use (Competitors mainly adopt Single sided PWBs).
- Equipped with a variable resistor to adjust output voltage
- For Input/Output connectors, Nylon connector or European terminal is selectable.
- Safety standards are acquired (UL60950-1, CSA60950-1, EN60950-1, and EN50178)
- High efficiency with synchronous rectifying system except 24V output model

Safety standard	UL	CSA	EN	CE	CCC
Reliability grade	HFA	FA	HOA	OA	

●Function



●Input

AC input	85V~264V (Worldwide range)
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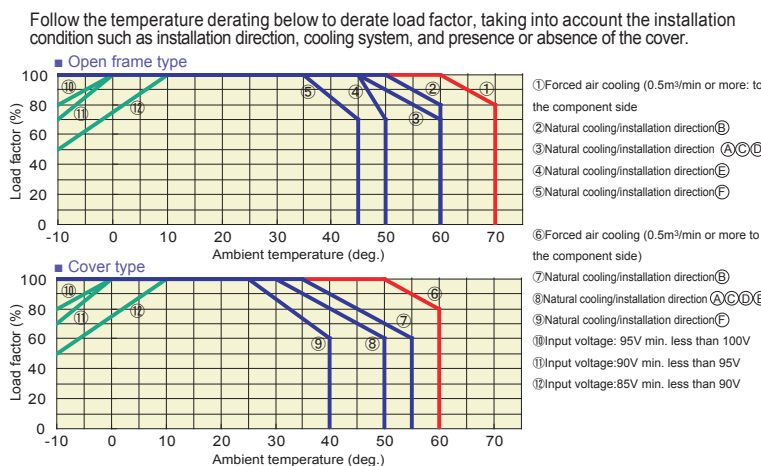
●Dimension

W×H×D (mm)	W/O Chassis & Cover	55×32×195
	W/T Chassis & Cover	65×42×225

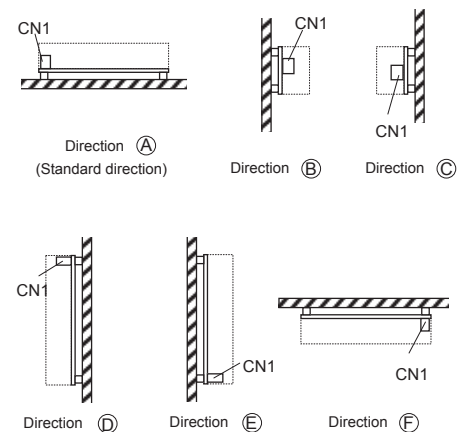
General Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

