







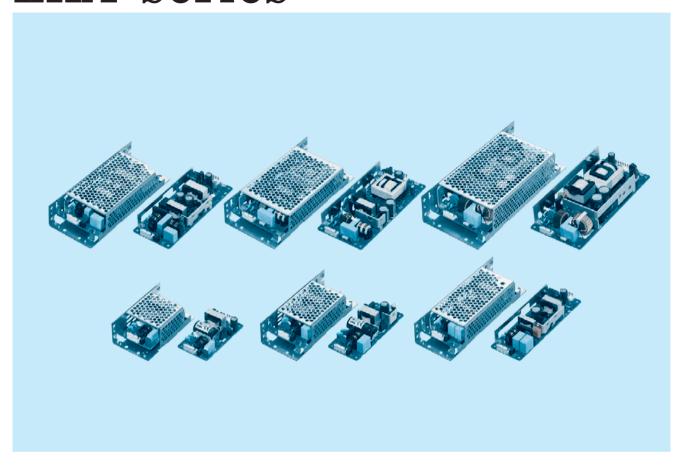








# LHA-series



#### 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

#### **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

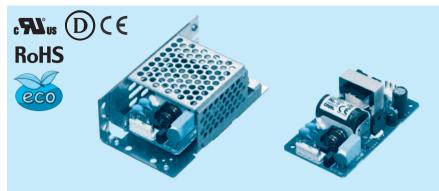
EN61000-4-5

EN61000-4-6

EN61000-4-8

EN61000-4-11

30



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(Tyco)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

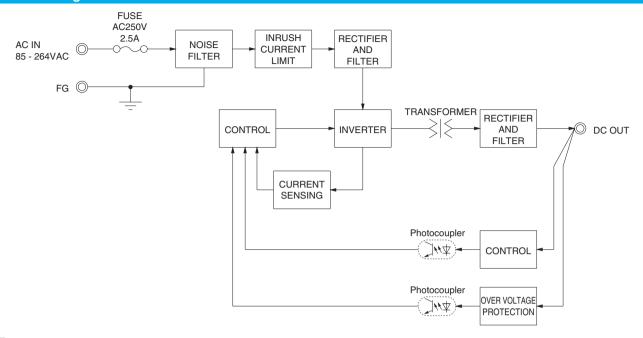
#### **SPECIFICATIONS**

	MODEL		LHA30F-3R3-Y	LHA30F-5	LHA30F-12	LHA30F-15	LHA30F-24				
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to	"Derating" and Instruct	ion Manual 1.1)						
	CURRENT[A]	ACIN 100V	0.42typ	0.62typ							
	CONNENT[A]	ACIN 230V	71 71								
	FREQUENCY[Hz]		50 / 60 (45 - 440)								
NPUT	EFFICIENCY[%]	ACIN 100V	83.0typ	83.0typ	85.0typ	85.5typ	87.0typ				
	EFFICIENCI[/6]		85.5typ	87.0typ	88.5typ	89.0typ	90.0typ				
	INRUSH CURRENT[A]		15typ (lo=100%) Ta=2								
	INNOSTI CONNENT[A]	ACIN 230V	35typ (lo=100%) Ta=25℃ at cold start								
	LEAKAGE CURREN	T[mA]	0.20 / 0.45max (ACIN 100V / 240V 60Hz, lo=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[		20max	20max	48max	60max	96max				
	LOAD REGULATION			40max	100max	120max	150max				
	RIPPLE[mVp-p]	0 to +50°C		80max	120max	120max	120max				
	*4		140max	140max	160max	160max	160max				
		lo=0 to 15%	300max	300max	300max	300max	300max				
		0 to +50°C	120max	120max	150max	150max	150max				
UTPUT		-10 to 0℃	160max	160max	180max	180max	180max				
		lo=0 to 15%	360max	360max	360max	360max	360max				
TEM	TEMPERATURE REGULATION[mV]	0 to +50°C		50max	120max	150max	240max				
		-10 to +50°C	60max	60max	150max	180max	290max				
[	DRIFT[mV]	*5	20max	20max	48max	60max	96max				
	START-UP TIME[ms]		40typ (ACIN 100V, lo=100%)								
L	HOLD-UP TIME[ms]		71 \	o=100%) / 170typ (ACIN 230V, Io=100%)							
	OUTPUT VOLTAGE ADJUSTMENT		2.85 to 3.63		, ,	put voltage between ±	<del>, /</del>				
	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				
ROTECTION	OVERCURRENT PROT			ating and recovers auto	· · · · · · · · · · · · · · · · · · ·						
RCUIT AND	OVERVOLTAGE PROTE		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								
	REMOTE SENSING		Not provided								
	INPUT-OUTPUT			utoff current = 10mA, D							
SOLATION	INPUT-FG		, ,	utoff current = 10mA, D							
	OUTPUT-FG		,	off current = 25mA, DC							
	OPERATING TEMP., HUMID. AND A			6RH (Non condensing)							
VVIRONMENT	STORAGE TEMP., HUMID. AND	ALTITUDE		6RH (Non condensing)	<u>, , , , , , , , , , , , , , , , , , , </u>						
	VIBRATION			2G), 3minutes period, 6		, Y and Z axis					
	IMPACT	_		s, once each X, Y and							
	AGENCY APPROVAL			uivalent to CAN/CSA-C			JEN-AN				
OISE	CONDUCTED NOISE			, VCCI-B, CISPR11-B,	<u> </u>						
	HARMONIC ATTENU			000-3-2 (Class A) (No b							
HERG	CASE SIZE/WEIGHT			07×1.07×3.44 inches]		x (with chassis & cover	: 210g max)				
	COOLING METHOD	*2	Convection/Forced air	(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.
- 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. 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.

