

# AC Input

## Single Output, General-Purpose, UL/C-UL Approved

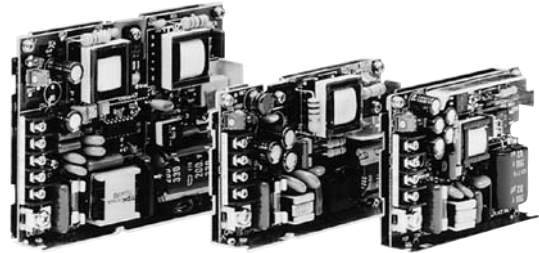
Conformity to RoHS Directive

### F Series FAK(25 to 150W)

The F series FAK is a device-embedded type power supply that has realized a thin type having a thickness of 25 to 40mm. This series of products satisfy various requirements such as low price, safety standards, and EMI countermeasures as well as the thin and compact configuration.

#### FEATURES

- AC.100V input thin-type single output power supply.
- Compact open frame type (A cover is available as option).
- Low price.
- LED indicator display function.
- Low noise (FCC class B compliant).
- Remote sensing function (100W, 150W).
- It is a product conforming to RoHS directive.



#### PART NUMBERS AND RATINGS

Output voltage(V)	25W Type		50W Type		100W Type		150W Type	
	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.	Current(A)	Part No.
5	5	FAK05-5R0	10	FAK05-10R	20	FAK05-20R	30	FAK05-30R
12	2.1	FAK12-2R1	4.2	FAK12-4R2	8.3	FAK12-8R3	12	FAK12-12R
15	1.7	FAK15-1R7	3.4	FAK15-3R4	6.6	FAK15-6R6	10	FAK15-10R
24	1.1	FAK24-1R1	2.1	FAK24-2R1	4.2	FAK24-4R2	6	FAK24-6R0
48					2	FAK48-2R0	3	FAK48-3R0

• 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.

• All specifications are subject to change without notice.

## FAK25W Type

### SPECIFICATIONS AND STANDARDS

Part No.		FAK05-5R0*4	FAK12-2R1	FAK15-1R7	FAK24-1R1
Rated output voltage and current*1		5V • 5A	12V • 2.1A	15V • 1.7A	24V • 1.1A
Maximum output power	W	25	25.2	25.5	26.4
Input conditions					
Input voltage	V	Eac: 85 to 132V[Rating: 100 to 120] /Edc: 110 to 175V			
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)			
Input current	A	0.65max.[AC.100/120V]			
Fuse rating	A	2.5[Built-in]			
Surge current*2	A	36 to 43max.[AC.100 to 120V, 25°C, cold start]			
Leakage current	mA	0.5max.[Input and output ratings]			
Efficiency	%	70typ.[Input and output ratings]			
Output characteristics					
Output voltage Edc	V	5	12	15	24
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5	21.6 to 26.4
Maximum output current	A	5	2.1	1.7	1
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19	27 to 30.5
Overcurrent threshold	A	5.5 to 7.5	2.3 to 3.3	1.9 to 2.8	1.2 to 1.8
Voltage stability	Source effect	%	±1max.(±0.3typ.)[Within the input voltage range]		
	Load effect	%	±1.5max.(±0.6typ.)[10 to 100% load] Total effect ±3max.(±1typ.)		
	Temperature effect	%	±1.5max.(±0.3typ.)[Ambient temperature: 0 to +60°C]		
	Drift(Time effect)	%	0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]		
	Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]		
Ripple Ep-p	mV	80max.	80max.	80max.	100max.
Ripple noise Ep-p	mV	120max.	190max.	220max.	310max.
Start up time	ms	100max.			
Hold up time	ms	20min.			
Auxiliary functions					
Indicator display	LED(Green) indicates when voltage output is ON.				
Overvoltage protection	Voltage shut-down type, recovers upon reset, set value fixed(interval approx. 40s).				
Overcurrent protection	Fixed threshold, higher overcurrent detection point at low load, automatic recovery.				
Remote ON-OFF	No				
Remote sensing	No				
Current balance	No				
Standards					
Safety standards	UL1950, CSA C22.2 No.950-95(C-UL) approved.				
Noise terminal voltage	FCC class B meet.				
Constructions					
External dimensions	mm	25×70×115[H×W×L] / With cover(Option)*3: 28.5×70×115[H×W×L]			
Weight	g	220max.			
Mounting method	Can be attached to 2 sides.				
Case material	Frame: Aluminum / Cover(Option: 2JC0ZB146-FAK25CA): Iron				

