

HWS-A SERIES

Single Output 15W ~ 150W

UNIT
PC Board

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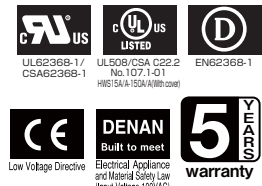
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HWS-A



15 - 150W standard :without cover HWS15A/A HWS30A/A HWS50A/A HWS80A/A HWS100A/A HWS150A/A



Features

- Environmentally-friendly
 - Contributing to energy conservation of the customer's equipment in a further high efficiency
 - Also improve efficiency at light load
 - Reduction of no-load power
- Easy to use
 - Enlarge ambient temperature to ensure the load factor of 100% to 50 °C from 40 °C , the customer's equipment is up the degree of freedom of the mechanism design even at high temperatures (Ambient temperature -10°C to +70°C)
- Safety and security
 - Reduce the maintenance frequency of your device by a long life
 - Double-sided board adopted inherited the conventional model
 - "Safety terminal" covering current flowing part secures safety for users. "No screw-dropping" design prevents from losing screws during maintenance operation.

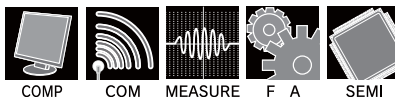
Model naming method

[HWS15A-150A]
HWS 15A - 24 / □
 Series name Output power

- Blank: Without cover(standard)
- /A : With cover
- /R : Remote ON/OFF control, without cover (HWS50A,80A,100A,150A only)
- /RA : Remote ON/OFF control, with cover (HWS50A,80A,100A,150A only)
- /ADIN : DIN rail mountable (with cover type only, from 5 to 48 VDC type)
- /B : Connector connection(JST) (HWS50A,80A,100A,150A only, 100A and 150A,12V-48V only)

Nominal Output Voltage
 ex. 3 : 3.3V, 5 : 5V, 48 : 48V

Applications



Conformity to RoHS Directive

Product Line up

Output Voltage	15W		30W		50W		80W		100W		150W	
	Output Current	MODEL	Output Current	MODEL	Output Current	MODEL	Output Current	MODEL	Output Current	MODEL	Output Current	MODEL
3.3V	3A	HWS15A-3	6A	HWS30A-3	10A	HWS50A-3	16A	HWS80A-3	20A	HWS100A-3	30A	HWS150A-3
5V	3A	HWS15A-5	6A	HWS30A-5	10A	HWS50A-5	16A	HWS80A-5	20A	HWS100A-5	30A	HWS150A-5
12V	1.3A	HWS15A-12	2.5A	HWS30A-12	4.3A	HWS50A-12	6.7A	HWS80A-12	8.5A	HWS100A-12	13A	HWS150A-12
15V	1A	HWS15A-15	2A	HWS30A-15	3.5A	HWS50A-15	5.4A	HWS80A-15	7A	HWS100A-15	10A	HWS150A-15
24V	0.65A	HWS15A-24	1.3A	HWS30A-24	2.2A	HWS50A-24	3.4A	HWS80A-24	4.5A	HWS100A-24	6.5A	HWS150A-24
48V	0.33A	HWS15A-48	0.65A	HWS30A-48	1.1A	HWS50A-48	1.7A	HWS80A-48	2.1A	HWS100A-48	3.3A	HWS150A-48

• All specifications are subject to change without notice.

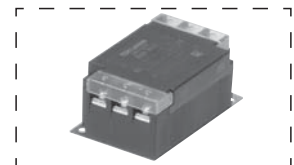
HWS15A SPECIFICATIONS (Read instruction manual carefully, before using the power supply unit.)

UNIT -
PC Board

ITEMS/UNITS		MODEL		HWS15A-3	HWS15A-5	HWS15A-12	HWS15A-15	HWS15A-24	HWS15A-48
Input	Input Voltage Range	(*2)	V	AC85 - 265 (47 - 63Hz) or DC120 - 370					
	Efficiency(100VAC) (typ)	(*1)	%	70	77	80	81	82	82
	Efficiency(200VAC) (typ)	(*1)	%	71	79	83	84	85	82
	Input Current (100/200VAC) (typ)	(*1)	A	0.24/0.15	0.35/0.2				
	Inrush Current (100/200VAC) (typ) (*1)(*3)		A	14/28 (Ta = 25°C , Cold Start)					
	Leakage Current	(*9)	mA	Less than 0.5 (0.2 (typ) at 100VAC / 0.4 (typ) at 230VAC)					
Output	Nominal Output Voltage		VDC	3.3	5	12	15	24	48
	Maximum Output Current		A	3	3	1.3	1	0.65	0.33
	Maximum Output Power		W	10.0	15.0	15.6	15.0	15.6	15.8
	Maximum Line Regulation	(*5)	mV	20	20	48	60	96	192
	Maximum Load Regulation	(*6)	mV	40	40	96	120	150	240
	Temperature Coefficient			Less than 0.02% /°C					
	Maximum Ripple & Noise(0≤Ta≤70°C) (*4)		mV	120	120	150	150	150	200
	Maximum Ripple & Noise(-10≤Ta<0°C) (*4)		mV	160	160	180	180	180	240
	Hold-up Time (typ)	(*1)	ms	20					
	Output Voltage Range		VDC	2.97 - 3.96	4.0 - 6.0	9.6 - 14.4	12.0 - 18.0	19.2 - 28.8	38.4 - 52.8
Function	Over Current Protection	(*7)	A	3.15 -	3.15 -	1.36 -	1.05 -	0.68 -	0.34 -
	Over Voltage Protection	(*8)	VDC	4.13 - 4.95	6.25 - 7.25	15.0 - 17.4	18.8 - 21.8	30.0 - 34.8	55.2 - 64.8
	Remote Sensing			-					
	Remote ON/OFF			-					
	Parallel Operation			-					
	Series Operation			Possible					
	Line DIP			Designed to meet SEMI-F47 (200VAC Line only)					
Environment	Operating Temperature	(*10)	°C	-10 to +70 (-10 to +50°C :100%, +60°C :80%, +70°C :60%)					
	Storage Temperature		°C	-30 to +85					
	Operating Humidity		% RH	30 - 90 (No Condensing)					
	Storage Humidity		% RH	10 - 95 (No Condensing)					
	Vibration			At no operating, 10-55Hz (Sweep for 1min) 19.6m/s ² Constant, X,Y,Z 1hour each.					
	Shock			Less than 196.1m/s ²					
	Cooling			Convection Cooling					
Isolation	Withstand Voltage			Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (20mA) for 1min					
	Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC					
Standards	Safety			Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1. (Expire date of 60950-1: 20/12/2020) Designed to meet Den-an Appendix 8 at 100VAC only. With cover type only: Approved by UL508, CSA C22.2 No.107.1-01.					
	PFHC			Designed to meet IEC61000-3-2					
	Conducted Emission, Radiated Emission	(*11)		Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B					
	Immunity	(*11)		Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11					
Mechanical	Weight (typ)		g	160 (With cover: 190)					
	Size (W x H x D)		mm	26.5 x 82 x 80 (Refer to Outline Drawing)					

- (*1) At 100VAC/200VAC, Ta=25°C , nominal output voltage and maximum output power.
- (*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50 - 60Hz).
- (*3) Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- (*4) Measure with JEITA RC-9131B probe, Bandwidth of scope :100MHz.
For start up at low ambient temperature and low input voltage, output ripple noise might not meet specification. However, specification can be met after one second.
- (*5) 85 - 265VAC, constant load.
- (*6) No load-Full load, constant input voltage.
- (*7) Hiccup with automatic recovery. Avoid to operate at over load or short circuit condition.
- (*8) OVP circuit will shut down output, manual reset (Re power on).
- (*9) Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C .
- (*10) Output Derating
- Refer to Output Derating Curve.
- Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.
- (*11) The power supply is considered a component which will be installed into a final equipment.
The final equipment should be re-evaluated that it meets EMC directives.

Recommended EMC Filter

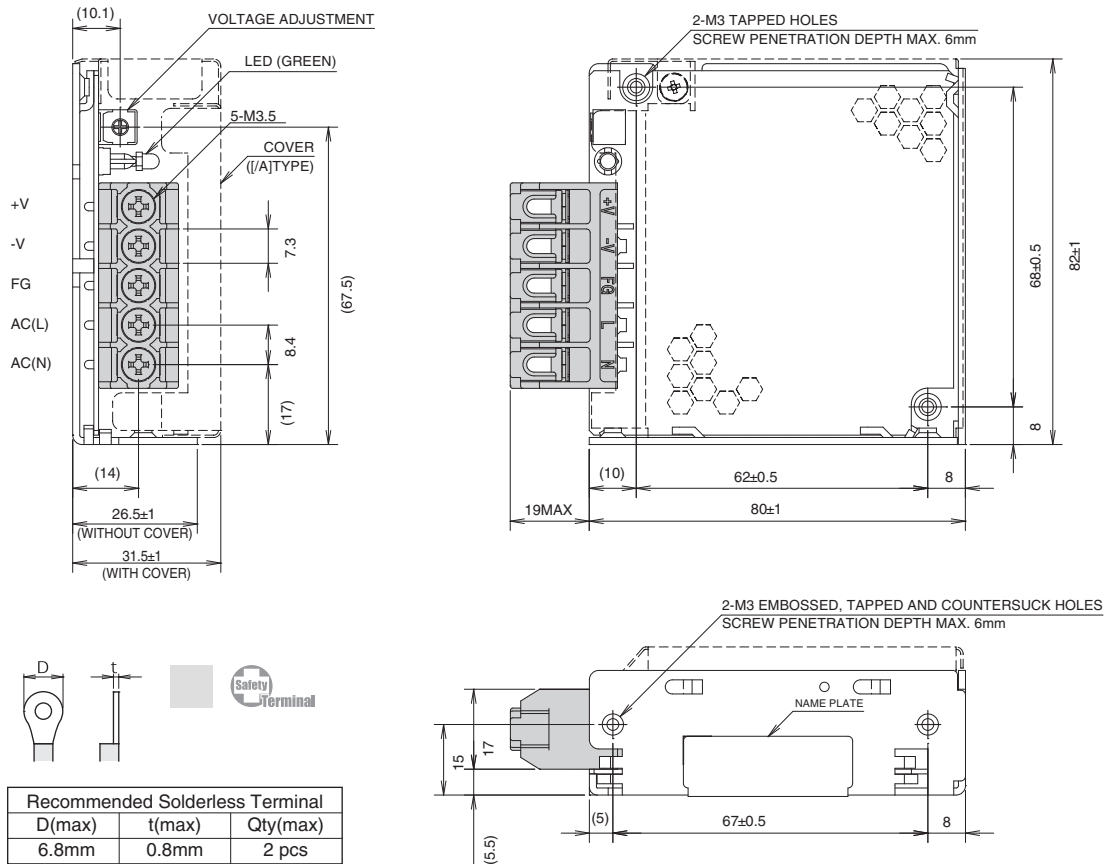


RSEN-2003D or RSEN-2003
Please refer to "TDK-Lambda
EMC Filters" catalog.