Items		Specification	Measurements, etc.					
AC Input	Rated voltage	AC100-240V(AC85-264V)	Worldwide range					
	Frequency	50/60Hz	Frequency range: 47-63Hz					
	Efficiency	100V input 74% typ(+3.3V),77% typ(+5V),80% typ(+12V),82% typ(+15V),82% typ(+24V) 240V input 75% typ(+3.3V),79% typ(+5V),82% typ(+12V),82% typ(+15V),83% typ(+24V)	(Characteristics data on Fig.3)	at Rated load				
	Power factor	(Characteristics data on Fig.4)						
	Inrush current	25A typ(AC100V),50A typ(AC200V)	(Characteristics data on Fig.5)	at Rated load and Cold start (25 deg.)				
Input current	100V input	0.85A typ(+3.3V),1.23A typ(+5V),1.18A typ(+12V),1.15A typ(+15V),1.14A typ(+24V)	at Rated load					
	240V input	0.48A typ(+3.3V),0.67A typ(+5V),0.64A typ(+12V),0.64A typ(+15V),0.63A typ(+24V)						
Output	Model	OZ-060-3R3 OZ-060-5 OZ-060-12 OZ-060-15 OZ-060-24						
	Rated voltage	+3.3V +5V +12V +15V +24V						
	Rated current	12A 12A 5A 4A 2.5A						
	Max. current/power		12A 12A 5A 4A 2.5A					
			39.6W 60W 60W 60W 60W					
	Min. load	0A 0A 0A 0A 0A						
	Voltage adjustable range (%)	±10					at Rated input with 50% load	
	Total voltage regulation (mV)	±165 max ±250 max ±600 max ±750 max ±1200 max					Sum of fluctuation by Temp., Input and Load	
	Max. ripple voltage (mVp-p)	0-50deg.	80 max	80 max	120 max	120 max	120 max	To measure on the test board with a capacitor (47µF) with 20MHz oscilloscope. The test board shall be away from load wires and within 150 mm from the output terminals. (Data on Fig.16)
		-10-0deg.	140 max	140 max	160 max	160 max	160 max	
Max. spike voltage (mVp-p)	0-50deg.	120 max	120 max	150 max	150 max	150 max		
	-10-0deg.	160 max	160 max	180 max	180 max	180 max		
Overcurrent protection	OCP point (A)	12.6 min	12.6 min	5.25 min	4.2 min	2.65 min	at the load when output voltage falls down by 10%.	
	Method	Foldback current limiting (Characteristics data on Fig.18)						
	Recovery	Automatic recovery						
	Recovery	Reclosing of AC input					Reclosing interval: 60s or more	
Overvoltage protection	OVP point(V)	4-6	Operation point: 115% to 140% of rated voltage					
	Method	Output latch lock *						
Environment	Operating Temperature and Humidity	-10-60deg./20-90%					* See <Fig.1> Temperature derating below. No condensation	
	Storage Temp. and Humidity	-20-75 deg./10-95%					No condensation	
Insulation	Vibration	Acceleration of 2G with vibration frequency of 10-55Hz for 10 sweep cycles in the X · Y · Z directions.					To follow JIS-C-60068-2-6 at no operation	
	Mechanical shock (surface dropping)	Lift one bottom edge up to 50mm and let it fall. Repeat three times for each of four edges. No malfunction.					To follow JIS-C-60068-2-31 at no operation	
EMC	Dielectric strength	AC 1500V for 1 min. between AC input and DC output/FG					Cut-off current: 20mA	
	Insulation resistance	50MΩ min. between AC input and DC output/FG, and between DC output and FG.					At DC500V	
	Leakage current	0.5mA max. at AC 100V, and 1mA max. at AC 200V (Characteristics data on Fig.6)					YEW, TYPE3226 (1kΩ) or equivalent	
Others	Line noise immunity	±1000V (Pulse width: 100/1000ns, Repeated cycle: 30 to 100Hz, Normal mode/Common mode with Positive/Negative polarity for 1 minute.)					To measure with INS-410. There shall be no DC-factor fluctuation of output and malfunction.	
	Electrostatic discharge	EN61000-4-2 Compliant						
	Radioactive radio frequency electromagnetic field	EN61000-4-3 Compliant						
	Fast Transient Burst	EN61000-4-4 Compliant						
	Lightning	EN61000-4-5 Compliant						
	Conductive radio frequency electromagnetic field	EN61000-4-6 Compliant						
	Power source frequency magnetic field Immunity	EN61000-4-8 Compliant						
	Voltage dips/Fluctuation	EN61000-4-11 Compliant						
Safety standard	Certified UL60950-1,CSA60950-1(c-UL),EN60950-1,EN50178,CE Marking (LVD,EMCD)/The Electrical Appliance and Material Safety Law (section 2) compliant					Connect a metal spacer of 8mm in height between FG land of PSU board mounting hole on the PCB solder side and an iron plate to measure the PSU single body. The iron plate shall be the same size as the PSU board and 1mm thick.		
Conducted Emission	VCCI-B,FCC-B,EN55022-B, and CISPR22-B Compliant (Characteristics data on Fig.7,8)							
Cooling system	Natural air cooling							
Output GND grounding	Capacitor grounding							
Output hold-up time	AC turn-off → 90% of rated voltage: 20ms min at AC100V, 100ms min. at AC200V. (Data on page Fig.13)					at Rated load		
Reliability Grade	FA (Industrial equipment grade to use double-sided PWBs with through holes)					To follow our standard		
MTBF	200,000 H min					To follow EIAJ RCR-9102		
Weight	300g typical without Chassis and Cover							
Warranty	Three years after delivery. However, if any faults belong to us, the defective unit shall be repaired or replaced at our cost.					Except causes generated by operation out of this specification		

