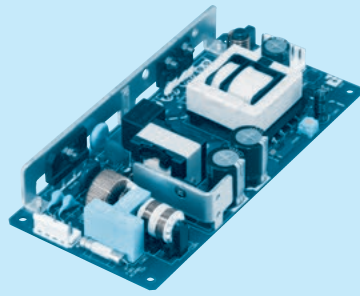
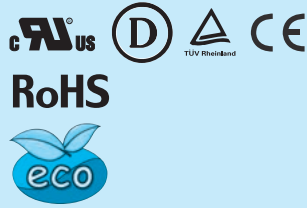


# LHA150F

LH A 150 F -□□ -□

① ② ③ ④ ⑤ ⑥



Example recommended EMI/EMC filter  
EAC-03-472



High voltage pulse noise type : EAP series  
Low leakage current type : EAM series  
\* A higher current rating EMI/EMC filter may be recommended in view of the other devices that could be connected in parallel with the power supply.

- ① Series name
- ② Single output
- ③ Output wattage
- ④ Universal input
- ⑤ Output voltage
- ⑥ Optional \*1
- C : with Coating
- G : Low leakage current
- J4 : EP(Tyco)connector type
- R2 : with Remote ON/OFF
- S : with Chassis
- SN : with Chassis & cover
- U1 : Can be attached the external capacitor unit
- Y : with Potentiometer

This power supply is manufactured by SMD technology. The stress to PCB like twisting or bending causes the defect of the unit, so handle the unit with care.  
\* Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

For option details, refer to instruction manual 6.

MODEL	LHA150F-12	LHA150F-24	LHA150F-36	LHA150F-48
MAX OUTPUT WATTAGE[W]	150	151.2	151.2	153.6
DC OUTPUT	12V 12.5A	24V 6.3A	36V 4.2A	48V 3.2A

## SPECIFICATIONS

	MODEL	LHA150F-12	LHA150F-24	LHA150F-36	LHA150F-48	
INPUT	VOLTAGE[VAC]	85 - 264 1 φ (Refer to "Derating" and Instruction Manual 3)				
	CURRENT[A]	ACIN 100V	1.8typ			
		ACIN 230V	0.8typ			
	FREQUENCY[Hz]	50 / 60 (45 - 66)				
	EFFICIENCY[%]	ACIN 100V	86.5typ	89.0typ	89.5typ	90.0typ
		ACIN 230V	89.5typ	92.0typ	92.5typ	93.0typ
	POWER FACTOR (Io=100%)	ACIN 100V	0.99typ			
INRUSH CURRENT[A]	ACIN 100V	15typ (Io=100%) Ta=25°C at cold start				
	ACIN 230V	35typ (Io=100%) Ta=25°C at cold start				
LEAKAGE CURRENT[mA]	0.40 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1)					
OUTPUT	VOLTAGE[V]	12	24	36	48	
	CURRENT[A]	12.5	6.3	4.2	3.2	
	LINE REGULATION[mV]	48max	96max	144max	192max	
	LOAD REGULATION[mV]	100max	150max	240max	240max	
	RIPPLE[mVp-p]	0 to +50°C	120max	120max	150max	150max
		-10 to 0°C	160max	160max	200max	200max
		Io=0 to 10%	160max	160max	200max	200max
	RIPPLE NOISE[mVp-p]	0 to +50°C	150max	150max	250max	250max
		-10 to 0°C	180max	180max	300max	300max
		Io=0 to 10%	230max	230max	300max	300max
	TEMPERATURE REGULATION[mV]	0 to +50°C	120max	240max	360max	480max
		-10 to +50°C	150max	290max	450max	600max
	DRIFT[mV]	48max	96max	144max	192max	
	START-UP TIME[ms]	700typ (ACIN 100V, Io=100%)				
HOLD-UP TIME[ms]	20typ (ACIN 100V, Io=100%)					
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	Fixed ("Y" option is available for adjusting output voltage between +10%, -5%)					
OUTPUT VOLTAGE SETTING[V]	11.50 to 12.50	23.00 to 25.00	34.50 to 37.50	46.00 to 50.00		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically				
	OVERVOLTAGE PROTECTION	13.80 to 16.80	27.60 to 33.60	41.40 to 50.40	55.20 to 67.20	
	OPERATING INDICATION	Not provided				
	REMOTE SENSING	Not provided				
REMOTE ON/OFF	Option (Refer to Instruction Manual 6.1)					
ISOLATION	INPUT-OUTPUT-RC	AC3,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)				
	INPUT-FG	AC2,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)				
	OUTPUT-RC-FG	AC500V 1minute, Cutoff current = 25mA, DC500V 100MΩ min (At Room Temperature)				
	OUTPUT-RC	AC100V 1minute, Cutoff current = 25mA, DC100V 10MΩ min (At Room Temperature)				
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-10 to +70°C, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max (EN62477-1 (OVC III) : 2,000m (6,600feet) max)				
	STORAGE TEMP., HUMID. AND ALTITUDE	-20 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max				
	VIBRATION	10 - 55Hz, 19.6m/s <sup>2</sup> (2G), 3minutes period, 60minutes each along X, Y and Z axis				
	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis				
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS	UL62368-1, c-UL (equivalent to CAN/CSA-22.2 No.62368-1), EN62368-1, EN62477-1 (OVC III)				
	CONDUCTED NOISE	Complies with FCC-B, VCCI-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B				
	HARMONIC ATTENUATOR	Complies with IEC61000-3-2 (Class A)				
OTHERS	CASE SIZE/WEIGHT	75 X 27 X 160mm [2.95 X 1.07 X 6.30 inches] (W X H X D) / 320g max				
	COOLING METHOD	Convection/Forced air (Requires external fan) (Refer to "Derating" and Instruction Manual 3)				