\*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

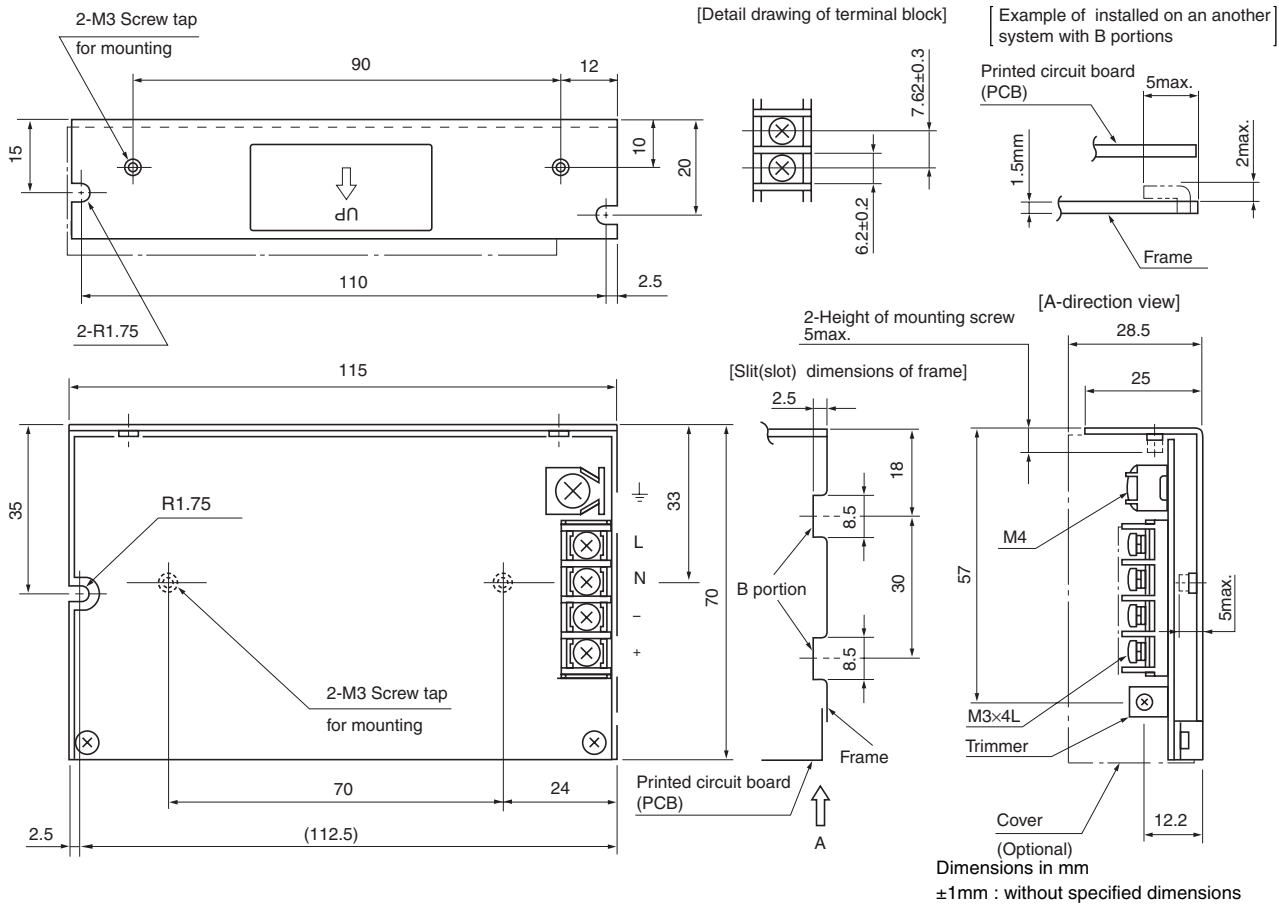
\*2 The surge current suppression element is a power thermistor.

\*3 Derating is required when the optional cover is attached.

\*4 Output may fail to come on when operated in series.

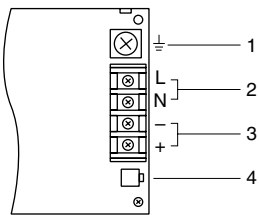
# FAK25W Type

## SHAPES AND DIMENSIONS



• Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

## TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line.
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.The output voltage increases by rotating it clockwise.

• All specifications are subject to change without notice.

## FAK50W Type

### SPECIFICATIONS AND STANDARDS

Part No.	FAK05-10R	FAK12-4R2	FAK15-3R4	FAK24-2R1
Rated output voltage and current*1	5V • 10A	12V • 4.2A	15V • 3.4A	24V • 2.1A
Maximum output power	W	50	50.4	51
Input conditions				
Input voltage	V	Eac: 85 to 132V[Rating: 100 to 120] /Edc: 110 to 175V		
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)		
Input current	A	1.2max.[AC.100/120V]		
Fuse rating	A	3.15[Built-in]		
Surge current*2	A	36 to 43max.[AC.100 to 120V, 25°C, cold start]		
Leakage current	mA	0.5max.[Input and output ratings]		
Efficiency	%	80typ.[Input and output ratings]		
Output characteristics				
Output voltage Edc	V	5	12	15
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5
Maximum output current	A	10	4.2	3.4
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19
Overcurrent threshold	A	10.5 to 12	4.4 to 5.1	3.6 to 4.1
Voltage stability	Source effect	% ±1max.(±0.3typ.)[Within the input voltage range]		
	Load effect	% ±1.5max.(±0.6typ.)[10 to 100% load] Total effect ±3max.(±1typ.)		
	Temperature effect	% ±1max.(±0.3typ.)[Ambient temperature: 0 to +60°C]		
	Drift(Time effect)	% 0.5max.[25°C, input and output ratings, after input voltage ON for 30min to 8h]		
Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]		
Ripple Ep-p	mV	60max.	80max.	80max.
Ripple noise Ep-p	mV	120max.	190max.	220max.
Start up time	ms	100max.		
Hold up time	ms	20min.		
Auxiliary functions				
Indicator display	LED(Green) indicates when voltage output is ON.			
Overvoltage protection	Voltage shut-down type, recovers upon reset, set value fixed(interval approx. 40s).			
Overcurrent protection	Fixed current and voltage threshold type, automatic recovery, set value fixed.			
Remote ON-OFF	No			
Remote sensing	No			
Current balance	No			
Standards				
Safety standards	UL1950, CSA C22.2 No.950-95(C-UL) approved.			
Noise terminal voltage	FCC class B meet.			
Constructions				
External dimensions	mm	25×95×130[H×W×L] / With cover(Option)*3: 28.5×95×130[H×W×L]		
Weight	g	300max.		
Mounting method	Can be attached to 2 sides.			
Case material	Frame: Aluminum / Cover(Option: 2JC00B147-FAK50CA): Iron			