Outline Drawing

UNIT · PC Board

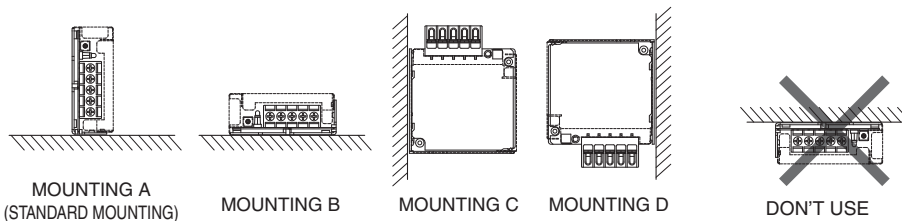
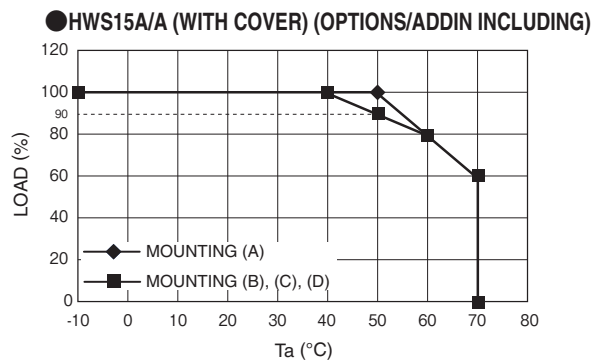
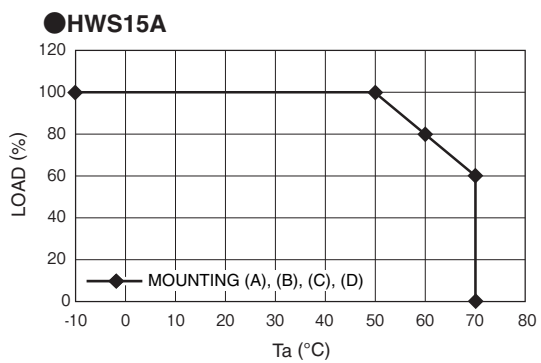
[HWS15A]



[unit: mm]

HWS-A

Output Derating



• All specifications are subject to change without notice.

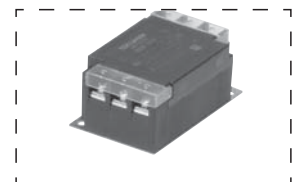
HWS30A SPECIFICATIONS (Read instruction manual carefully, before using the power supply unit.)

UNIT -
PC Board

ITEMS/UNITS		MODEL		HWS30A-3	HWS30A-5	HWS30A-12	HWS30A-15	HWS30A-24	HWS30A-48	
Input	Input Voltage Range	(*2)	V	AC85 - 265 (47 - 63Hz) or DC120 - 370						
	Efficiency(100VAC) (typ)	(*1)	%	75	80	84	85	86	86	
	Efficiency(200VAC) (typ)	(*1)	%	77	82	86	87	88	87	
	Input Current (100/200VAC) (typ)	(*1)	A	0.5/0.3	0.65/0.4					
	Inrush Current (100/200VAC) (typ) (*1)(*3)		A	14/28 (Ta = 25°C , Cold Start)						
	Leakage Current	(*9)	mA	Less than 0.5 (0.2 (typ) at 100VAC / 0.4 (typ) at 230VAC)						
Output	Nominal Output Voltage		VDC	3.3	5	12	15	24	48	
	Maximum Output Current		A	6	6	2.5	2	1.3	0.65	
	Maximum Output Power		W	20.0	30.0	30.0	30.0	31.2	31.2	
	Maximum Line Regulation	(*5)	mV	20	20	48	60	96	192	
	Maximum Load Regulation	(*6)	mV	40	40	96	120	150	240	
	Temperature Coefficient			Less than 0.02% /°C						
	Maximum Ripple & Noise(0≤Ta≤70°C) (*4)		mV	120	120	150	150	150	200	
	Maximum Ripple & Noise(-10≤Ta<0°C) (*4)		mV	160	160	180	180	180	240	
	Hold-up Time (typ)	(*1)	ms	20						
	Output Voltage Range		VDC	2.97 - 3.96	4.0 - 6.0	9.6 - 14.4	12.0 - 18.0	19.2 - 28.8	38.4 - 52.8	
Function	Over Current Protection	(*7)	A	6.3 -	6.3 -	2.62 -	2.1 -	1.36 -	0.68 -	
	Over Voltage Protection	(*8)	VDC	4.13 - 4.95	6.25 - 7.25	15.0 - 17.4	18.8 - 21.8	30.0 - 34.8	55.2 - 64.8	
	Remote Sensing			-						
	Remote ON/OFF			-						
	Parallel Operation			-						
	Series Operation			Possible						
	Line DIP			Designed to meet SEMI-F47 (200VAC Line only)						
	Operating Temperature	(*10)	°C	-10 to +70 (-10 to +50°C :100%, +60°C :60%, +70°C :40%)						
Storage Temperature		°C	-30 to +85							
Environment	Operating Humidity		% RH	30 - 90 (No Condensing)						
	Storage Humidity		% RH	10 - 95 (No Condensing)						
	Vibration			At no operating, 10-55Hz (Sweep for 1min) 19.6m/s ² Constant, X,Y,Z 1hour each.						
	Shock			Less than 196.1m/s ²						
Isolation	Cooling			Convection Cooling						
	Withstand Voltage			Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (20mA) for 1min						
Standards	Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC						
	Safety			Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1. (Expire date of 60950-1: 20/12/2020) Designed to meet Den-an Appendix 8 at 100VAC only. With cover type only: Approved by UL508, CSA C22.2 No.107.1-01.						
	PFHC			Designed to meet IEC61000-3-2						
	Conducted Emission, Radiated Emission	(*11)		Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
	Immunity	(*11)		Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11						
Mechanical	Weight (typ)		g	200 (With cover: 240)						
	Size (W x H x D)		mm	26.5 x 82 x 95 (Refer to Outline Drawing)						

- (*1) At 100VAC/200VAC, Ta=25°C , nominal output voltage and maximum output power.
- (*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50 - 60Hz).
- (*3) Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- (*4) Measure with JEITA RC-9131B probe, Bandwidth of scope :100MHz.
For start up at low ambient temperature and low input voltage, output ripple noise might not meet specification.
However, specification can be met after one second.
- (*5) 85 - 265VAC, constant load.
- (*6) No load-Full load, constant input voltage.
- (*7) Hiccup with automatic recovery. Avoid to operate at over load or short circuit condition.
- (*8) OVP circuit will shut down output, manual reset (Re power on).
- (*9) Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C .
- (*10) Output Derating
- Refer to Output Derating Curve.
- Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.
- (*11) The power supply is considered a component which will be installed into a final equipment.
The final equipment should be re-evaluated that it meets EMC directives.