\*1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.

\*2 Derating is required.

\*3 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.

\*4 This is the value that measured on measuring board with capacitor of 22 μF and 0.1 μF at 150mm from output terminal. Measured

by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM104).  
Ripple and ripple noise spec is change at Io=0 to 10% by burst operation.

\*5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C, with the input voltage held constant at the rated input/output.

\*6 Please contact us about another class.

\*7 12V output product, the maximum temperature of 40°C.

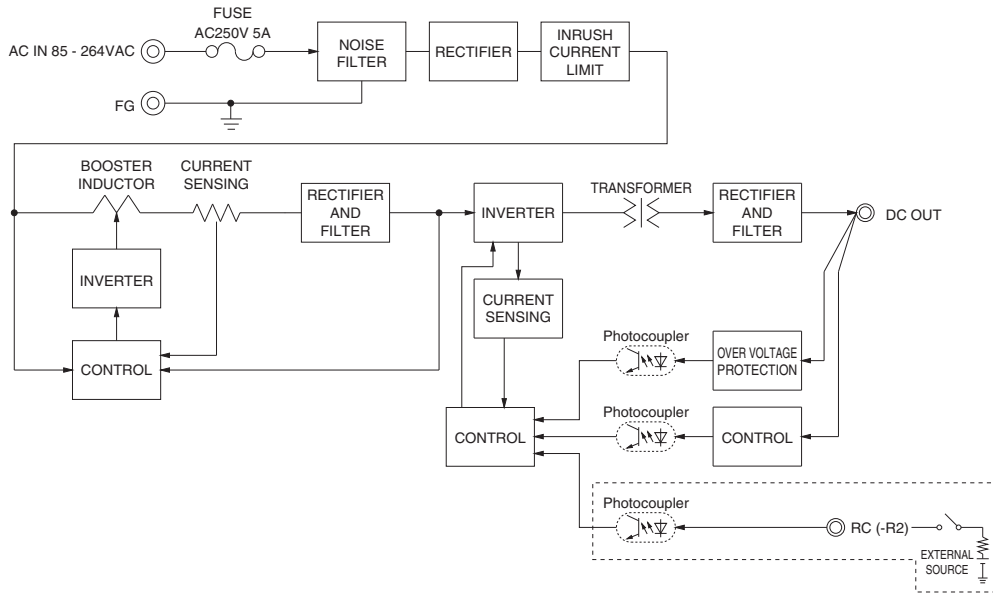
\*8 Applicable when Remote ON/OFF (optional) is added.

\* To meet the specification, do not operate overload condition.

\* Parallel operation is not possible.

\* Sound noise may be generated by power supply in case of pulse load.