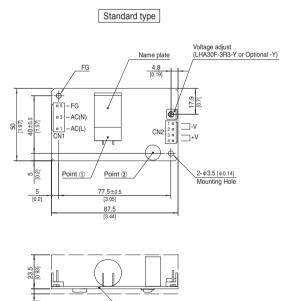
LHA-2





#### **External view**

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



PCB t=1.6 [0.06]

Voltage adjust (LHA30F-3R3-SNY or Optional -SNY) 97.5±0.5 ė₩ AC(N) 9 AC(L) Ф **(2)** (A) 00 Point ① Point ② 4-M4 Mounting Hole CN2 2-φ4.5 [φ0.18] Mounting Hole Name plate 97.5±0.5 [3.84] Mounting Hole 00000000 37.5 [1.48] 35.5 [1.4] ф 8.5 2- φ 4.5 [ φ 0.18] Mounting Hole

Chassis and cover 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. 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	I/O Connector Mating conne				
ONIA	DODE VIII	VHR-5N	Chain	SVH-21T-P1.1	
CNT	B3P5-VH	VHK-5N	Loose	BVH-21T-P1.1	
ONIO	D4D VIII	VHR-4N	Chain	SVH-21T-P1.1	
CNZ	CN2 B4P-VH	VHR-4N	Loose	BVH-21T-P1.1	

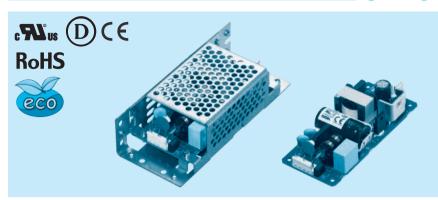
(Mfr: J.S.T.)

- \* I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (Tyco Electronics) connector type.
- CN1 Pin N 1 2 3 4

		CIVE	
О.	Input	Pin No.	Output
	AC(L)	1. 2	-V
		1, 2	-v
	AC(N)	3, 4	+V
		3, 4	T 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: 100g max (with chassis and cover: 210g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]
- ※ Optional chassis and cover material : Hot-dip galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

**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(Tyco)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

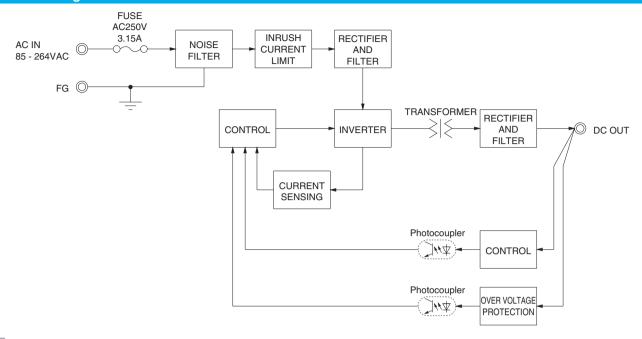
#### **SPECIFICATIONS**

M	IODEL		LHA50F-3R3-Y	LHA50F-5	LHA50F-12	LHA50F-15	LHA50F-24	LHA50F-36	LHA50F-48		
V	OLTAGE[VAC]	*2	85 - 264 1 φ (R	efer to "Derating"	and Instruction	Manual 1.1)					
	UDDENTIAL	ACIN 100V	0.56typ	0.82typ	1.05typ						
	CURRENT[A]	ACIN 230V	0.30typ	0.42typ	0.52typ						
F	REQUENCY[Hz]	,	50 / 60 (45 - 440)								
INPUT _	TELOIENOVIO/1	ACIN 100V	80.0typ	83.0typ	87.0typ	85.5typ	86.0typ	86.5typ	86.5typ		
-	FFICIENCY[%]	ACIN 230V	83.5typ	86.5typ	90.5typ	89.0typ	89.0typ	90.0typ	90.0typ		
	IDUCU OUDDENTIAL	ACIN 100V	15typ (lo=100%	) Ta=25°C at col							
l IIV	NRUSH CURRENT[A]	ACIN 230V	35typ (lo=100%) Ta=25°C at cold start								
L	EAKAGE CURREN	T[mA]	0.30 / 0.65max	(ACIN 100V / 24	0V 60Hz, lo=10	0%, According t	o IEC62368-1 ar	nd DEN-AN)			
V	OLTAGE[V]		3.3	5	12	15	24	36	48		
С	URRENT[A]	*2	8.0	8.0	4.3	3.5	2.1	1.4	1.1		
L	INE REGULATION[I	mV] *3	20max	20max	48max	60max	96max	144max	192max		
L	OAD REGULATION	[mV] *3	40max	40max	100max	120max	150max	240max	240max		
	RIPPLE[mVp-p]	0 to +50℃	80max	80max	120max	120max	120max	150max	150max		
H		-10 to 0℃	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		
OUTPUT   H	RIPPLE NOISE[mVp-p]	-10 to 0℃	160max	160max	180max	180max	180max	300max	300max		
		lo=0 to 15%	360max	360max	360max	360max	360max	360max	360max		
тс	EMPERATURE REGULATION[mV]	0 to +50°C	50max	50max	120max	150max	240max	360max	480max		
	INFERMIONE NEGOLATION[IIIV]	-10 to +50°C	60max	60max	150max	180max	290max	450max	600max		
	RIFT[mV]	*5	20max	20max	48max	60max	96max	144max	192max		
S	TART-UP TIME[ms]		40typ (ACIN 100V, Io=100%)								
н	HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%) / 140typ (ACIN 230V, Io=100%)								
OL	UTPUT VOLTAGE ADJUSTMENT	RANGE[V]	2.85 to 3.63	Fixed ("Y"option	·	adjusting output	voltage between	±10%)			
	UTPUT VOLTAGE SET		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		
	VERCURRENT PROT	,		% of rating and I	recovers automa						
CIRCUIT AND	VERVOLTAGE PROTE		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 O	PERATING INDICA	TION	Not provided								
R	REMOTE SENSING		Not provided								
	NPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)								
	NPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)								
	OUTPUT-FG		AC500V 1minute, Cutoff current = 25mA, DC500V 100M $\Omega$ min (At Room Temperature)								
	PERATING TEMP.,HUMID.AND A										
	TORAGE TEMP.,HUMID.AND	ALTITUDE				000m (30,000fee					
V	IBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis								
	MPACT			), 11ms, once ea							
	GENCY APPROVAL							olies with DEN-A	N		
	ONDUCTED NOISE						11-B, EN55032-	В			
	IARMONIC ATTENU		Complies with II								
OTHERS -	ASE SIZE/WEIGHT			_ •				s & cover : 280g i	max)		
С	COOLING METHOD	*2	Convection/Ford	ced air (Requires	external fan) (F	Refer to "Derating	<u>j")</u>				

- 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. 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.

