









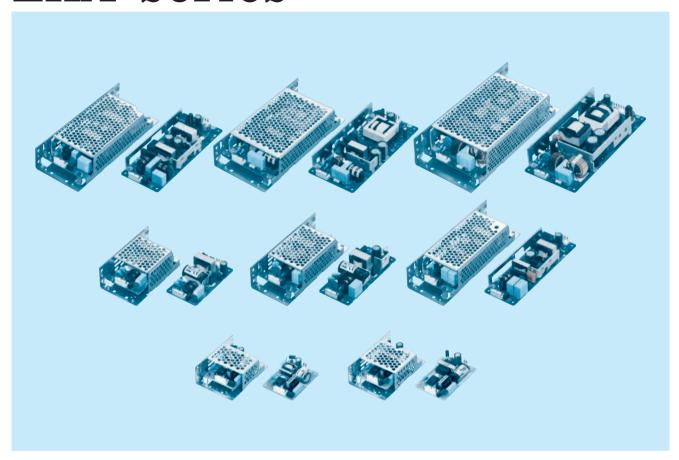








# LHA-series



#### Feature

EN62477-1 (OVC III)

Low-profile

Small and compact PCB construction

High efficiency

Low noise

Harmonic attenuator (Complies with IEC61000-3-2)

Power factor correction (LHA75F-300F)

Universal input (85-264VAC)

Built-in inrush current, overcurrent and overvoltage protection circuits

### Safety agency approvals

UL62368-1, C-UL (equivalent to CAN/CSA-C22.2 No.62368-1),

EN62368-1

EN62477-1 (OVC III): LHA150F, 300F

Complies with DEN-AN

### 5-year warranty (refer to Instruction Manual)

### CE marking

Low Voltage Directive RoHS Directive

### UKCA marking

Electrical Equipment Safety Regulations RoHS Regulations

#### **EMI**

Complies with FCC-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B, VCCI-B

#### **EMS Compliance** : EN61204-3, EN61000-6-2

EN61000-4-2

EN61000-4-3

EN61000-4-4

EN61000-4-5

EN61000-4-6

EN61000-4-8

EN61000-4-11

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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. Series name
 Single output
 Output wattage

4)Universal input

⑤Output voltage

Optional \*1
 C: with Coating
 J4: EP (TE Connectivity) connector type

S: with Chassis

SN: with Chassis & cover Y: with Potentiometer

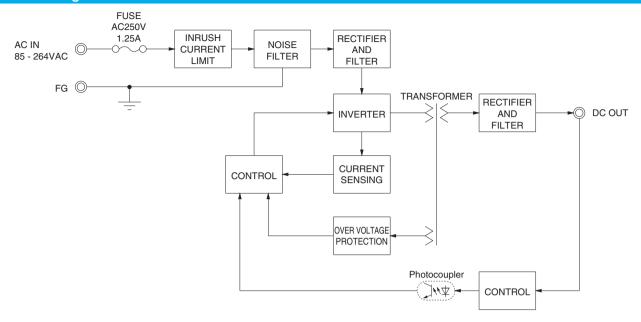
For option details, refer to Instruction Manual 6.

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	LHA10F-3R3-Y	LHA10F-5	LHA10F-12	LHA10F-15	LHA10F-24
MAX OUTPUT WATTAGE[W] *2	6.6	10	10.8	10.5	12
DC OUTPUT *2	3.3V 2A	5V 2A	12V 0.9A	15V 0.7A	24V 0.5A

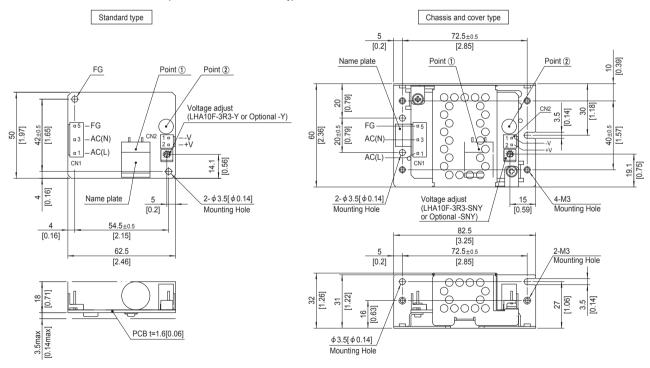
	MODEL		LHA10F-3R3-Y	LHA10F-5	LHA10F-12	LHA10F-15	LHA10F-24			
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to	"Derating" and Instruct	ion Manual 1.1)					
	CURRENT[A]		0.18typ	0.26typ						
	CONNENT[A]	ACIN 230V	0.10typ	0.14typ						
	FREQUENCY[Hz]		50 / 60 (45 - 440)							
IDI IT	EFFICIENCY[%]	ACIN 100V	72.0typ	77.0typ	79.5typ	81.0typ	82.5typ			
	EFFICIENCT[%]	ACIN 230V	72.0typ	78.5typ	81.0typ	83.0typ	84.5typ			
	INRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%)							
	INNUSH CONNENT[A]	ACIN 230V	35typ (lo=100%)							
	LEAKAGE CURREN	T[mA]	0.07 / 0.15max (ACIN		=100%, According to IE	C62368-1, and DEN-A				
	VOLTAGE[V]		3.3	5	12	15	24			
	CURRENT[A]	*2	2.0	2.0	0.9	0.7	0.5			
	LINE REGULATION[	mV] *3	20max	20max	48max	60max	96max			
	LOAD REGULATION	[mV] *3	40max	40max	100max	120max	150max			
	DIDDI ElmVa al	0 to +60°C *7	80max	80max	120max	120max	120max			
	RIPPLE[mVp-p]	-10 to 0°C	140max	140max	160max	160max	160max			
		lo=0 to 25%	300max	300max	300max	300max	300max			
	DIDDLE NOIGE	0 to +60°C *7	120max	120max	150max	150max	150max			
DUTPUT	RIPPLE NOISE[mVp-p]	-10to0°C 160max 160max 180max 180max	180max							
	***	lo=0 to 25%	360max	360max	360max	360max	360max			
	TEMPERATURE REGULATION[mV]	0 to +60°C *7	50max	50max	120max	150max	240max			
	TEMPERATURE REGULATION[IIIV]	-10 to +60°C <b>*</b> 7	60max	60max	150max	180max	290max			
	DRIFT[mV]	*5	20max	20max	48max	60max	96max			
	START-UP TIME[ms]		40typ (ACIN 100V, lo=	=100%)						
	HOLD-UP TIME[ms]		20typ (ACIN 100V, lo=	=100%) / 150typ (ACIN	230V, lo=100%)					
	OUTPUT VOLTAGE ADJUSTMENT	RANGE[V]	2.85 to 3.63	Fixed ("Y"option is av	ailable for adjusting out	put voltage between ±	10%)			
	<b>OUTPUT VOLTAGE SET</b>	TING[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			
POTEOTION	OVERCURRENT PROT	ECTION	Works over 105% of r	ating and recovers aut	omatically					
ROTECTION IRCUIT AND	OVERVOLTAGE PROTE	ECTION	4.00 to 6.00	5.75 to 8.00	13.80 to 18.00	17.25 to 23.30	27.60 to 34.50			
THERS	OPERATING INDICA	TION	Not provided							
, , , , LIIO	REMOTE SENSING		Not provided							
	INPUT-OUTPUT		, ,		DC500V 100M $\Omega$ min (A					
SOLATION	INPUT-FG		, ,		DC500V 100M $\Omega$ min (A					
	OUTPUT-FG		,		C500V 100M $\Omega$ min (At					
	OPERATING TEMP., HUMID. AND A	ALTITUDE *2	-10 to +70°C, 20 - 90%	RH (Non condensing)	, 5,000m (16,500feet) r	nax				
NVIRONMENT	STORAGE TEMP., HUMID. AND	ALTITUDE	-20 to +75°C, 20 - 90°	%RH (Non condensing)	), 9,000m (30,000feet) r	nax				
INVIRUINIENI	VIBRATION		10 - 55Hz, 19.6m/s <sup>2</sup> (2	2G), 3minutes period, 6	60minutes each along X	, Y and Z axis				
	IMPACT		196.1m/s² (20G), 11m	s, once each X, Y and	Z axis					
AFETY AND	AGENCY APPROVAL	LS	UL62368-1, C-UL (eq	uivalent to CAN/CSA-0	C22.2No.62368-1), EN6	2368-1, Complies with	DEN-AN			
IOISE	CONDUCTED NOISE		Complies with FCC-B	, VCCI-B, CISPR11-B,	CISPR32-B, EN55011-	B, EN55032-B				
REGULATIONS	HARMONIC ATTENU	JATOR *6	Complies with IEC610	000-3-2 (Class A) (No b	ouilt-in power factor cor	rection)				
OTHERS	CASE SIZE/WEIGHT		50×21.5×62.5mm [1	1.97×0.85×2.46 inche	es] (W×H×D) / 45g ma	ıx				
יו חבאס	COOLING METHOD	*2	Convection/Forced air	r (Requires external far	n) (Refer to "Derating")					

- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- 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. This is the value that measured on measuring board with capacitor of 22  $\mu$ F and 0.1  $\mu$ F 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 lo=0 to 25% by burst operation. Audible noise may be generated.
- **\***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.
- 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.
- 3.3V, 5V, 12V output product, the maximum temperature of 55°C.
- 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.



#### **External view**

\* External size of option is different from standard type.



- % The back side of PCB of the power supply is assembled some
- Be careful not to bump against the attached area by vibration. W 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
CNIA	DODE VIII	VHR-5N	Chain	SVH-21T-P1.1
CIVI	B3P5-VH	VHR-5N	Loose	BVH-21T-P1.1
CNIO	B2P-VH	VHR-2N	Chain	SVH-21T-P1.1
CINZ	BZP-VH	VHK-ZIV	Loose	BVH-21T-P1.1

(Mfr: J.S.T.)

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

CN1 Р

N1		CN2	
Pin No.	Input	Pin No.	Output
1	AC(L)	4	-V
2		'	-v
3	AC(N)	2	+V
4			+v
5	FG		

- % Pin No.2 and 4 is NC at CN1.