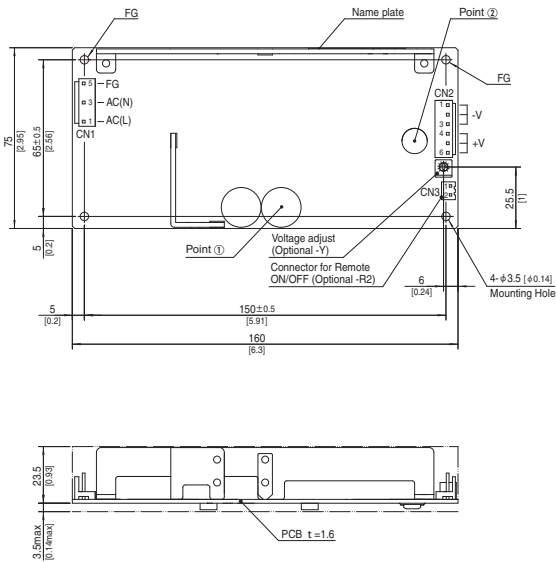
## Block diagram



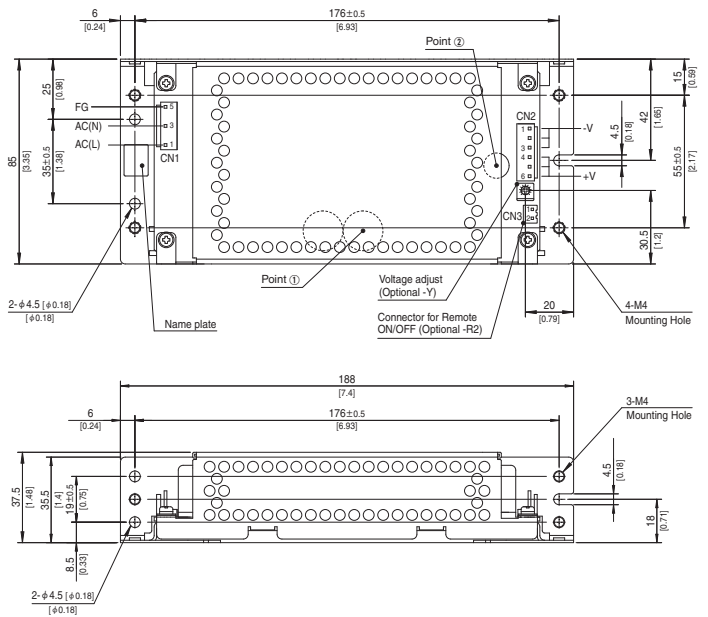
## External view

※ External size of option is different from standard type.

Standard type



Chassis and cover type



- ※ 4 Mounting holes are existing.
- ※ The back side of PCB of the power supply is assembled some SMDs.  
Be careful not to bump against the attached area by vibration.
- ※ Use the spacer of 8mm [0.31] length or more for isolation.  
And do not use press-fitting bush.
- ※ Point ①, Point ② are thermometry points. Please refer to Instruction Manual 3.

I/O Connector	Mating connector	Terminal
CN1	B3P5-VH	Chain SVH-21T-P1.1
		Loose BVH-21T-P1.1
CN2	B6P-VH	Chain SVH-21T-P1.1
		Loose BVH-21T-P1.1

(Mfr: J.S.T.)

- ※ I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (Tyco Electronics) connector type.

Pin No.	Input
1	AC(L)
2	
3	AC(N)
4	
5	FG

Pin No.	Output
1 to 3	-V
4 to 6	+V

※ Keep drawing current per pin below 5A for CN2.

- ※ Tolerance : ±1 [±0.04]
- ※ Weight : 320g max (with chassis and cover : 570g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Optional chassis and cover material : Electric galvanizing steel board.
- ※ Dimensions in mm, [ ]=inches
- ※ Mounting torque (Mounting hole of chassis) : 1.5N · m max
- ※ Please connect safety ground to FG terminal on the unit.

Connector type

CN3 Option (Mfr:J.S.T.)