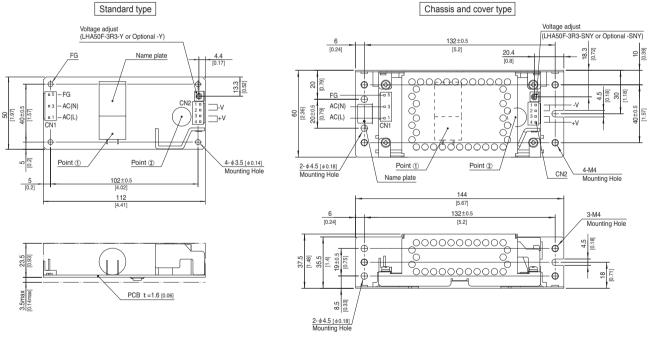
LHA-4





#### **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	CN1 B3P5-VH	VILID EN	Chain	SVH-21T-P1.1	
CNT		VHR-5N	Loose	BVH-21T-P1.1	
ONIO	B4P-VH	VILID AN	Chain	SVH-21T-P1.1	
CN2	B4P-VH	VHR-4N	Loose	BVH-21T-P1.1	

(Mfr: J.S.T.)

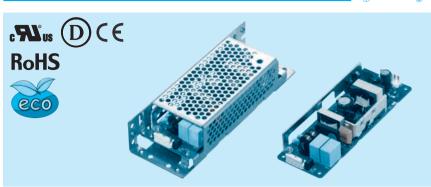
- \* I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (Tyco Electronics) connector type.
- CN1 CN<sub>2</sub> Pin No. Pin No. Output Input AC(L) 1, 2 AC(N) 3 3. 4 4 FG
- ※ Pin No.2 and 4 is NC at CN1.
- ※ Keep drawing current per pin below 5A for CN2.
- ※ Dimensions in mm, [ ]=inches
- % Tolerance : ±1 [±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 : Hot-dip galvanizing steel board

-V

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

### LHA75F

A 75 F



Example recommended EMI/EMC filter

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(Tyco)connector type

S: with Chassis SN: with Chassis & cover

Y: with Potentiometer

For option details, refer to Instruction Manual 6.

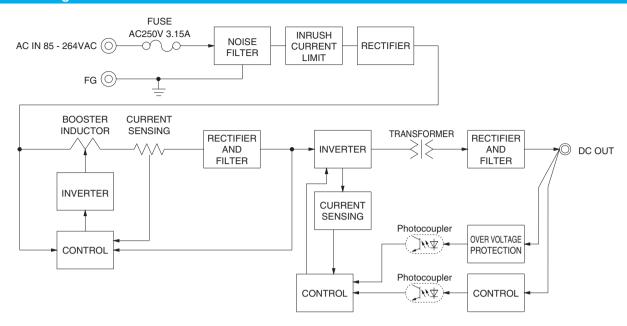
This power supply is manufactured by SMD technology. The stress to PCB like twisting or bending causes the defect of the unit, so handle the unit with care. \*Make sure necessary tests will be carried out on your end equipment with the power supply installed in accordance with any required EMC/EMI regulations.

MODEL	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)						
	CURRENT[A]	ACIN 100V	0.6typ	0.8typ	0.9typ							
	CONNENT[A]	ACIN 230V	0.3typ	0.4typ	0.5typ							
	FREQUENCY[Hz]		50 / 60 (45 - 66)									
	EFFICIENCY[%]	ACIN 100V	74.0typ	79.0typ	84.5typ	85.5typ	86.0typ	87.5typ	87.5typ			
NPUT		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									
	INDUCH CURRENTIAL	NRUSH CURRENT[A] ACIN 100V		15typ (lo=100%) Ta=25°C at cold start								
	INNUSH CONNENT[A]	ACIN 230V		a) Ta=25°C at col								
	LEAKAGE CURREN	T[mA]	0.40 / 0.75max	(ACIN 100V / 24	0V 60Hz, lo=10	00%, According	to IEC62368-1 ar	nd 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[	mV] *3	20max	20max	48max	60max	96max	144max	192max			
	LOAD REGULATION	[mV] *3	40max	40max	100max	120max	150max	240max	240max			
	DIDDI EtV1	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			
	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 REQUILATIONS	0 to +50°C *7	50max	50max	120max	150max	240max	360max	480max			
	TEMPERATURE REGULATION[mV]	-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, lo=100%)			•					
	HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%)									
	OUTPUT VOLTAGE ADJUSTMENT	RANGE[V]	2.85 to 3.63	Fixed ("Y"option	is available for a	djusting output vo	oltage 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 50.0			
	OVERCURRENT PROT	ECTION	Works over 105	% of rating and	recovers automa	atically						
PROTECTION	OVERVOLTAGE PROTI	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 67.2			
CIRCUIT AND	<b>OPERATING INDICA</b>	TION	Not provided									
THENS	REMOTE SENSING		Not provided									
	INPUT-OUTPUT		AC3,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)									
SOLATION	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)									
	OUTPUT-FG		AC500V 1minut	te, Cutoff current	= 25mA, DC500	0V 100M $\Omega$ min	(At Room Tempe	rature)				
	OPERATING TEMP., HUMID. AND /	ALTITUDE *2	-10 to +70°C, 20	0 - 90%RH (Non	condensing), 5,	000m (16,500fe	et) max					
NVIRONMENT	STORAGE TEMP., HUMID. AND	ALTITUDE	-20 to +75°C, 20	0 - 90%RH (Non	condensing), 9,	000m (30,000fe	et) max					
NVIRONWENT	VIBRATION		10 - 55Hz, 19.6	m/s² (2G), 3minu	ites period, 60m	inutes each alor	ng X, Y and Z axis	S				
	IMPACT			i), 11ms, once ea								
AFETY AND	AGENCY APPROVA	LS	UL62368-1, c-L	JL (equivalent to	CAN/CSA-C22.	2No.62368-1), E	N62368-1, Com	plies with DEN-Al	N			
IOISE	CONDUCTED NOISE		Complies with F	CC-B, VCCI-B,	CISPR11-B, CIS	SPR32-B, EN550	011-B, EN55032-	В				
REGULATIONS	HARMONIC ATTENU	JATOR *6	Complies with I	EC61000-3-2 (C	lass A)							
	CASE SIZE/WEIGHT		50×27×150m	m [1.97×1.07×5	5.91 inches] (WX	(H×D) / 190g m	nax (with chassis	& cover : 370g m	iax)			
OTHERS												

