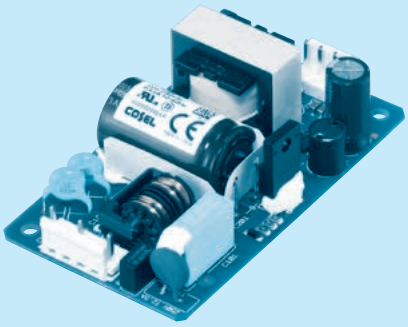
COSEL AC-DC Power Supplies Open Frame

LHA30F

Ordering information

LH ① A ② 30 ③ F 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.

①Series name
②Single output
③Output wattage
④Universal input
⑤Output voltage
⑥Optional ＊1
C : with Coating
G : Low leakage current
J4 : EP(Tyco)connector type
Y : with Potentiometer

For option details, refer to instruction manual 6.

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.

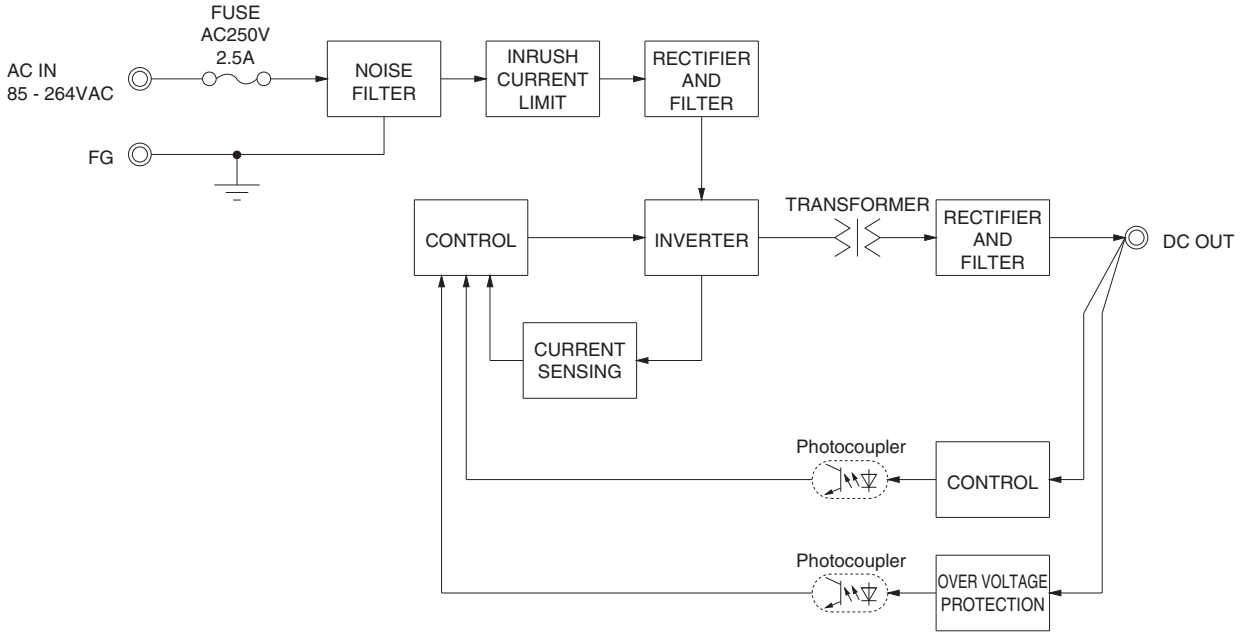
MODEL	LHA30F-3R3-Y	LHA30F-5	LHA30F-12	LHA30F-15	LHA30F-24
MAX OUTPUT WATTAGE[W] ＊2	19.8	30	30	30	31.2
DC OUTPUT ＊2	3.3V6A	5V6A	12V2.5A	15V2A	24V1.3A

