







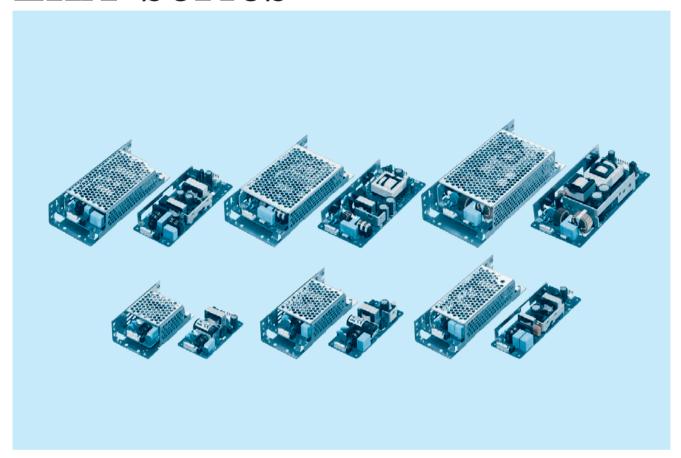








LHA-series



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

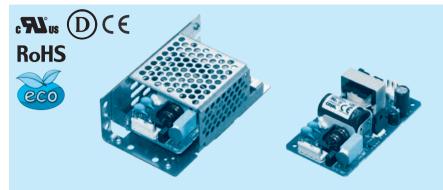
EN61000-4-5

EN61000-4-6

EN61000-4-8

EN61000-4-11

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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
 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

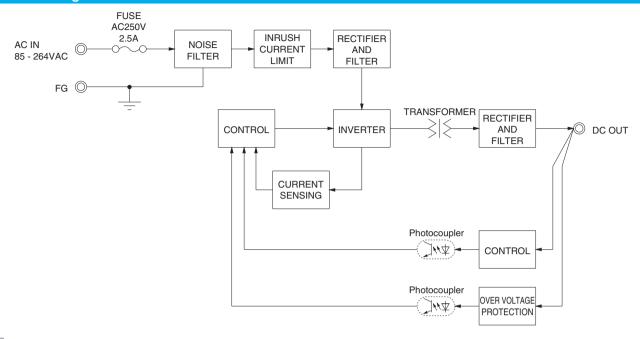
	MODEL		LHA30F-3R3-Y	LHA30F-5	LHA30F-12	LHA30F-15	LHA30F-24			
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to	"Derating" and Inst	ruction Manual 1.1)					
	CURRENT[A]	ACIN 100V	0.42typ	0.62typ						
	CORRENT[A]	ACIN 230V	0.23typ	0.32typ						
	FREQUENCY[Hz]		50 / 60 (45 - 440)							
NPUT	EFFICIENCY[%]	ACIN 100V	83.0typ	83.0typ	85.0typ	85.5typ	87.0typ			
	EFFICIENCY[%]	ACIN 230V	85.5typ	87.0typ	88.5typ	89.0typ	90.0typ			
	INRUSH CURRENT[A]	ACIN 100V	15typ (Io=100%) Ta=25°C at cold start							
	INKUSH CUKKENI[A]	ACIN 230V	35typ (lo=100%) Ta=25℃ at cold start							
	LEAKAGE CURRENT[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[mV] *3		20max	20max	48max	60max	96max			
[LOAD REGULATION	[mV] *3	40max	40max	100max	120max	150max			
	DIDDI E()/3	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			
	RIPPLE NOISE[mVp-p]	0 to +50°C	120max	120max	150max	150max	150max			
UTPUT		-10 to 0℃	160max	160max	180max	180max	180max			
1	**	lo=0 to 15%	360max	360max	360max	360max	360max			
	TEMPERATURE REGULATION[mV]	0 to +50°C	50max	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, Io=100%)							
	HOLD-UP TIME[ms]		25typ (ACIN 100V, lo=100%) / 170typ (ACIN 230V, lo=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			
DOTEOTION	OVERCURRENT PROT	ECTION	Works over 105% of r	ating and recovers	automatically					
ROTECTION RCUIT 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			
THERS	OPERATING INDICA	TION	Not provided							
THEITS	REMOTE SENSING		Not provided							
	INPUT-OUTPUT		AC3,000V 1minute, C	utoff current = 10m/	A, DC500V 100M Ω mir	(At Room Temperature	e)			
OLATION	INPUT-FG		AC2,000V 1minute, C	cutoff current = 10m	A, DC500V 100M Ω mir	n (At Room Temperature	e)			
	OUTPUT-FG		AC500V 1minute, Cut	toff current = 25mA,	DC500V 100M Ω 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	et) max				
NVIRONMENT	STORAGE TEMP., HUMID. AND	ALTITUDE	-20 to +75°C, 20 - 90°	%RH (Non condensi	ng), 9,000m (30,000fee	et) max				
NVIRONNENI	VIBRATION		10 - 55Hz, 19.6m/s ² (2	2G), 3minutes perio	d, 60minutes each alon	g X, Y and Z axis				
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis							
AFETY AND	AGENCY APPROVAL	_S	UL62368-1, c-UL (equ	uivalent to CAN/CS/	A-C22.2No.62368-1), E	N62368-1, Complies wi	th DEN-AN			
DISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, CISPR11-B, CISPR32-B, EN55011-B, EN55032-B							
EGULATIONS	HARMONIC ATTENU	IATOR *6	Complies with IEC610	000-3-2 (Class A) (N	lo built-in power factor	correction)				
THERS	CASE SIZE/WEIGHT		50×27×87.5mm [1.9	97×1.07×3.44 inch	es] (WXHXD) / 100g	max (with chassis & co	ver : 210g max)			
THERS	COOLING METHOD	*2	Convection/Forced air	r (Requires external	fan) (Refer to "Derating	j")	-			

- 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).
- *****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.

