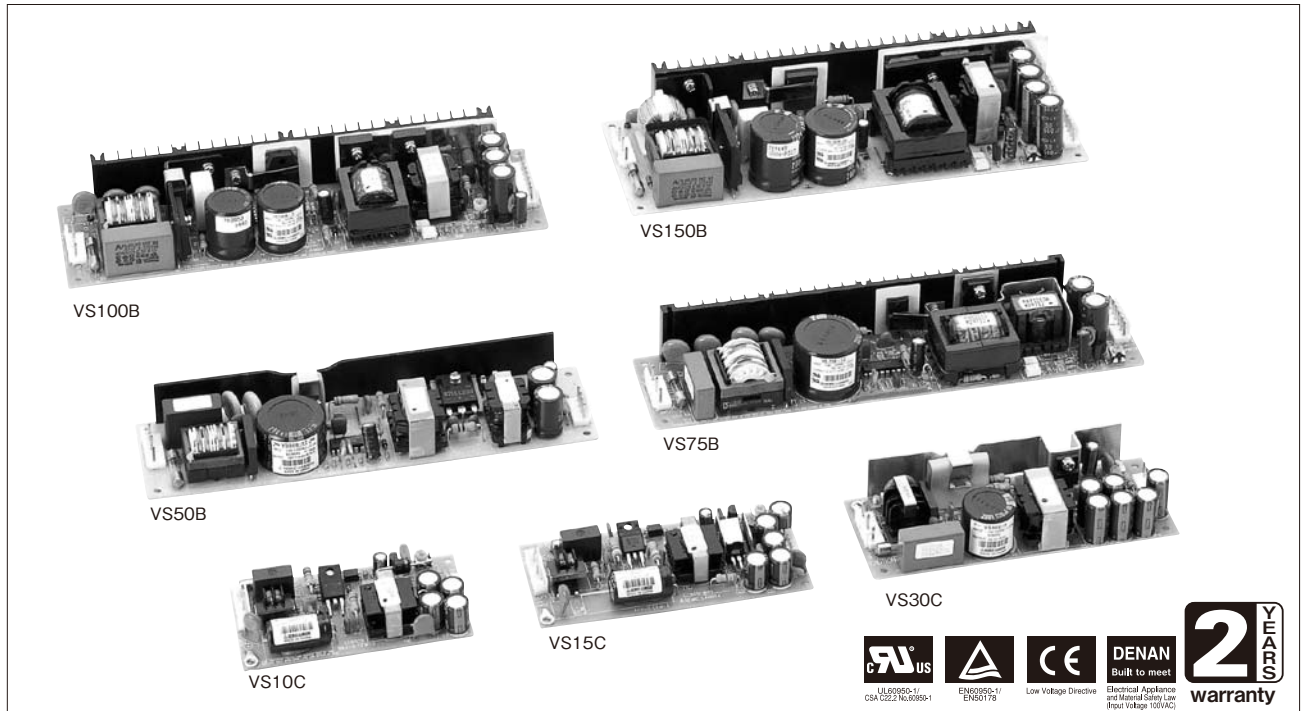


# VS SERIES

Single Output 10W - 150W



## ■ Features

CE marking applicable

- 100VAC input / single output / super low cost on board type
- Applicable to a wide range of usages, including game devices and printers

## ■ Applications



## ■ Model naming method

**VS 100B - 24**



## ■ Conformity to RoHS Directive

This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

## ■ Product Line up

VS-C

Output Voltage	10W		15W		30W	
	Output Current	Model	Output Current	Model	Output Current	Model
3.3V	2.0A	VS10C-3	3.0A	VS15C-3	6.0A	VS30C-3
5V	2.0A	VS10C-5	3.0A	VS15C-5	6.0A	VS30C-5
12V	0.9A	VS10C-12	1.3A	VS15C-12	2.5A	VS30C-12
15V	0.7A	VS10C-15	1.0A	VS15C-15	2.0A	VS30C-15
24V	0.5A	VS10C-24	0.7A	VS15C-24	1.3A	VS30C-24
36V	-	-	-	-	0.9A	VS30C-36
48V	-	-	-	-	0.7A	VS30C-48

VS-B (Peak)