- Dimensions in mm, []=inches
   Tolerance: ±1 [±0.04]
   Weight: 45g max (with chassis and cover: 115g max)
- PCB Material / thickness : CEM-3 / 1.6mm [0.06]
   Optional chassis and cover material : Galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N m max

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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. Series name
 Single output
 Output wattage

4)Universal input

⑤Output voltage

Optional \*1
 C: with Coating
 J4: EP (TE Connectivity) connector type

S: with Chassis

SN: with Chassis & cover Y: with Potentiometer

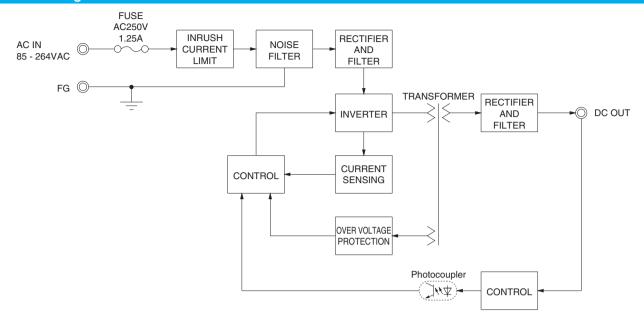
For option details, refer to Instruction Manual 6.

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	LHA15F-3R3-Y	LHA15F-5	LHA15F-12	LHA15F-15	LHA15F-24
MAX OUTPUT WATTAGE[W] *2	9.9	15	15.6	15	16.8
DC OUTPUT *2	3.3V 3A	5V 3A	12V 1.3A	15V 1.0	24V 0.7A

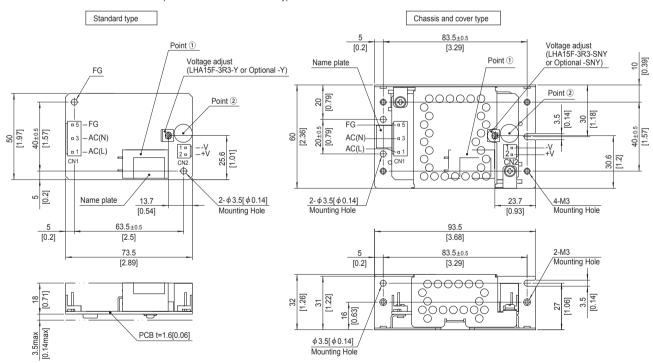
	MODEL		LHA15F-3R3-Y	LHA15F-5	LHA15F-12	LHA15F-15	LHA15F-24		
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to	"Derating" and Instru	uction Manual 1.1)				
	CURRENT[A]	ACIN 100V	0.24typ	0.35typ					
	CURRENT[A]	ACIN 230V	0.15typ	0.19typ					
	FREQUENCY[Hz]		50 / 60 (45 - 440)						
NPUT	EFFICIENCY[%]	ACIN 100V	71.5typ	75.0typ	79.0typ	80.0typ	81.5typ		
	EFFICIENCY[%]	ACIN 230V	72.5typ	77.0typ	82.0typ	83.0typ	84.5typ		
	INRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%) Ta=2	25℃ at cold start			,		
	INHUSH CURRENT[A]	ACIN 230V	35typ (lo=100%) Ta=2	25℃ at cold start					
	LEAKAGE CURREN	T[mA]	0.05 / 0.10max (ACIN	I 100V / 240V, 60Hz,	lo=100%, According to	IEC62368-1, and DEN	N-AN)		
Î	VOLTAGE[V]		3.3	5	12	15	24		
	CURRENT[A]	*2	3.0	3.0	1.3	1.0	0.7		
	LINE REGULATION[	mV] *3	20max	20max	48max	60max	96max		
Ī	LOAD REGULATION	[mV] *3	40max	40max	100max	120max	150max		
Ī	DIDDI EL V	0 to +60°C *7	80max	80max	120max	120max	120max		
	RIPPLE[mVp-p]	-10 to 0°C	140max	140max	160max	160max	160max		
	**	*4   -1010   140   140   140   140   140   160	300max	300max					
		0 to +60°C *7	120max	120max	150max	150max	150max		
OUTPUT	RIPPLE NOISE[mVp-p]	-10 to 0°C	160max 160max 180max 180max 18	180max					
	**	lo=0 to 25%	360max	360max	360max	360max	360max		
	TEMPERATURE REGULATION(mV)	0 to +60°C *7	50max	50max	120max	150max	240max		
	TEMPERATURE REGULATION[MV]	-10 to +60℃ *7	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]		20typ (ACIN 100V, Io:	=100%) / 150typ (AC	CIN 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 SET	TING[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		
	OVERCURRENT PROT	ECTION	Works over 105% of r	rating and recovers a	utomatically	,			
ROTECTION	OVERVOLTAGE PROTE	ECTION	4.00 to 6.00	5.75 to 8.00	13.80 to 18.00	17.25 to 23.30	27.60 to 34.50		
IRCUIT AND THERS	OPERATING INDICA	TION	Not provided			<u> </u>	·		
/ITEN3	REMOTE SENSING		Not provided						
	INPUT-OUTPUT		AC3,000V 1minute, C	Cutoff current = 10m/	A, DC500V 100M $\Omega$ mir	(At Room Temperature	e)		
SOLATION	INPUT-FG		AC2,000V 1minute, C	Cutoff current = 10m/	A, DC500V 100M $\Omega$ mir	(At Room Temperature	e)		
Ī	OUTPUT-FG		AC500V 1minute, Cut	toff current = 25mA,	DC500V 100M $\Omega$ min (	At Room Temperature)			
	OPERATING TEMP., HUMID. AND A	ALTITUDE *2	-10 to +70°C, 20 - 90°	%RH (Non condensi	ng), 5,000m (16,500fee	t) max			
NVIRONMENT	STORAGE TEMP., HUMID. AND	ALTITUDE	-20 to +75°C, 20 - 90°	%RH (Non condensi	ng), 9,000m (30,000fee	t) max			
NVIRONWENT	VIBRATION		10 - 55Hz, 19.6m/s <sup>2</sup> (2	2G), 3minutes period	d, 60minutes each alon	g X, Y and Z axis			
	IMPACT		196.1m/s² (20G), 11m	ns, once each X, Y a	nd Z axis				
AFETY AND	AGENCY APPROVAL	LS	UL62368-1, C-UL (eq	uivalent to CAN/CS/	A-C22.2No.62368-1), E	N62368-1, Complies w	ith DEN-AN		
IOISE	CONDUCTED NOISE		Complies with FCC-B	, VCCI-B, CISPR11-	B, CISPR32-B, EN550	11-B, EN55032-B			
REGULATIONS	HARMONIC ATTENU	JATOR *6	Complies with IEC610	000-3-2 (Class A) (N	o built-in power factor of	correction)			
	CASE SIZE/WEIGHT		50×21.5×73.5mm [	1.97×0.85×2.89 inc	ches] (W×H×D) / 60g	max			
OTHERS	COOLING METHOD	*2	Convection/Forced air	r (Requires external	fan) (Refer to "Derating	")			

- The listed options may affect the published standard specifications. Please contact us for
- detailed product specifications. 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. This is the value that measured on measuring board with capacitor of 22  $\mu$ F and 0.1  $\mu$ F 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 lo=0 to 25% by burst operation. Audible noise may be generated.
- **\***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.
- 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.
- 3.3V, 5V, 12V output product, the maximum temperature of 55°C.
- 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.



#### **External view**

\* External size of option is different from standard type.



- \* 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	
CNT	B3P5-VH	5-VH VHR-5N		BVH-21T-P1.1
0140	B2P-VH	\#UD 014	Chain	SVH-21T-P1.1
CNZ	BZP-VH	VHR-2N	Loose	BVH-21T-P1.1

(Mfr: J.S.T.)

- \* I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (TE Connectivity) connector type
- CN1 Pin No. Inpu AC(L 2 AC(N 3 4 FG 5

	CN2	
ıt	Pin No.	Output
_)	1	-V
۷)	2	+V

- % Pin No.2 and 4 is NC at CN1.

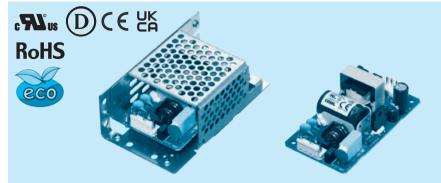
- Dimensions in mm, []=inches
   Tolerance: ±1 [±0.04]
   Weight: 60g max (with chassis and cover: 140g max)
- # PCB Material / thickness : CEM-3 / 1.6mm [0.06]

  Optional chassis and cover material : Galvanizing steel board

  Mounting torque (Mounting hole of chassis) : 1.5N m max

#### Ordering information

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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.