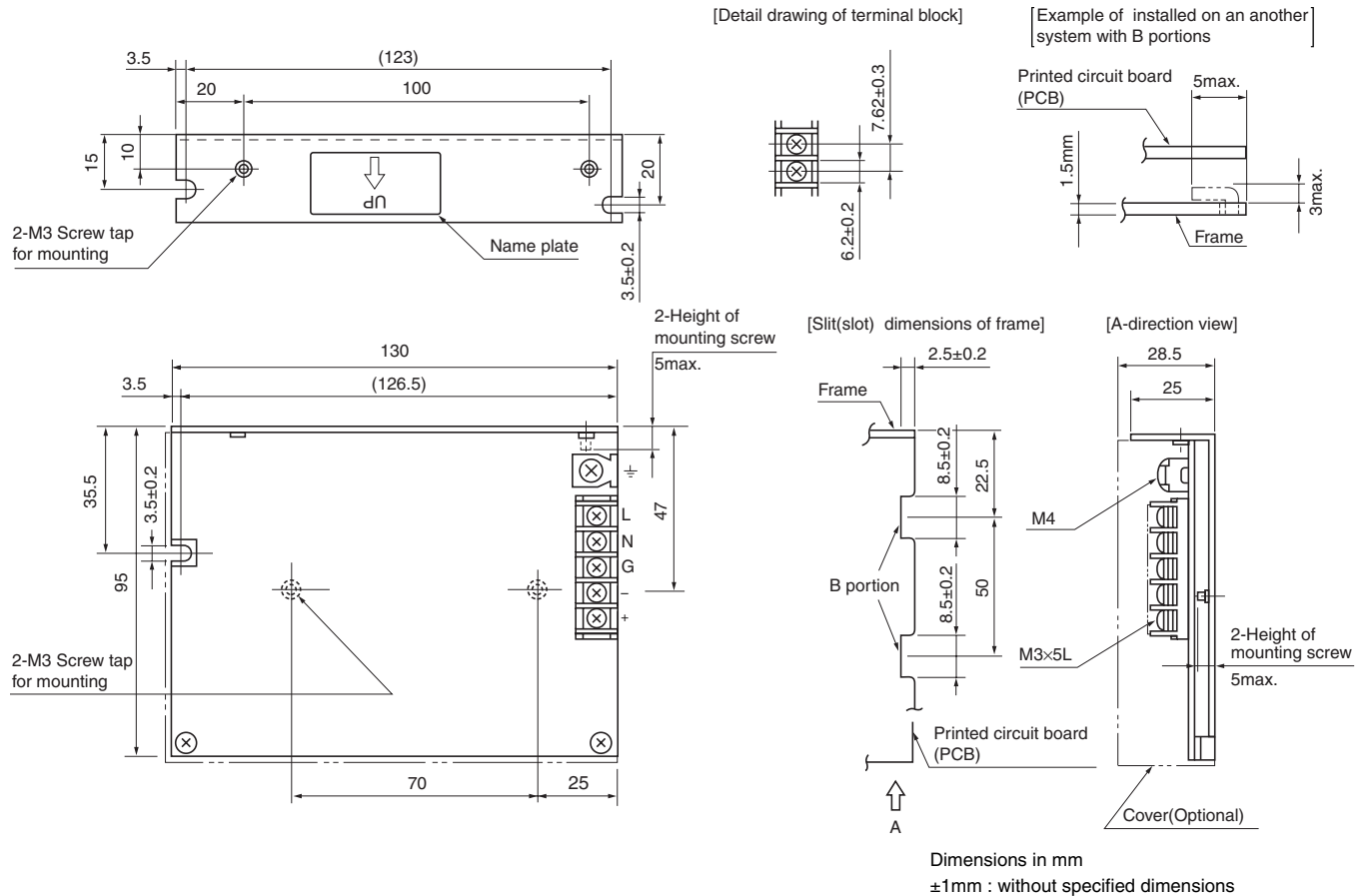
\*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

\*2 The surge current suppression element is a power thermistor.

\*3 Derating is required when the optional cover is attached.

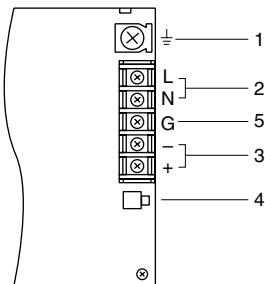
# FAK50W Type

## SHAPES AND DIMENSIONS



- Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

## TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line.
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.The output voltage increases by rotating it clockwise.
5	Ground terminal(G)	Connected to the frame ground terminal 1.

- All specifications are subject to change without notice.