Ripple and ripple noise spec is change at lo=0 to 15% by burst operation.

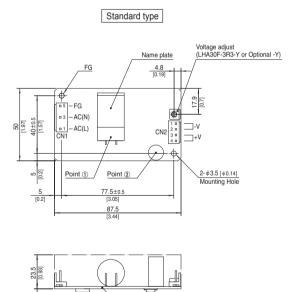
LHA-2 August 26, 2020





External view

* External size of option is different from standard type.



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- φ 4.5 [φ 0.18] 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.

PCB t=1.6 [0.06]

- 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	DODE VIII	VHR-5N	Chain	SVH-21T-P1.1	
CNT	CN1 B3P5-VH	VHK-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	

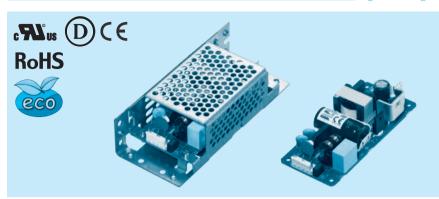
(Mfr: J.S.T.)

- * I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (Tyco Electronics) connector type.
- CN2 CN1 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: 100g max (with chassis and cover: 210g max)
- ※ PCB Material / thickness : FR-4 / 1.6mm [0.06]

-V

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

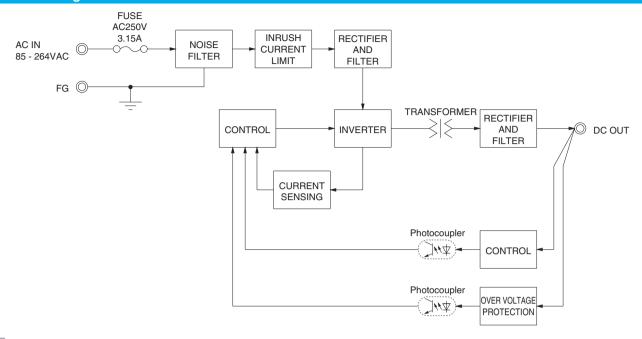
	MODEL		LHA50F-3R3-Y	LHA50F-5	LHA50F-12	LHA50F-15	LHA50F-24	LHA50F-36	LHA50F-48		
	VOLTAGE[VAC]	*2	85 - 264 1 φ (R	efer to "Derating	and Instruction	Manual 1.1)					
	CUDDENTIAL	ACIN 100V	0.56typ	0.82typ	1.05typ						
	CURRENT[A]	ACIN 230V	0.30typ	0.42typ	0.52typ						
	FREQUENCY[Hz]		50 / 60 (45 - 440)								
NPUT	EFFICIENCY[%]	ACIN 100V	80.0typ	83.0typ	87.0typ	85.5typ	86.0typ	86.5typ	86.5typ		
	EFFICIENCI[%]	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						
	INKUSH CUKKENT[A]	ACIN 230V	35typ (lo=100%) Ta=25°C at cold start								
	LEAKAGE CURRENT[mA]		0.30 / 0.65max	(ACIN 100V / 24	0V 60Hz, lo=10	00%, According t	o IEC62368-1 aı	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] *4	-10 to 0℃	140max	140max	160max	160max	160max	200max	200max		
		lo=0 to 15%	300max	300max	300max	300max	300max	300max	300max		
	RIPPLE NOISE[mVp-p]	0 to +50℃	120max	120max	150max	150max	150max	250max	250max		
OUTPUT		-10 to 0℃	160max	160max	180max	180max	180max	300max	300max		
		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[IIIV]	-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 100V, 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 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	34.50 to 37.50	46.00 to 50.00		
	OVERCURRENT PROT	ECTION	Works over 105	% of rating and	ecovers automa	atically		·			
PROTECTION	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		
CIRCUIT AND	OPERATING INDICA	TION	Not provided								
UTHENS	REMOTE SENSING		Not provided								
	INPUT-OUTPUT		AC3,000V 1mir	ute, Cutoff curre	nt = 10mA, DC5	$000V~100M\Omega~mir$	n (At Room Temp	perature)			
ISOLATION	INPUT-FG		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M Ω min (At Room Temperature)								
	OUTPUT-FG		AC500V 1minu	te, Cutoff current	= 25mA, DC500	0V 100M Ω min (At Room Tempe	rature)			
	OPERATING TEMP., HUMID. AND A	ALTITUDE *2	-10 to +70°C, 20	0 - 90%RH (Non	condensing), 5,	000m (16,500fee	et) max				
ENVIRONMENT	STORAGE TEMP., HUMID. AND	ALTITUDE	-20 to +75°C, 20	0 - 90%RH (Non	condensing), 9,	000m (30,000fee	et) max				
ENVIRONMENT	VIBRATION		10 - 55Hz, 19.6	m/s² (2G), 3minu	tes period, 60m	inutes each alon	g X, Y and Z axi	S			
	IMPACT		196.1m/s² (20G), 11ms, once each X, Y and Z axis								
SAFETY AND	AGENCY APPROVAL	LS	UL62368-1, c-L	JL (equivalent to	CAN/CSA-C22.	2No.62368-1), E	N62368-1, Com	olies with DEN-A	N		
NOISE	CONDUCTED NOISE		Complies with F	CC-B, VCCI-B,	CISPR11-B, CIS	SPR32-B, EN550	11-B, EN55032-	В			
REGULATIONS	HARMONIC ATTENU	JATOR *6	Complies with I	EC61000-3-2 (C	lass A) (No buil	t-in power factor	correction)				
OTHERS	CASE SIZE/WEIGHT		50×27×112m	m [1.97×1.07×	4.41 inches] (W	×H×D) / 140g r	nax (with chassi	s & cover : 280g	max)		
CILLERS	COOLING METHOD	*2	Convection/For	and air /Daguira	outornal fam) /F	Ofer to "Deretine	."\				

- 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).
- 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.