<Fig.1> Temperature Derating



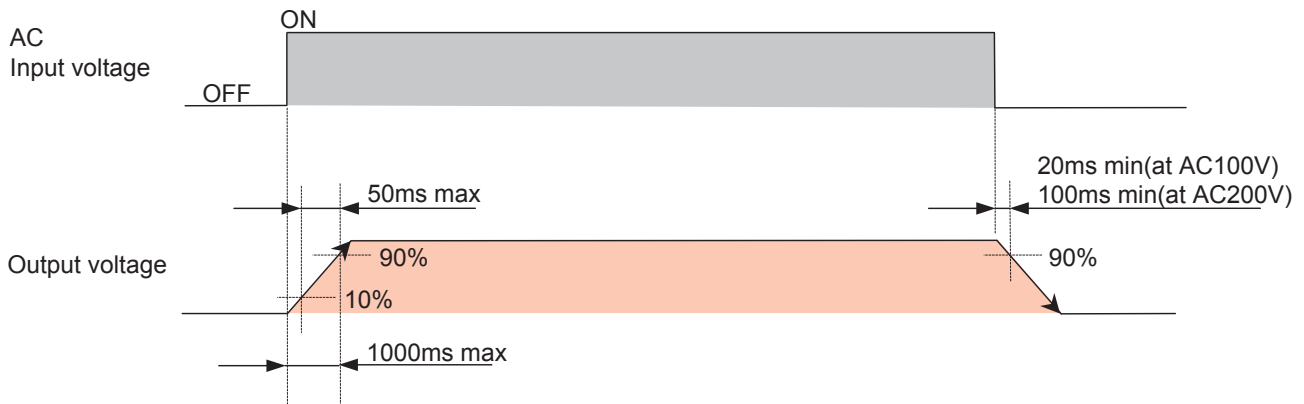
<Fig.2> Installation condition



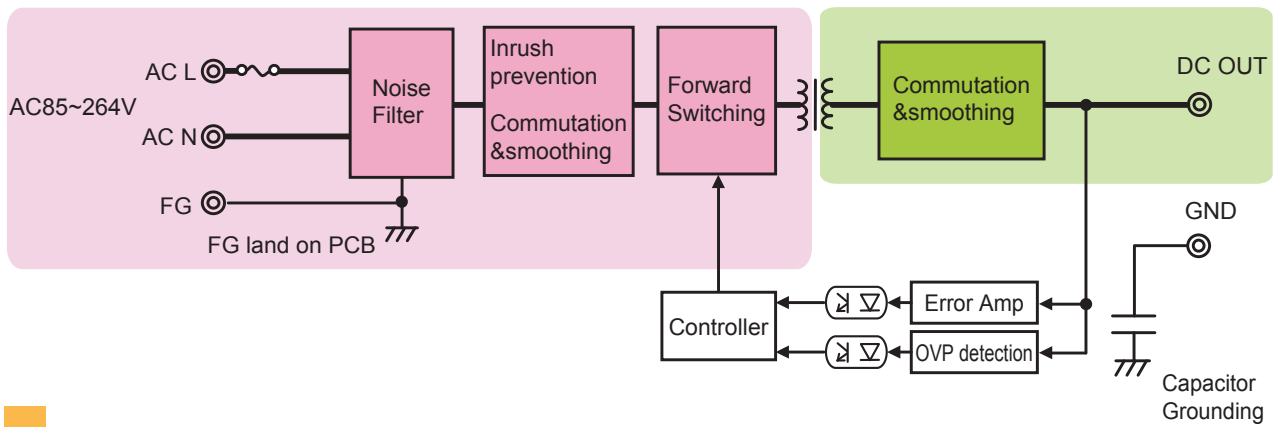
***Output latch lock**

When overvoltage occurs due to malfunction of the unit, output shuts down by stopping switching operation of the primary circuit. This status lasts as long as AC input exists. For recovery, remove the cause and turn on AC input again.