## FAK100W Type

### SPECIFICATIONS AND STANDARDS

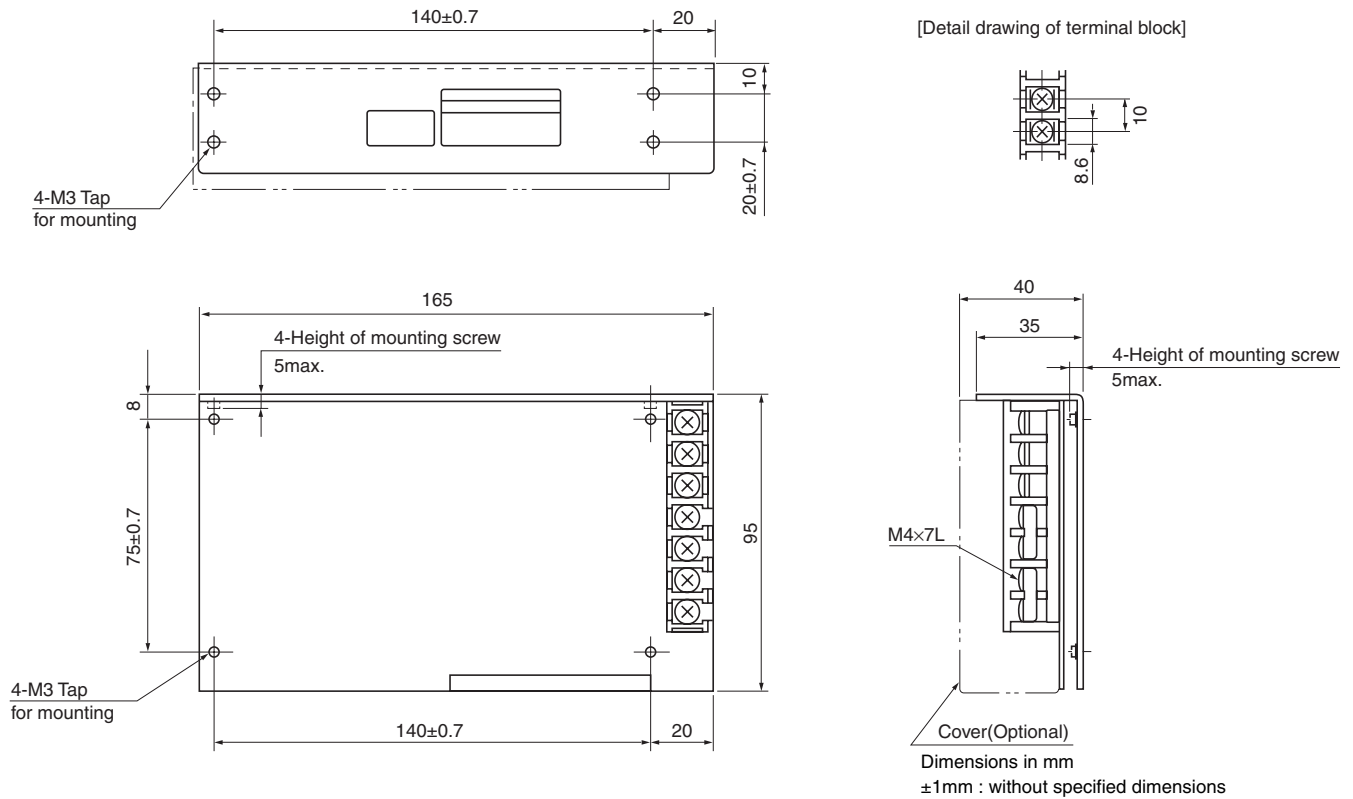
Part No.		FAK05-20R	FAK12-8R3	FAK15-6R6	FAK24-4R2	FAK48-2R0
Rated output voltage and current*1		5V • 20A	12V • 8.3A	15V • 6.6A	24V • 4.2A	48V • 2A
Maximum output power	W	100	99.6	99	100.8	96
Input conditions						
Input voltage Eac	V	85 to 132[Rating: 100 to 120]				
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)				
Input current	A	2.5max.[AC.100/120V]				
Fuse rating	A	5[Built-in]				
Surge current	A	25max.[Input and output ratings, 1st surge current, reset after 30s minimum.]				
Leakage current	mA	0.5max.[Input and output ratings]				
Efficiency	%	82typ.	84typ.	85typ.	86typ.	87typ.
Output characteristics						
Output voltage Edc	V	5	12	15	24	48
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5	21.6 to 26.4	43.2 to 52.8
Maximum output current	A	20	8.3	6.6	4.2	2
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19	27 to 30.5	53.5 to 60
Overcurrent threshold	A	21 to 24	8.7 to 10	7 to 8	4.4 to 5.2	2.1 to 2.4
Voltage stability	Source effect	%	2max.(1typ.)[Within the input voltage range]			Total effect ±2max.(±1typ.)
	Load effect	%	2max.(1typ.)[10 to 100% load]			
	Temperature effect	%	2max.(1typ.)[Ambient temperature: 0 to +50°C]			
	Drift(Time effect)	%	0.5max.(0.1typ.)[25°C, input and output ratings, after input voltage ON for 30min to 8h]			
Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]				
Ripple Ep-p	mV	60max.	80max.	80max.	100max.	200max.
Ripple noise Ep-p	mV	120max.	190max.	220max.	310max.	400max.
Start up time	ms	200max.				
Hold up time	ms	20min.				
Auxiliary functions						
Indicator display		LED(Green) indicates when voltage output is ON.				
Overvoltage protection		Voltage shut-down type, recovers upon reset(interval approx. 40s).				
Overcurrent protection		Fixed current and voltage threshold type, automatic recovery.				
Remote ON-OFF		No				
Remote sensing		Yes				
Output voltage external variable function		No				
Standards						
Safety standards		UL1950, CSA C22.2 No.950-95(C-UL) approved.				
Noise terminal voltage		FCC class B meet.				
Constructions						
External dimensions	mm	35×95×165[H×W×L] / With cover(Option)*2: 40×95×165[H×W×L]				
Weight	g	600max.				
Mounting method		Can be attached to 2 sides.				
Case material		Frame: Aluminum / Cover(Option: 2JC0ZB390-FAK100CA): Iron				

\*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

\*2 Derating is required when the optional cover is attached.

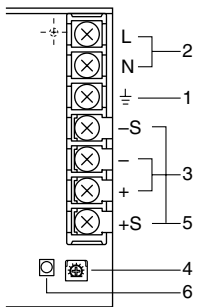
# FAK100W Type

## SHAPES AND DIMENSIONS



- Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

## TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line.
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage. The output voltage increases by rotating it clockwise.
5	Remote sensing terminals(+S, -S)	These terminals are used to compensate voltage loss from the output terminal to a load. Normally they are shorted with a metal bar.
6	Operation indicator LED	This Green LED becomes indicated when voltage is output.