Output Voltage	50W			75W			100W			150W		
	Output Current	Peak Current	Model	Output Current	Peak Current	Model	Output Current	Peak Current	Model	Output Current	Peak Current	Model
3.3V	10.0A	12.0A	VS50B-3	15.0A	18.0A	VS75B-3	20.0A	24.0A	VS100B-3	30.0A	36.0A	VS150B-3
5V	10.0A	12.0A	VS50B-5	15.0A	18.0A	VS75B-5	20.0A	24.0A	VS100B-5	30.0A	36.0A	VS150B-5
12V	4.3A	5.16A	VS50B-12	6.3A	7.56A	VS75B-12	8.5A	10.2A	VS100B-12	12.5A	15.0A	VS150B-12
15V	3.5A	4.2A	VS50B-15	5.0A	6.0A	VS75B-15	7.0A	8.4A	VS100B-15	10.0A	12.0A	VS150B-15
24V	2.5A	3.0A	VS50B-24	3.2A	3.84A	VS75B-24	4.3A	5.16A	VS100B-24	6.3A	7.56A	VS150B-24
36V	-	-	-	2.1A	2.52A	VS75B-36	3.0A	3.6A	VS100B-36	4.2A	5.04A	VS150B-36
48V	-	-	-	1.6A	1.92A	VS75B-48	2.2A	2.64A	VS100B-48	3.2A	3.84A	VS150B-48

# VS10C Specifications

ITEMS/UNITS		MODEL	VS10C-3	VS10C-5	VS10C-12	VS10C-15	VS10C-24
Input	Voltage Range (*2)	V	AC85-132 or DC110-175				
	Frequency (*2)	Hz	47-440				
	Efficiency (typ)	(%)*1	62	71	75		78
	Current (typ)	(A)*1	0.3				
	Inrush Current (100VAC)(typ)	A	25, Ta=25°C				
Output	Nominal Voltage	VDC	3.3	5	12	15	24
	Minimum Current	A	0				
	Maximum Current	A	2.0		0.9	0.7	0.5
	Maximum Power	W	6.6	10.0	10.8	10.5	12.0
	Maximum Line Regulation(*3)(*4)	mV	20		48	60	96
	Maximum Load Regulation(*3)(*5)	mV	40		96	120	150
	Temperature Coefficient(*3)(*6)	mV	50		120	150	240
	Maximum Ripple & Noise (*3)	mVp-p	120		150		200
	Hold-up Time (typ)	(ms)*1	20 at 10W				
	Voltage Adjustable Range		±10%				
Function	Over Current Protection (*7)		>105%				
	Over Voltage Protection (*8)		>115%				
	Parallel Operation		-				
	Series Operation		Possible				
	Operating Temperature (*9)	°C	-10 to +50: 100%, +60: 70%				
Environment	Storage Temperature	°C	-30 to 85				
	Operating Humidity	%RH	30 - 90				
	Storage Humidity	%RH	10 - 95				
	Vibration		10-55Hz Amplitude (sweep 1min) Less than 19.6m/s <sup>2</sup> X, Y, Z 1h each				
	Shock		Less than 196.1m/s <sup>2</sup>				
	Cooling		Convection cooling				
Isolation	Withstand Voltage		Input-Output: 2kVAC (20mA), Input-FG: 2kVAC (20mA) Output-FG: 500VAC (100mA) 1min				
	Isolation Resistance		More than 100MΩ at 25°C and 70% RH Output-FG 500VDC				
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1, Built to meet DENAN.				
	EMI		Built to meet VCCI-B & FCC class B				
Mechanical	Weight (typ)	g	65				
	Size (W x H x D)	mm	49 x 17 x 94				

(\*1) At 100VAC and maximum output power, Ta=25°C.

(\*2) For cases where conformance to various safety specs (UL, CSA, EN) are required to be described as 100-120VAC, 50/60Hz on name plate.

(\*3) Please refer to Fig A for measurement determination of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(\*4) From 85-132VAC, constant load.

(\*5) From min load - Full load (maximum power), constant input voltage.

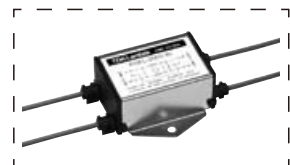
(\*6) From -10~+50°C constant input voltage and load.

(\*7) Current limiting with automatic recovery, Avoid to operate over load or dead short for 30 seconds.

(\*8) Over voltage clamping by zener diode.