- Series name
   Single output
   Output wattage
- 4)Universal input
- ⑤Output voltage
- Optional \*1
   C : with Coating
   G: Low leakage current J4 : EP (TE Connectivity) connector type
  - S: with Chassis
  - SN: with Chassis & cover
- 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

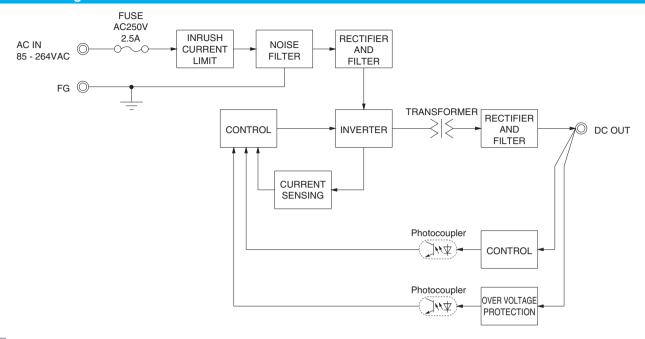
#### **SPECIFICATIONS**

	MODEL		LHA30F-3R3-Y	LHA30F-5	LHA30F-12	LHA30F-15	LHA30F-24			
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to	"Derating" and Instru	ction Manual 1.1)					
	CURRENT[A]	ACIN 100V	0.42typ	0.62typ						
	CORNEIVICAL	ACIN 230V	0.23typ	0.32typ						
	FREQUENCY[Hz]		50 / 60 (45 - 440)							
IDIT	EFFICIENCY[%]	ACIN 100V	83.0typ	83.0typ	85.0typ	85.5typ	87.0typ			
	EFFICIENCI[%]	ACIN 230V	85.5typ	87.0typ	88.5typ	89.0typ	90.0typ			
	INRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%) Ta=2	typ (lo=100%) Ta=25°C at cold start						
	INNUSH CONNENT[A]	ACIN 230V	35typ (lo=100%) Ta=2	25℃ at cold start						
	LEAKAGE CURREN	T[mA]	0.20 / 0.45max (ACIN	100V / 240V 60Hz,	o=100%, According to	IEC62368-1 and DEN	-AN)			
	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	I[mV] *3	40max	40max	100max	120max	150max			
	DIDDI EL-V	0 to +50°C	80max	80max	120max	120max	120max			
	RIPPLE[mVp-p]	-10 to 0℃	140max	140max	160max	160max	160max			
	***	lo=0 to 15%	300max	300max	300max	300max	300max			
		0 to +50°C	120max	120max	150max	150max	150max			
DUTPUT	RIPPLE NOISE[mVp-p]	-10 to 0℃	0 to 0°C 160max 160max 180max 1	180max						
	**	lo=0 to 15%	360max	360max	360max	360max	360max			
	TEMPEDATURE RECUI ATION(\/)	0 to +50°C	50max	50max	120max	150max	240max			
	TEMPERATURE REGULATION[MV]	TEMPERATURE REGULATIONIMVI	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, lo-	=100%) / 170typ (ACI	N 230V, Io=100%)					
	OUTPUT VOLTAGE ADJUSTMENT	RANGE[V]	2.85 to 3.63	Fixed ("Y"option is a	vailable for adjusting o	utput voltage between	±10%)			
	<b>OUTPUT VOLTAGE SET</b>	TING[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			
	OVERCURRENT PROT	ECTION	Works over 105% of r	ating and recovers at	tomatically	·	· ·			
ROTECTION	OVERVOLTAGE PROTI		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			
THERS	OPERATING INDICA	TION	Not provided			<del></del>	·			
ILLEUS	REMOTE SENSING		Not provided							
	INPUT-OUTPUT		AC3,000V 1minute, C	utoff current = 10mA,	DC500V 100M $\Omega$ min	(At Room Temperature	9)			
SOLATION	INPUT-FG		AC2,000V 1minute, C	outoff current = 10mA,	DC500V 100M $\Omega$ min	(At Room Temperature	e)			
	OUTPUT-FG		AC500V 1minute, Cut	toff current = 25mA, D	C500V 100MΩ min (A	t Room Temperature)	•			
	OPERATING TEMP., HUMID. AND A	ALTITUDE *2	-10 to +70°C, 20 - 90°	%RH (Non condensing	g), 5,000m (16,500feet	) max				
	STORAGE TEMP., HUMID. AND	ALTITUDE			g), 9,000m (30,000feet					
NVIRONMENT	VIBRATION				60minutes each along					
	IMPACT		196.1m/s² (20G), 11m			•				
AFETY AND	AGENCY APPROVA	LS				N62368-1, Complies wi	th DEN-AN			
OISE	CONDUCTED NOISE				, CISPR32-B, EN5501					
REGULATIONS	HARMONIC ATTENU		Complies with IEC610							
	CASE SIZE/WEIGHT					nax (with chassis & cov	/er : 210g max)			
OTHERS	COOLING METHOD	40			n) (Refer to "Derating"		/			

- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- Derating is required.
- 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. This is the value that measured on measuring board with capacitor of 22  $\mu$ F and 0.1  $\mu$ F 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 lo=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°C, with the input voltage held constant at the rated input/output.
- 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.

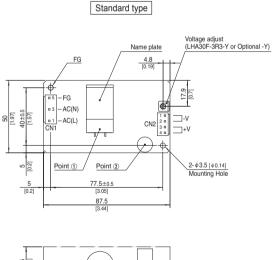
LHA-6 December 27, 2022 www.cosel.co.jp/en/

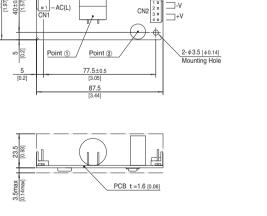




#### **External view**

\* External size of option is different from standard type.



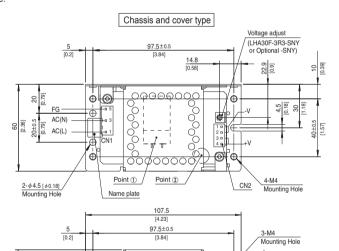


- $\ensuremath{\,\times\,}$  The back side of PCB of the power supply is assembled some SMDs. Be careful not to bump against the attached area by vibration.
- W Use the spacer of 8mm [0.31] length or more for isolation. And do not use press-fitting bush.
- % Point ①, Point ② are thermometry points. Please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

I/O	Connector	Mating connector		Terminal
ONIA	B3P5-VH	VIIID EN	Chain	SVH-21T-P1.1
CNT	B3P5-VH	VHR-5N	Loose	BVH-21T-P1.1
ONIO	B4P-VH	VHR-4N	Chain	SVH-21T-P1.1
CNZ	B4P-VH	VHR-4N	Loose	BVH-21T-P1.1

(Mfr: J.S.T.)

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



00000000

다 한 분								
CN1 CN2								
Pin No.	Input		Pin No.	Output				
1	AC(L)		1, 2	-V				
2			1, 2	-v				
3	AC(N)		2.4	+\/				
			3, 4	, +v				

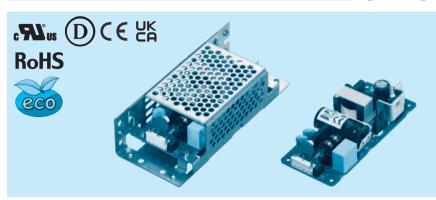
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\* Pin No.2 and 4 is NC at CN1.

- ※ Keep drawing current per pin below 5A for CN2.
- ※ Dimensions in mm, [ ]=inches
- ※ Tolerance : ±1 [±0.04]
- Weight: 100g max (with chassis and cover: 210g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Optional chassis and cover material : Galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

#### Ordering information

**50** 



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.

- Series name
   Single output
   Output wattage
  - 4)Universal input ⑤Output voltage

  - Optional \*1
     C : with Coating
     G: Low leakage current J4 : EP (TE Connectivity) connector type
    - S: with Chassis
    - SN: with Chassis & cover
  - Y: with Potentiometer

For option details, refer to Instruction Manual 6.

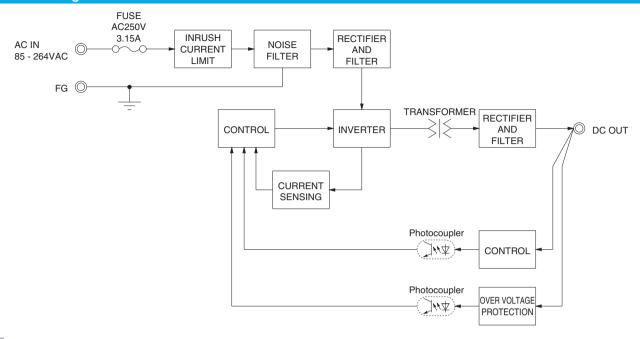
This power supply is manufactured by SMD technology. The stress to PCB like twisting or bending causes the defect of the unit, so handle the unit with care. \*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	LHA50F-3R3-Y	LHA50F-5	LHA50F-12	LHA50F-15	LHA50F-24	LHA50F-36	LHA50F-48
MAX OUTPUT WATTAGE[W] *2	26.4	40	51.6	52.5	50.4	50.4	52.8
DC OUTPUT *2	3.3V8A	5V8A	12V4.3A	15V3.5A	24V2.1A	36V1.4A	48V1.1A