Sequence Timing Chart



Block Diagram



Connection In Series And Parallel

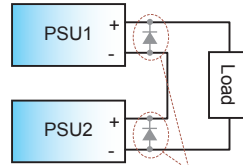
Series connection

Series connection shown on the right is available. Series connection between different output voltages is available, such as 12V and 24V.

Note: In the case that different voltages are connected in series like Fig. (1) on the right;

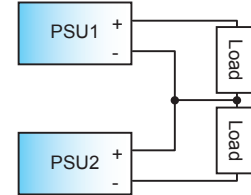
1. The output current shall be the rated current or less of the smaller rated current among the PSU1 and PSU2 connected in series.
2. Connect diodes for protection as shown in the Fig. (1). Current rating of the diode shall be 1.5 times or more of rated output current whose unit has larger rated output current among PSU1 and PSU2. Also, use Schottky diodes whose forward voltage is lower than the forward voltage of the diodes used in the PSU.

Fig. (1)



In the case of series connection of different output voltages, connect diodes shown as above.

Fig. (2)



Parallel operation

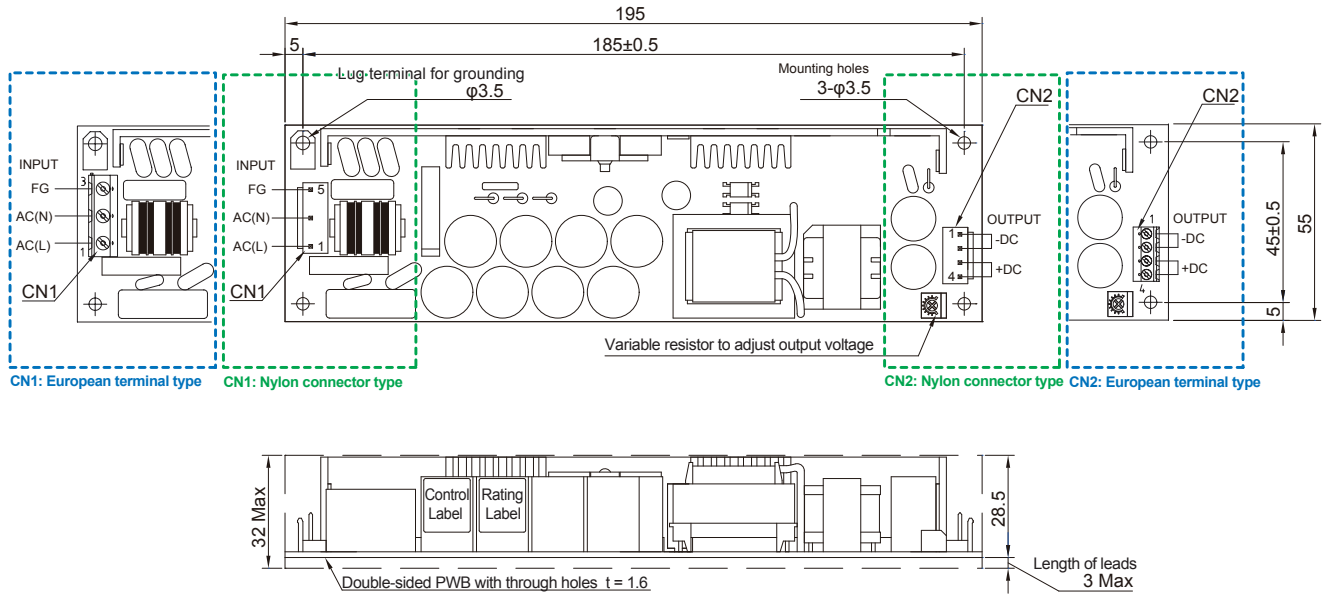
Parallel operation is unacceptable.

Options(Sold separately)

Cable			
Photos	Model	Category	Description
	WH-C05VH-800	Input harness	Connection to nylon connector is acceptable.
	WH-C05VH-800-01	Input harness (with ferrite core)	Connection to nylon connector is acceptable.
	WH-C04VH-800	Output harness	Connection to nylon connector is acceptable.