PIN No.	Contents
1	RC(+)
2	RC(-)

Barrier strip type

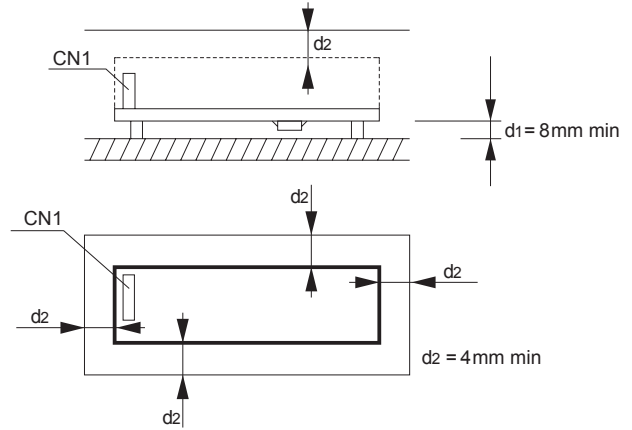
Model B2B-XH-A  
Mating Connector (Terminal)  
XHP-2  
(BXH-001T-P0.6  
or SXH-001T-P0.6)

**Assembling and Installation Method**

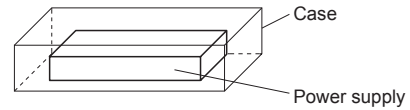
**Installation method**

■ This power supply is manufactured by SMD technology. The stress to P.C.B like twisting or bending causes the defect of the unit, so handle the unit with care.

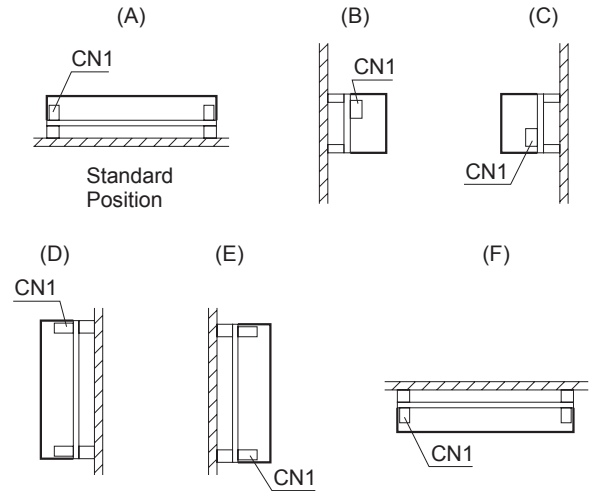
■ In case of metal chassis, keep the distance between d1 & d2 for to insulate between lead of component and metal chassis, use the spacer of 8mm or more between d1. If it is less than d1 & d2, insert the insulation sheet between power supply and metal chassis.



■ There is a possibility that it is not possible to cool enough when the power supply is used by the sealing up space as showing in right figure. Please use it after confirming the temperature of point ① and point ② of Instruction Manual right figure.



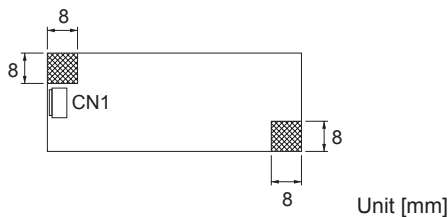
■ (F) mounting is not possible when unit is with case cover, but if you need to operate unit by (F) positioning with case cover, temperature / load derating is necessary. For more details, please contact our sales or engineering departments.



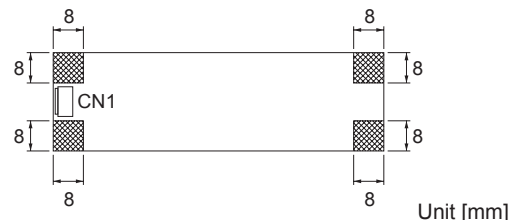
**Mounting screw**

■ The mounting screw should be  $\phi 3\text{mm}$ . The hatched area shows the allowance of metal parts for mounting.