Ripple and ripple noise spec is change at lo=0 to 15% by burst operation.

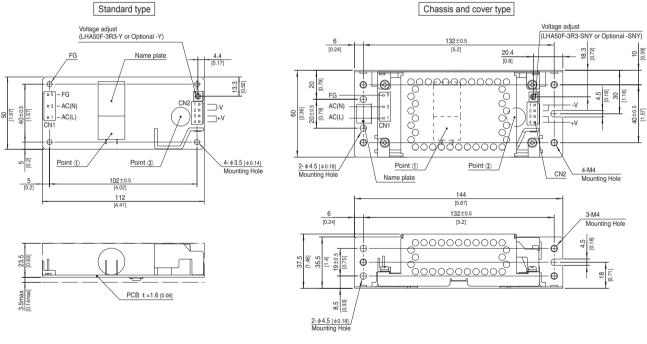
LHA-4 August 26, 2020





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.

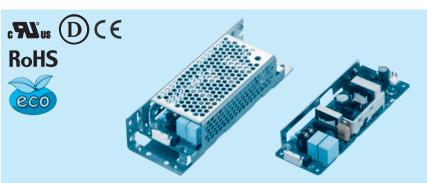
I/O	Connector	Mating connector			
ONIA	DODE VIII	VILID EN	Chain	SVH-21T-P1.1	
CNT	B3P5-VH	VHR-5N	Loose	BVH-21T-P1.1	
ONIO	D4D VIII	V/UD 4N	Chain	SVH-21T-P1.1	
CN2	B4P-VH	VHR-4N	Loose	BVH-21T-P1.1	

(Mfr: J.S.T.)

- * I/O Connector is Mfr.J.S.T.
- ※ Option:-J4:EP (Tyco Electronics) connector type.
- CN1 CN₂ 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: Hot-dip galvanizing steel board
- Mounting torque (Mounting hole of chassis): 1.5N·m max

LHA75F

A 75 F



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	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

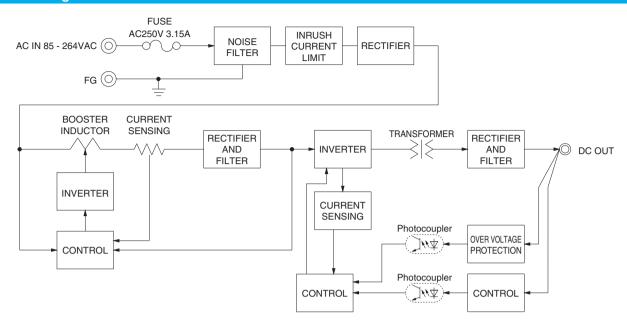
SPECIFICATIONS

	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		0.4typ	0.5typ						
	FREQUENCY[Hz]		50 / 60 (45 - 66)								
	EEEICIENCVI0/1	ACIN 100V	74.0typ	79.0typ	84.5typ	85.5typ	86.0typ	87.5typ	87.5typ		
NPUT	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							
	FOWER PACTOR (10=100%)	ACIN 230V	0.70typ 0.80typ								
	INRUSH CURRENT[A]	ACIN 100V	15typ (Io=100%) Ta=25℃ at cold start								
	INNUSH CONNENT[A]	ACIN 230V	35typ (lo=100%) Ta=25°C at cold start								
	LEAKAGE CURRENT	T[mA]	0.40 / 0.75max	(ACIN 100V / 24	0V 60Hz, lo=10	00%, According t	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[I	mV] *3	20max	20max	48max	60max	96max	144max	192max		
	LOAD REGULATION	[mV] *3	40max	40max	100max	120max	150max	240max	240max		
		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		
ОИТРИТ	* 4.	lo=0 to 15%	300max	300max	360max	500max	500max	500max	500max		
	RIPPLE NOISE[mVp-p] *4	0 to +50°C *7	120max	120max	150max	150max	150max	250max	250max		
		-10 to 0℃	160max	160max	180max	180max	180max	300max	300max		
		lo=0 to 15%	360max	360max	400max	600max	600max	600max	600max		
	I TEMPEDATIIDE DECIII ATIONIMVI L	0 to +50°C *7	50max	50max	120max	150max	240max	360max	480max		
		-10 to +50℃*7	60max	60max	150max	180max	290max	450max	600max		
	DRIFT[mV] *5		20max	20max	48max	60max	96max	144max	192max		
	START-UP TIME[ms]		100typ (ACIN 100V, Io=100%)								
	HOLD-UP TIME[ms]		20typ (ACIN 100V, Io=100%)								
	OUTPUT VOLTAGE ADJUSTMENT	RANGE[V]	2.85 to 3.63	Fixed ("Y"option		djusting output vo	oltage 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	34.50 to 37.50	46.00 to 50.00		
POTEOTION	OVERCURRENT PROT	ECTION	Works over 105	% of rating and	recovers automa	atically	*	`			
ROTECTION RICUIT 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								
IIILNO	REMOTE SENSING		Not provided								
	INPUT-OUTPUT		AC3,000V 1mir	ute, Cutoff curre	nt = 10mA, DC5	$00V~100 { m M}\Omega$ mi	n (At Room Temp	perature)			
SOLATION	INPUT-FG		AC2,000V 1min	ute, Cutoff curre	nt = 10mA, DC5	$00V$ 100M Ω mi	n (At Room Temp	perature)			
	OUTPUT-FG		AC500V 1minut	te, Cutoff current	t = 25mA, DC500	0V 100M Ω min	(At Room Tempe	rature)			
	OPERATING TEMP., HUMID. AND A	ALTITUDE *2	-10 to +70°C, 20	0 - 90%RH (Non	condensing), 5,	000m (16,500fee	et) max				
NVIRONMENT	STORAGE TEMP., HUMID. AND	ALTITUDE	-20 to +75°C, 20	0 - 90%RH (Non	condensing), 9,	000m (30,000fee	et) max				
NVINONWENT	VIBRATION		10 - 55Hz, 19.6	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-L	JL (equivalent to	CAN/CSA-C22.	2No.62368-1), E	N62368-1, Comp	olies with DEN-A	N		
IOISE	CONDUCTED NOISE		Complies with F	CC-B, VCCI-B,	CISPR11-B, CIS	SPR32-B, EN550	11-B, EN55032-	В			
REGULATIONS	HARMONIC ATTENU	JATOR *6	Complies with I	EC61000-3-2 (C	lass A)						
OTHERS	CASE SIZE/WEIGHT		50×27×150m	m [1.97×1.07×	5.91 inches] (W X	(H×D) / 190g m	ax (with chassis	& cover : 370g m	nax)		
	COOLING METHOD	-	Convection/For								