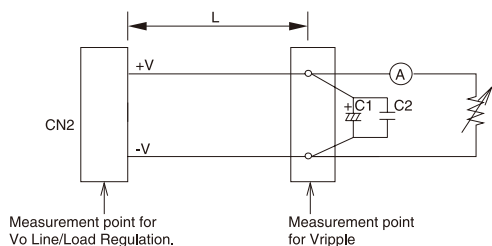
(\*9) At standard mounting method, Fig B.

● Recommended EMC Filter



RESL-20R5W

Please refer to "TDK-Lambda EMC Filters" catalog.



L: 150mm AWG#22  
C1: Elec. Cap 100uF  
C2: Film Cap 0.1uF  
Bandwidth of scope: 100MHz

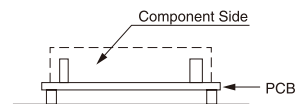


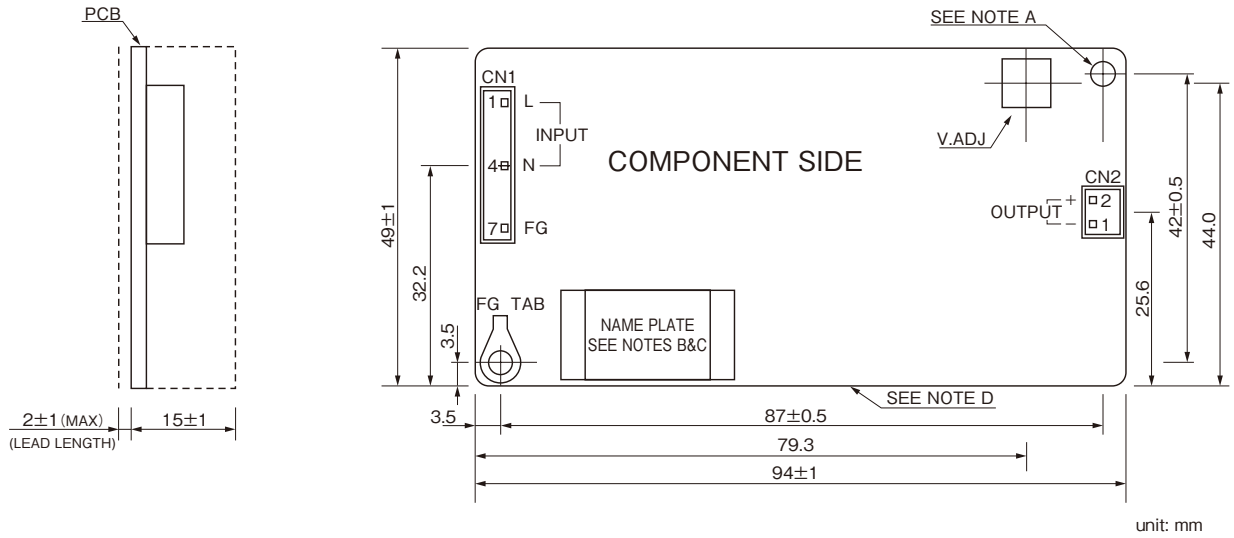
Fig B

Fig A

VS

# Outline Drawing

## [VS10C]



**CONNECTORS USED :**

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3(7.5)B-XH-A	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B2B-XH-A	J.S.T	1

**MATCHING HOUSINGS & PINS :  
\* NOT INCLUDED WITH THE PRODUCT**

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN1)	XHP-7	J.S.T	1
SOCKET HOUSING (CN2)	XHP-2	J.S.T	1
TERMINAL PINS (CN1,2)	BXH-001T-P0.6 OR SXH-001T-P0.6	J.S.T	5

HAND CRIMPING TOOL : YC-110R CN1,2 MANUFACTURER : J.S.T  
: YRS-110 CN1,2 MANUFACTURER : J.S.T

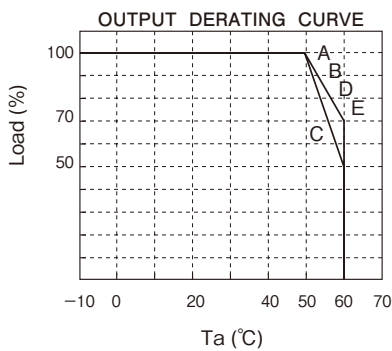
**NOTES:**

- A: THE 4x $\phi$ 3.5 HOLES ARE CUSTOMER CHASSIS MOUNTING HOLES, ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D: TO KEEP THE DISTANCE MORE THAN 2mm BETWEEN PCB-BOARD EDGE AND CUSTOMER CHASSIS.