## FAK150W Type

### SPECIFICATIONS AND STANDARDS

Part No.	FAK05-30R	FAK12-12R	FAK15-10R	FAK24-6R0	FAK48-3R0	
Rated output voltage and current*1	5V • 30A	12V • 12A	15V • 10A	24V • 6A	48V • 3A	
Maximum output power	W	150	144	150	144	
Input conditions						
Input voltage Eac	V	85 to 132[Rating: 100 to 120]				
Input frequency	Hz	47 to 66[Rating: 50 to 60](Single phase)				
Input current	A	3.5max.[AC.100/120V]				
Fuse rating	A	6.3[Built-in]				
Surge current	A	25max.[Input and output ratings, 1st surge current, reset after 30s minimum.]				
Leakage current	mA	0.5max.[Input and output ratings]				
Efficiency	%	82typ.	84typ.	85typ.	86typ.	88typ.
Output characteristics						
Output voltage Edc	V	5	12	15	24	48
Voltage variable range Edc	V	4.5 to 5.5	10.8 to 13.2	13.5 to 16.5	21.6 to 26.4	43.2 to 52.8
Maximum output current	A	30	12	10	6	3
Overvoltage threshold Edc	V	6 to 6.9	13.7 to 15.7	17 to 19	27 to 30.5	53.5 to 60
Overcurrent threshold	A	32 to 36	13 to 15	11 to 13	6.3 to 7.5	3.3 to 3.7
Voltage stability	Source effect	%	2max.(1typ.)(Within the input voltage range]			Total effect ±2max.(±1typ.)
	Load effect	%	2max.(1typ.)(10 to 100% load]			
	Temperature effect	%	2max.(1typ.)(Ambient temperature: 0 to +50°C]			
	Drift(Time effect)	%	0.5max.(0.1typ.)(25°C, input and output ratings, after input voltage ON for 30min to 8h]			
Recovery	%/ms	±4max./1max.[50 to 100% sudden load change]				
Ripple Ep-p	mV	60max.	80max.	80max.	100max.	200max.
Ripple noise Ep-p	mV	120max.	190max.	220max.	310max.	400max.
Start up time	ms	200max.				
Hold up time	ms	20min.				
Auxiliary functions						
Indicator display	LED(Green) indicates when voltage output is ON.					
Overvoltage protection	Voltage shut-down type, recovers upon reset(interval approx. 40s).					
Overcurrent protection	Fixed current and voltage threshold type, automatic recovery.					
Remote ON-OFF	No					
Remote sensing	Yes					
Output voltage external variable function	No					
Standards						
Safety standards	UL1950, CSA C22.2 No.950-95(C-UL) approved.					
Noise terminal voltage	FCC class B compliant.					
Constructions						
External dimensions	mm	40×95×200[H×W×L] / With cover(Option)*2: 45×95×200[H×W×L]				
Weight	kg	1max.				
Mounting method	Can be attached to 2 sides.					
Case material	Frame: Aluminum / Cover(Option: 2JC0ZB391-FAK150CA): Iron					

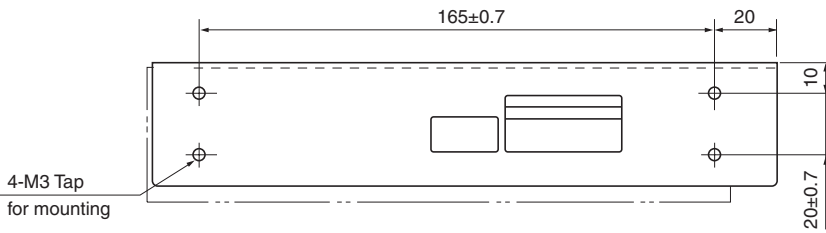
\*1 Current rating(maximum output current) is determined for 0 to +50°C. Derating is required when used outside this temperature range.

\*2 Derating is required when the optional cover is attached.

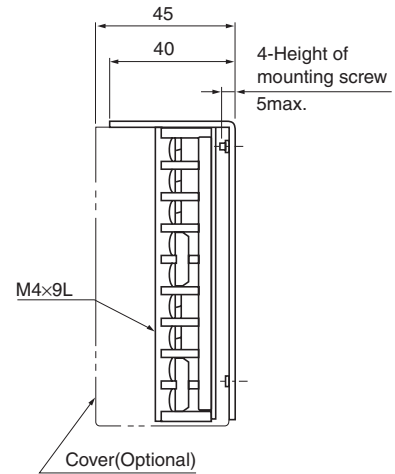
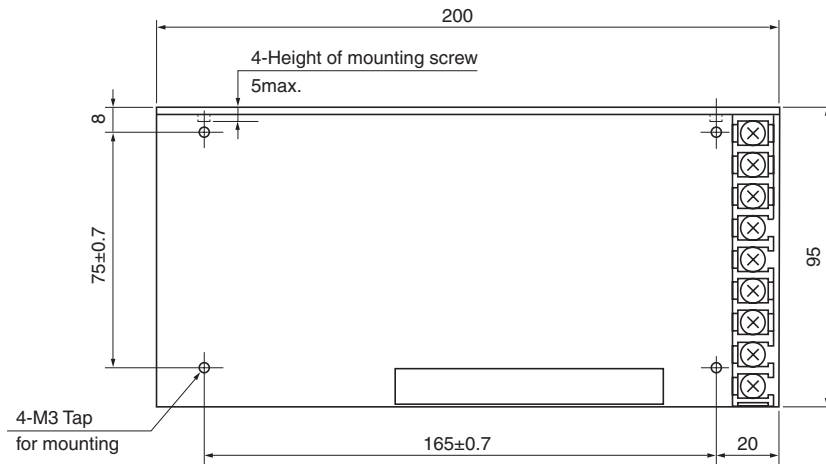
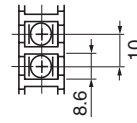