- 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.
- 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.

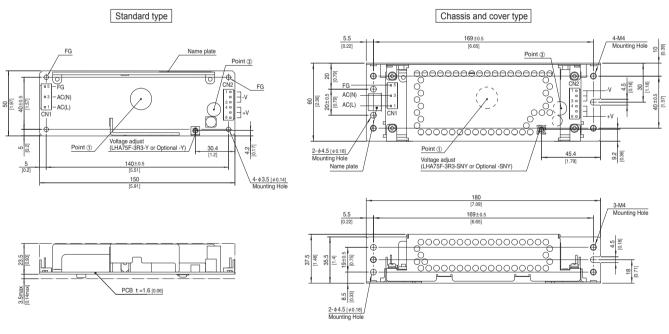
LHA-6





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			
ONIA	DODE VIII	VILID 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	
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 No. 3 4

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

- * 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

LHA100F

100



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

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

SPECIFICATIONS

	MODEL		LHA100F-5	LHA100F-12	LHA100F-15	LHA100F-24	LHA100F-36	LHA100F-48				
V	/OLTAGE[VAC]			er to "Derating" and	Instruction Manua	l 1.1)						
	CURRENT[A]	ACIN 100V	1.0typ	1.2typ								
	JUNNENT[A]	ACIN 230V	0.5typ									
F	REQUENCY[Hz]		50 / 60 (45 - 66)									
_	EFFICIENCY[%]	ACIN 100V	82.0typ	87.0typ	88.0typ	86.5typ	87.0typ	87.0typ				
NPUT	FFICIENCY[%]	ACIN 230V	84.0typ	89.0typ	90.0typ	89.0typ	89.0typ	89.0typ				
	OWED FACTOR (In 1000/)	ACIN 100V	0.97typ	0.97typ								
	OWER FACTOR (Io=100%)	ACIN 230V	0.83typ 0.87typ									
10	NRUSH CURRENT[A]	ACIN 100V	15typ (lo=100%) Ta=25℃ at cold start									
	NHUSH CUNNENT[A]	ACIN 230V	35typ (lo=100%) Ta=25℃ at cold start									
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				
	NIDDLE CONTRACT	0 to +50°C *7	80max	120max	120max	120max	150max	150max				
	RIPPLE[mVp-p]	-10 to 0℃	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				
7.0	EMPERATURE REGULATION[mV]	0 to +50°C *7	50max	120max	150max	240max	360max	480max				
"	EMPERATURE REGULATION[IIIV]	-10 to +50°C *7	60max	150max	180max	290max	450max	600max				
	PRIFT[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%)									
0	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	OVERCURRENT PROT	ECTION	Works over 105%	of rating and recov								
ROTECTION	OVERVOLTAGE 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									
R	REMOTE CONTROL			struction Manual 6								
II	NPUT-OUTPUT-RC	*8				$OM\Omega$ min (At Room						
SOLATION II	NPUT-FG		,	<u>'</u>		$OM\Omega$ min (At Room						
C	DUTPUT-RC-FG					$M\Omega$ min (At Room Π						
	OUTPUT-RC					Ω min (At Room Te	emperature)					
0	PERATING TEMP.,HUMID.AND A	ALTITUDE *2			densing), 5,000m (1							
NVIRONMENT S	TORAGE TEMP.,HUMID.AND	ALTITUDE			densing), 9,000m (3							
V	/IBRATION					ach along X, Y and	Z axis					
	MPACT			11ms, once each X								
	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	HARMONIC ATTENU	ATOR *6		61000-3-2 (Class A								
THERS -	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.

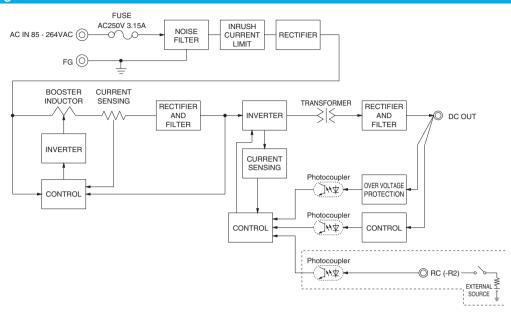
 At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.