Recommended EMC Filter

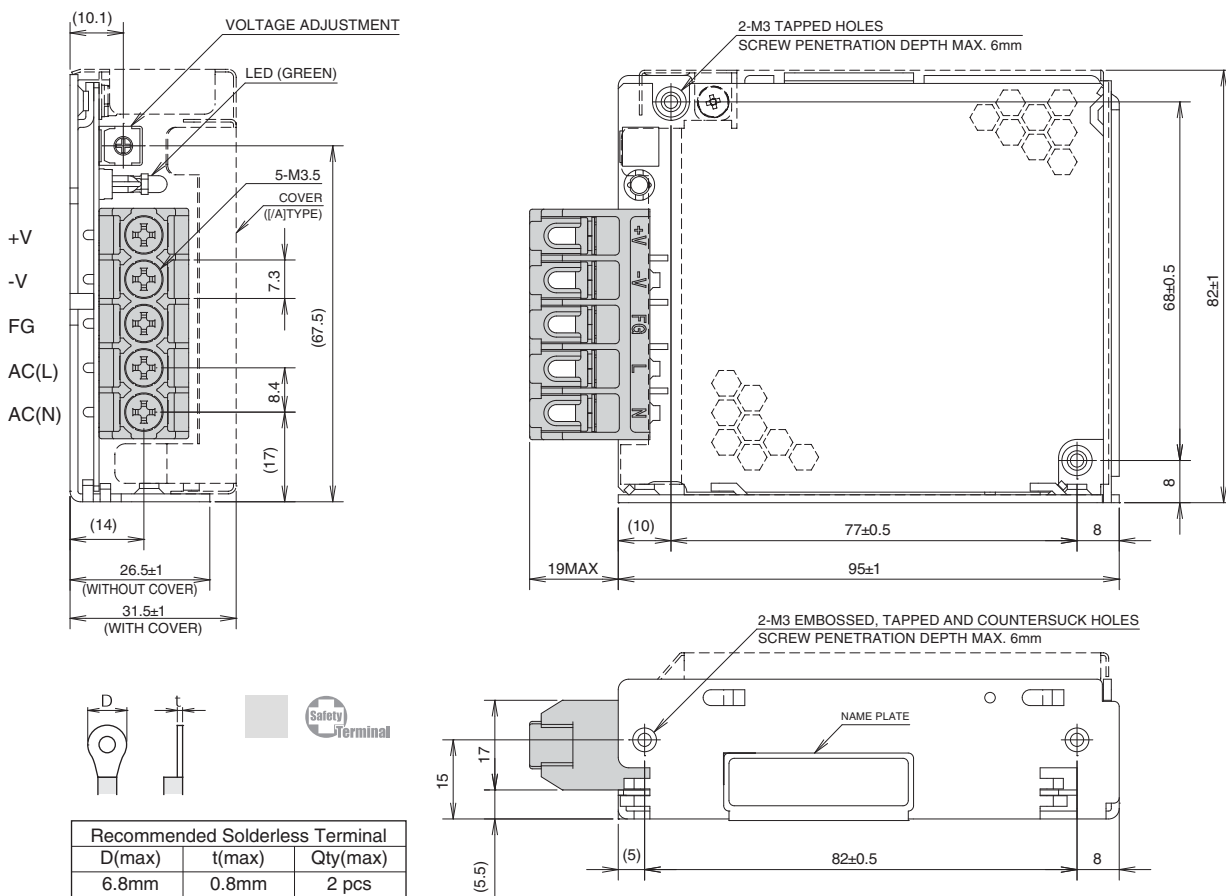


RSEN-2003D or RSEN-2003
Please refer to "TDK-Lambda
EMC Filters" catalog.

Outline Drawing

UNIT
PC Board

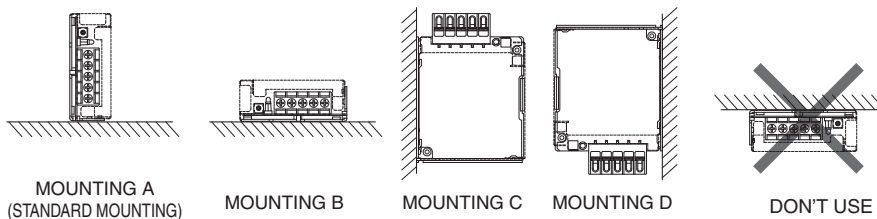
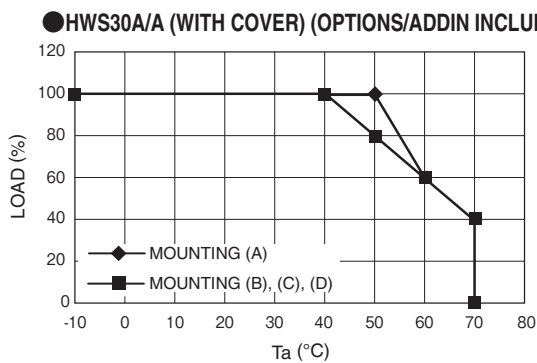
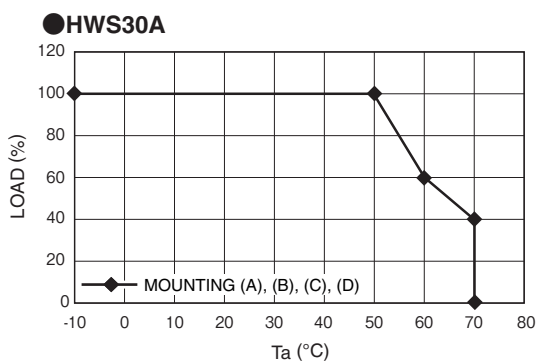
[HWS30A]



[unit: mm]

HWS-A

Output Derating



• All specifications are subject to change without notice.

HWS50A SPECIFICATIONS (Read instruction manual carefully, before using the power supply unit.)

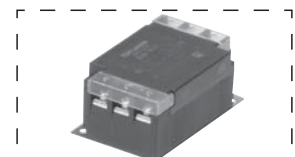
UNIT -
PC Board

HWS-A

ITEMS/UNITS		MODEL	HWS50A-3	HWS50A-5	HWS50A-12	HWS50A-15	HWS50A-24	HWS50A-48	
Input	Input Voltage Range	(*2) V	AC85 - 265 (47 - 63Hz) or DC120 - 370						
	Power Factor(100/200VAC) (typ)	(*1)	0.96/0.85	0.97/0.91					
	Efficiency(100VAC) (typ)	(*1) %	76	82	83	83	84	84	
	Efficiency(200VAC) (typ)	(*1) %	78	84	85	86	87	86	
	Input Current (100/200VAC) (typ)	(*1) A	0.45/0.25	0.65/0.35					
	Inrush Current (100/200VAC) (typ) (*1)(*3)	A	14/28 (Ta = 25°C , Cold Start)						
	Leakage Current	(*9) mA	Less than 0.5 (0.2 (typ) at 100VAC / 0.4 (typ) at 230VAC)						
Output	Nominal Output Voltage	VDC	3.3	5	12	15	24	48	
	Maximum Output Current	A	10	10	4.3	3.5	2.2	1.1	
	Maximum Output Power	W	33.0	50.0	51.6	52.5	52.8	52.8	
	Maximum Line Regulation	(*5) mV	20	20	48	60	96	192	
	Maximum Load Regulation	(*6) mV	40	40	96	120	150	240	
	Temperature Coefficient		Less than 0.02% /°C						
	Maximum Ripple & Noise(0≤Ta≤70°C) (*4)	mV	120	120	150	150	150	200	
	Maximum Ripple & Noise(-10≤Ta<0°C) (*4)	mV	160	160	180	180	180	240	
	Hold-up Time (typ)	(*1) ms	20						
Function	Output Voltage Range	VDC	2.97 - 3.96	4.0 - 6.0	9.6 - 14.4	12.0 - 18.0	19.2 - 28.8	38.4 - 52.8	
	Over Current Protection	(*7) A	10.5 -	10.5 -	4.51 -	3.67 -	2.31 -	1.15 -	
	Over Voltage Protection	(*8) VDC	4.13 - 4.95	6.25 - 7.25	15.0 - 17.4	18.8 - 21.8	30.0 - 34.8	55.2 - 64.8	
	Remote Sensing		-						
	Remote ON/OFF		- (/R Option: Output ON in the external voltage is applied)						
	Parallel Operation		-						
	Series Operation		Possible						
	Line DIP		Designed to meet SEMI-F47 (200VAC Line only)						
	Environment	Operating Temperature	(*10) °C	-10 to +70 (-10 to +50°C :100%, +60°C :70%, +70°C :40%)					
		Storage Temperature	°C	-30 to +85					
Operating Humidity		% RH	30 - 90 (No Condensing)						
Storage Humidity		% RH	10 - 95 (No Condensing)						
Vibration			At no operating, 10-55Hz (Sweep for 1min) 19.6m/s ² Constant, X,Y,Z 1hour each.						
Shock			Less than 196.1m/s ²						
Cooling			Convection Cooling						
Isolation	Withstand Voltage		Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (20mA) for 1min						
	Isolation Resistance		More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC						
Standards	Safety		Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1. (Expire date of 60950-1: 20/12/2020) Designed to meet Den-an Appendix 8 at 100VAC only. With cover type only: Approved by UL508, CSA C22.2 No.107.1-01.						
	PFHC		Designed to meet IEC61000-3-2						
	Conducted Emission, Radiated Emission	(*11)	Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
	Immunity	(*11)	Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11						
	Weight (typ)	g	260 (With cover: 300)						
Mechanical	Size (W x H x D)	mm	26.5 x 82 x 120 (Refer to Outline Drawing)						

- (*1) At 100VAC/200VAC, Ta=25°C , nominal output voltage and maximum output power.
- (*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50 - 60Hz).
- (*3) Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- (*4) Measure with JEITA RC-9131B probe, Bandwidth of scope :100MHz.
- (*5) 85 - 265VAC, constant load.
- (*6) No load-Full load, constant input voltage.
- (*7) Hiccup with automatic recovery. Avoid to operate at over load or short circuit condition.
- (*8) OVP circuit will shut down output, manual reset (Re power on).
- (*9) Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C .
- (*10) Output Derating
- Refer to Output Derating Curve.
- Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.
- (*11) The power supply is considered a component which will be installed into a final equipment.
The final equipment should be re-evaluated that it meets EMC directives.