# FAK150W Type

## SHAPES AND DIMENSIONS



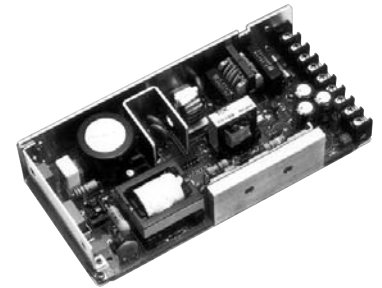
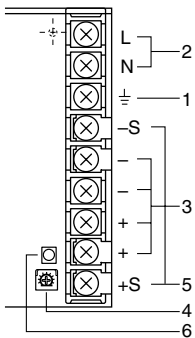
[Detail drawing of terminal block]



Dimensions in mm  
±1mm : without specified dimensions

- Do not insert M3 tap installation screws more than 5mm from the surface of power supply.

## TERMINAL DESIGNATIONS AND FUNCTIONS



Terminal No.	Designations and functions	
1	Frame ground terminal(G)	Connect to earth ground. This is connected to the case.
2	AC input terminals(L, N)	Connect to AC.100 to 120V single phase input line.
3	DC output terminals(+, -)	Connect to load. Connected to a load line (Allowable current for a single pin of the 20A max.).
4	Output voltage adjustment trim(V.ADJ)	Adjusts output voltage.The output voltage increases by rotating it clockwise.
5	Remote sensing terminals(+S, -S)	These terminals are used to compensate voltage loss from the output terminal to a load. Normally they are shorted with a metal bar.
6	Operation indicator LED	This Green LED becomes indicated when voltage is output.

• All specifications are subject to change without notice.

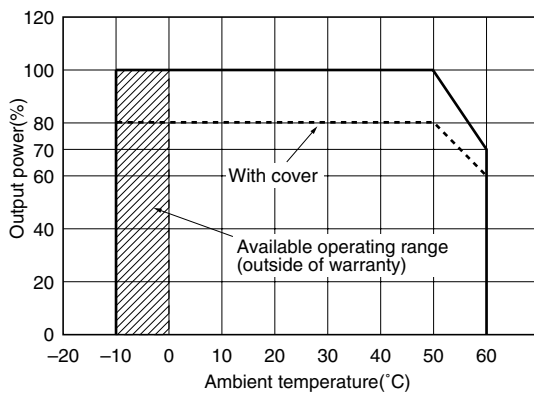
## Characteristics, Functions, and Applications

### COMMON SPECIFICATIONS

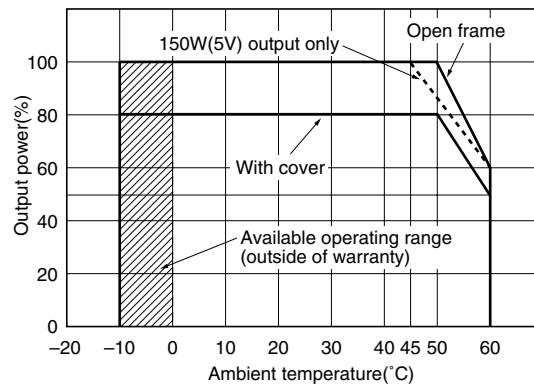
Temperature and humidity		
Temperature range	Operating(°C)	0 to +60[Derating is necessary when operating environment temperature exceed 50°C.]
	Storage(°C)	-25 to +75
Humidity range	Operating(%)RH	20 to 95[Maximum wet-bulb temperature: 35°C, without dewing]
	Storage(%)RH	
Vibration and shock		
Vibration	5 to 10Hz	All amplitude 10mm[3 directions, each 1h]
	10 to 55Hz	Acceleration 19.6m/s <sup>2</sup> (2G)[3 directions, each 1h](25W and 50W Types) Acceleration 29.4m/s <sup>2</sup> (3G)[3 directions, each 1h] (100W and 150W Types, 19.6m/s <sup>2</sup> (2G) for installation with angle bracket downward.) 196m/s <sup>2</sup> (20G)[3 directions, each 3 times] (25W and 50W Types)
Shock	Acceleration	588m/s <sup>2</sup> (60G)[3 directions, each 3 times] (100W and 150W Types, 19.6m/s <sup>2</sup> (2G) for installation with angle bracket downward.)
	Pulse duration	11±5ms
Withstand voltage and insulation resistance		
Withstand voltage	Input terminal to ground terminal(G)	Eac: 2kV, 1min[Normal temperature, normal humidity, cutout current 10mA]
	Input terminal to output terminal	
Insulation resistance	Input terminal to ground terminal(G)	Edc: 500V, 100MΩ min. [Normal temperature, normal humidity]
	Input terminal to output terminal	
	Output terminal to ground terminal(G)	