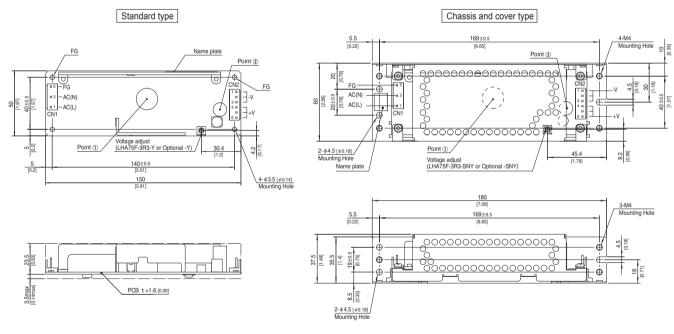
- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- Derating is required.
- At low load conditions, the burst mode operation will start. To check load regulation, you
- will need to measure the characteristics at average mode 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.



- $\ensuremath{\,\times\,}$  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	CN1 B3P5-VH	VILID EN	Chain	SVH-21T-P1.1	
CNT		VHR-5N	Loose	BVH-21T-P1.1	
ONIO	DOD VIII	V/LID ON	Chain	SVH-21T-P1.1	
CN2	B6P-VH	VHR-6N	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

1		CINZ	
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	+ν
5	FG		

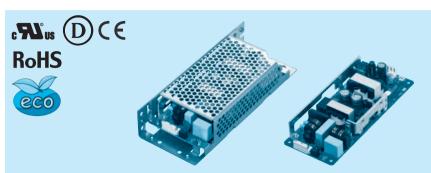
CNIO

- \* 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]
- ※ Optional chassis and cover material : Hot-dip galvanizing steel board
- ※ Mounting torque (Mounting hole of chassis): 1.5N⋅m max

LHA-7

### **LHA100F**

100



Example recommended EMI/EMC filter EAC-03-472

 $\label{pulse noise type : EAP series} \label{eq:energy} \mbox{High voltage pulse noise type : EAP series}$ 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(Tyco)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]		85 - 264 1 φ (Refe	er to "Derating" and	Instruction Manua	l 1.1)			
	CURRENT[A] ACIN 100V ACIN 230V		1.0typ	1.0typ 1.2typ					
			0.5typ	0.6typ					
F	FREQUENCY[Hz]		50 / 60 (45 - 66)						
_	POWER FACTOR (In-100%)	ACIN 100V	82.0typ	87.0typ	88.0typ	86.5typ	87.0typ	87.0typ	
NPUT   E		ACIN 230V	84.0typ	89.0typ	90.0typ	89.0typ	89.0typ	89.0typ	
D.		ACIN 100V	0.97typ	0.97typ					
"		ACIN 230V	0.83typ	0.87typ					
I.	NRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%) Ta=25℃ at cold start						
"	NRUSH CURRENT[A]	ACIN 230V	35typ (lo=100%) 7	ā=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	
	DIDDI E[mVn n]	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	
_	RIPPLE NOISE[mVp-p]	0 to +50°C *7	120max	150max	150max	150max	250max	250max	
OUTPUT   K		-10 to 0℃	160max	180max	180max	180max	300max	300max	
		lo=0 to 15%	360max	400max	600max	600max	600max	600max	
75	I TEMPERATURE REGIII ATIONIMVI E	0 to +50°C *7	50max	120max	150max	240max	360max	480max	
["		-10 to +50°C *7	60max	150max	180max	290max	450max	600max	
D	DRIFT[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, Io=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						
	REMOTE SENSING		Not provided						
	REMOTE CONTROL			struction Manual 6					
	NPUT-OUTPUT-RC	*8				$0 {\sf M} \Omega$ min (At Room			
SOLATION IN	NPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)						
O	OUTPUT-RC-FG		AC500V 1minute, Cutoff current = 25mA, DC500V 100M $\Omega$ min (At Room Temperature)						
	OUTPUT-RC		AC100V 1minute, Cutoff current = 25mA, DC100V 10M $\Omega$ min (At Room Temperature)						
<u> </u>	PERATING TEMP.,HUMID.AND A		3,, -,						
NVIRONMENT —	TORAGE TEMP.,HUMID.AND	ALTITUDE			lensing), 9,000m (3				
V	/IBRATION					ach along X, Y and	Z axis		
	MPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis						
	AGENCY APPROVAL						Complies with DEN	N-AN	
	CONDUCTED NOISE		Complies with FC	C-B, VCCI-B, CISP	R11-B, CISPR32-E	B, EN55011-B, EN5	5032-B		
REGULATIONS H	IARMONIC ATTENU	IATOR *6		61000-3-2 (Class A					
OTHERS —	CASE SIZE/WEIGHT						chassis & cover : 45	0g max)	
C	COOLING METHOD	*2	Convection/Force	d air (Requires exte	ernal fan) (Refer to	"Derating")			

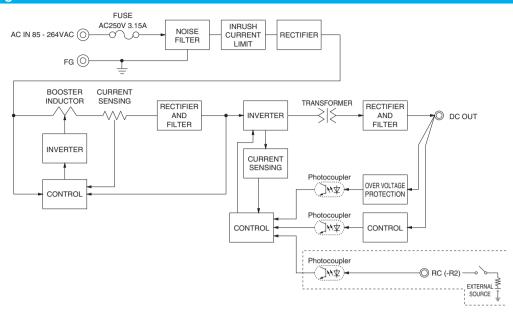
- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.
- specifications.