SPECIFICATIONS

	MODEL		LHA30F-3R3-Y	LHA30F-5	LHA30F-12	LHA30F-15	LHA30F-24
INPUT	VOLTAGE[VAC] ＊2		85 - 264 1φ (Refer to "Derating" and Instruction Manual 3)				
	CURRENT[A]	ACIN 100V	0.42typ	0.62typ			
		ACIN 230V	0.23typ	0.32typ			
	FREQUENCY[Hz]		50 / 60 (45 - 440)				
	EFFICIENCY[%]	ACIN 100V	83.0typ	83.0typ	85.0typ	85.5typ	87.0typ
		ACIN 230V	85.5typ	87.0typ	88.5typ	89.0typ	90.0typ
	INRUSH CURRENT[A]	ACIN 100V	15typ (Io=100%) Ta=25℃ at cold start				
		ACIN 230V	35typ (Io=100%) Ta=25℃ at cold start				
	LEAKAGE CURRENT[mA]		0.20 / 0.45max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1)				
OUTPUT	VOLTAGE[V]		3.3	5	12	15	24
	CURRENT[A] ＊2		6.0	6.0	2.5	2.0	1.3
	LINE REGULATION[mV] ＊3		20max	20max	48max	60max	96max
	LOAD REGULATION[mV] ＊3		40max	40max	100max	120max	150max
	RIPPLE[mVp-p] ＊4	0 to +50℃	80max	80max	120max	120max	120max
		-10 to 0℃	140max	140max	160max	160max	160max
		Io=0 to 15%	300max	300max	300max	300max	300max
	RIPPLE NOISE[mVp-p] ＊4	0 to +50℃	120max	120max	150max	150max	150max
		-10 to 0℃	160max	160max	180max	180max	180max
		Io=0 to 15%	360max	360max	360max	360max	360max
	TEMPERATURE REGULATION[mV]	0 to +50℃	50max	50max	120max	150max	240max
		-10 to +50℃	60max	60max	150max	180max	290max
	DRIFT[mV] ＊5		20max	20max	48max	60max	96max
	START-UP TIME[ms]		40typ (ACIN 100V, Io=100%)				
	HOLD-UP TIME[ms]		25typ (ACIN 100V, Io=100%) / 170typ (ACIN 230V, Io=100%)				
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		2.85 to 3.63	Fixed ("Y"option is available for adjusting output voltage between ±10%)			
	OUTPUT VOLTAGE SETTING[V]		3.30 to 3.40	4.90 to 5.30	11.50 to 12.50	14.40 to 15.60	23.00 to 25.00
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically				
	OVERVOLTAGE PROTECTION		4.00 to 5.25	5.75 to 7.00	13.80 to 16.80	17.25 to 21.00	27.60 to 33.60
	OPERATING INDICATION		Not provided				
	REMOTE SENSING		Not provided				
ISOLATION	INPUT-OUTPUT		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-FG		AC500V 1minute, Cutoff current = 25mA, DC500V 100MΩ min (At Room Temperature)				
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE ＊2		-10 to +70℃, 20 - 90%RH (Non condensing), 3,000m (10,000feet) max				
	STORAGE TEMP.,HUMID.AND ALTITUDE		-20 to +75℃, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max				
	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis				
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis				
SAFETY AND NOISE REGULATIONS	AGENCY APPROVALS		UL62368-1, c-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1				
	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B				
	HARMONIC ATTENUATOR ＊6		Complies with IEC61000-3-2 (Class A) (Not built-in to active filter)				
OTHERS	CASE SIZE/WEIGHT		50×27×87.5mm [1.97×1.07×3.44 inches] (W×H×D) / 100g max				
	COOLING METHOD ＊2		Convection/Forced air (Requires external fan) (Refer to "Derating" and Instruction Manual 3)				