### OUTPUT POWER-AMBIENT TEMPERATURE(DERATINGS)

#### 25W AND 50W TYPES



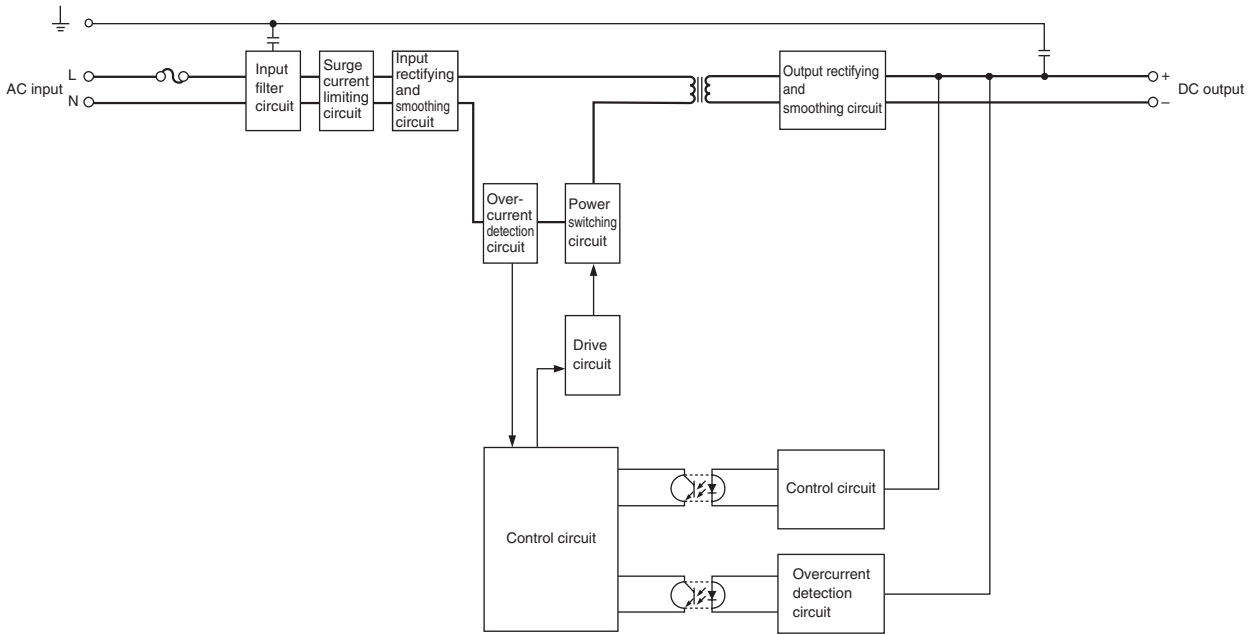
#### 100W AND 150W TYPES



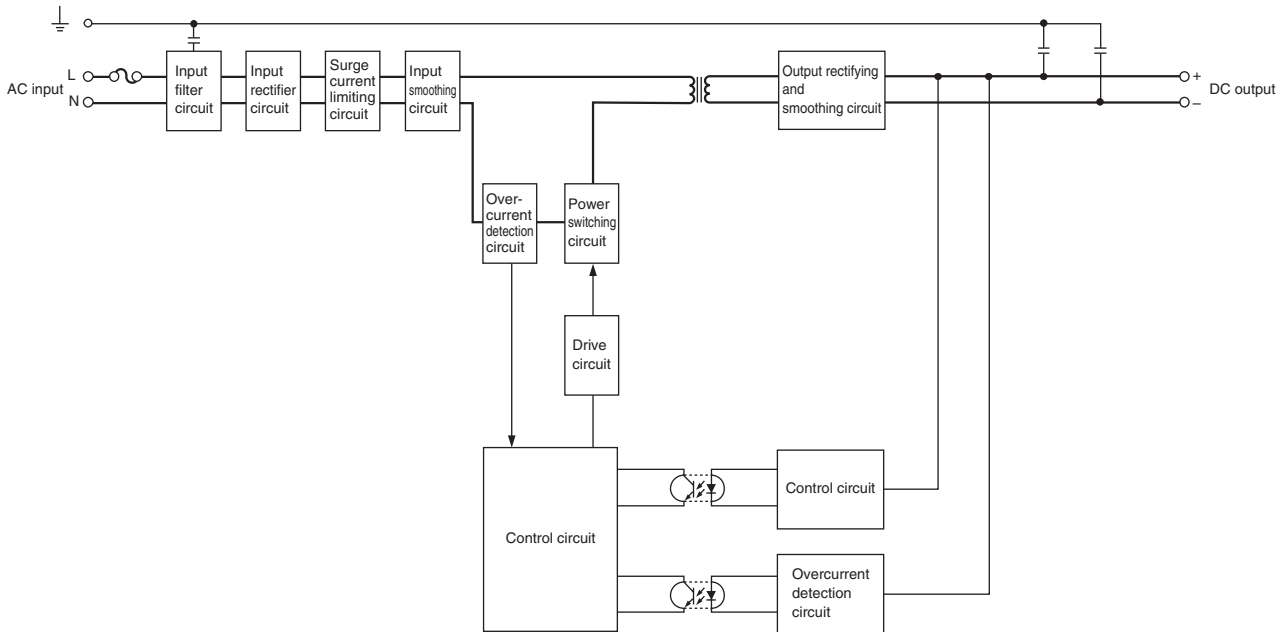
# Characteristics, Functions, and Applications

## BLOCK DIAGRAMS

### 25W TYPE



### 50W, 100W AND 150W TYPES



• All specifications are subject to change without notice.

# Characteristics, Functions, and Applications

## INSTALLATION

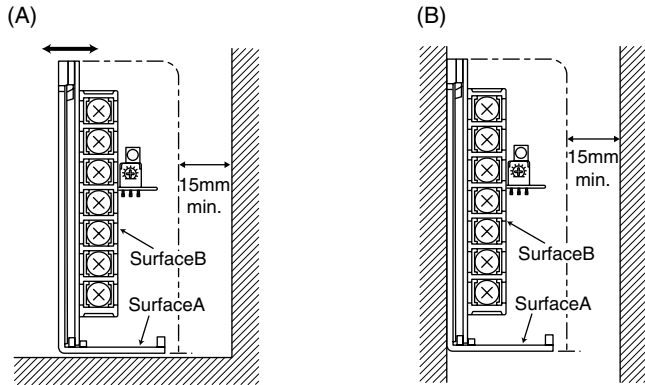
For natural cooling, apply either of the following installation methods so as to provide a thermal convection:

- (1) Standard installation
- (2) Other installations on component surface (upward).