Outline Drawing

■ PCB type (open frame) model



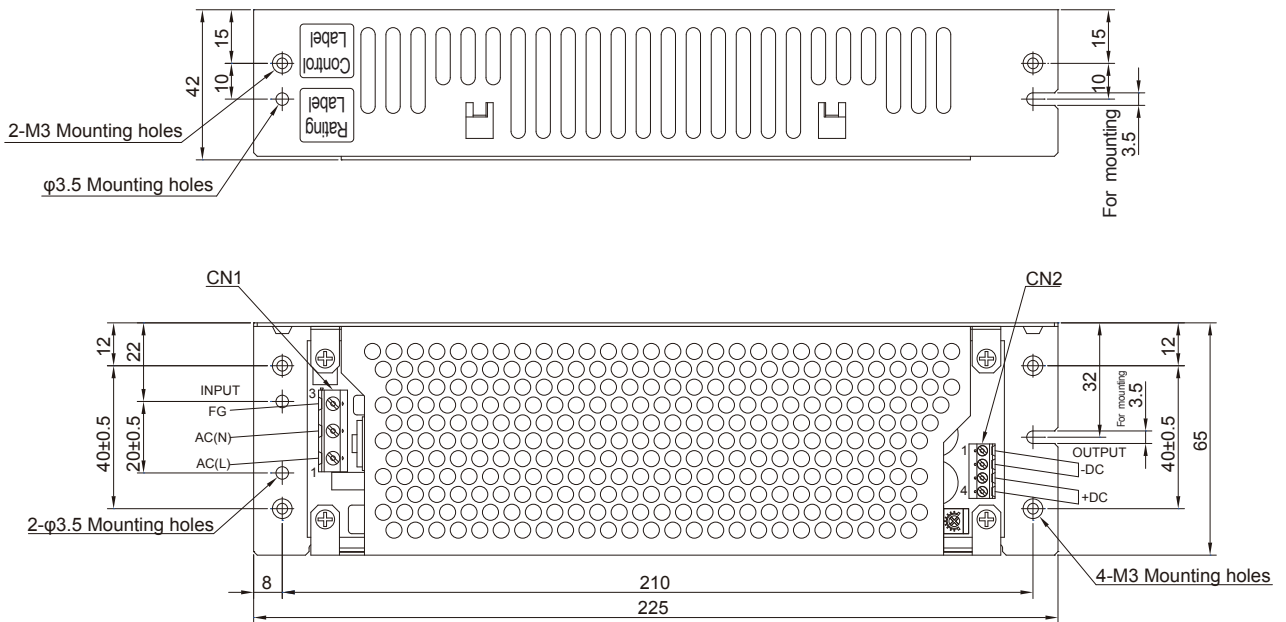
Dimensional tolerance shall be ± 1 unless otherwise specified.
Tightening torque for the unit mounting hole is $0.6N \cdot m$ Max.
(the screw diameter shall be 3mm).

■ Connector pin allocation

Nylon connector type			European terminal type																													
CN1:INPUT <table border="1"> <thead> <tr> <th>PIN No.</th> <th>FUNCTION</th> <th>CONNECTOR TYPE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>AC(L)</td> <td rowspan="2">B3P5-VH (JST)</td> </tr> <tr> <td>2</td> <td>AC(N)</td> </tr> <tr> <td>3</td> <td>AC(L)</td> <td rowspan="2">B3P5-VH (JST)</td> </tr> <tr> <td>4</td> <td>AC(N)</td> </tr> <tr> <td>5</td> <td>FG</td> <td></td> </tr> </tbody> </table>			PIN No.	FUNCTION	CONNECTOR TYPE	1	AC(L)	B3P5-VH (JST)	2	AC(N)	3	AC(L)	B3P5-VH (JST)	4	AC(N)	5	FG		<table border="1"> <thead> <tr> <th>PIN No.</th> <th>FUNCTION</th> <th>CONNECTOR TYPE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>AC(L)</td> <td rowspan="2">GMKDSN 1.5/3-7.62 (PHOENIX)</td> </tr> <tr> <td>2</td> <td>AC(N)</td> </tr> <tr> <td>3</td> <td>FG</td> <td></td> </tr> </tbody> </table>			PIN No.	FUNCTION	CONNECTOR TYPE	1	AC(L)	GMKDSN 1.5/3-7.62 (PHOENIX)	2	AC(N)	3	FG	
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*Applicable housing VHR-5N (JST) *Applicable terminal Reel:SVH-21T-P1.1 Bulk:BVH-21T-P1.1			*Applicable wire gauge: UL 1007 AWG#26 to 18 *Stripped length: 5mm																													
*Applicable housing VHR-4N (JST) *Applicable terminal Reel:SVH-21T-P1.1 Bulk:BVH-21T-P1.1			*Applicable wire gauge: UL 1007 AWG#26 to 18 *Stripped length: 5mm *Current per pin shall be 6A or less for CN2.																													