Recommended EMC Filter

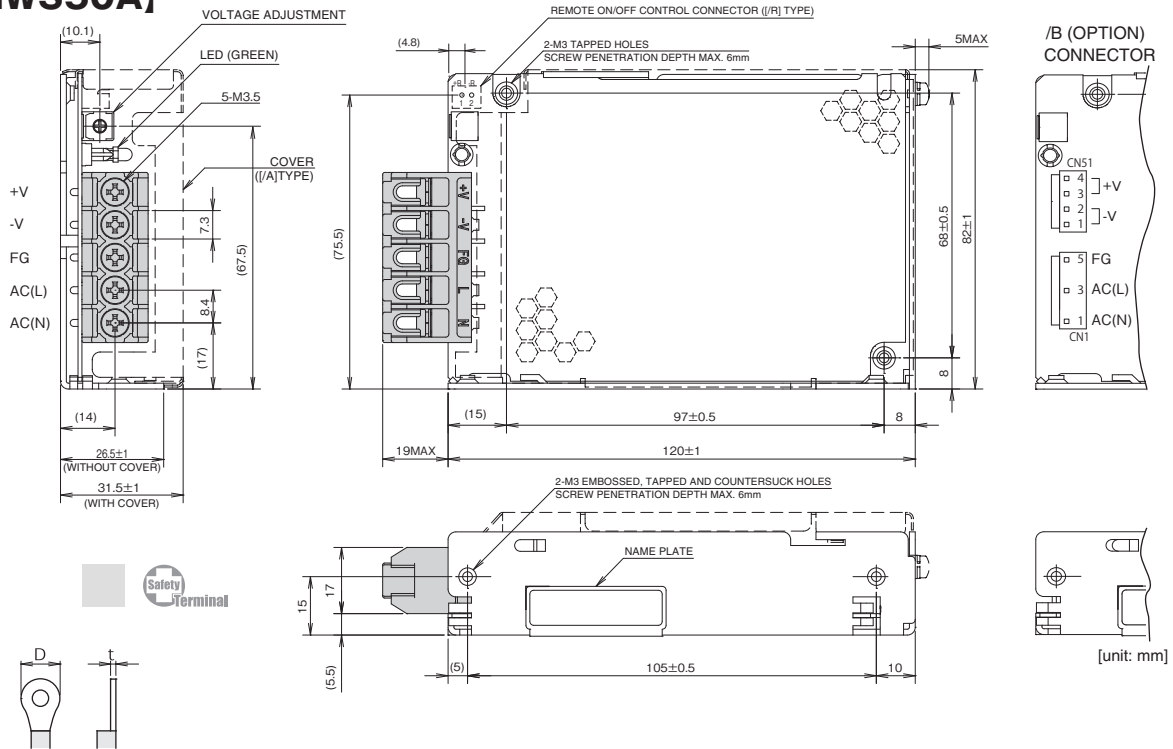


RSEN-2003D or RSEN-2003
Please refer to "TDK-Lambda EMC Filters" catalog.

Outline Drawing

UNIT · PC Board

[HWS50A]



Recommended Solderless Terminal		
D(max)	t(max)	Qty(max)
6.8mm	0.8mm	2 pcs

/R (Option)

Remote ON / OFF control connector (JST)

PIN HEADER	B2B-XH-AM
SOCKET HOUSING	XHP-2
TERMINAL PINS	BXH-001T-P0.6 or SXH-001T-P0.6
HAND CRIMPING TOOL	YC-110R or YRS-110

※ Housing and terminal pin are not attached to the product.

/B (Option) Use connector

PART DESCRIPTION	PART NAME	MANUFACT	QTY
CONNECTOR INPUT SIDE(CN1)	B3P5-VH(LF)(SN)	JST	1
CONNECTOR OUTPUT SIDE(CN51)	B4P-VH(LF)(SN)	JST	1

※Output terminal, please use one pin per 5A below.

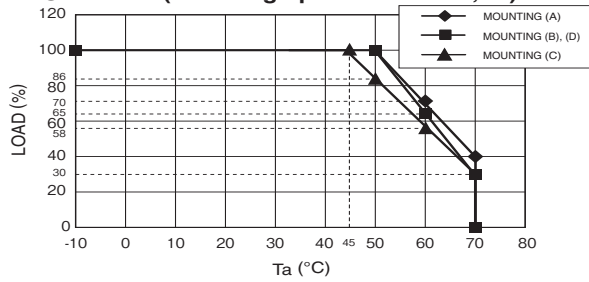
/B (Option) Recommended connector (it is not affixed to the product)

PART DESCRIPTION	PART NAME	MANUFACT	QTY
SOCKET HOUSING (CN1)	VHR-5N	JST	1
SOCKET HOUSING (CN51)	VHR-4N	JST	1
TERMINAL PINS (CN1,CN51)	BVH-21T-P1.1 or SVH-21T-P1.1	JST	7

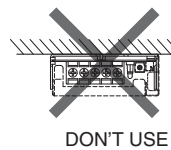
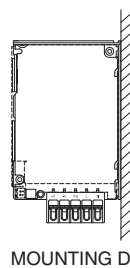
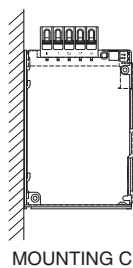
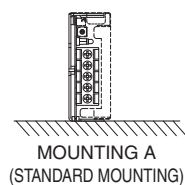
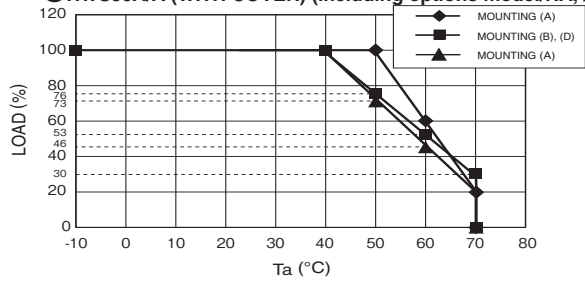
HAND CRIMPING TOOL: YC-160R (JST)

Output Derating

●HWS50A(Including options model/R, /B)



●HWS50A/A (WITH COVER) (Including options model/RA, /ADDIN)



HWS80A SPECIFICATIONS (Read instruction manual carefully, before using the power supply unit.)

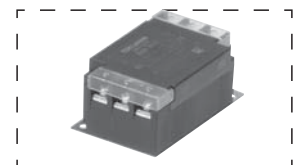
UNIT -
PC Board

HWS-A

ITEMS/UNITS			MODEL	HWS80A-3	HWS80A-5	HWS80A-12	HWS80A-15	HWS80A-24	HWS80A-48	
Input	Input Voltage Range	(*2)	V	AC85 - 265 (47 - 63Hz) or DC120 - 370						
	Power Factor(100/200VAC) (typ)	(*1)		0.96/0.87	0.98/0.91					
	Efficiency(100VAC) (typ)	(*1)	%	81	83	85	85	86	87	
	Efficiency(200VAC) (typ)	(*1)	%	83	85	87	87	88	89	
	Input Current (100/200VAC) (typ)	(*1)	A	0.72/0.36	1.04/0.52					
	Inrush Current (100/200VAC) (typ) (*1)(*3)		A	14/28 (Ta = 25°C , Cold Start)						
	Leakage Current	(*9)	mA	Less than 0.5 (0.2 (typ) at 100VAC / 0.4 (typ) at 230VAC)						
Output	Nominal Output Voltage		VDC	3.3	5	12	15	24	48	
	Maximum Output Current		A	16	16	6.7	5.4	3.4	1.7	
	Maximum Output Power		W	52.8	80.0	80.4	81.0	81.6	81.6	
	Maximum Line Regulation	(*5)	mV	20	20	48	60	96	192	
	Maximum Load Regulation	(*6)	mV	40	40	96	120	150	240	
	Temperature Coefficient			Less than 0.02% /°C						
	Maximum Ripple & Noise(0≦Ta≦70°C) (*4)		mV	120	120	150	150	150	200	
	Maximum Ripple & Noise(-10≦Ta<0°C) (*4)		mV	160	160	180	180	180	240	
	Hold-up Time (typ)	(*1)	ms	20						
Function	Output Voltage Range		VDC	2.97 - 3.96	4.0 - 6.0	9.6 - 14.4	12.0 - 18.0	19.2 - 28.8	38.4 - 52.8	
	Over Current Protection	(*7)	A	16.8 -	16.8 -	7.04 -	5.67 -	3.57 -	1.79 -	
	Over Voltage Protection	(*8)	VDC	4.13 - 4.95	6.25 - 7.25	15.0 - 17.4	18.8 - 21.8	30.0 - 34.8	55.2 - 64.8	
	Remote Sensing			Possible						
	Remote ON/OFF			- (/R Option: Output ON in the external voltage is applied)						
	Parallel Operation			-						
	Series Operation			Possible						
	Line DIP			Designed to meet SEMI-F47(200VAC Line only)						
	Environment	Operating Temperature	(*10)	°C	-10 ~ +70(-10 ~ +50°C :100%, +60°C :80%, +70°C :60%)					
		Storage Temperature		°C	-30 to +85					
Operating Humidity			% RH	30 - 90 (No Condensing)						
Storage Humidity			% RH	10 - 95 (No Condensing)						
Vibration				At no operating, 10-55Hz (Sweep for 1min) 19.6m/s ² Constant, X,Y,Z 1hour each.						
Shock				Less than 196.1m/s ²						
Cooling				Convection Cooling						
Isolation	Withstand Voltage			Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (20mA) for 1min						
	Isolation Resistance			More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC						
Standards	Safety			Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1. (Expire date of 60950-1: 20/12/2020) Designed to meet Den-an Appendix 8 at 100VAC only. With cover type only: Approved by UL508, CSA C22.2 No.107.1-01.						
	PFHC			Designed to meet IEC61000-3-2						
	Conducted Emission, Radiated Emission	(*11)		Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
	Immunity	(*11)		Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11						
Mechanical	Weight (typ)		g	420 (With cover: 470)						
	Size (W x H x D)		mm	28 x 82 x 160 (Refer to Outline Drawing)						

- (*1) At 100VAC/200VAC, Ta=25°C , nominal output voltage and maximum output power.
- (*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50 - 60Hz).
- (*3) Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- (*4) Measure with JEITA RC-9131B probe, Bandwidth of scope :100MHz.
- (*5) 85 - 265VAC, constant load.
- (*6) No load-Full load, constant input voltage.
- (*7) Constant current limit and hiccup with automatic recovery.
Avoid to operate at over load or short circuit condition.
- (*8) OVP circuit will shut down output, manual reset (Re power on).
- (*9) Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C .
- (*10) Output Derating
- Refer to Output Derating Curve.
- Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.
- (*11) The power supply is considered a component which will be installed into a final equipment.
The final equipment should be re-evaluated that it meets EMC directives.