In addition, maintain a 15mm min. distance between the component (cover) surface and surrounding equipment, etc.

### (1) Standard Installation

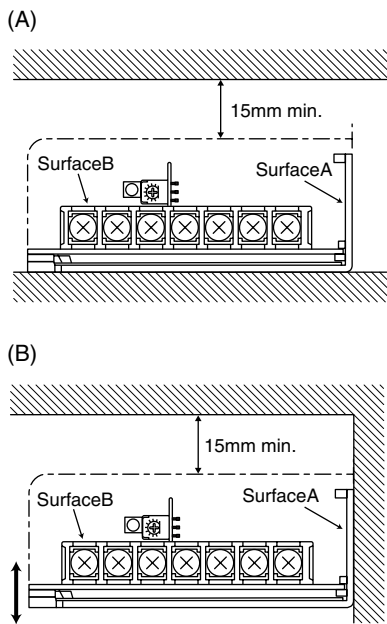
#### (1)-1. Angle bracket (downward)



- For the installation in (A), arrange a bearer for preventing vibrations on the surface B of the angle bracket or in a direction indicated by an arrow.

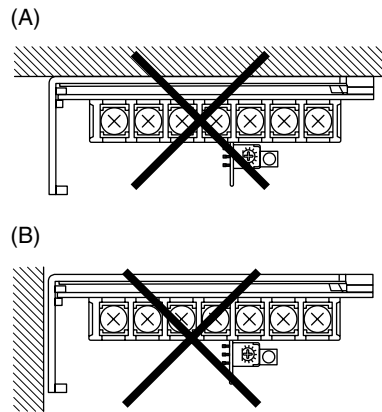
### (2) Other Installations

#### (2)-1. Component surface (upward)



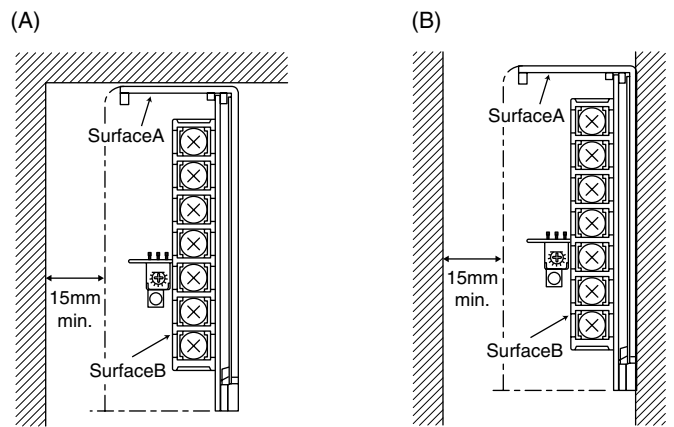
- For the installation in (B), arrange a bearer for preventing vibrations on the surface B of the angle bracket or in a direction indicated by an arrow.

#### (2)-2. Component surface (downward)



- This type of installation is inhibited due to a difficulty of the thermal convection.

#### (2)-3. Angle bracket (upward)



- This type of installation is inhibited due to a difficulty of the thermal convection.

## COVER

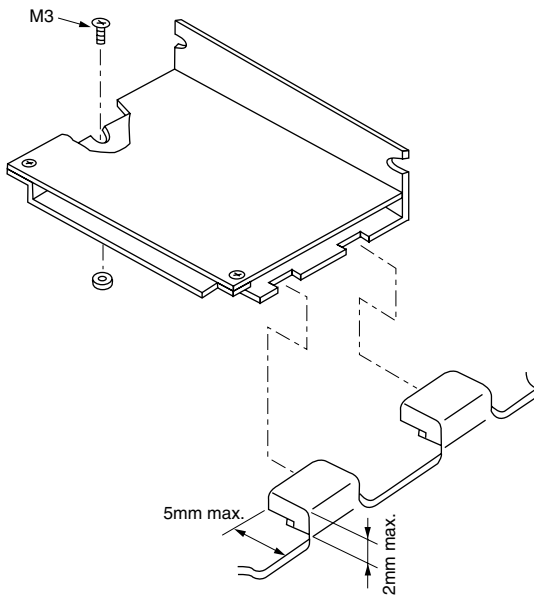
The cover is separately available. Please order it with the following model names:

Type	Cover model No.
25W	2JC0ZB146-FAK25CA
50W	2JC00B147-FAK50CA
100W	2JC0ZB390-FAK100CA
150W	2JC0ZB391-FAK150CA

## Characteristics, Functions, and Applications

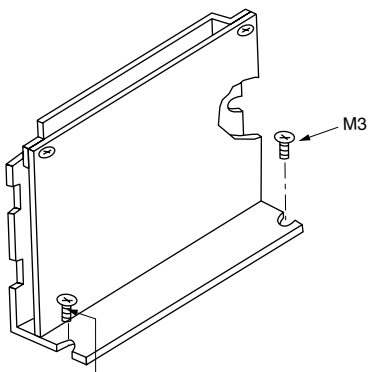
### HANGING INSTALLATION (applicable to 25W and 50W types)

Recesses are provided at two places on an L-shaped frame. Use them to mount the power supply from its surface.



- Install carefully so that there is no wobbling.

Use the notched and mounting holes for stand-up installation of the power supply.



A screwdriver may touch a component on the PC board when rotating the M3 screw. Be careful not to apply any excessive force.

### OTHER CONDITIONS

- Unless conditions are otherwise specified in the specifications or standards, 25°C and rated input-output should be applied.
- Ripple and noise (50MHz max.) were determined for 0 to +50°C temperature range and 10 to 100% load.