 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.
- 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.

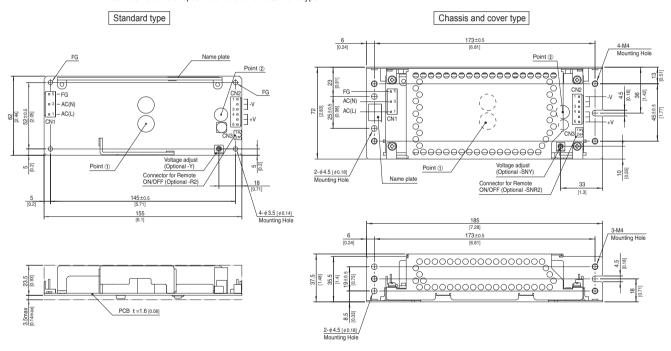
- Please contact us about another class. 5V output product, the maximum temperature of 40°C. Applicable when Remote ON/OFF (optional) is added. To meet the specification, do not operate overload condition. Parallel operation is not possible. Sound noise may be generated by power supply in case of pulse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

I/O	Connector	Mating connector	Terminal	
ONIA	D0D5 \// I	VILID EN	Chain	SVH-21T-P1.1
CNT	B3P5-VH	VHR-5N	Loose	BVH-21T-P1.1
ONIO	B6P-VH	VALID 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 (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		CN2	
Pin No.	Input	Pin No.	Output
1	AC(L)	1 to 3	-V
2		100	- v
3	AC(N)	4 to 6	+V
4		4 10 0	T V
_	FG		

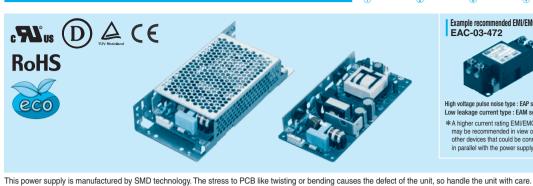
-\/		RC(+)
- v	2	RC(-)
+V	Model B2 Mating Co	B-XH-A onnector (Terr

- ※ Pin No.2 and 4 is NC at CN1.
- ※ Keep drawing current per pin below 5A for CN2.
- minal) XHP-2 BXH-001T-P0.6 or SXH-001T-P0.6

CN3 Option (Mfr:J.S.T.) PIN No. Contents

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. *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

SPECIFICATIONS

	MODEL		LHA150F-12	LHA150F-24	LHA150F-36	LHA150F-48			
	VOLTAGE[VAC]	*2	85 - 264 1 φ (Refer to "De	erating" and Instruction Mar	nual 1.1)				
	CURRENT[A]	ACIN 100V	1.8typ						
	ACIN 230V		0.8typ						
	FREQUENCY[Hz]		50 / 60 (45 - 66)						
	EFFICIENCY[%]	ACIN 100V	86.5typ	89.0typ	89.5typ	90.0typ			
INPUT	EFFICIENCI[%]	ACIN 230V	89.5typ	92.0typ	92.5typ	93.0typ			
	POWER FACTOR (Io=100%)	ACIN 100V	0.99typ						
	FOWER FACTOR (10=100 /6)	ACIN 230V	0.91typ						
	INRUSH CURRENT[A]	ACIN 100V		5typ (lo=100%) Ta=25℃ at cold start					
		ACIN 230V	35typ (lo=100%) Ta=25℃						
	LEAKAGE CURREN	T[mA]	` ` `		According to IEC62368-1 a	<u> </u>			
	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°C *7		120max	150max	150max			
	NIFFEE[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]	- DANOEDO	20typ (ACIN 100V, lo=100		100(50()				
	OUTPUT VOLTAGE ADJUSTMENT		11.50 to 12.50	ole for adjusting output volta		40.00 to 50.00			
	OUTPUT VOLTAGE SET				34.50 to 37.50	46.00 to 50.00			
	OVERCURRENT PROT		13.80 to 16.80	g and recovers automatical 27.60 to 33.60	41.40 to 50.40	55.20 to 67.20			
PROTECTION	OPERATING INDICA	_	Not provided	27.00 10 33.00	41.40 to 50.40	55.20 (0 67.20			
OTHERS	REMOTE SENSING	IIION	Not provided						
OTTLETTO	REMOTE ON/OFF		Option (Refer to Instruction	n Manual 6.1)					
	INPUT-OUTPUT-RC	*8			100MO min (At Room Tem	nerature)			
	INPUT-FG		AC3,000V 1minute, Cutoff current = 10mA, DC500V 100M Ω min (At Room Temperature) AC2,000V 1minute, Cutoff current = 10mA, DC500V 100M Ω min (At Room Temperature)						
ISOLATION	OUTPUT:RC-FG	*8	AC5,000 Timinute, Cutoff current = 25mA, DC500V 100MΩ min (At Room Temperature)						
	OUTPUT-RC								
	OPERATING TEMP.,HUMID.AND								
	STORAGE TEMP., HUMID. AND								
ENVIRONMENT	VIBRATION		10 - 55Hz, 19.6m/s² (2G), 3minutes period, 60minutes each along X, Y and Z axis						
	IMPACT		196.1m/s² (20G), 11ms, o						
SAFETY AND	AGENCY APPROVA	LS			368-1), EN62368-1, EN62477	-1 (OVC III), Complies with DEN-AN			
NOISE	CONDUCTED NOISE	•	Complies with FCC-B, VC	CI-B, CISPR11-B, CISPR3	32-B, EN55011-B, EN55032-	·B			
REGULATIONS	HARMONIC ATTENU	JATOR *6	Complies with IEC61000-						
OTHERS	CASE SIZE/WEIGHT		75×27×160mm [2.95×	1.07×6.30 inches] (W×H)	XD) / 320g max (with chassi	s & cover : 570g max)			
OTHERS	COOLING METHOD	*2	Convection/Forced air (Re	equires external fan) (Refer	r 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 10% by burst
- operation.