	MODEL		LHA50F-3R3-Y	LHA50F-5	LHA50F-12	LHA50F-15	LHA50F-24	LHA50F-36	LHA50F-48
	VOLTAGE[VAC]			efer to "Derating	and Instruction	Manual 1.1)			
	CURRENT[A]	ACIN 100V	0.56typ	0.82typ	1.05typ				
	CONNENT[A]	ACIN 230V	0.30typ	0.42typ	0.52typ				
FREQUENCY[Hz]	FREQUENCY[Hz]		50 / 60 (45 - 44	0)					
NPUT	EFFICIENCY[%]	ACIN 100V	80.0typ	83.0typ	87.0typ	85.5typ	86.0typ	86.5typ	86.5typ
	EFFICIENCY[%]	ACIN 230V	83.5typ	86.5typ	90.5typ	89.0typ	89.0typ	90.0typ	90.0typ
	INRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%	a) Ta=25°C at col	d start				
	INNUSH CURRENT[A]	ACIN 230V	35typ (lo=100%	at col	d start				
	LEAKAGE CURREN	T[mA]	0.30 / 0.65max	(ACIN 100V / 24	0V 60Hz, lo=10	0%, According t	o IEC62368-1 ar	nd DEN-AN)	
	VOLTAGE[V]		3.3	5	12	15	24	36	48
	CURRENT[A]	*2	8.0	8.0	4.3	3.5	2.1	1.4	1.1
	LINE REGULATION[	mV] *3	20max	20max	48max	60max	96max	144max	192max
	LOAD REGULATION	[mV] *3	40max	40max	100max	120max	150max	240max	240max
		0 to +50°C	80max	80max	120max	120max	120max	150max	150max
	RIPPLE[mVp-p]	-10 to 0°C	140max	140max	160max	160max	160max	200max	200max
	**	lo=0 to 15%	300max	300max	300max	300max	300max	300max	300max
		0 to +50°C	120max	120max	150max	150max	150max	250max	250max
UTPUT	RIPPLE NOISE[mVp-p]	-10 to 0°C	160max	160max	180max	180max	180max	300max	300max
TEMPE	**	lo=0 to 15%	360max	360max	360max	360max	360max	360max	360max
	TEMPERATURE REGULATION[mV]	0 to +50°C	50max	50max	120max	150max	240max	360max	480max
	TEMPERATURE REGULATION[MV]	-10 to +50°C	60max	60max	150max	180max	290max	450max	600max
	DRIFT[mV]	*5	20max	20max	48max	60max	96max	144max	192max
	START-UP TIME[ms]		40typ (ACIN 10	0V, lo=100%)					
	HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%) / 140typ (ACIN 230V, Io=100%)						
	OUTPUT VOLTAGE ADJUSTMENT	RANGE[V]	2.85 to 3.63	Fixed ("Y"option	n is available for	adjusting output	voltage between	±10%)	
	<b>OUTPUT VOLTAGE SET</b>	TING[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	34.50 to 37.50	46.00 to 50.00
POTEOTION	OVERCURRENT PROT	ECTION	Works over 105	% of rating and	recovers automa	tically	•	•	
ROTECTION IRCUIT AND	OVERVOLTAGE PROTE	ECTION	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	41.40 to 50.40	55.20 to 67.20
THERS	OPERATING INDICA	TION	Not provided						
, III EII G	REMOTE SENSING		Not provided						
	INPUT-OUTPUT		AC3,000V 1min	ute, Cutoff curre	nt = 10mA, DC5	00V 100M $\Omega$ mir	(At Room Temp	erature)	
SOLATION	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)						
	OUTPUT-FG		AC500V 1minut	te, Cutoff current	= 25mA, DC500	OV 100M $\Omega$ min (	At Room Tempe	rature)	
	OPERATING TEMP., HUMID. AND A	ALTITUDE *2	2 -10 to +70°C, 20 - 90%RH (Non condensing), 5,000m (16,500feet) max						
NVIRONMENT STORAGE TEMP., HUMID. AND ALTITUDE									
NVIRONWENT	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						
AFETY AND	AGENCY APPROVAL	LS	UL62368-1, C-U	JL (equivalent to	CAN/CSA-C22.	2No.62368-1), E	N62368-1, Com	plies with DEN-A	N
OISE	CONDUCTED NOISE		Complies with F	CC-B, VCCI-B,	CISPR11-B, CIS	PR32-B, EN550	11-B, EN55032-	В	
EGULATIONS	HARMONIC ATTENU	JATOR *6		EC61000-3-2 (C					
THERS	CASE SIZE/WEIGHT		50×27×112m	m [1.97×1.07×	4.41 inches] (W	×H×D) / 140g r	nax (with chassis	s & cover : 280g r	nax)
JIHEKS	COOLING METHOD	*2		ced air (Requires					•

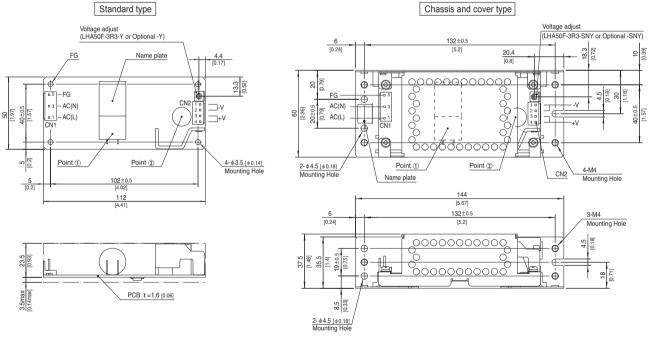
- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- Derating is required.
- \*3 At low load conditions, the burst mode operation will start. To check load regulation, you
- will need to measure the characteristics at average mode with instruments. This is the value that measured on measuring board with capacitor of 22  $\mu$  F and 0.1  $\mu$  F 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 lo=0 to 15% by burst operation.
- 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.
- 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.





#### **External view**

\* External size of option is different from standard type.



- $\ensuremath{\,\times\,}$  The back side of PCB of the power supply is assembled some
- Be careful not to bump against the attached area by vibration. W 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	onnector Mating connector				
ONIA	D0D5 \// I	VILID EN	Chain	SVH-21T-P1.1		
CNT	B3P5-VH	VHR-5N	Loose	BVH-21T-P1.1		
ONIO	B4P-VH	VHR-4N	Chain	SVH-21T-P1.1		
CN2	B4P-VH	VHR-4N	Loose	BVH-21T-P1.1		

(Mfr: J.S.T.)

- % I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (TE Connectivity) connector type.
- CN1 CN<sub>2</sub> Pin No. Pin No. Output Input AC(L) 1, 2 -V AC(N) 3 3. 4 4 FG
- ※ Pin No.2 and 4 is NC at CN1.
- ※ Keep drawing current per pin below 5A for CN2.
- ※ Dimensions in mm, [ ]=inches
- % Tolerance : ±1 [±0.04]
- Weight: 140g max (with chassis and cover: 280g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Optional chassis and cover material : Galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

#### Ordering information

## LHA75F

**75** 



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.

LUATER 40 LUATER 45 LUATER 04 LUATER 00 LUATER 40

- Series name
   Single output
   Output wattage
- 4)Universal input
- ⑤Output voltage
- Optional \*1
   C : with Coating
   G: Low leakage current
  - J4 : EP (TE Connectivity) connector type S: with Chassis
  - SN: with Chassis & cover
- Y: with Potentiometer

For option details, refer to Instruction Manual 6.

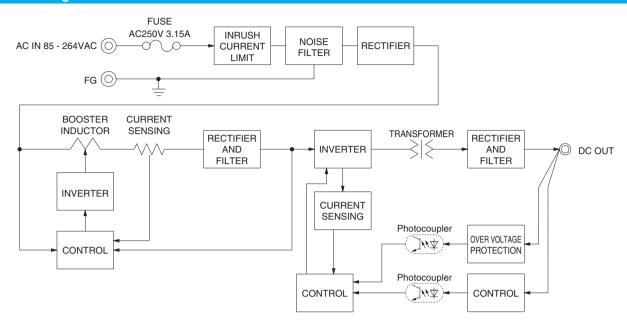
This power supply is manufactured by SMD technology. The stress to PCB like twisting or bending causes the defect of the unit, so handle the unit with care. \*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

LUATER ODO V LUATER E

MODEL	LHA75F-3R3-Y	LHA75F-5	LHA75F-12	LHA75F-15	LHA75F-24	LHA75F-36	LHA75F-48
MAX OUTPUT WATTAGE[W] *2	39.6	60	75.6	75	76.8	75.6	76.8
DC OUTPUT *2	3.3V12A	5V12A	12V6.3A	15V5A	24V3.2A	36V2.1A	48V1.6A

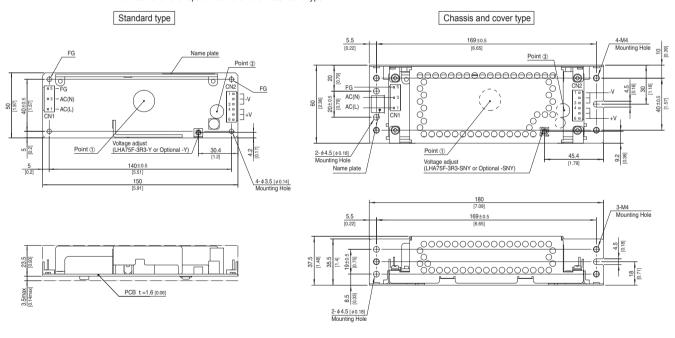
	MODEL		LHA75F-3R3-Y	LHA75F-5	LHA75F-12	LHA75F-15	LHA75F-24	LHA75F-36	LHA75F-48
	VOLTAGE[VAC]	*2	85 - 264 1 φ (R	efer to "Derating	and Instruction	Manual 1.1)			
	OUDDENTIAL	ACIN 100V	0.6typ	0.8typ	0.9typ				
	CURRENT[A]	ACIN 230V	0.3typ	p 0.4typ 0.5typ					
	FREQUENCY[Hz]		50 / 60 (45 - 66)	)					
EFFICIENC	EEEIOIENOVI0/1	ACIN 100V	74.0typ	79.0typ	84.5typ	85.5typ	86.0typ	87.5typ	87.5typ
INPUT	EFFICIENCY[%]	ACIN 230V	75.0typ	81.0typ	86.5typ	87.5typ	88.0typ	89.5typ	89.5typ
	POWER FACTOR (Io=100%)	ACIN 100V	0.96typ	0.97typ					
	POWER FACTOR (10=100%)	ACIN 230V	0.70typ	0.80typ					
	INRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%	) Ta=25°C at col	d start				
		ACIN 230V	35typ (lo=100%	) Ta=25°C at col	d start				
	LEAKAGE CURREN	T[mA]	0.40 / 0.75max	(ACIN 100V / 24	0V 60Hz, lo=10	0%, According to	IEC62368-1 an	d DEN-AN)	
	VOLTAGE[V]		3.3	5	12	15	24	36	48
	CURRENT[A]	*2	12.0	12.0	6.3	5.0	3.2	2.1	1.6
	LINE REGULATION[I	mV] *3	20max	20max	48max	60max	96max	144max	192max
Ī	LOAD REGULATION	[mV] *3	40max	40max	100max	120max	150max	240max	240max
Γ	DIDDI EL-V	0 to +50°C *7	80max	80max	120max	120max	120max	150max	150max
	RIPPLE[mVp-p]	-10 to 0℃	140max	140max	160max	160max	160max	200max	200max
	**	lo=0 to 15%	300max	300max	360max	500max	500max	500max	500max
		0 to +50°C *7	120max	120max	150max	150max	150max	250max	250max
DUTPUT	RIPPLE NOISE[mVp-p]	-10 to 0℃	160max	160max	180max	180max	180max	300max	300max
	**	lo=0 to 15%	360max	360max	400max	600max	600max	600max	600max
	TEMPERATURE REGULATION[mV]	0 to +50°C *7	50max	50max	120max	150max	240max	360max	480max
	TEMPERATURE REGULATION[IIIV]	-10 to +50°C *7	60max	60max	150max	180max	290max	450max	600max
	DRIFT[mV]	*5	20max	20max	48max	60max	96max	144max	192max
	START-UP TIME[ms]		100typ (ACIN 1	00V, Io=100%)					
	HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%)						
	OUTPUT VOLTAGE ADJUSTMENT		2.85 to 3.63			djusting output vo	ltage between ±1		
	OUTPUT VOLTAGE SET	TING[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	34.50 to 37.50	46.00 to 50.00
DDOTECTION -	OVERCURRENT PROT		Works over 105	% of rating and	ecovers automa				
CIRCUIT AND	OVERVOLTAGE PROTE	CTION	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	41.40 to 50.40	55.20 to 67.20
OTHERS	OPERATING INDICA	TION	Not provided						
	REMOTE SENSING		Not provided				,		
	INPUT-OUTPUT						(At Room Temp		
L	INPUT-FG						(At Room Temp		
	OUTPUT-FG						At Room Temper	rature)	
-	OPERATING TEMP., HUMID. AND A		37, -,						
-NVIRONMENI ⊨	/IRONMENT STORAGE TEMP., HUMID.AND A			) - 90%RH (Non					
	VIBRATION						g X, Y and Z axis	3	
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis  UL62368-1, C-UL (equivalent to CAN/CSA-C22.2No.62368-1), EN62368-1, Complies with DEN-AN						
	AGENCY APPROVAL								N
	CONDUCTED NOISE					PR32-B, EN550	11-B, EN55032-I	В	
	HARMONIC ATTENU			EC61000-3-2 (C					
OTHERS +	CASE SIZE/WEIGHT					, ,		& cover : 370g m	ıax)
	COOLING METHOD	*2	Convection/Ford	ced air (Requires	external fan) (P	lefer to "Derating	")		

- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- Derating is required.
- 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. This is the value that measured on measuring board with capacitor of 22  $\mu$  F and 0.1  $\mu$  F 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 lo=0 to 15% by burst operation.
- 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.
- Please contact us about another class.
- 3.3V and 5V output product, the maximum temperature of 40°C. 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.



#### **External view**

\* External size of option is different from standard type.



- ※ 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
- ※ Point ①, Point ② are thermometry points. Please refer to Instruction Manual 3.

I/O	Connector	onnector Mating connector		Terminal		
ONIA	D0D5 \// I	VIIID EN	Chain	SVH-21T-P1.1		
CNT	B3P5-VH	VHR-5N	Loose	BVH-21T-P1.1		
ONIO	DOD VIII	V/LID ON	Chain	SVH-21T-P1.1		
CNZ	B6P-VH	VHR-6N	Loose	BVH-21T-P1.1		

(Mfr: J.S.T.)

- \* I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (TE Connectivity) connector type.
- CN1

  Pin No. Input

  1 AC(L)

  2 3 AC(N)

  4

CN2						
Input		Pin No.	Output			
AC(L)		1 to 3	-V			
AC(N)		4 to 6	+V			
FG						

- % Pin No.2 and 4 is NC at CN1.
- ※ Keep drawing current per pin below 5A for CN2.
- ※ Dimensions in mm, [ ]=inches
- ※ Tolerance : ±1 [±0.04]
- Weight: 190g max (with chassis and cover: 370g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- $\ensuremath{\mathbb{X}}$  Optional chassis and cover material : Galvanizing steel board

## LHA100F

100



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.

 Series name
 Single output
 Output wattage 4)Universal input

⑤Output voltage

Optional \*1
 C : with Coating
 G: Low leakage current

J4 : EP (TE Connectivity) connector type

R2: with Remote ON/OFF S: with Chassis

SN: with Chassis & cover

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	LHA100F-5	LHA100F-12	LHA100F-15	LHA100F-24	LHA100F-36	LHA100F-48
MAX OUTPUT WATTAGE[W] *2	75	102	100.5	103.2	100.8	100.8
DC OUTPUT *2	5V15A	12V8.5A	15V6.7A	24V4.3A	36V2.8A	48V2.1A

	MODEL		LHA100F-5	LHA100F-12	LHA100F-15	LHA100F-24	LHA100F-36	LHA100F-48		
V	/OLTAGE[VAC]	*2	85 - 264 1 φ (Refe	er to "Derating" and	Instruction Manua	l 1.1)				
	CURRENT[A]	ACIN 100V	1.0typ	1.2typ						
٢	ONNENT[A]	ACIN 230V	0.5typ	0.6typ						
F	REQUENCY[Hz]		50 / 60 (45 - 66)	50 / 60 (45 - 66)						
_	FFICIENCY[%]	ACIN 100V	82.0typ	87.0typ	88.0typ	86.5typ	87.0typ	87.0typ		
NPUT   E	FFICIENCY[%]	ACIN 230V	84.0typ	89.0typ	90.0typ	89.0typ	89.0typ	89.0typ		
D.	OWED FACTOR (In 1000/)	ACIN 100V	0.97typ	0.97typ						
P'	OWER FACTOR (Io=100%)	ACIN 230V	0.83typ	0.87typ						
I.	NRUSH CURRENT[A]	ACIN 100V		p (lo=100%) Ta=25℃ at cold start						
"	NRUSH CURRENT[A]	ACIN 230V	35typ (lo=100%) 7	īa=25℃ at cold sta	rt					
L	EAKAGE CURREN	T[mA]	0.40 / 0.75max (A	CIN 100V / 240V 6	60Hz, lo=100%, Ac	cording to IEC6236	8-1 and DEN-AN)			
V	/OLTAGE[V]		5	12	15	24	36	48		
C	CURRENT[A]	*2	15.0	8.5	6.7	4.3	2.8	2.1		
L	INE REGULATION[I	mV] *3	20max	48max	60max	96max	144max	192max		
L	OAD REGULATION	[mV] *3	40max	100max	120max	150max	240max	240max		
	NDDI E[	0 to +50°C *7	80max	120max	120max	120max	150max	150max		
	RIPPLE[mVp-p]	-10 to 0°C	140max	160max	160max	160max	200max	200max		
	**	lo=0 to 15%	300max	360max	500max	500max	500max	500max		
_	NDDI E NOIGEEV1	0 to +50°C *7	120max	150max	150max	150max	250max	250max		
OUTPUT   K	RIPPLE NOISE[mVp-p]	-10 to 0℃	160max	180max	180max	180max	300max	300max		
	**	lo=0 to 15%	360max	400max	600max	600max	600max	600max		
75	TEMPERATURE REGULATION[mV]	0 to +50°C *7	50max	120max	150max	240max	360max	480max		
["	EMPERATURE REGULATION[IIIV]	-10 to +50℃*7	60max	150max	180max	290max	450max	600max		
D	RIFT[mV]	*5	20max	48max	60max	96max	144max	192max		
S	START-UP TIME[ms]		100typ (ACIN 100V, Io=100%)							
Н	HOLD-UP TIME[ms]		20typ (ACIN 100V, lo=100%)							
01	UTPUT VOLTAGE ADJUSTMENT	RANGE[V]	Fixed ("Y"option is available for adjusting output voltage between ±10%)							
0	OUTPUT VOLTAGE SET	TING[V]	4.90 to 5.30	11.50 to 12.50	14.40 to 15.60	23.00 to 25.00	34.50 to 37.50	46.00 to 50.00		
0	VERCURRENT PROT	ECTION	Works over 105%	of rating and recov						
PROTECTION	VERVOLTAGE PROTE	CTION	5.75 to 7.00	13.80 to 16.80	17.25 to 21.00	27.60 to 33.60	41.40 to 50.40	55.20 to 67.20		
	PERATING INDICA	TION	Not provided							
OTHERS R	REMOTE SENSING		Not provided							
R	REMOTE CONTROL			struction Manual 6						
11	NPUT-OUTPUT-RC	*8				$OM\Omega$ min (At Room				
SOLATION IN	NPUT-FG			<u>'</u>		$OM\Omega$ min (At Room				
O	OUTPUT-RC-FG					$M\Omega$ min (At Room $\Pi$				
	OUTPUT-RC					$\Omega$ min (At Room Te	emperature)			
<u> </u>	PERATING TEMP., HUMID. AND A				densing), 5,000m (1					
NVIRONMENT —	TORAGE TEMP.,HUMID.AND	ALTITUDE			densing), 9,000m (3					
V	/IBRATION					ach along X, Y and	I Z axis			
	MPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis							
	AGENCY APPROVAL						, Complies with DE	N-AN		
	CONDUCTED NOISE		Complies with FC	C-B, VCCI-B, CISP	R11-B, CISPR32-E	B, EN55011-B, EN5	55032-B			
REGULATIONS	IARMONIC ATTENU	ATOR *6		61000-3-2 (Class A						
CASE SIZE/WEIGHT							chassis & cover : 45	0g max)		
C	COOLING METHOD *2			d air (Requires exte	ernal fan) (Refer to	"Derating")				

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

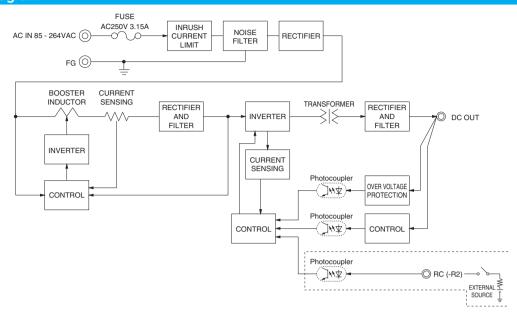
  Derating is required.

  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.

  This is the value that measured on measuring board with capacitor
- of 22 µ F and 0.1 µ F 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 lo=0 to 15% by burst
- operation. 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.
- Please contact us about another class.

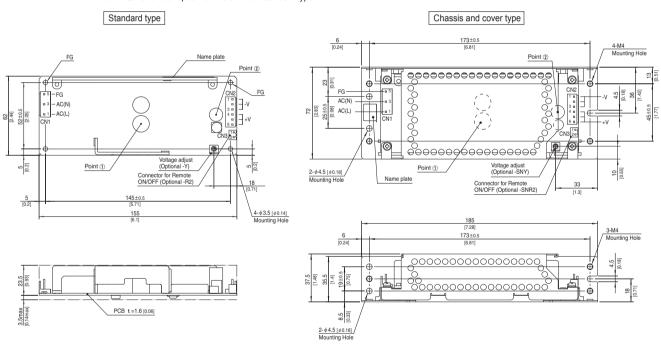
- riesse contact us about another class. 5V output product, the maximum temperature of 40°C. Applicable when Remote ON/OFF (optional) is added. To meet the specification, do not operate overload condition. Parallel operation is not possible. Sound noise may be generated by power supply in case of pulse load.