Recommended EMC Filter

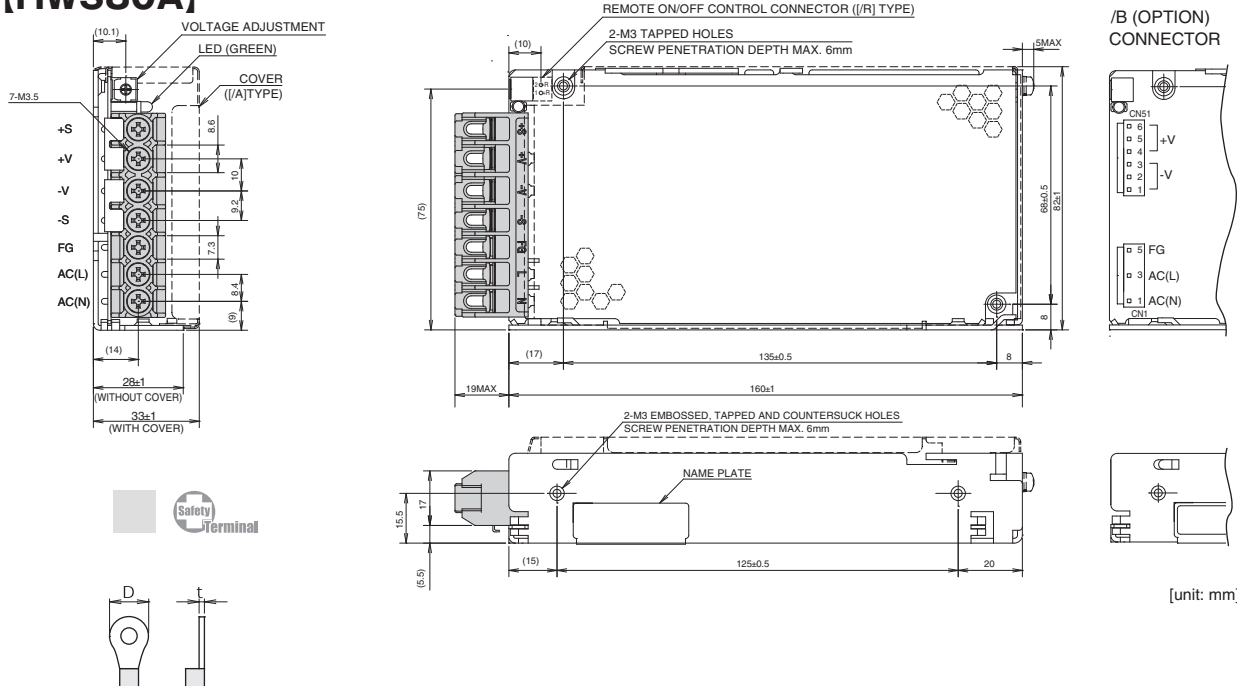


RSEN-2003D or RSEN-2003
Please refer to "TDK-Lambda
EMC Filters" catalog.

Outline Drawing

UNIT · PC Board

[HWS80A]



HWS-A

Terminal	Recommended Solderless Terminal		
	D(max)	t(max)	Qty(max)
+V / -V	8.1mm	0.8mm	2 pcs
		1.0mm	1 pcs
Others	6.8mm	0.8mm	2 pcs

/B (Option) Use connector

PART DESCRIPTION	PART NAME	MANUFACT	QTY
CONNECTOR INPUT SIDE(CN1)	B3P5-VH(LF)(SN)	JST	1
CONNECTOR OUTPUT SIDE(CN51)	B4P-VH(LF)(SN)	JST	1

※Output terminal, please use one pin per 5A below.

/R (Option)

Remote ON / OFF control connector (JST)

PIN HEADER	B2B-XH-AM
SOCKET HOUSING	XHP-2
TERMINAL PINS	BXH-001T-P0.6 or SXH-001T-P0.6
HAND CRIMRING TOOL	YC-110R or YRS-110

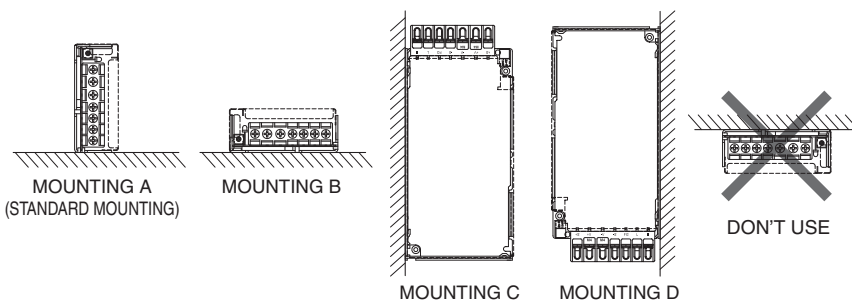
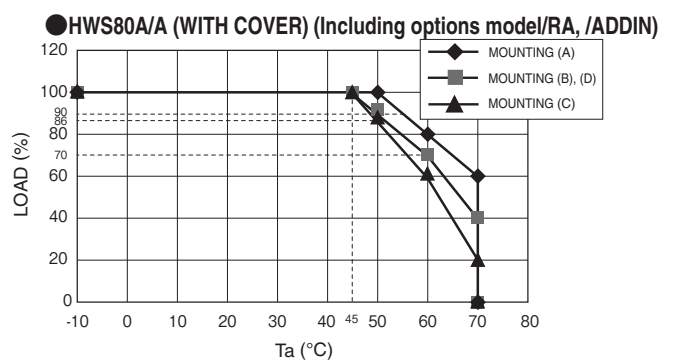
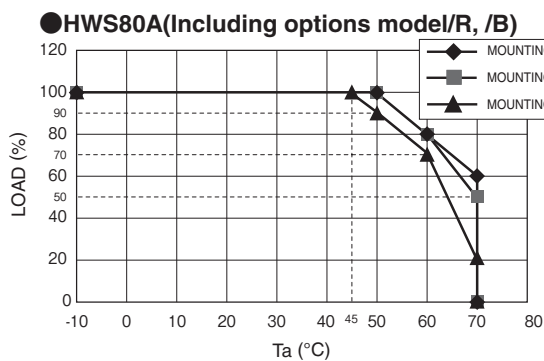
※ Housing and terminal pin are not attached to the product.

/B (Option) Recommended connector (it is not affixed to the product)

PART DESCRIPTION	PART NAME	MANUFACT	QTY
SOCKET HOUSING (CN1)	VHR-5N	JST	1
SOCKET HOUSING (CN51)	VHR-6N	JST	1
TERMINAL PINS (CN1, CN51)	BVH-21T-P1.1 or SVH-21T-P1.1	JST	9

HAND CRIMRING TOOL: YC-160R (JST)

Output Derating



HWS100A SPECIFICATIONS (Read instruction manual carefully, before using the power supply unit.)

UNIT -
PC Board

ITEMS/UNITS		MODEL	HWS100A-3	HWS100A-5	HWS100A-12	HWS100A-15	HWS100A-24	HWS100A-48	
Input	Input Voltage Range	(*2) V	AC85 - 265 (47 - 63Hz) or DC120 - 370						
	Power Factor(100/200VAC) (typ)	(*1)	0.96/0.89	0.98/0.93					
	Efficiency(100VAC) (typ)	(*1) %	82	84	86	86	87	88	
	Efficiency(200VAC) (typ)	(*1) %	84	86	88	88	89	90	
	Input Current (100/200VAC) (typ)	(*1) A	0.9/0.45	1.3/0.65					
	Inrush Current (100/200VAC) (typ) (*1)(*3)	A	14/28 (Ta = 25°C Cold Start)						
	Leakage Current	(*9) mA	Less than 0.5 (0.2 (typ) at 100VAC / 0.4 (typ) at 230VAC)						
Output	Nominal Output Voltage	VDC	3.3	5	12	15	24	48	
	Maximum Output Current	A	20	20	8.5	7	4.5	2.1	
	Maximum Output Power	W	66.0	100.0	102.0	105.0	108.0	100.8	
	Maximum Line Regulation	(*5) mV	20	20	48	60	96	192	
	Maximum Load Regulation	(*6) mV	40	40	96	120	150	240	
	Temperature Coefficient		Less than 0.02% /°C						
	Maximum Ripple & Noise(0≤Ta≤70°C) (*4)	mV	120	120	150	150	150	200	
	Maximum Ripple & Noise(-10≤Ta<0°C) (*4)	mV	160	160	180	180	180	240	
	Hold-up Time (typ)	(*1) ms	20						
Function	Output Voltage Range	VDC	2.97 - 3.96	4.0 - 6.0	9.6 - 14.4	12.0 - 18.0	19.2 - 28.8	38.4 - 52.8	
	Over Current Protection	(*7) A	21.0 -	21.0 -	8.92 -	7.35 -	4.72 -	2.20 -	
	Over Voltage Protection	(*8) VDC	4.13 - 4.95	6.25 - 7.25	15.0 - 17.4	18.8 - 21.8	30.0 - 34.8	55.2 - 64.8	
	Remote Sensing		Possible						
	Remote ON/OFF		- (/R Option: Output ON in the external voltage is applied)						
	Parallel Operation		-						
	Series Operation		Possible						
	Line DIP		Designed to meet SEMI-F47 (200VAC Line only)						
	Environment	Operating Temperature	(*10) °C	-10 to +70 (-10 to +50°C :100%, +60°C :65%, +70°C :30%)					
		Storage Temperature	°C	-30 to +85					
Operating Humidity		% RH	30 - 90 (No Condensing)						
Storage Humidity		% RH	10 - 95 (No Condensing)						
Vibration			At no operating, 10-55Hz (Sweep for 1min) 19.6m/s ² Constant, X,Y,Z 1hour each.						
Shock			Less than 196.1m/s ²						
Cooling			Convection Cooling						
Isolation	Withstand Voltage		Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (20mA) for 1min						
	Isolation Resistance		More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC						
Standards	Safety		Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1. (Expire date of 60950-1: 20/12/2020) Designed to meet Den-an Appendix 8 at 100VAC only. With cover type only: Approved by UL508, CSA C22.2 No.107.1-01.						
	PFHC		Designed to meet IEC61000-3-2						
	Conducted Emission, Radiated Emission	(*11)	Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
	Immunity	(*11)	Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11						
Mechanical	Weight (typ)	g	420 (With cover: 470)						
	Size (W x H x D)	mm	28 x 82 x 160 (Refer to Outline Drawing)						

(*1) At 100VAC/200VAC, Ta=25°C, nominal output voltage and maximum output power.