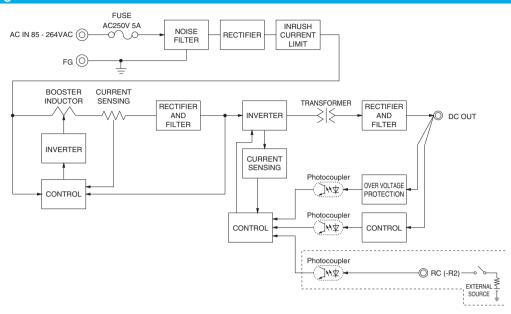
 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25 C, with the input voltage held constant at the rated input/output.
- Please contact us about another class.

 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.



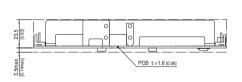


External view

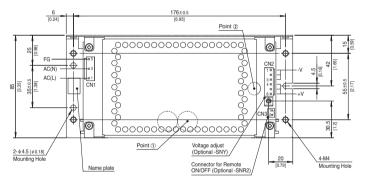
* External size of option is different from standard type.

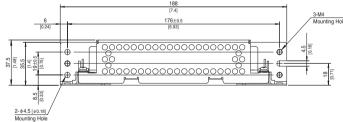
Point ② 93 - AC(N) - AC(L) Point ① l- φ3.5 [φ0.14]

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	Terminal	
ONIA	B3P5-VH	VHR-5N	Chain	SVH-21T-P1.1
CNT	B3P5-VH	VHK-5N	Loose	BVH-21T-P1.1
ONIO	DOD VIII	VHR-6N	Chain	SVH-21T-P1.1
CNZ	B6P-VH		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

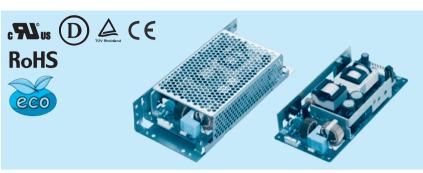
CN3 Option (Mfr:J.S.T.)					
PIN No.	Contents				
1	RC(+)				
2	RC(-)				
Model B2B-XH-A Mating Connector (Terminal) XHP-2					

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

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

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.

 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 J5: 8 pin type(Output connector)

R2: with Remote ON/OFF

S: with Chassis SN: with Chassis & cover

T : 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

SPECIFICATIONS

	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)				
	CUDDENTIAL	ACIN 100V	3.5typ					
	CURRENT[A]	ACIN 230V	1.6typ					
	FREQUENCY[Hz]		50 / 60 (45 - 66)					
	EFFICIENCY[%]	ACIN 100V	90.0typ	91.5typ	92.0typ			
INPUT		ACIN 230V	92.0typ	93.5typ	94.0typ			
		ACIN 100V	0.99typ					
	POWER FACTOR (Io=100%)	ACIN 230V	93typ					
	ACIN 10		20typ (lo=100%) Ta=25℃ at cold	start				
	INRUSH CURRENT[A]	ACIN 230V	40typ (lo=100%) Ta=25℃ at cold	start				
	LEAKAGE CURREN	T[mA]	0.40 / 0.75max (ACIN 100V / 240	V 60Hz, lo=100%, According to	IEC62368-1 and DEN-AN)			
	VOLTAGE[V]		12	24	48			
	CURRENT[A]	*2	25.0	12.5	6.3			
Ī	LINE REGULATION[mV] *3	48max	96max	192max			
Ī	LOAD REGULATION	[mV] *3	100max	150max	240max			
		0 to +50°C *7	120max	120max	150max			
	RIPPLE[mVp-p]	-10 to 0℃	160max	160max	200max			
	* 4	lo=0 to 10%	160max	160max	200max			
Ī		0 to +50°C *7	150max	150max	250max			
OUTPUT	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		48max	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	TING[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 PROTE	ECTION	13.80 to 16.80	27.60 to 33.60	55.20 to 67.20			
CIRCUIT AND	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		AC2,000V 1minute, Cutoff current = 10mA, DC500V 100MΩ min (At Room Temperature)					
ISOLATION	OUTPUT-RC-FG	*8	AC500V 1minute, Cutoff current = 25mA, DC500V 100M Ω min (At Room Temperature)					
	OUTPUT-RC	*8	AC100V 1minute, Cutoff current = 25mA, DC100V 10M Ω min (At Room Temperature)					
	OPERATING TEMP., HUMID. AND	ALTITUDE *2	-10 to +70°C, 20 - 90%RH (Non condensing), 3,000m (10,000feet) 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					
FIAAIUOMMEMI	VIBRATION		10 - 55Hz, 19.6m/s ² (2G), 3minut	es period, 60minutes each along	y X, Y and Z axis			
	IMPACT		196.1m/s² (20G), 11ms, once each					
SAFETY AND	AGENCY APPROVAL				368-1, EN62477-1 (OVC III), Complies with DEN-AN			
NOISE	CONDUCTED NOISE		Complies with FCC-B, VCCI-B, C		1-B, EN55032-B			
REGULATIONS	HARMONIC ATTENU		Complies with IEC61000-3-2 (Cla					
OTHERS	CASE SIZE/WEIGHT		84×37×180mm [3.31×1.46×7	09 inches] (W X H X D) / 580g ma	ax (with chassis & cover : 890g max)			
J110	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.