#### **External view**

\* External size of option is different from standard type.



- $\ensuremath{\,\times\,}$  The back side of PCB of the power supply is assembled some SMDs.
- Be careful not to bump against the attached area by vibration.
- W 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.

Mating connector			
VIID EN	Chain	SVH-21T-P1.1	
VHK-5N	Loose	BVH-21T-P1.1	
V/UD ON	Chain	SVH-21T-P1.1	
VHK-6IN	Loose	BVH-21T-P1.1	
	Mating connector  VHR-5N  VHR-6N	VHR-5N Chain Loose Chain	

(Mfr: J.S.T.)

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

- ※ Dimensions in mm, [ ]=inches
- % Tolerance : ±1 [±0.04]
- Weight: 250g max (with chassis and cover: 450g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- \* Optional chassis and cover material : Galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

CN1		CN2	
Pin No.	Input	Pin No.	Output
1	AC(L)	1 to 3	-V
2		1 10 3	-v
3	AC(N)	4 to 6	+V
4		4 10 0	T V
5	FG		

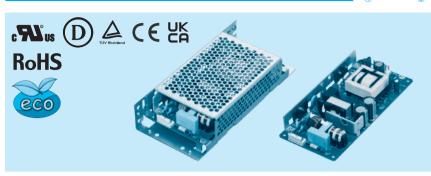
5	10	
Pin No	.2 and 4 is	NC at CN1.

CN3 Option (Mfr:J.S.T.)						
	PIN No.	Contents				
	1	RC(+)				
	2	RC(-)				
	Model B2B	-XH-A	inal)			

XHP-2 BXH-001T-P0.6 or SXH-001T-P0.6

## LHA150F

150



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. Series name
 Single output
 Output wattage

4)Universal input

⑤Output voltage

Optional \*1
 C : with Coating
 G: Low leakage current

J4 : EP (TE Connectivity) 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

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	LHA150F-12	LHA150F-24	LHA150F-36	LHA150F-48
MAX OUTPUT WATTAGE[W] *2	150	151.2	151.2	153.6
DC OUTPUT *2	12V 12.5A	24V 6.3A	36V 4.2A	48V 3.2A

	MODEL		LHA150F-12	LHA150F-24	LHA150F-36	LHA150F-48			
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to "Dera	ting" and Instruction Manual	1.1)				
	OUDDENTIAL	ACIN 100V	1.8typ						
	CURRENT[A]	ACIN 230V	0.8typ						
	FREQUENCY[Hz]		50 / 60 (45 - 66)						
EE	EEEIOIENOVIO/1	ACIN 100V	86.5typ	89.0typ	89.5typ	90.0typ			
INPUT	EFFICIENCY[%]	ACIN 230V	89.5typ	92.0typ	92.5typ	93.0typ			
	DOWED FACTOR (L. 4000()	ACIN 100V	0.99typ						
	POWER FACTOR (lo=100%)	ACIN 230V	0.91typ						
	INDUCU CUDDENTIAL	ACIN 100V	15typ (lo=100%) Ta=25°C at cold start						
	INRUSH CURRENT[A] ACIN 230V		35typ (Io=100%) Ta=25℃ a	t cold start					
	LEAKAGE CURREN	T[mA]	0.40 / 0.75max (ACIN 100V	/ 240V 60Hz, lo=100%, Acc	ording to IEC62368-1 and DE	EN-AN)			
	VOLTAGE[V]		12	24	36	48			
	CURRENT[A]	*2	12.5	6.3	4.2	3.2			
	LINE REGULATION[	mV] *3	48max	96max	144max	192max			
LOAD F	LOAD REGULATION	[mV] *3	100max	150max	240max	240max			
	DIDDI Electronia	0 to +50℃*7	120max	120max	150max	150max			
	RIPPLE[mVp-p]	-10 to 0℃	160max	160max	200max	200max			
		lo=0 to 10%	160max	160max	200max	200max			
OUTPUT RIPPLE NOISE[mVp-p	DIDDI E NOICEIV1	0 to +50°C *7	150max	150max	250max	250max			
	*4	-10 to 0℃	180max	180max	300max	300max			
	***	lo=0 to 10%	230max	230max	300max	300max			
	TEMPERATURE REGULATION(m)/1	0 to +50°C *7	120max	240max	360max	480max			
	TEMPERATURE REGULATION[IIIV]	-10 to +50°C <b>*</b> 7	150max	290max	450max	600max			
	DRIFT[mV] *5		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			for adjusting output voltage I					
	OUTPUT VOLTAGE SET		11.50 to 12.50	23.00 to 25.00	34.50 to 37.50	46.00 to 50.00			
	OVERCURRENT PROT		Works over 105% of rating a		1				
PROTECTION	OVERVOLTAGE PROTI		13.80 to 16.80	27.60 to 33.60	41.40 to 50.40	55.20 to 67.20			
	OPERATING INDICA	TION	Not provided						
OTHERS	REMOTE SENSING	-	Not provided						
	REMOTE ON/OFF		Option (Refer to Instruction		MO -: ALD T				
	INPUT-OUTPUT-RC	*8	AC3,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)						
ISOLATION	INPUT-FG OUTPUT-RC-FG	*8	AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)						
	OUTPUT-RC	*8	, , , , , , , , , , , , , , , , , , , ,						
	OPERATING TEMPHUMID.AND		AC100V 1minute, Cutoff current = 25mA, DC100V 10M $\Omega$ min (At Room Temperature) -10 to +70 $^{\circ}$ C, 20 - 90%RH (Non condensing), 5.000m (16,500feet) max (EN62477-1 (OVC III) : 2,000m (6,600feet) max)						
	STORAGE TEMP., HUMID. AND		-10 to +70 C, 20 - 90%RH (Non condensing), 5,000m (16,500feet) max (EN62477-1 (OVC III) : 2,000m (6,600feet) max) -20 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max						
ENVIRONMENT	VIBRATION	ALIIIODE		minutes period, 60minutes ea	-				
	IMPACT		196.1m/s² (20G), 11ms, one		2011 GIOLIS X, 1 GIOL 2 GAIS				
SAFETY AND	AGENCY APPROVA	LS			1), EN62368-1, EN62477-1 (O\	/C III). Complies with DFN-AN			
NOISE	CONDUCTED NOISE		, , ,	I-B, CISPR11-B, CISPR32-B	,, , , , , , , , , , , , , , , , , , , ,				
	HARMONIC ATTENU		Complies with IEC61000-3-		,,				
	CASE SIZE/WEIGHT		<u> </u>		/ 320g max (with chassis & c	over : 570g max)			
OTHERS	COOLING METHOD	*2		uires external fan) (Refer to "					

- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- Derating is required.

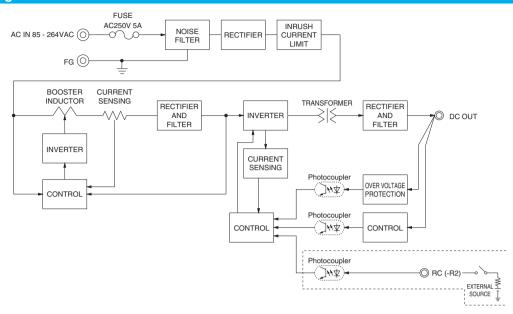
  At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.
- This is the value that measured on measuring board with capacitor of 22 µ F and 0.1 µ F at 150mm from output terminal. Measured
- by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM104). Ripple and ripple noise spec is change at lo=0 to 10% by burst
- operation.

  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.
- Please contact us about another class.

  12V output product, the maximum temperature of 40°C
- Applicable when Remote ON/OFF (optional) is added. To meet the specification, do not operate overload condition.

- . arctical operation is not possible. Sound noise may be generated by power supply in case of pulse load.

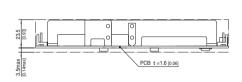




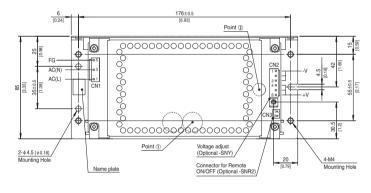
#### **External view**

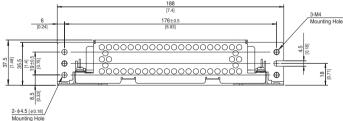
\* External size of option is different from standard type.

## Standard type Point ② - 3 - AC(N) - AC(L) Point (1 - φ3.5 [φ0.14]



#### Chassis and cover type





- $\ensuremath{\,\times\,}$  The back side of PCB of the power supply is assembled some SMDs.
- Be careful not to bump against the attached area by vibration.
- W 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 M		Mating connector	Terminal	
ONIA	B3P5-VH	VHR-5N	Chain	SVH-21T-P1.1
CNT	B3P5-VH	VHK-5N	Loose	BVH-21T-P1.1
ONIO	DOD \ // I	VHR-6N	Chain	SVH-21T-P1.1
CNZ	B6P-VH	VHK-6N	Loose	BVH-21T-P1.1

(Mfr: J.S.T.)

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

- % Dimensions in mm, [ ]=inches
  % 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 : Galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

#### CN1 Pin No. Input AC(L) 2 AC(N) 3 4 FG

CN2	
Pin No.	Output
1 to 3	-V
4 to 6	+V

CN3 Option (Mfr:J.S.T.				
PIN No.	Contents			
1	RC(+)			
2	RC(-)			
Model B2B Mating Cor (HP-2	-XH-A nnector (Term	inal)		

BXH-001T-P0.6

※ Pin No.2 and 4 is NC at CN1.※ Keep drawing current per pin below 5A for CN2.