■ Model with Chassis and Cover

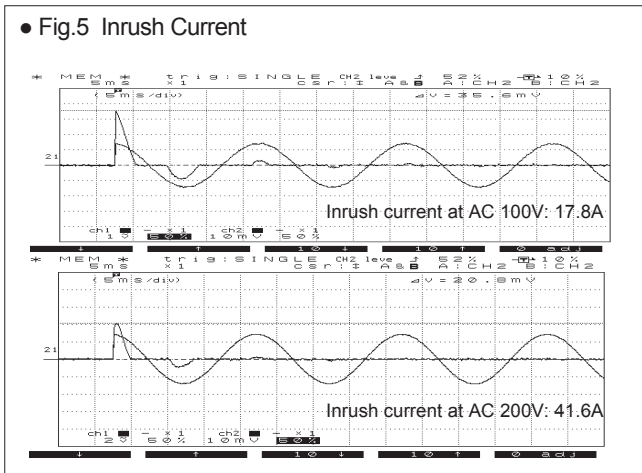
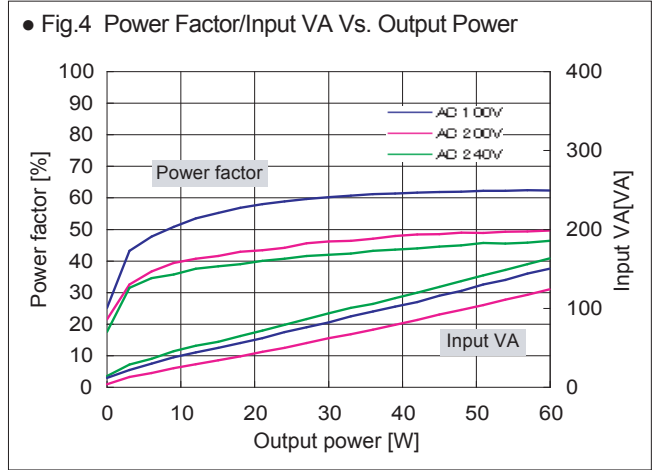
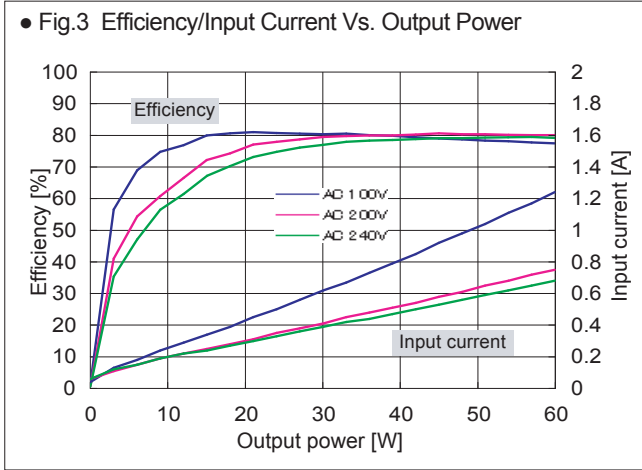
(For Input/Output connectors, Nylon connector type is also available.)



Dimensional tolerance shall be ± 1 unless otherwise specified.