  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.

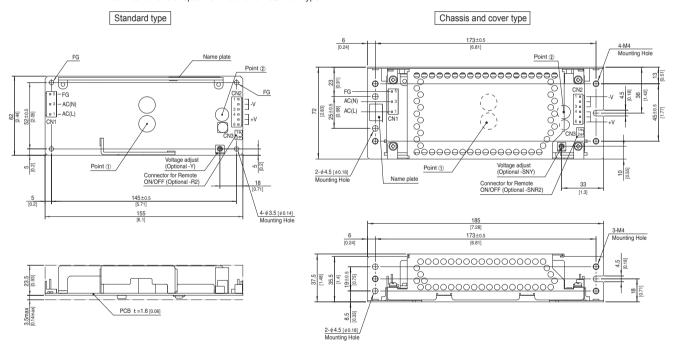
  This is the value that measured on measuring board with capacitor
- of 22 µ F and 0.1 µ F at 150mm from output terminal. Measured by 20MHz oscilloscope or Ripple-Noise meter (Equivalent to KEISOKU-GIKEN:RM104).
- Ripple and ripple noise spec is change at lo=0 to 15% by burst
- operation. Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25  $^{\circ}$ C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.
- rrease 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.

Chain	SVH-21T-P1.1
CNIA DODE VIII VIID ENI CIIdill	SVH-211-P1.1
CN1 B3P5-VH VHR-5N Loose	BVH-21T-P1.1
CN2 B6P-VH VHR-6N Chain	SVH-21T-P1.1
CN2 B6P-VH VHR-6N Loose	BVH-21T-P1.1

(Mfr: J.S.T.)

- \* I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (Tyco Electronics) 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 : Hot-dip galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

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

Pin No.	Output	PI	N No.	Contents
1 to 3	-V		1	RC(+)
1 10 3	- v		2	RC(-)
4 to 6	+V		del B2B	-XH-A

Model B2B-XH-A	
Mating Connector (Ter	minal)
XHP-2	
/ BXH-001T-P0.6	1

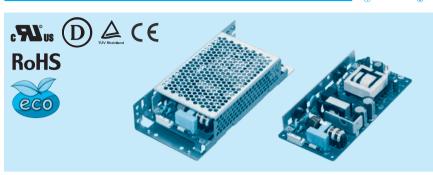
CN3 Option (Mfr:J.S.T.)

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

  √ 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(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

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 "De	erating" and Instruction Ma	anual 1.1)				
	CURRENT[A]	ACIN 100V	1.8typ						
	CORNENT[A]	ACIN 230V	0.8typ						
	FREQUENCY[Hz]		50 / 60 (45 - 66)						
	EFFICIENCY[%]	ACIN 100V	86.5typ	89.0typ	89.5typ	90.0typ			
INPUT	LITIOILINO I [/0]	ACIN 230V	89.5typ	92.0typ	92.5typ	93.0typ			
	POWER FACTOR (Io=100%)	ACIN 100V	0.99typ						
	FOWER FACTOR (IO=100 /6)	ACIN 230V	0.91typ						
	INRUSH CURRENT[A]	ACIN 100V		5typ (lo=100%) Ta=25°C at cold start					
		ACIN 230V		85typ (lo=100%) Ta=25°C at cold start					
	LEAKAGE CURREN	T[mA]	` `		6, According to IEC62368-1 a				
	VOLTAGE[V]		12	24	36	48			
	CURRENT[A]	*2	12.5	6.3	4.2	3.2			
	LINE REGULATION[			96max	144max	192max			
	LOAD REGULATION			150max	240max	240max			
	RIPPLE[mVp-p]	0 to +50℃ *7		120max	150max	150max			
	NIPPLE[IIIVP-P]	-10 to 0℃	160max	160max	200max	200max			
		lo=0 to 10%	160max	160max	200max	200max			
	RIPPLE NOISE[mVp-p]	0 to +50°C *7	150max	150max	250max	250max			
OUTPUT	*4	-10 to 0℃	180max	180max	300max	300max			
		_	230max	230max	300max	300max			
	TEMPERATURE REGULATION[mV]	0 to +50°C *7	120max	240max	360max	480max			
		-10 to +50°C *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%)   Fixed ("Y"option is available for adjusting output voltage between +10%, -5%)						
	OUTPUT VOLTAGE ADJUSTMENT								
	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 ratin	<u> </u>					
PROTECTION	OVERVOLTAGE PROT		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 Manual 6.1)						
	INPUT-OUTPUT-RC	*8	AC3,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)						
ISOLATION	INPUT-FG OUTPUT-RC-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)  AC500V 1minute, Cutoff current = 25mA, DC500V 100M $\Omega$ min (At Room Temperature)						
			·		<u>'</u>				
	OUTPUT-RC OPERATING TEMP., HUMID.AND		The reet intimately eaten earrent Zenning De reet renner intimately						
ENVIRONMENT	STORAGE TEMP., HUMID. AND	ALIIIUDE			tes each along X, Y and Z axi	·			
	VIBRATION IMPACT			once each X, Y and Z axis		15			
SAFETY AND	AGENCY APPROVA	1 6				'-1 (OVC III), Complies with DEN-AN			
NOISE	CONDUCTED NOISE		, , ,		R32-B, EN55011-B, EN55032-				
REGULATIONS			Complies with IEC61000-		102-D, EN00011-D, EN00032-	-U			
	CASE SIZE/WEIGHT				HXD) / 320g max (with chassi	is 8 cover : 570g max)			
OTHERS	COOLING METHOD		Convection/Forced air (R			is a cover . 370y max)			
	COOLING WE I HOD	*2	Convection/Forced air (R	equires externarian) (Refe	ei to Delatting )				

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

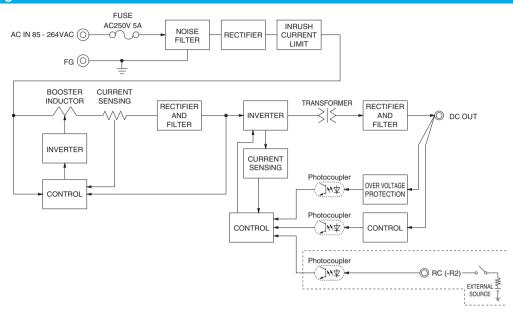
  At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.
- This is the value that measured on measuring board with capacitor of 22 µ F and 0.1 µ F at 150mm from output terminal. Measured
- by 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.