## LHA300F

300



Example recommended EMI/EMC filter EAC-06-472

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
- G: Low leakage current

  4: EP (TE Connectivity) connector type

  J5: 8 pin type(Output connector)

  R2: with Remote ON/OFF

  S: with Chassis

  NI: with Chassis & cover

- T: Terminal block type
- T4: Push-in Terminal block type U1: Can be attached the external capacitor unit

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	LHA300F-12-Y	LHA300F-24-Y	LHA300F-48-Y
MAX OUTPUT WATTAGE[W] *2	300	300	302.4
DC OUTPUT *2	12V 25A	24V 12.5A	48V 6.3A

	MODEL		LHA300F-12-Y	LHA300F-24-Y	LHA300F-48-Y			
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to "Derating" and	Instruction Manual 1.1)				
	OUDDENTIAL	ACIN 100V						
	CURRENT[A]	ACIN 230V	1.6typ					
	FREQUENCY[Hz]		50 / 60 (45 - 66)					
EFFICIENCY[%]	ACIN 100V	90.0typ	91.5typ	92.0typ				
NPUT	EFFICIENCY[%]	ACIN 230V	92.0typ	93.5typ	94.0typ			
	DOWED FACTOR (L. 4000()	ACIN 100V	0.99typ	, , , , , , , , , , , , , , , , , , , ,	, , ,			
	POWER FACTOR (lo=100%)	ACIN 230V	0.93typ					
	INDUCUI QUIDDENITAL	ACIN 100V	20typ (lo=100%) Ta=25℃ at cold star	t				
	INRUSH CURRENT[A]	ACIN 230V	40typ (lo=100%) Ta=25℃ at cold star	t				
	LEAKAGE CURREN	T[mA]	0.40 / 0.75max (ACIN 100V / 240V 6	0Hz, lo=100%, According to IEC62368	3-1 and DEN-AN)			
	VOLTAGE[V]		12	24	48			
	CURRENT[A]	*2	25.0	12.5	6.3			
	LINE REGULATION		48max	96max	192max			
COAD REGUL RIPPLE[mVp-	LOAD REGULATION		100max	150max	240max			
		0 to +50°C *7		120max	150max			
	RIPPLE[mVp-p]	-10 to 0℃	160max	160max	200max			
	*4	lo=0 to 10%	160max	160max	200max			
		0 to +50℃*7	150max	150max	250max			
	RIPPLE NOISE[mVp-p]	-10 to 0℃	180max	180max	300max			
	*4	lo=0 to 10%	180max	180max	300max			
	TEMPERATURE REGULATION[mV]	0 to +50°C *7	120max	240max	480max			
		-10 to +50°C *7	150max	290max	600max			
	DRIFT[mV] *5			96max	192max			
	START-UP TIME[ms]		700typ (ACIN 100V, Io=100%)					
	HOLD-UP TIME[ms]		25typ (ACIN 100V, Io=100%)					
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		11.40 to 13.20	22.80 to 26.40	45.60 to 52.80			
	OUTPUT VOLTAGE SET		12.00 to 12.48	24.00 to 24.96	48.00 to 49.92			
	OVERCURRENT PROT		Works over 105% of rating and recov	ers automatically				
PROTECTION	OVERVOLTAGE PROTI	ECTION	13.80 to 16.80	27.60 to 33.60	55.20 to 67.20			
CIRCUIT AND			Not provided		1			
OTHERS	REMOTE SENSING		Not provided					
	REMOTE ON/OFF		Option (Refer to Instruction Manual 6	.1)				
	INPUT-OUTPUT-RC	*8	AC3,000V 1minute, Cutoff current = 1	I0mA, DC500V 100MΩ min (At Room	Temperature)			
	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)					
SOLATION	OUTPUT-RC-FG	*8	AC500V 1minute, Cutoff current = 25mA, DC500V 100MΩ min (At Room Temperature)					
	OUTPUT-RC	*8	AC100V 1minute, Cutoff current = 25mA, DC100V 10M $\Omega$ min (At Room Temperature)					
	OPERATING TEMP., HUMID. AND	ALTITUDE *2		nsing), 5,000m (16,500feet) max (EN624				
	STORAGE TEMP., HUMID. AND	ALTITUDE						
NVIRONMENT	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					
SAFETY AND	AGENCY APPROVA	LS		SA-C22.2 No.62368-1), EN62368-1, EN62	2477-1 (OVC III), Complies with DEN-AN			
IOISE	CONDUCTED NOISE			R11-B, CISPR32-B, EN55011-B, EN55				
REGULATIONS	HARMONIC ATTENU		Complies with IEC61000-3-2 (Class A					
	CASE SIZE/WEIGHT			nches] (W×H×D) / 580g max (with ch	assis & cover : 890g max)			
OTHERS	COOLING METHOD		Convection/Forced air (Requires exte		,			
	antions may affect the publish		· · · · · · · · · · · · · · · · · · ·	Noise mater (Equivalent to #8 Applicable )				

- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- Derating is required.
- 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.
- This is the value that measured on measuring board with capacitor of 22  $\mu$  F and 0.1  $\mu$  F 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 lo=0 to 10% by burst
- operation. Drift is the change in DC output for an eight hour period after a halfhour warm-up at 25°C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.
  - 12V output product, the maximum temperature of 35℃. December 27, 2022
- Applicable when Remote ON/OFF (optional) is added.

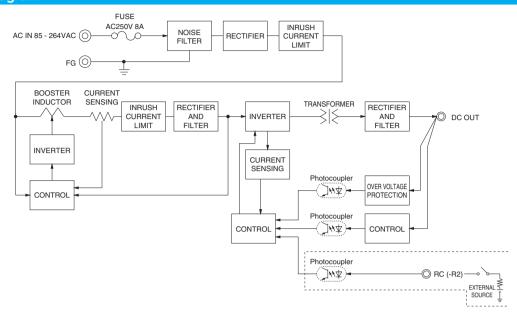
- Applicable When Hendrie Ordon (Optional) is acuted.

  To meet the specification, do not operate overload condition.

  Parallel operation is not possible.

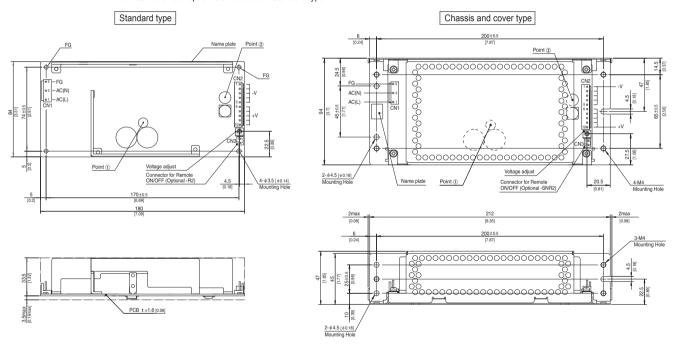
  Sound noise may be generated by power supply in case of pulse





#### **External view**

\* External size of option is different from standard type.



- $\ensuremath{\,\times\,}$  The back side of PCB of the power supply is assembled some SMDs.
- Be careful not to bump against the attached area by vibration.
- W 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	
ONIA	DODE VIII	VHR-5N	Chain	SVH-21T-P1.1
CNT	B3P5-VH	VHK-5N	Loose	BVH-21T-P1.1
ONIO	B10P-VH	VHR-10N	Chain	SVH-21T-P1.1
CNZ	B10P-VH	VHR-TUN	Loose	BVH-21T-P1.1

(Mfr: J.S.T.)

- \* I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (TE Connectivity) connector type.
- \* Option:-J5:Output connector as 8 pin type.

- % Dimensions in mm, [ ]=inches
  % Tolerance : ±1 [±0.04]
- Weight: 580g max (with chassis and cover: 890g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]

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

- ※ Optional chassis and cover material : Galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

#### CN1 Pin No. Input AC(L) 2 AC(N) 3 4 FG

CN2	
Pin No.	Output
1 to 5	-V
6 to 10	+V

CN3 Option (Mfr:J.S.T.					
PIN No.	Contents				
1	RC(+)				
2	RC(-)				
Model B2B-XH-A Mating Connector (Terminal) XHP-2					

BXH-001T-P0.6 or SXH-001T-P0.6

※ Pin No.2 and 4 is NC at CN1.

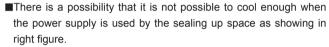
#### **Assembling and Installation Method**

#### Installation method

- ■This power supply is manufactured by SMD technology. Do not touch any SMD components on the unit. Be especially careful when handling.
- ■If using a metal chassis, keep proper insulation between the component and metal chassis, use the spacer of 8mm or more between bottom of power supply and metal chassis.

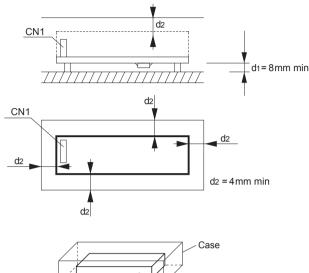
If d1 and/or d2 are less than the value mentioned in right figure, insert an insulating sheet with reinforced insulation between the power supply unit and metal chassis.

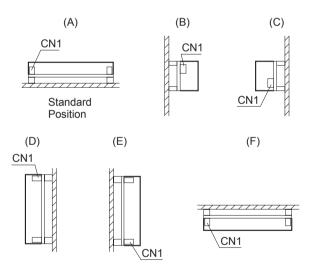
The following distance is not satisfactory for cooling condition. Please refer to "Derating" and Instruction Manual 3 for cooling method.



Please use it after confirming the temperature of points ① and points ② of Instraction Manual 3.

- ■Installation method shown right is possible.
- ■In optional -SN, Method (F) is not available with convection cooling. If method (F) is used, use with forced air cooling or derate temperature / load. For more details, please contact us.

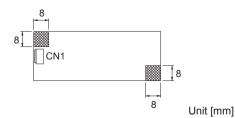




Power supply

#### **Mounting screw**

- ■The mounting screw should be  $\phi$ 3mm. The hatched area shows the allowance of metal parts for mounting.
- LHA10F, LHA15F, LHA30F



#### LHA50F, LHA75F, LHA100F, LHA150F, LHA300F

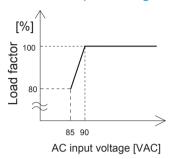


- ■If mounting metallic fittings on the board surface, ensure there is no contact with components.
- ■This product uses SMD technology. Please avoid the PCB installation method which includes the twisting stress or the bending stress.