Characteristics Data(Typical features of the product series) **OZ-060-5** (Examples of actual measurement)

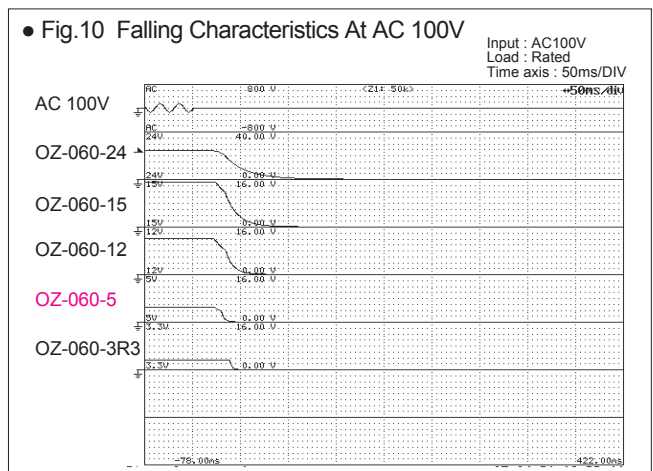
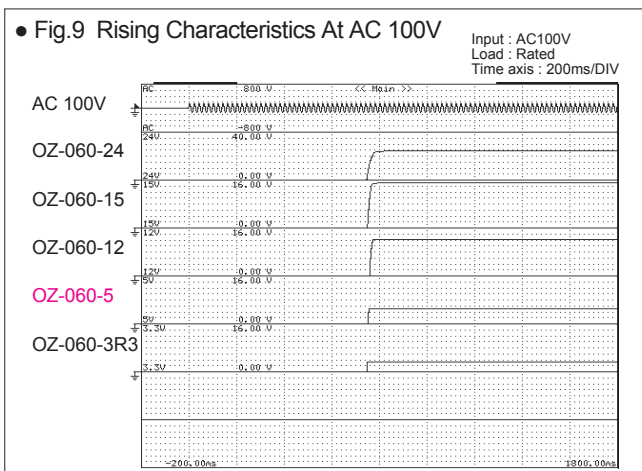
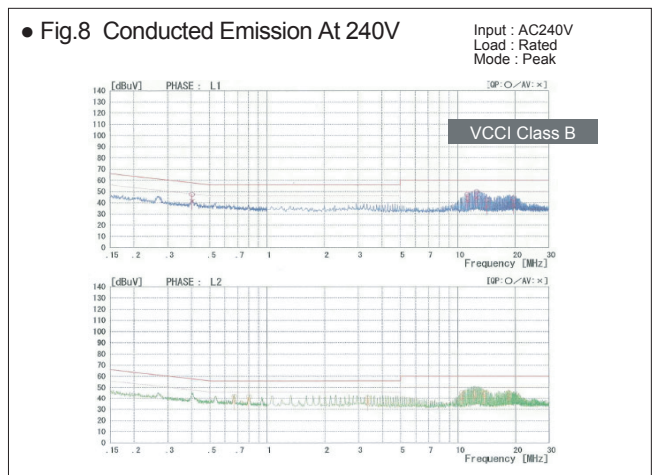
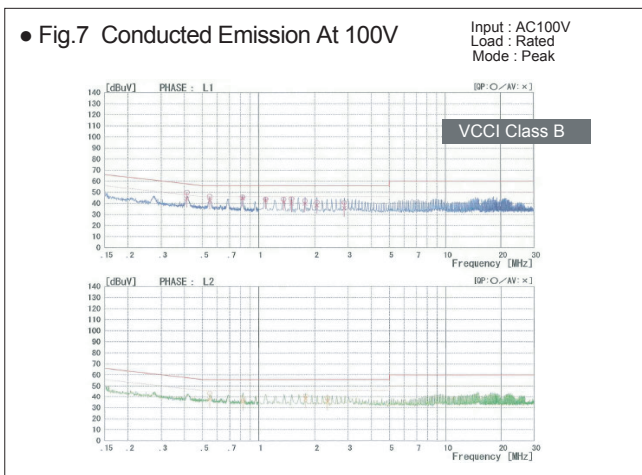
* If you request property data of other products, please visit our website and download for getting them.



● Fig.6 Leakage Current

Input : AC100,200,240V
Load : Rated load and Min. load

	Rated load	Min. load
AC 100V	0.15mA	0.14mA
AC 200V	0.3mA	0.3mA
AC 240V	0.37mA	0.37mA



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