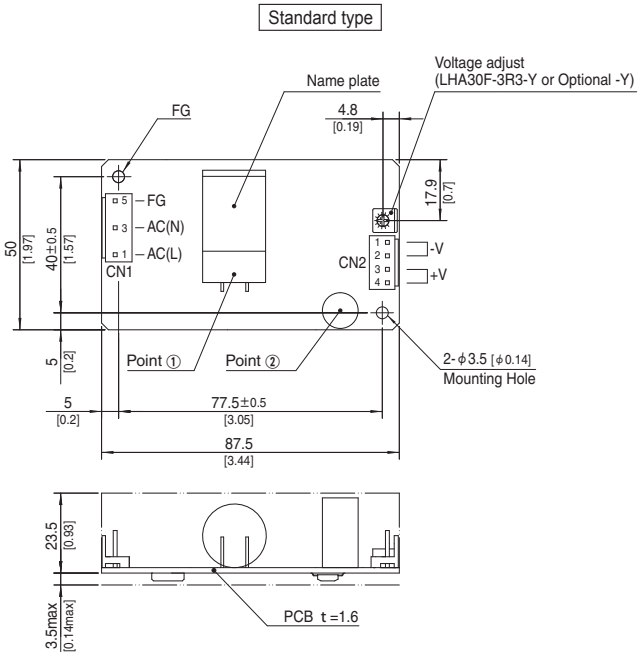
＊1 The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
＊2 Derating is required.
＊3 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.
＊4 This is the value that measured on measuring board with capacitor of 22μF and 0.1μF 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 15% by burst operation.
＊5 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25℃, with the input voltage held constant at the rated input/output.
＊6 Please contact us about another class. When two or more units are operating it may not comply with the IEC61000-3-2. Please contact us for details.
＊ 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.



※ 2 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	VHR-5N	Chain	SVH-21T-P1.1
			Loose	BVH-21T-P1.1
CN2	B4P-VH	VHR-4N	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.

CN1

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

CN2

Pin No.	Output
1, 2	-V
3, 4	+V

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

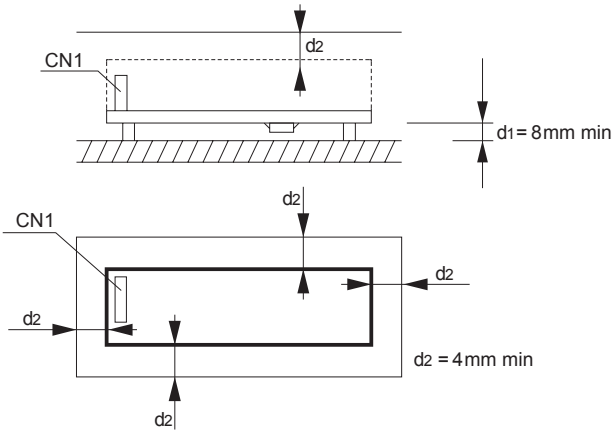
※ Tolerance : ±1 [±0.04]
※ Weight : 100g max
※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
※ Dimensions in mm, [ ]=inches
※ Please connect safety ground to FG terminal on the unit.

Assembling and Installation Method

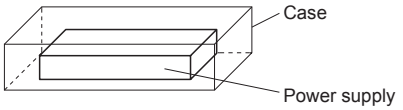
Installation method

■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.

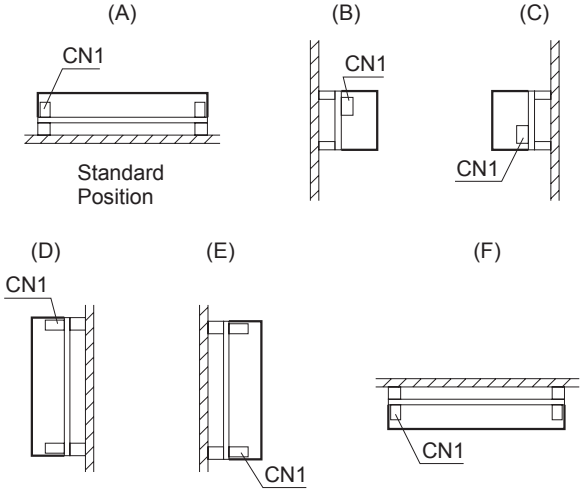
■In case of metal chassis, keep the distance between d_1 & d_2 for to insulate between lead of component and metal chassis, use the spacer of 8mm or more between d_1. If it is less than d_1 & d_2, insert the insulation sheet between power supply and metal chassis.