● **LHA30F**



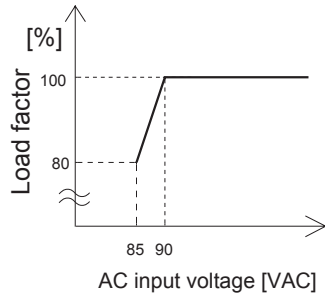
● **LHA50F, LHA75F, LHA100F, LHA150F, LHA300F**



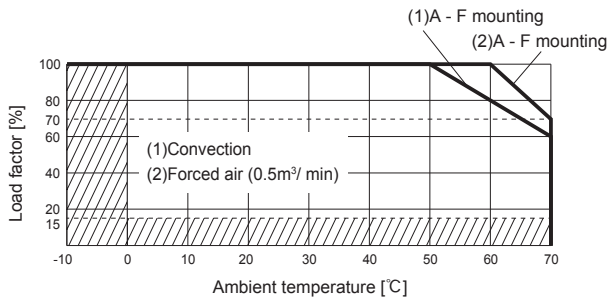
■ If metallic fittings are used on the component side of the board, ensure there is no contact with surface mounted components.  
 ■ This product uses SMD technology. Please avoid the PCB installation method which includes the twisting stress or the bending stress.

Derating

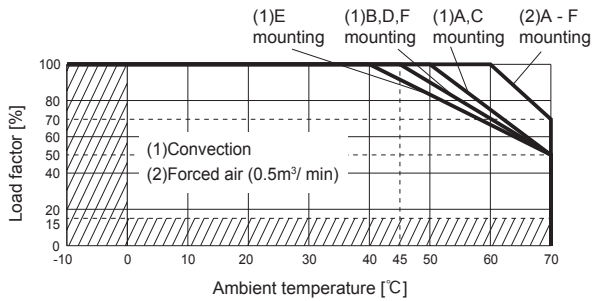
● Derating curve for input voltage



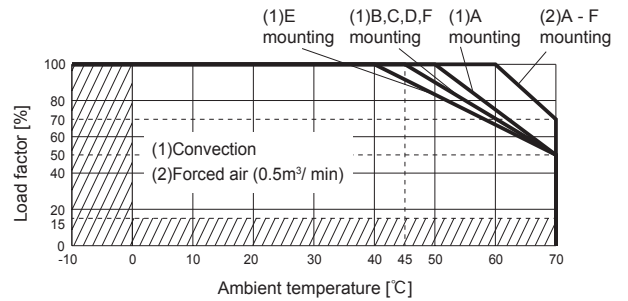
● LHA30F  
Ambient temperature derating curve  
(Reference value)



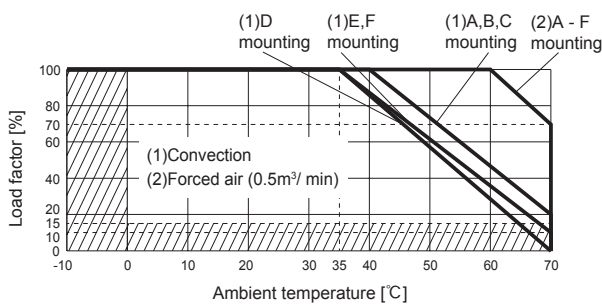
● LHA50F-3R3-Y, -5, -24, -36, -48  
Ambient temperature derating curve  
(Reference value)



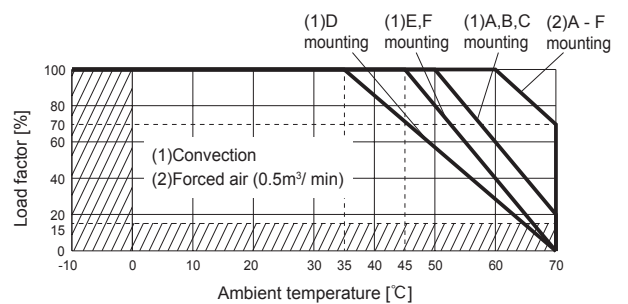
● LHA50F-12, -15  
Ambient temperature derating curve  
(Reference value)



● LHA75F-3R3-Y, -5  
Ambient temperature derating curve  
(Reference value)

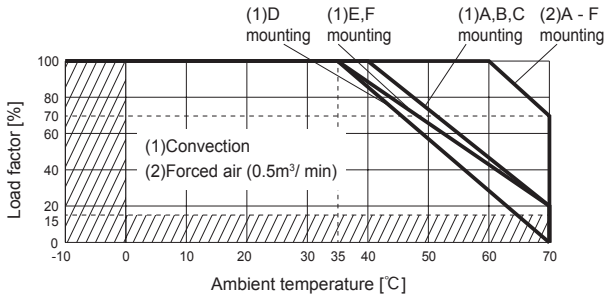


● LHA75F-12, -15, -24, -36, -48  
Ambient temperature derating curve  
(Reference value)