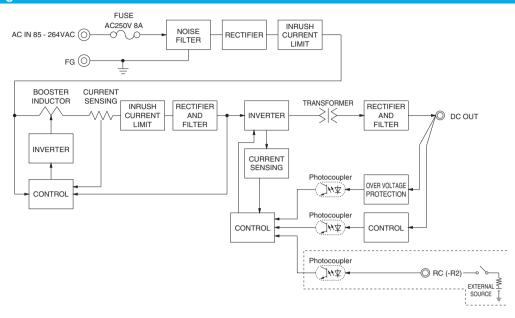
 Derating is required.
- At low load conditions, the burst mode operation will start. To check load regulation, you will need to measure the characteristics at average mode with instruments.
- This is the value that measured on measuring board with capacitor of 22 μ F and 0.1 μ F at 150mm from output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

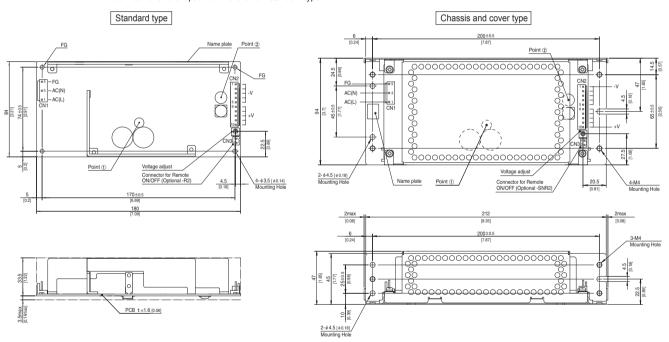
LHA-12





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	
-	014	B3P5-VH	VHR-5N	Chain	SVH-21T-P1.1
Ľ	CINT	B3P5-VH		Loose	BVH-21T-P1.1
	0110	B10P-VH	VHR-10N	Chain	SVH-21T-P1.1
Ľ	CNZ	B10P-VH		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 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) KHP-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.

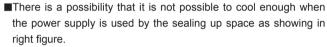
Assembling and Installation Method

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.

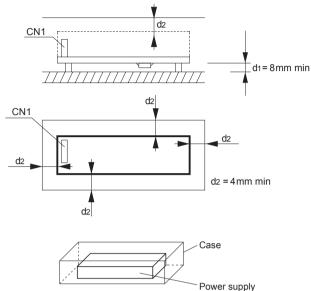
If d1 and/or d2 are less than the value mentioned in right figure, insert an insulating sheet with reinforced insulation between the power supply unit and metal chassis.

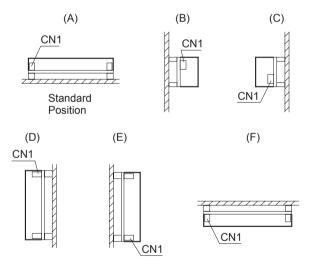
The following distance is not satisfactory for cooling condition. Please refer to "Derating" and Instruction Manual 3 for cooling method.



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.

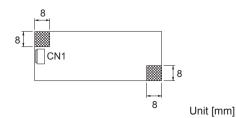




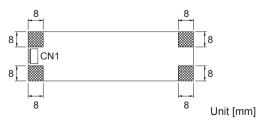
Mounting screw

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

LHA30F



LHA50F, LHA75F, LHA100F, LHA150F, LHA300F

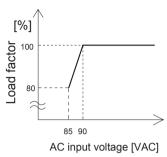


- ■If mounting metallic fittings on the board surface, ensure there is no contact with components.
- ■This product uses SMD technology. Please avoid the PCB installation method which includes the twisting stress or the bending stress.

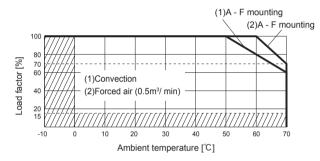


Derating

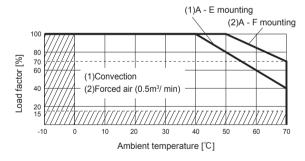
Derating curve for input voltage



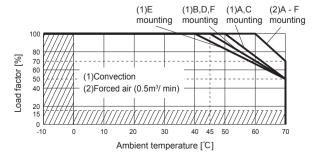
LHA30F-3R3-Y,-5,-12,-15,-24 Ambient temperature derating curve (Reference value)



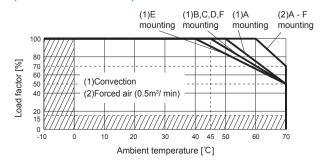
LHA30F-3R3-SNY,-5-SN,-12-SN,-15-SN,-24-SN Ambient temperature derating curve (Reference value)



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



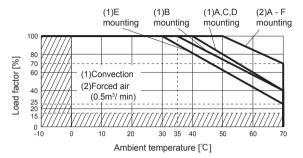
LHA50F-12, -15 Ambient temperature derating curve (Reference value)



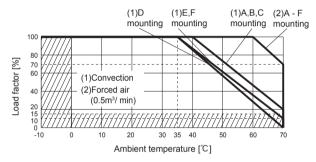
COSEL | LHA-series

Derating

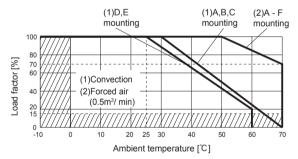
 LHA50F-3R3-SNY,-12-SN,-24-SN,-36-SN,-48-SN Ambient temperature derating curve (Reference value)