■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.



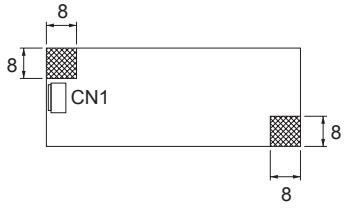
■(F) mounting is not possible when unit is with case cover, but if you need to operate unit by (F) positioning with case cover, temperature / load derating is necessary. For more details, please contact our sales or engineering departments.



Mounting screw

■The mounting screw should be ϕ3mm. The hatched area shows the allowance of metal parts for mounting.

● LHA30F



Unit [mm]

● LHA50F, LHA75F, LHA100F, LHA150F, LHA300F

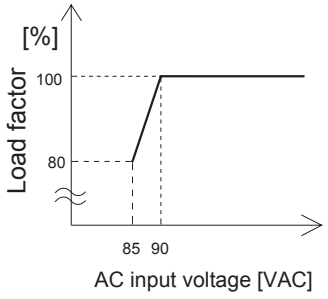
Unit [mm]

■If metallic fittings are used on the component side of the board, ensure there is no contact with surface mounted components.

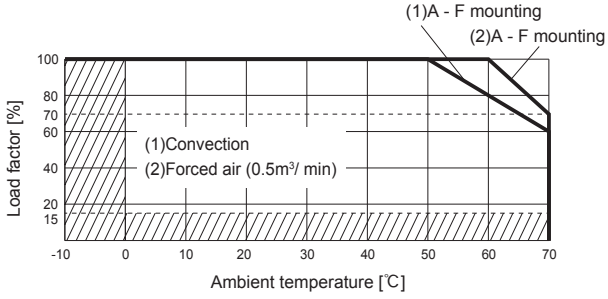
■This product uses SMD technology. Please avoid the PCB installation method which includes the twisting stress or the bending stress.

Derating

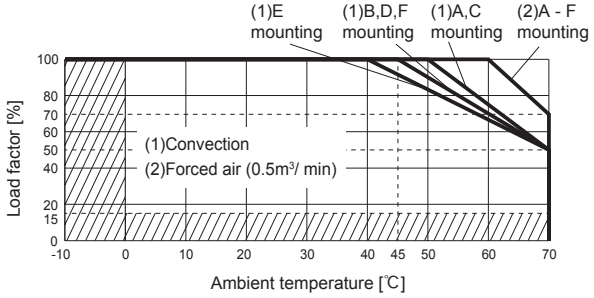
Derating curve for input voltage



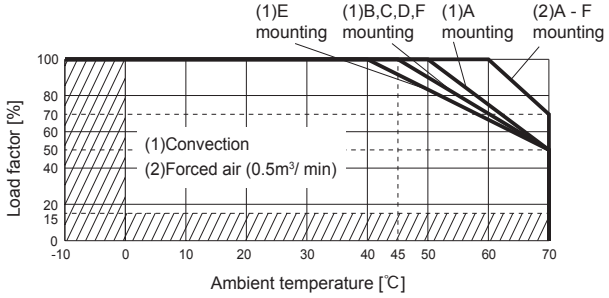
LHA30F
Ambient temperature derating curve
(Reference value)



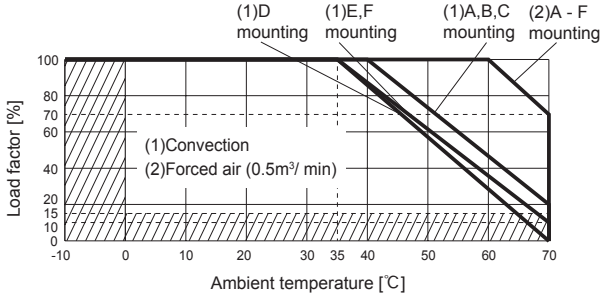
LHA50F-3R3-Y, -5, -24, -36, -48
Ambient temperature derating curve
(Reference value)