(*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50 - 60Hz).

(*3) Not applicable for the inrush current to Noise Filter for less than 0.2ms.

(*4) Measure with JEITA RC-9131B probe, Bandwidth of scope :100MHz.

(*5) 85 - 265VAC, constant load.

(*6) No load-Full load, constant input voltage.

(*7) Constant current limit and hiccup with automatic recovery.

Avoid to operate at over load or short circuit condition.

(*8) OVP circuit will shut down output, manual reset (Re power on).

(*9) Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C.

(*10) Output Derating

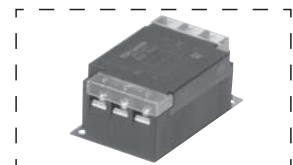
- Refer to Output Derating Curve.

- Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.

(*11) The power supply is considered a component which will be installed into a final equipment.

The final equipment should be re-evaluated that it meets EMC directives.

Recommended EMC Filter

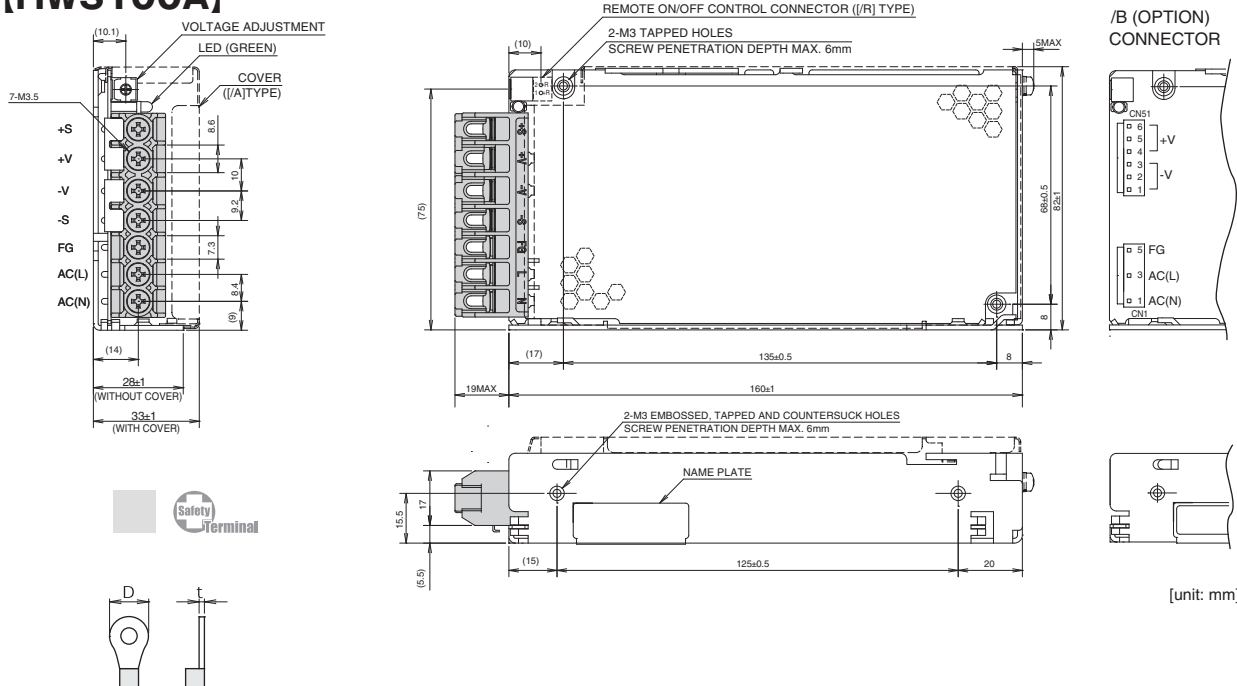


RSEN-2003D or RSEN-2003
Please refer to "TDK-Lambda
EMC Filters" catalog.

Outline Drawing

UNIT - PC Board

[HWS100A]



[unit: mm]

HWS-A

Terminal	Recommended Solderless Terminal		
	D(max)	t(max)	Qty(max)
+V / -V	8.1mm	0.8mm	2 pcs
		1.0mm	1 pcs
Others	6.8mm	0.8mm	2 pcs

/B (Option) Use connector

PART DESCRIPTION	PART NAME	MANUFACT	QTY
CONNECTOR INPUT SIDE(CN1)	B3P5-VH(LF)(SN)	JST	1
CONNECTOR OUTPUT SIDE(CN51)	B4P-VH(LF)(SN)	JST	1

※Output terminal, please use one pin per 5A below.

/R (Option)

Remote ON / OFF control connector (JST)

PIN HEADER	B2B-XH-AM
SOCKET HOUSING	XHP-2
TERMINAL PINS	BXH-001T-P0.6 or SXH-001T-P0.6
HAND CRIMRING TOOL	YC-110R or YRS-110

※ Housing and terminal pin are not attached to the product.

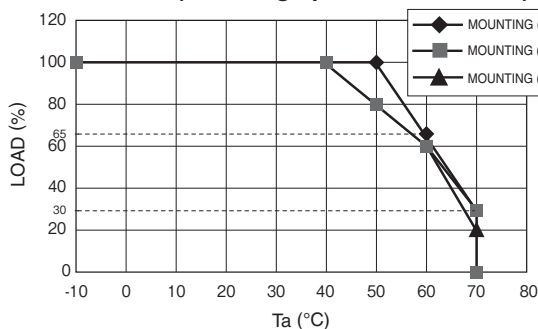
/B (Option) Recommended connector (it is not affixed to the product)

PART DESCRIPTION	PART NAME	MANUFACT	QTY
SOCKET HOUSING (CN1)	VHR-5N	JST	1
SOCKET HOUSING (CN51)	VHR-6N	JST	1
TERMINAL PINS (CN1, CN51)	BVH-21T-P1.1 or SVH-21T-P1.1	JST	9

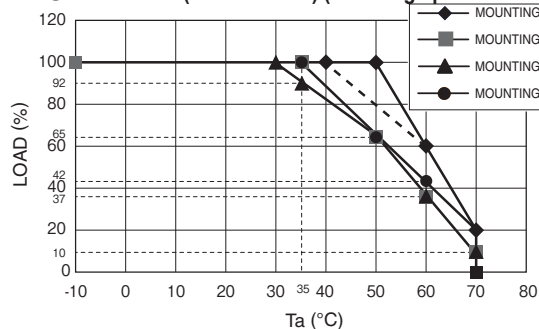
HAND CRIMRING TOOL: YC-160R (JST)

Output Derating

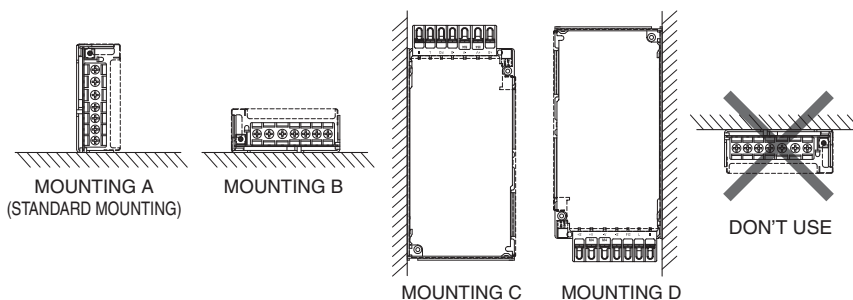
● HWS100A(Including options model/R, /B)



● HWS100A/A (WITH COVER) (Including options model/RA, /ADDIN)



* Refer to dotted line for output derating curve, when input voltage range is "85VAC ≤ Vin < 90VAC" for the Mounting (A).



HWS150A SPECIFICATIONS (Read instruction manual carefully, before using the power supply unit.)