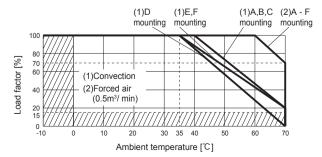
LHA75F-3R3-Y, -5
 Ambient temperature derating curve (Reference value)



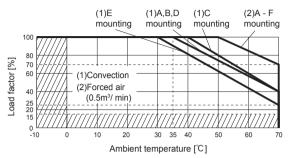
LHA75F-3R3-SNY,-5-SN
 Ambient temperature derating curve (Reference value)



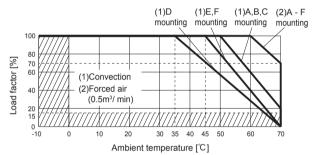
LHA100F-5
 Ambient temperature derating curve (Reference value)



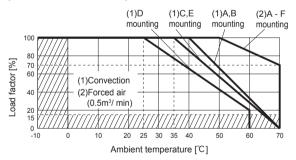
LHA50F-5-SN,-15-SN
 Ambient temperature derating curve (Reference value)



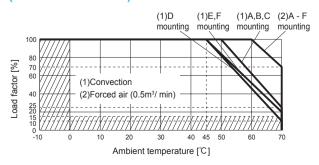
LHA75F-12, -15, -24, -36, -48
 Ambient temperature derating curve (Reference value)



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



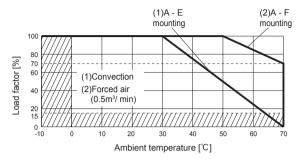
● LHA100F-12, -15, -24, -36, -48 Ambient temperature derating curve (Reference value)



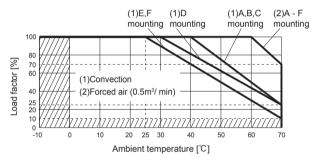


Derating

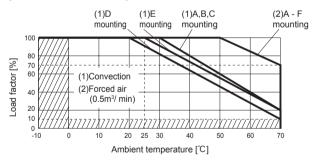
LHA100F-5-SN Ambient temperature derating curve (Reference value)



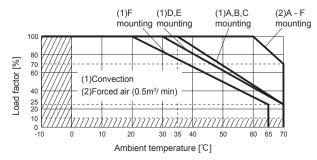
LHA150F-12 Ambient temperature derating curve (Reference value)



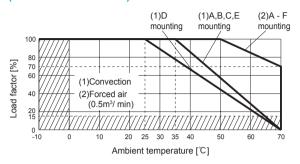
LHA150F-12-SN Ambient temperature derating curve (Reference value)



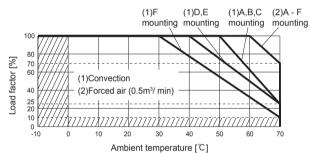
■ LHA300F-12-Y Ambient temperature derating curve (Reference value)



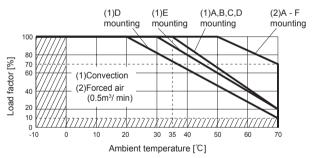
LHA100F-12-SN.-15-SN.-24-SN.-36-SN.-48-SN Ambient temperature derating curve (Reference value)



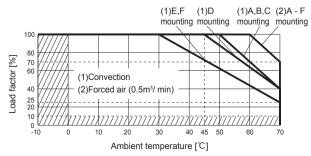
LHA150F-24, -36, -48 Ambient temperature derating curve (Reference value)



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



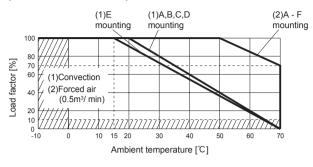
LHA300F-24-Y, -48-Y Ambient temperature derating curve (Reference value)



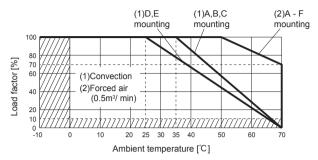
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Derating

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 120	0.62	Thermistor	FR-4	-	Yes	Yes	No
LHA50F	Flyback converter	30 to 120	1.05	Thermistor	FR-4	-	Yes	Yes	No
LHA75F	Active filter	25 to 155	0.9	Thermistor	FR-4	-	Yes	Yes	No
	Flyback converter	60 to 115							
LHA100F	Active filter	20 to 150	1.2	Thermistor	FR-4	-	Yes	Yes	No
	Flyback converter	45 to 110							
LHA150F	Active filter	20 to 150	1.8	Thermistor	FR-4	-	Yes	Yes	No
	LLC resonant converter	90 to 280							
LHA300F	Active filter	20 to 150	3.5	Thermistor	FR-4	-	Yes	Yes	No
	LLC resonant converter	65 to 200							

- *1 The value changes depending on input and load.
- *2 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.



Макро Групп – это:

- дистрибьютор электронных компонентов с 1994 года
- контрактный производитель электроники с 2007 года с собственным производством в Санкт-Петербурге (компания Макро EMC, входит в ГК Макро Групп)
- поставщик полупроводниковых материалов
- комплексный поставщик электронных компонентов
- моделирование и производство полупроводниковых эпитаксиальных гетероструктур для задач оптоэлектроники

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- отсрочки платежей
- поставка электронных компонентов по проектным ценам
- инженерная поддержка проектов заказчиков
- сертификат системы менеджмента качестве ISO 9001-2015
- необходимые сертификаты и лицензии

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