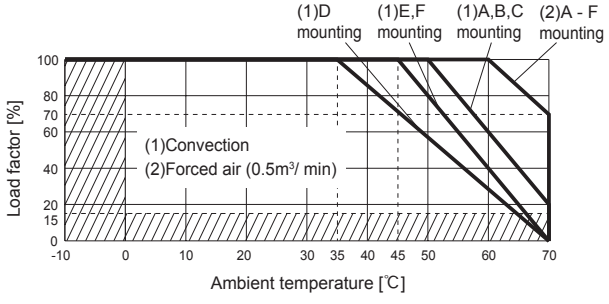
LHA50F-12, -15
Ambient temperature derating curve
(Reference value)



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

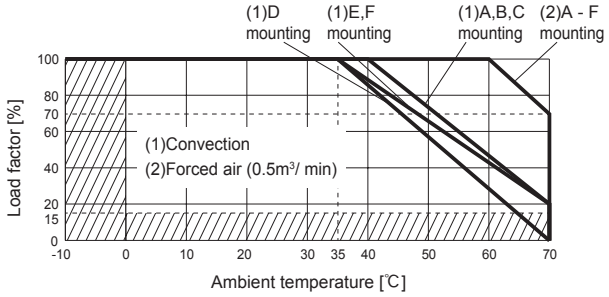


LHA75F-12, -15, -24, -36, -48
Ambient temperature derating curve
(Reference value)

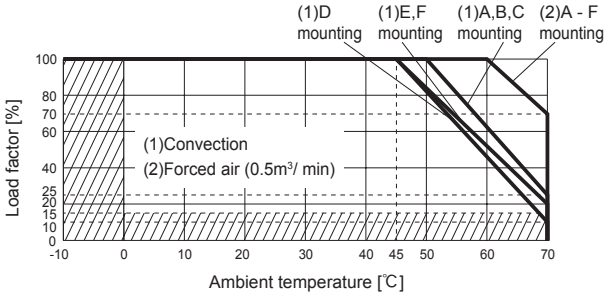


Derating

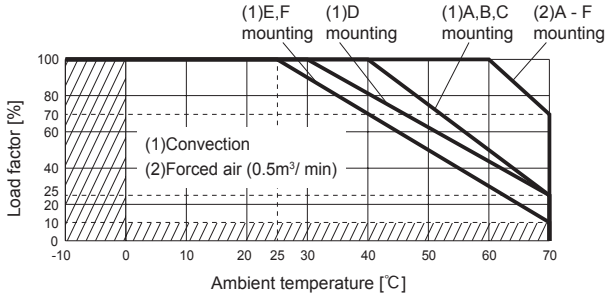
● LHA100F-5
Ambient temperature derating curve
(Reference value)



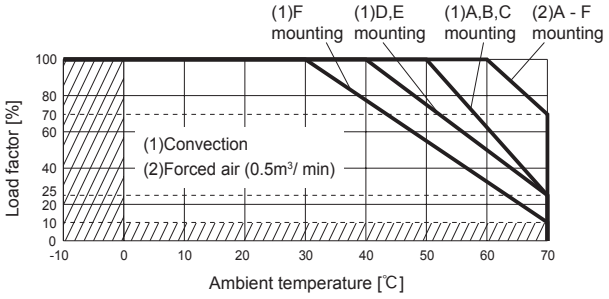
● LHA100F-12, -15, -24, -36, -48
Ambient temperature derating curve
(Reference value)