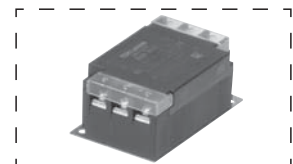
UNIT -
PC Board

HWS-A

ITEMS/UNITS		MODEL	HWS150A-3	HWS150A-5	HWS150A-12	HWS150A-15	HWS150A-24	HWS150A-48	
Input	Input Voltage Range	(*2) V	AC85 - 265 (47 - 63Hz) or DC120 - 370						
	Power Factor(100/200VAC) (typ)	(*1)	0.96/0.89	0.98/0.93					
	Efficiency(100VAC) (typ)	(*1) %	82	85	85	86	88	89	
	Efficiency(200VAC) (typ)	(*1) %	84	87	88	89	90	91	
	Input Current (100/200VAC) (typ)	(*1) A	1.3/0.65	1.9/0.95					
	Inrush Current (100/200VAC) (typ) (*1)(*3)	A	14/28 (Ta = 25°C , Cold Start)						
	Leakage Current	(*9) mA	Less than 0.5 (0.2 (typ) at 100VAC / 0.4 (typ) at 230VAC)						
Output	Nominal Output Voltage	VDC	3.3	5	12	15	24	48	
	Maximum Output Current	A	30	30	13	10	6.5	3.3	
	Maximum Output Power	W	99.0	150.0	156.0	150.0	156.0	158.4	
	Maximum Line Regulation	(*5) mV	20	20	48	60	96	192	
	Maximum Load Regulation	(*6) mV	40	40	96	120	150	240	
	Temperature Coefficient		Less than 0.02% /°C						
	Maximum Ripple & Noise(0≦Ta≦70°C) (*4)	mV	120	120	150	150	150	200	
	Maximum Ripple & Noise(-10≦Ta<0°C) (*4)	mV	160	160	180	180	180	240	
	Hold-up Time (typ)	(*1) ms	20						
Function	Output Voltage Range	VDC	2.97 - 3.96	4.0 - 6.0	9.6 - 14.4	12.0 - 18.0	19.2 - 28.8	38.4 - 52.8	
	Over Current Protection	(*7) A	31.5 -	31.5 -	13.6 -	10.5 -	6.82 -	3.46 -	
	Over Voltage Protection	(*8) VDC	4.13 - 4.95	6.25 - 7.25	15.0 - 17.4	18.8 - 21.8	30.0 - 34.8	55.2 - 64.8	
	Remote Sensing		Possible						
	Remote ON/OFF		- (/R Option: Output ON in the external voltage is applied)						
	Parallel Operation		-						
	Series Operation		Possible						
	Line DIP		Designed to meet SEMI-F47 (200VAC Line only)						
	Environment	Operating Temperature	(*10) °C	-10 to +70 (-10 to +50°C :100%, +60°C :60%, +70°C :20%)					
		Storage Temperature	°C	-30 to +85					
Operating Humidity		% RH	30 - 90 (No Condensing)						
Storage Humidity		% RH	10 - 95 (No Condensing)						
Vibration			At no operating, 10-55Hz (Sweep for 1min) 19.6m/s ² Constant, X,Y,Z 1hour each.						
Shock			Less than 196.1m/s ²						
Cooling			Convection Cooling						
Isolation	Withstand Voltage		Input - FG : 2kVAC (20mA), Input - Output : 3kVAC (20mA) Output - FG : 500VAC (20mA) for 1min						
	Isolation Resistance		More than 100MΩ at 25°C and 70%RH Output - FG : 500VDC						
Standards	Safety		Approved by UL62368-1, CSA62368-1, EN62368-1, UL60950-1, CSA60950-1, EN60950-1. (Expire date of 60950-1: 20/12/2020) Designed to meet Den-an Appendix 8 at 100VAC only. With cover type only: Approved by UL508, CSA C22.2 No.107.1-01.						
	PFHC		Designed to meet IEC61000-3-2						
	Conducted Emission, Radiated Emission	(*11)	Designed to meet EN55011/EN55032-B, FCC-B, VCCI-B						
	Immunity	(*11)	Designed to meet IEC61000-6-2 IEC61000-4-2, -3, -4, -5, -6, -8, -11						
Mechanical	Weight (typ)	g	470 (With cover: 520)						
	Size (W x H x D)	mm	37 x 82 x 160 (Refer to Outline Drawing)						

- (*1) At 100VAC/200VAC, Ta=25°C , nominal output voltage and maximum output power.
- (*2) For cases where conformance to various safety specs (UL, CSA, EN) are required, to be described as 100 - 240VAC(50 - 60Hz).
- (*3) Not applicable for the inrush current to Noise Filter for less than 0.2ms.
- (*4) Measure with JEITA RC-9131B probe, Bandwidth of scope :100MHz.
- (*5) 85 - 265VAC, constant load.
- (*6) No load-Full load, constant input voltage.
- (*7) Constant current limit and hiccup with automatic recovery. Avoid to operate at over load or short circuit condition.
- (*8) OVP circuit will shut down output, manual reset (Re power on).
- (*9) Measured by the each measuring method of UL, CSA, EN and Den-an (at 60Hz), Ta=25°C .
- (*10) Output Derating
- Refer to Output Derating Curve.
- Load (%) is percent of maximum output power or maximum output current, do not exceed its derating of maximum load.
- (*11) The power supply is considered a component which will be installed into a final equipment. The final equipment should be re-evaluated that it meets EMC directives.

●Recommended EMC Filter

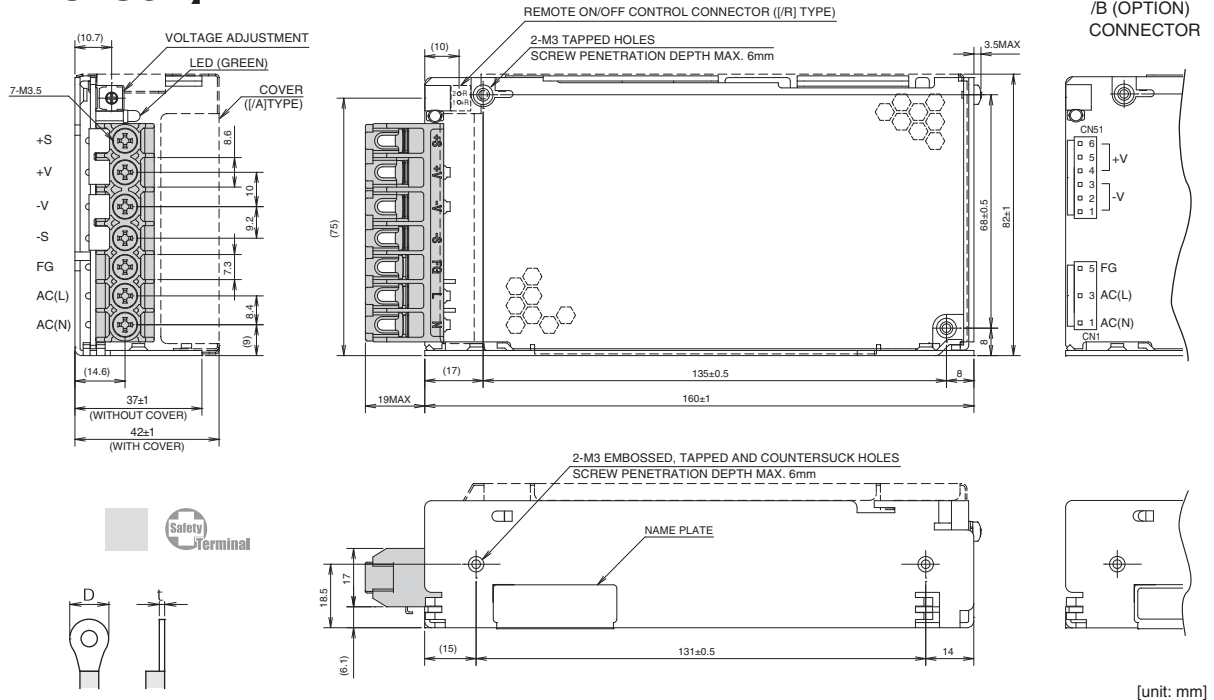


RSEN-2003D or RSEN-2003
Please refer to "TDK-Lambda EMC Filters" catalog.

Outline Drawing

UNIT · PC Board

[HWS150A]



Terminal	Recommended Solderless Terminal		
	D(max)	t(max)	Qty(max)
+V / -V	8.1mm	0.8mm 1.0mm	2 pcs 1 pcs
Others	6.8mm	0.8mm	2 pcs

/B (Option) Use connector

PART DESCRIPTION	PART NAME	MANUFACT	QTY
CONNECTOR INPUT SIDE(CN1)	B3P5-VH(LF)(SN)	JST	1
CONNECTOR OUTPUT SIDE(CN51)	B6P-VH(LF)(SN)	JST	1

※Output terminal, please use one pin per 5A below.

/R (Option)

Remote ON / OFF control connector (JST)

PIN HEADER	B2B-XH-AM
SOCKET HOUSING	XHP-2
TERMINAL PINS	BXH-001T-P0.6 or SXH-001T-P0.6
HAND CRIMRING TOOL	YC-110R or YRS-110

※ Housing and terminal pin are not attached to the product.

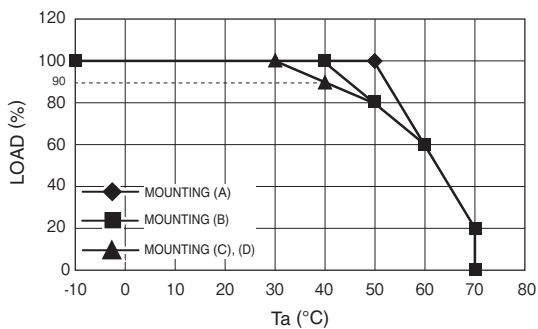
/B (Option) Recommended connector (it is not affixed to the product)

PART DESCRIPTION	PART NAME	MANUFACT	QTY
SOCKET HOUSING (CN1)	VHR-5N	JST	1
SOCKET HOUSING (CN51)	VHR-6N	JST	1
TERMINAL PINS (CN1,CN51)	BVH-21T-P1.1 or SVH-21T-P1.1	JST	9

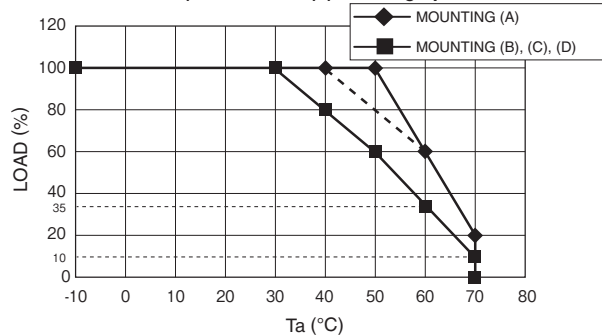
HAND CRIMRING TOOL: YC-160R (JST)

Output Derating

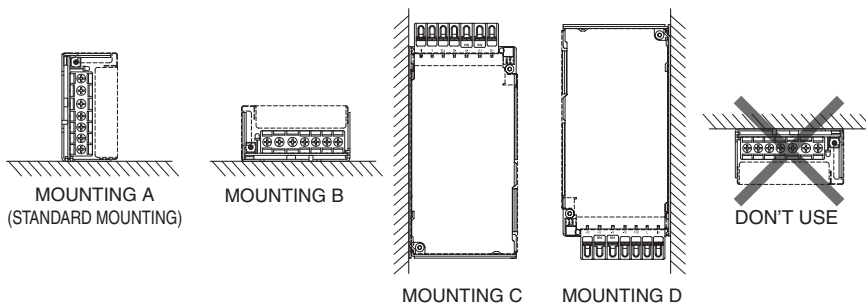
● HWS150A(Including options model /R, /B)



● HWS150A/A (WITH COVER) (Including options model /RA, /ADDIN)