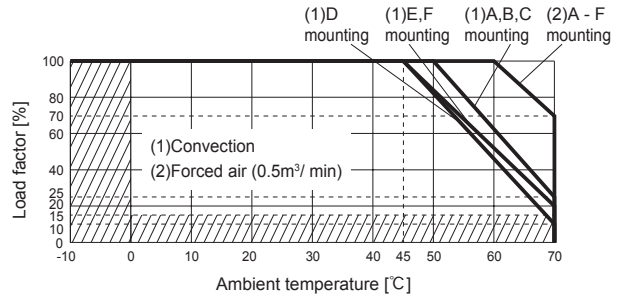


**Derating**

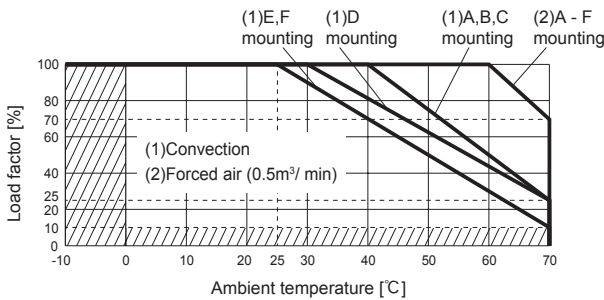
- **LHA100F-5**  
Ambient temperature derating curve  
(Reference value)



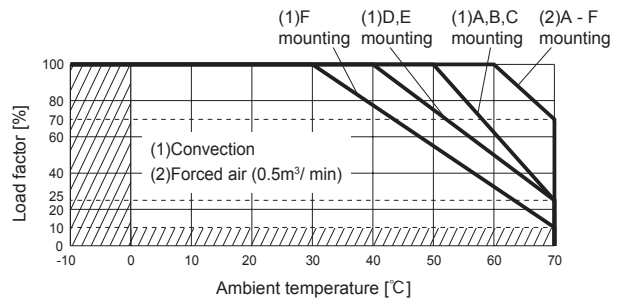
- **LHA100F-12, -15, -24, -36, -48**  
Ambient temperature derating curve  
(Reference value)



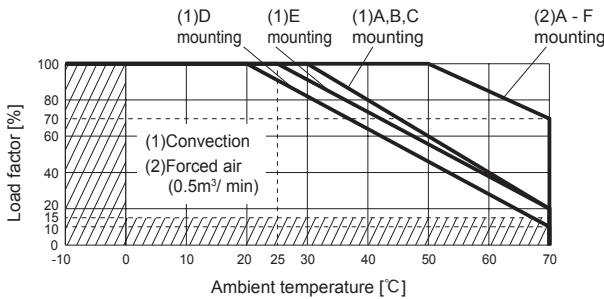
- **LHA150F-12**  
Ambient temperature derating curve  
(Reference value)



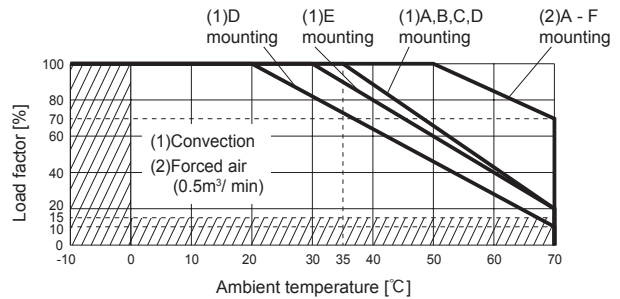
- **LHA150F-24, -36, -48**  
Ambient temperature derating curve  
(Reference value)



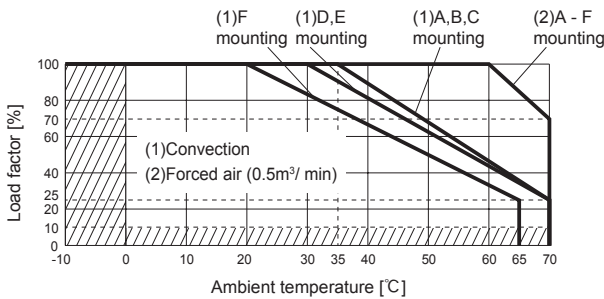
- **LHA150F-12-SN**  
Ambient temperature derating curve  
(Reference value)