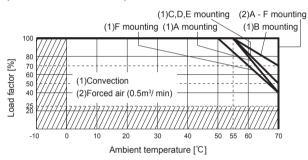


#### Derating

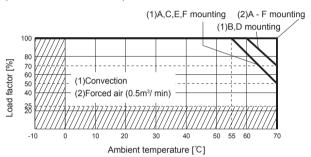
#### Derating curve for input voltage



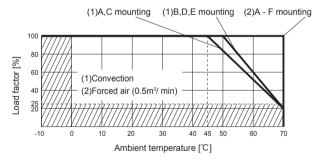
#### LHA10F-3R3-Y,-5,-12 Ambient temperature derating curve (Reference value)



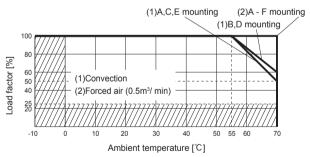
#### LHA10F-15,-24 Ambient temperature derating curve (Reference value)



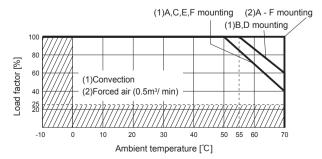
#### LHA10F-3R3-SNY,-5-SN,-12-SN Ambient temperature derating curve (Reference value)



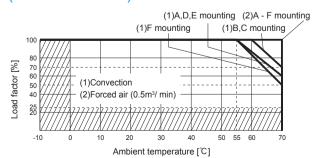
#### LHA10F-15-SN,-24-SN Ambient temperature derating curve (Reference value)



#### LHA15F-3R3-Y,-5,-12 Ambient temperature derating curve (Reference value)

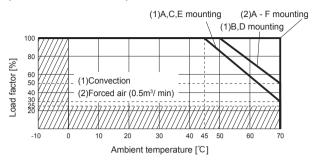


#### LHA15F-15,-24 Ambient temperature derating curve (Reference value)

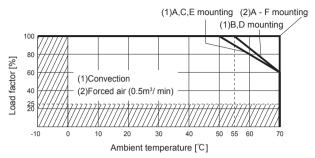


#### Derating

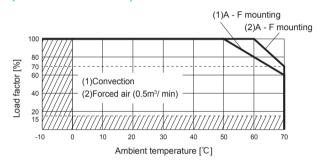
 LHA15F-3R3-SNY,-5-SN,-12-SN Ambient temperature derating curve (Reference value)



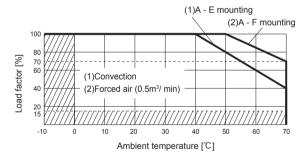
LHA15F-15-SN,-24-SN
 Ambient temperature derating curve (Reference value)



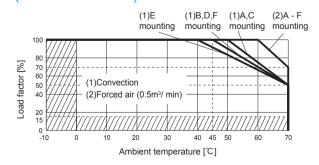
 LHA30F-3R3-Y,-5,-12,-15,-24
 Ambient temperature derating curve (Reference value)



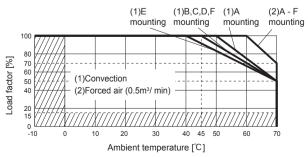
 LHA30F-3R3-SNY,-5-SN,-12-SN,-15-SN,-24-SN Ambient temperature derating curve (Reference value)



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



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



Ambient temperature derating curve

mounting

(1)Convection

(2)Forced air

, (0.5m<sup>3</sup>/ min)

(1)A,B,D

mounting

(1)C

mounting

LHA50F-5-SN.-15-SN

(Reference value)

100

70

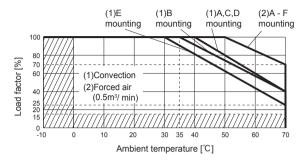


(2)A - F

mounting

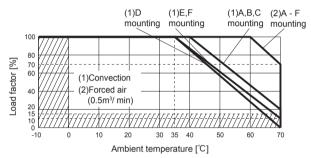
#### Derating

LHA50F-3R3-SNY.-12-SN.-24-SN.-36-SN.-48-SN Ambient temperature derating curve (Reference value)

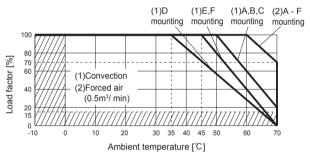


\_oad factor [%] Ambient temperature ſ℃1

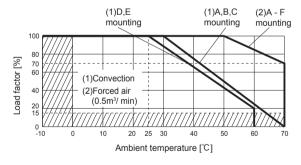
LHA75F-3R3-Y, -5 Ambient temperature derating curve (Reference value)



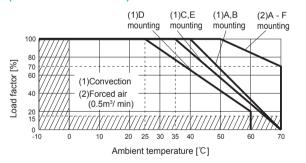
) LHA75F-12, -15, -24, -36, -48 Ambient temperature derating curve (Reference value)



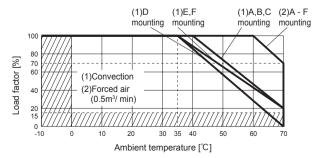
LHA75F-3R3-SNY,-5-SN Ambient temperature derating curve (Reference value)



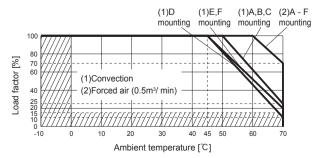
LHA75F-12-SN,-15-SN,-24-SN,-36-SN,-48-SN Ambient temperature derating curve (Reference value)



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

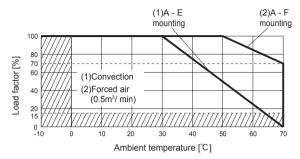


LHA100F-12, -15, -24, -36, -48 Ambient temperature derating curve (Reference value)

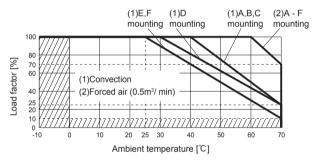


#### Derating

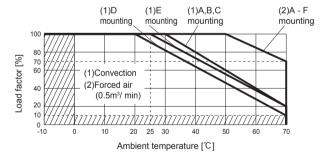
LHA100F-5-SN
 Ambient temperature derating curve (Reference value)



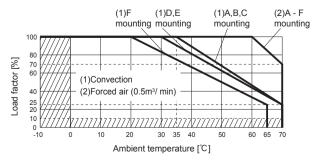
LHA150F-12
 Ambient temperature derating curve (Reference value)



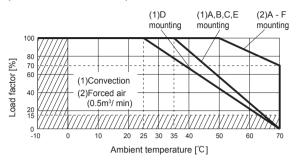
LHA150F-12-SN
 Ambient temperature derating curve (Reference value)



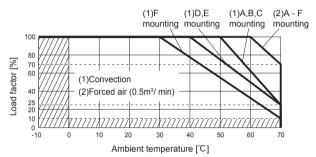
 LHA300F-12-Y Ambient temperature derating curve (Reference value)



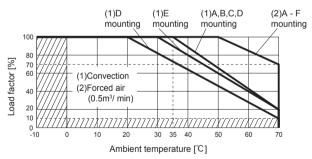
 LHA100F-12-SN,-15-SN,-24-SN,-36-SN,-48-SN Ambient temperature derating curve (Reference value)



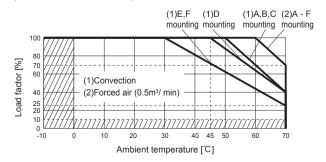
LHA150F-24, -36, -48
 Ambient temperature derating curve (Reference value)



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



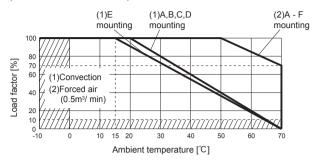
■ LHA300F-24-Y, -48-Y Ambient temperature derating curve (Reference value)



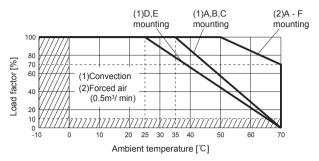


#### Derating

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



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



- ■The operating ambient temperature is different by with / without chassis cover or mounting position.
- ■In the hatched area, the specification of Ripple, Ripple Noise is different from other area.
- 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 make sure the maximum component temperature rise given in Instruction manual 3 is not exceeded.
- ■Please contact us for more information about operating ambient temperature.

#### **Instruction Manuals**

Please see catalog and instructionmanual before you use.

Instruction Manuals https://www.cosel.co.jp/redirect/catalog/en/LHA/ Before using our product https://en.cosel.co.jp/technical/caution/index.html





#### **Basic Characteristics Data**

Model	Circuit method	Switching frequency	Input Inrush current		PCB/Pattern			Series/Parallel operation availability	
Model	Circuit method		*3 [A]	protection	Material	Single sided	Double sided	Series operation	Parallel operation
LHA10F	Flyback converter	20 to 125	0.26	Resistance *4	CEM-3	Yes	-	Yes	No
LHA15F	Flyback converter	20 to 125	0.35	Thermistor	CEM-3	Yes	1	Yes	No
LHA30F	Flyback converter	30 to 130	0.62	Thermistor	FR-4	-	Yes	Yes	No
LHA50F	Flyback converter	30 to 130	1.05	Thermistor	FR-4	-	Yes	Yes	No
LHA75F	Active filter	15 to 300	0.9	Thermistor	FR-4	_	Yes	Yes	No
LHA75F	Flyback converter	50 to 140	0.9	THEITHSIO	FN-4	-	162	168	INO
LHA100F	Active filter	15 to 300	1.2	Thermistor	FR-4		Yes	Yes	No
LHATOUR	Flyback converter	35 to 130	1.2	THEITHISTO	FN-4	-	res	ies	INO
11141505	Active filter	15 to 300	1.0	Thoussistes	ED 4		V/0.0	Vaa	Na
LHA150F	LLC resonant converter	90 to 280	1.8	Thermistor	FR-4	-	Yes	Yes	No
11142005	Active filter	15 to 300	0.5	Thoussistes	ED 4		V/2.2	Vee	No
LHA300F	LLC resonant converter	65 to 200	3.5	Thermistor	FR-4	-	Yes	Yes	No

<sup>\*1</sup> The value changes depending on input and load.

<sup>\*2</sup> At light load, burst operation is performed to reduce input power. The switching frequency is changed by using condition. Please contact us for more details.

<sup>\*3</sup> The value of input current is at ACIN 100V and rated load.

<sup>\*4</sup> Resistance of the line filter.

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