- . wanter operation is not possible.

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



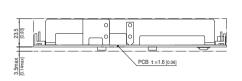


#### **External view**

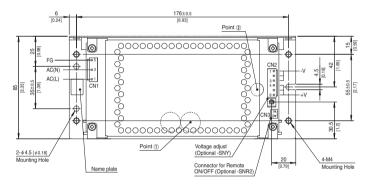
\* External size of option is different from standard type.

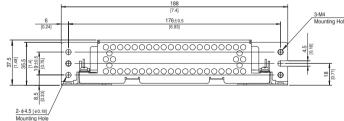
## Point ② 93 - AC(N) - AC(L) Point ① - φ3.5 [φ0.14]

Standard type



#### 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		Mating connector		
ONIA	ONA PODE VALL VALD EN		Chain	SVH-21T-P1.1
CN1 B3P5-V	B3P5-VH	VHR-5N	Loose	BVH-21T-P1.1
ONIO	DOD VIII	V/LID CN	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 (Tyco Electronics) 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: Hot-dip galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

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

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

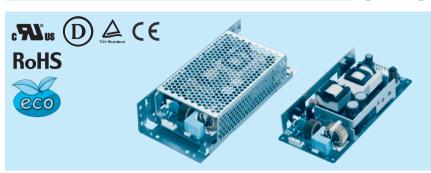
C	CN3 Option (Mfr:J.S.T.)						
	PIN No.	Contents					
	1	RC(+)					
	2	RC(-)					
N	Model B2B-XH-A Mating Connector (Terminal) XHP-2						

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

※ Pin No.2 and 4 is NC at CN1.※ 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. ①Series name ②Single output

3 Output wattage
4 Universal input
5 Output voltage
6 Optional \*1
C: with Coating

G: Low leakage current

4: EP(Tyco)connector type
J5: 8 pin type(Output connector)
R2: with Remote ON/OFF
S: with Chassis
SN: 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)						
INPUT	CURRENT[A]	ACIN 100V							
	CONNENT[A]	ACIN 230V							
	FREQUENCY[Hz]		50 / 60 (45 - 66)						
	EFFICIENCY[%]	ACIN 100V	90.0typ	91.5typ	92.0typ				
	EFFICIENCY[%]	ACIN 230V	92.0typ	93.5typ	94.0typ				
	POWER FACTOR (Io=100%)	ACIN 100V	0.99typ						
	FOWER FACTOR (IO=100 /6)	ACIN 230V	0.93typ						
	INRUSH CURRENT[A]	ACIN 100V	20typ (lo=100%) Ta=25℃ at cold star						
	INNUSH CONNENT[A]	ACIN 230V	40typ (lo=100%) Ta=25℃ at cold star	rt					
	LEAKAGE CURRENT[mA]		0.40 / 0.75max (ACIN 100V / 240V 60Hz, Io=100%, According to IEC62368-1 and DEN-AN)						
	VOLTAGE[V]		12	24	48				
	CURRENT[A]	*2	25.0	12.5	6.3				
	LINE REGULATION[	mV] *3	48max	96max	192max				
	LOAD REGULATION	[mV] *3	100max	150max	240max				
	DIDDLETTO VICTOR	0 to +50°C *7	120max	120max	150max				
	RIPPLE[mVp-p]	-10 to 0℃	160max	160max	200max				
	***	lo=0 to 10%	160max	160max	200max				
	DIDDLE MOIOEC W. 1	0 to +50°C *7	150max	150max	250max				
OUTPUT	RIPPLE NOISE[mVp-p]	-10 to 0℃	180max	180max	300max				
	***	lo=0 to 10%	180max	180max	300max				
	TEMPERATURE REGULATION[mV]	0 to +50°C *7	120max	240max	480max				
	TEMPERATURE REGULATION[IIIV]	-10 to +50°C *7	150max	290max	600max				
	DRIFT[mV]	*5	48max	96max	192max				
	START-UP TIME[ms]		700typ (ACIN 100V, Io=100%)						
	HOLD-UP TIME[ms]		25typ (ACIN 100V, lo=100%)						
	OUTPUT VOLTAGE ADJUSTMENT RANGE[V]		11.40 to 13.20	22.80 to 26.40	45.60 to 52.80				
	OUTPUT VOLTAGE SETTING[V]		12.00 to 12.48	24.00 to 24.96	48.00 to 49.92				
	OVERCURRENT PROT	ECTION	Works over 105% of rating and recovers automatically						
PROTECTION	OVERVOLTAGE PROTECTION		13.80 to 16.80	27.60 to 33.60	55.20 to 67.20				
CIRCUIT AND	OPERATING INDICATION		Not provided						
OTHERS	REMOTE SENSING		Not provided						
	REMOTE ON/OFF		Option (Refer to Instruction Manual 6.1)						
	INPUT-OUTPUT-RC *8		riosisos riminato, outen current remai, 2 cocor room min (ric ricem rempetature)						
ISOLATION	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M $\Omega$ min (At Room Temperature)						
ISOLATION	OUTPUT-RC-FG *8		7.00007 Timilate, Gaten Garrent Zenii i, 200007 Tesini Timir (7.1.1.10011 Temperature)						
	OUTPUT-RC *8		7.6 To T Thinlate, Gaton Carron Zona, Do Toot Tom Thin (7.4 Tooth Tompolataro)						
	OPERATING TEMP., HUMID. AND ALTITUDE *2		-10 to +70°C, 20 - 90%RH (Non condensing), 5,000m (16,600feet) max (EN62477-1 (OVC III) : 2,000m (6,600feet) max)						
ENVIRONMENT	STORAGE TEMP., HUMID. AND ALTITUDE		-20 to +75°C, 20 - 90%RH (Non condensing), 9,000m (30,000feet) max						
ENVIRONMENT	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	AGENCY APPROVAL				2477-1 (OVC III), Complies with DEN-AN				
NOISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B						
REGULATIONS	HARMONIC ATTENUATOR *6		Complies with IEC61000-3-2 (Class A)						
OTHERS	CASE SIZE/WEIGHT		84×37×180mm [3.31×1.46×7.09 inches] (W×H×D) / 580g max (with chassis & cover: 890g max)						
O.IILIIO	COOLING METHOD *2		Convection/Forced air (Requires external fan) (Refer to "Derating")						