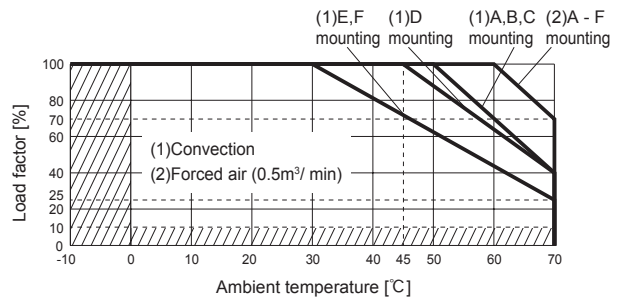
- **LHA150F-24-SN, -36-SN, -48-SN**  
Ambient temperature derating curve  
(Reference value)



- **LHA300F-12-Y**  
Ambient temperature derating curve  
(Reference value)

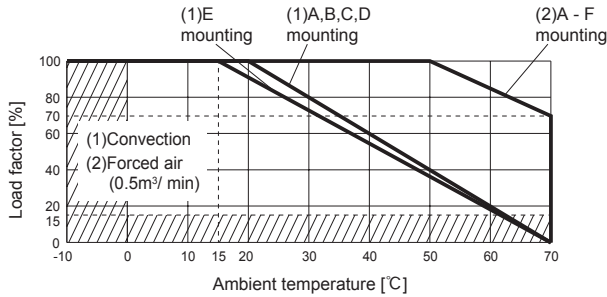


- **LHA300F-24-Y, -48-Y**  
Ambient temperature derating curve  
(Reference value)

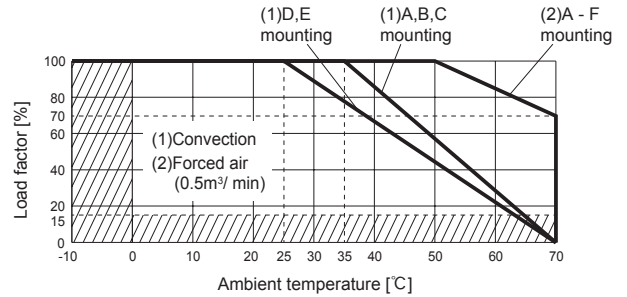


Derating

● LHA300F-12-SNY  
Ambient temperature derating curve  
(Reference value)



● LHA300F-24-SNY, -48-SNY  
Ambient temperature derating curve  
(Reference value)



- The operative ambient temperature is different by with / without chassis cover or mounting position.  
Note: In the hatched area, the specification of Ripple, Ripple Noise is different from other area.
- Make sure the case temperature at point ① and point ② is less than the temperatures shown in shown in Instruction Manual 3.
- The ambient temperature should be measured 5 to 10 cm away from the power supply so that it won't be influenced by the heat from the power supply. Please contact us for more details.

Instruction Manuals

◆ Please see catalog and instructionmanual before you use.

Instruction Manuals <https://en.cosel.co.jp/product/powersupply/LHA/>  
Before using our product <https://en.cosel.co.jp/technical/caution/index.html>

LHA



NOTICE



Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz] *1 *2	Input current *3 [A]	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
					Material	Single sided	Double sided	Series operation	Parallel operation
LHA30F	Flyback converter	30 to 120	0.62	Thermistor	FR-4	-	Yes	Yes	No
LHA50F	Flyback converter	30 to 120	1.05	Thermistor	FR-4	-	Yes	Yes	No
LHA75F	Active filter	25 to 155	0.9	Thermistor	FR-4	-	Yes	Yes	No
	Flyback converter	60 to 115							
LHA100F	Active filter	20 to 150	1.2	Thermistor	FR-4	-	Yes	Yes	No
	Flyback converter	45 to 110							
LHA150F	Active filter	20 to 150	1.8	Thermistor	FR-4	-	Yes	Yes	No
	LLC resonant converter	90 to 280							
LHA300F	Active filter	20 to 150	3.5	Thermistor	FR-4	-	Yes	Yes	No
	LLC resonant converter	65 to 200							

\*1 The value changes depending on input and load.  
\*2 Burst operation at light loading, frequency is change by use condition. Please contact us about detail.  
\*3 The value of input current is at ACIN 100V and rated load.