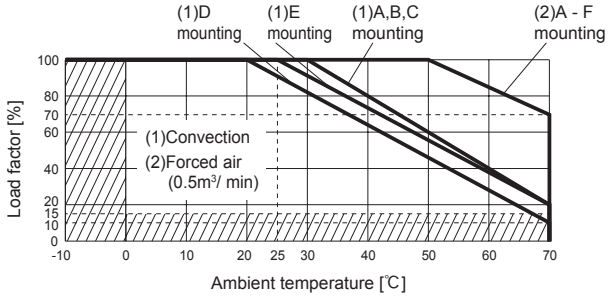
● LHA150F-12
Ambient temperature derating curve
(Reference value)



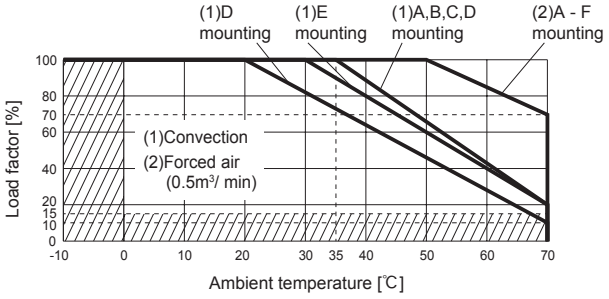
● LHA150F-24, -36, -48
Ambient temperature derating curve
(Reference value)



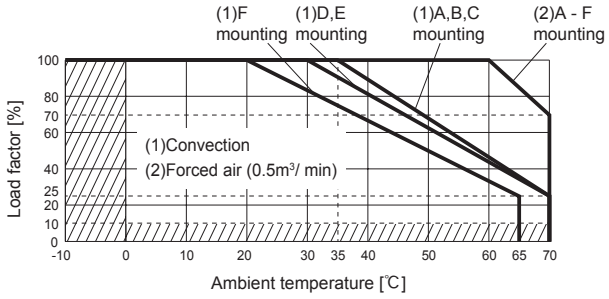
● LHA150F-12-SN
Ambient temperature derating curve
(Reference value)



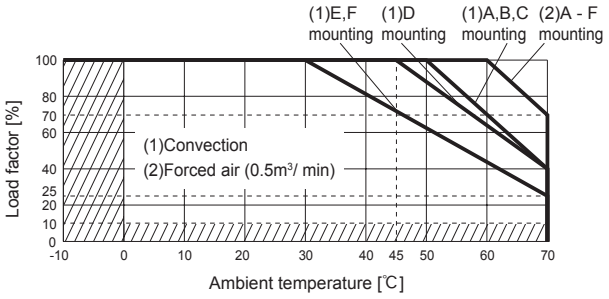
● LHA150F-24-SN, -36-SN, -48-SN
Ambient temperature derating curve
(Reference value)



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

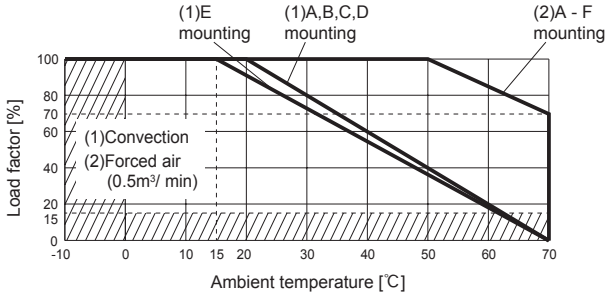


● LHA300F-24-Y, -48-Y
Ambient temperature derating curve
(Reference value)

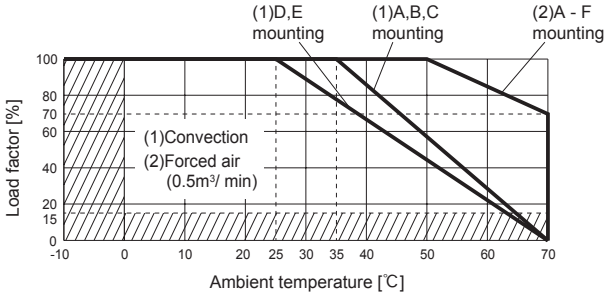


Derating

● 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.