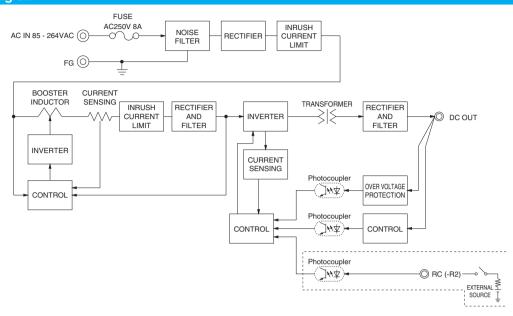
- The listed options may affect the published standard specifications. Please contact us for detailed product specifications.

  Derating is required.
- 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℃.
- Applicable when Remote ON/OFF (optional) is added.
- To meet the specification, do not operate overload condition.

  Parallel operation is not possible.

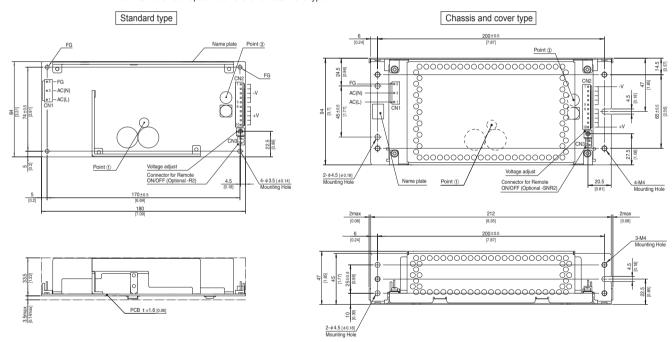
  Sound noise may be generated by power supply in case of pulse





#### **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		
Ι.	CN1	B3P5-VH	VHR-5N	Chain	SVH-21T-P1.1	
ľ			VHK-5N	Loose	BVH-21T-P1.1	
	CN2	B10P-VH	VHR-10N	Chain	SVH-21T-P1.1	
Ľ				Loose	BVH-21T-P1.1	

(Mfr: J.S.T.)

- \* I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (Tyco Electronics) 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]
- ※ Optional chassis and cover material: Hot-dip galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

CN1						
Pin No.	Input					
1	AC(L)					
2						
3	AC(N)					
4						
5	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) KHP-2						

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

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

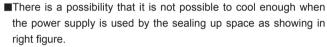
#### **Assembling and Installation Method**

#### 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.

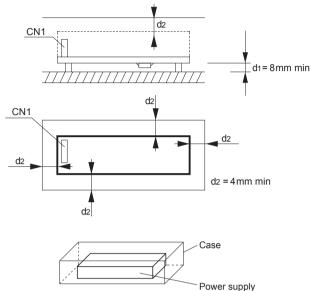
If d1 and/or d2 are less than the value mentioned in right figure, insert an insulating sheet with reinforced insulation between the power supply unit and metal chassis.

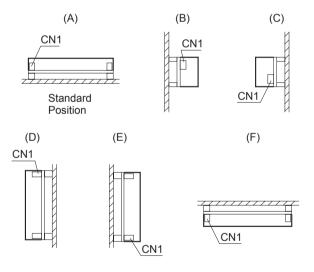
The following distance is not satisfactory for cooling condition. Please refer to "Derating" and Instruction Manual 3 for cooling method.



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.

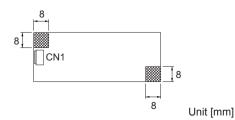




#### **Mounting screw**

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

#### LHA30F



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

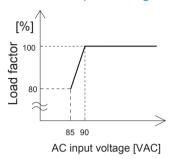


- ■If mounting metallic fittings on the board surface, ensure there is no contact with components.
- ■This product uses SMD technology. Please avoid the PCB installation method which includes the twisting stress or the bending stress.

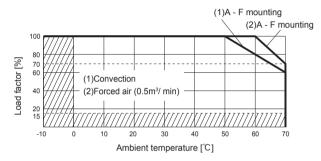


#### Derating

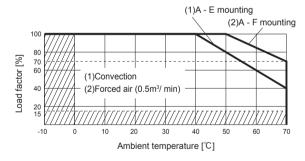
Derating curve for input voltage



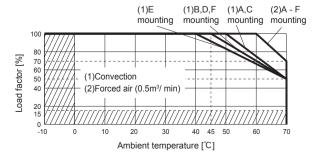
LHA30F-3R3-Y,-5,-12,-15,-24 Ambient temperature derating curve (Reference value)



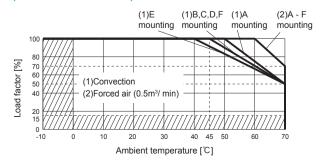
LHA30F-3R3-SNY,-5-SN,-12-SN,-15-SN,-24-SN Ambient temperature derating curve (Reference value)



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



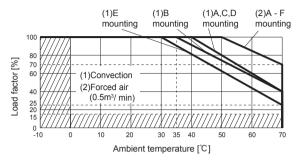
LHA50F-12, -15 Ambient temperature derating curve (Reference value)



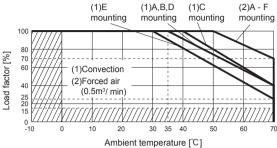
### **COSEL** | LHA-series

#### Derating

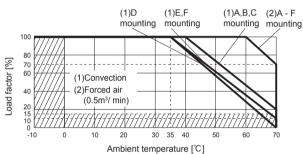
 LHA50F-3R3-SNY,-12-SN,-24-SN,-36-SN,-48-SN Ambient temperature derating curve (Reference value)