* In the case of using at the input voltage range "85 VAC ≤ Vin < 90VAC", output derating will be dashed line. (Mounting direction(A) only)

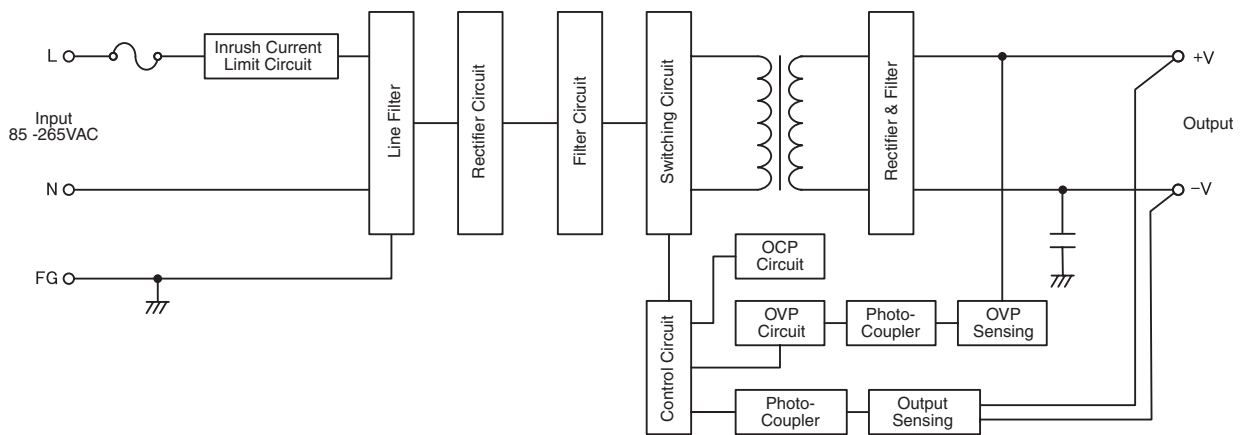


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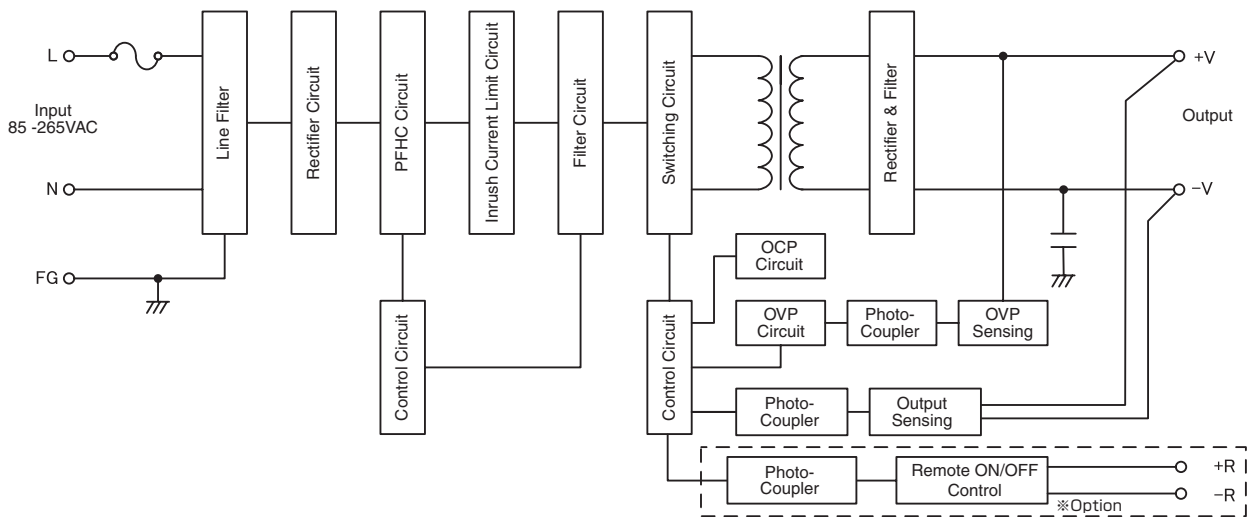
Block Diagram

UNIT - PC Board

[HWS15A, HWS30A]

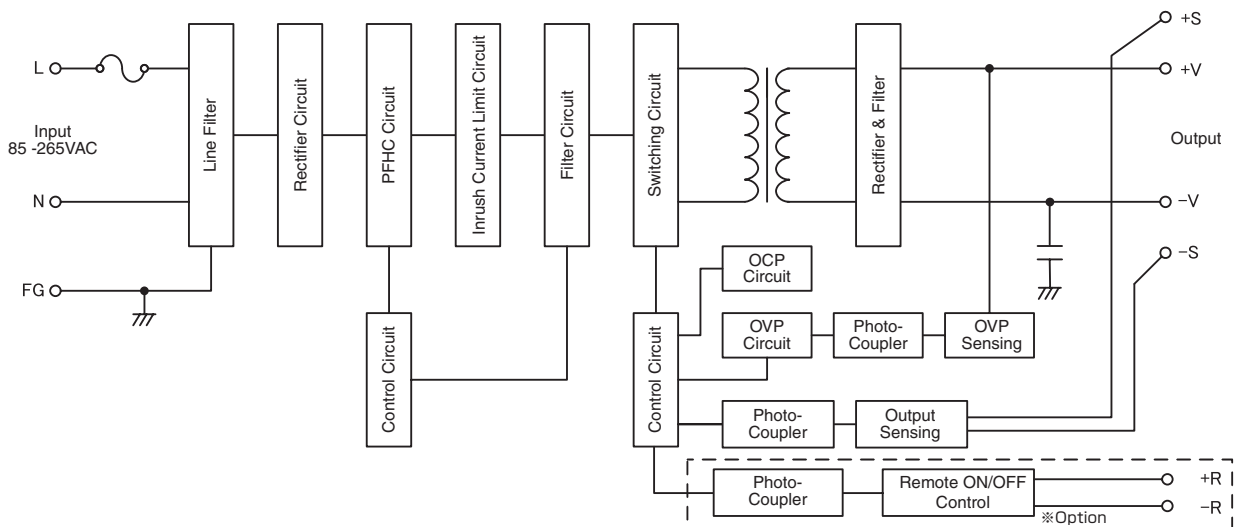


[HWS50A]



HWS-A

[HWS80A - HWS150A]



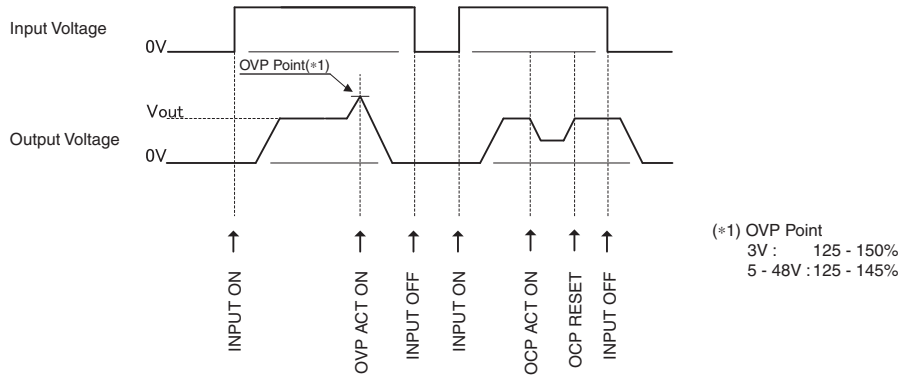
- Fuse rating :
 - HWS15A: 2A
 - HWS30A-100A: 3.15A
 - HWS150A: 5A

- Circuit topology, switching frequency
 - HWS15A-50A: Flyback topology 100kHz (fixed)
 - HWS80A-150A: Cascade forward topology 120kHz (fixed)
 - PFHC circuit : active filter 65kHz (fixed)

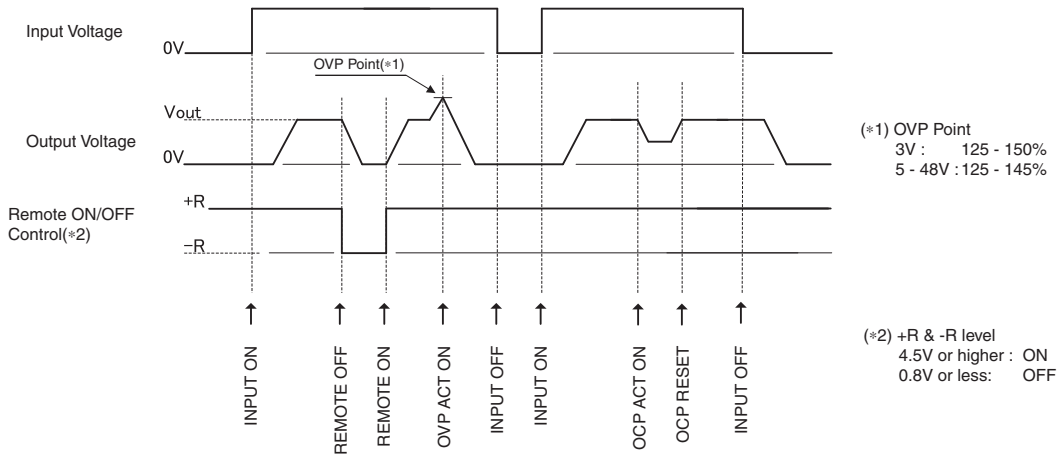
• All specifications are subject to change without notice.

Sequence Time Chart

[HWS15A, HWS30A]



[HWS50A - HWS150A]



HWS15A, 30A, 50A, 80A, 100A, 150A Instruction ManualUNIT ·
PC Board

Be sure to read this instruction manual thoroughly before using this product. Pay attention to all cautions and warnings before using this product.

HWS15A ~ 150A Instruction Manual

https://product.tdk.com/info/en/documents/instruction_manual/hws-a_apl.pdf

HWS-A
取扱説明

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