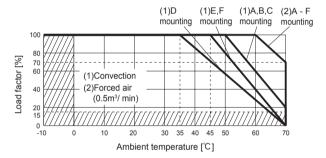
LHA50F-5-SN,-15-SN
 Ambient temperature derating curve (Reference value)



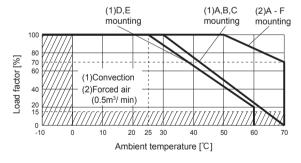
LHA75F-3R3-Y, -5
 Ambient temperature derating curve (Reference value)



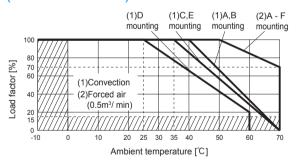
 LHA75F-12, -15, -24, -36, -48
 Ambient temperature derating curve (Reference value)



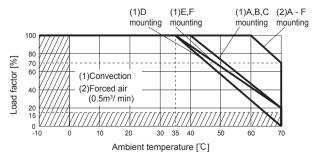
LHA75F-3R3-SNY,-5-SN
 Ambient temperature derating curve (Reference value)



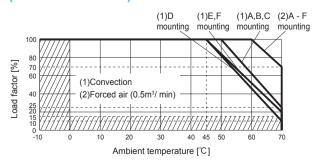
 LHA75F-12-SN,-15-SN,-24-SN,-36-SN,-48-SN Ambient temperature derating curve (Reference value)



LHA100F-5
 Ambient temperature derating curve (Reference value)



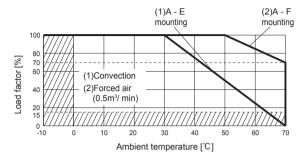
● LHA100F-12, -15, -24, -36, -48 Ambient temperature derating curve (Reference value)



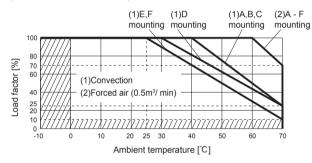


#### Derating

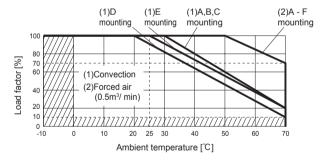
LHA100F-5-SN Ambient temperature derating curve (Reference value)



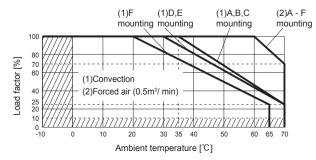
LHA150F-12 Ambient temperature derating curve (Reference value)



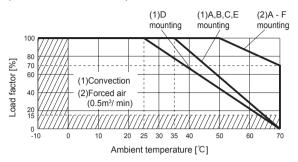
LHA150F-12-SN Ambient temperature derating curve (Reference value)



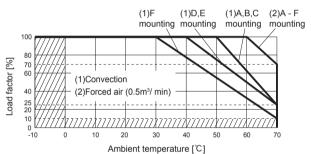
■ LHA300F-12-Y Ambient temperature derating curve (Reference value)



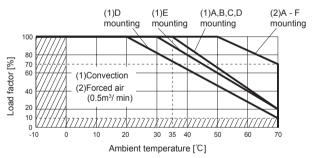
LHA100F-12-SN.-15-SN.-24-SN.-36-SN.-48-SN Ambient temperature derating curve (Reference value)



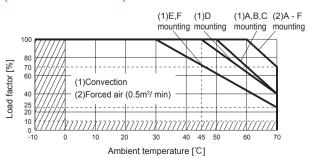
LHA150F-24, -36, -48 Ambient temperature derating curve (Reference value)



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



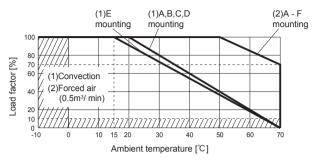
LHA300F-24-Y, -48-Y Ambient temperature derating curve (Reference value)



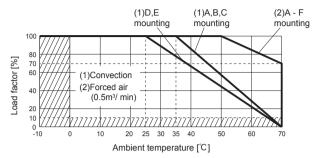
### **COSEL** LHA-series

#### 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://en.cosel.co.jp/product/powersupply/LHA/ Before using our product https://en.cosel.co.jp/technical/caution/index.html





#### **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 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
	Flyback converter	50 to 140							
LHA100F	Active filter	15 to 300	1.2	Thermistor	FR-4	-	Yes	Yes	No
	Flyback converter	35 to 130							
LHA150F	Active filter	15 to 300	1.8	Thermistor	FR-4	-	Yes	Yes	No
	LLC resonant converter	90 to 280							
LHA300F	Active filter	15 to 300	3.5	Thermistor	FR-4	-	Yes	Yes	No
	LLC resonant converter	65 to 200							

- \*1 The value changes depending on input and load.
- \*2 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.
- \*3 The value of input current is at ACIN 100V and rated load.

### **X-ON Electronics**

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Switching Power Supplies category:

Click to view products by Cosel manufacturer:

Other Similar products are found below:

70841011 73-551-0005 73-551-0048 EVS57-5R3/A AAD600S-4-OP MS924 HWS50A-5/RA KD0204 LDIN100150 FP80 FRV7000G
22929 PS3E-F12F CQM1IA121 VI-PU22-EXX LDIN5075 432703037161 09-160CFG LPM000-BBAR-08 LPM000-BBAR-07 08-304661055G DMB-EWG CQM1IPS01 SP-300-5 CQM1-IPS02 VI-MUL-ES 22829 08-30466-0028G 09-250CFG CA400 H47251 96PSRA460WOTH-2 VP-E2935648E G08-L G06-Q01 GHA300F-12-SNF MTA040009A FSA150024A VI-RUR22-EWXX VI-PU03-EYW
PM1-03B-48-2 VI-LUF-EW VI-QCWB3-CSV HLS30ZE-NT8 UT1404-7 ERP-350-12 S8FSG01512C S8FSG03012C VI-PU22-EYY
XPFM201A+ S8FS-G15015C