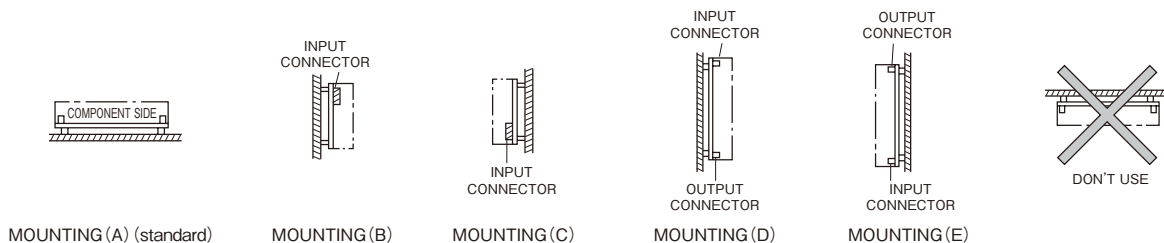
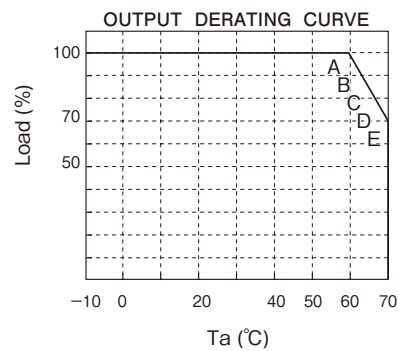
PCB MATERIAL:  
GLASS COMPOSITE : CEM-3

# Output Derating

**(CONVECTION COOLING)**



**(FORCED AIR COOLING)**



# VS15C Specifications

ITEMS/UNITS		MODEL	VS15C-3	VS15C-5	VS15C-12	VS15C-15	VS15C-24
Input	Voltage Range (*2)	V	AC85-132 or DC110-175				
	Frequency (*2)	Hz	47-440				
	Efficiency (typ)	(*) %	62	72	75		78
	Current (typ)	(*) A	0.4				
	Inrush Current (100VAC)(typ)	A	30, Ta=25°C				
Output	Nominal Voltage	VDC	3.3	5	12	15	24
	Minimum Current	A	0				
	Maximum Current	A	3.0		1.3	1.0	0.7
	Maximum Power	W	9.9	15.0	15.6	15.0	16.8
	Maximum Line Regulation(*3)(*4)	mV	20		48	60	96
	Maximum Load Regulation(*3)(*5)	mV	40		96	120	150
	Temperature Coefficient (*3)(*6)	mV	50		120	150	240
	Maximum Ripple & Noise (*3)	mVp-p	120		150		200
	Hold-up Time (typ)	(*) ms	20 at 15W				
	Voltage Adjustable Range		±10%				
Function	Over Current Protection (*7)		>105%				
	Over Voltage Protection (*8)		>115%				
	Parallel Operation		-				
	Series Operation		Possible				
	Operating Temperature (*9)	°C	-10 to +50: 100%, +60: 70%				
Environment	Storage Temperature	°C	-30 to 85				
	Operating Humidity	%RH	30 - 90				
	Storage Humidity	%RH	10 - 95				
	Vibration		10-55Hz amplitude (sweep 1min) less than 19.6m/s <sup>2</sup> X, Y, Z 1h each				
	Shock		Less than 196.1m/s <sup>2</sup>				
	Cooling		Convection cooling				
Isolation	Withstand Voltage		Input-Output: 2kVAC (20mA), Input-FG: 2kVAC (20mA) Output-FG: 500VAC (100mA) 1min				
	Isolation Resistance		More than 100MΩ at 25°C and 70% RH Output-FG 500VDC				
Standards	Safety Standards		Built to meet UL1950, CSA950, EN60950, DENTORI				
	EMI		Built to meet VCCI-II & FCC class B				
Mechanical	Weight (typ)	g	80				
	Size (W x H x D)	mm	50 x 17 x 115				

(\*1) At 100VAC and maximum output power, Ta=25°C.

(\*2) For cases where conformance to various safety specs (UL, CSA, EN) are required to be described as 100-120VAC, 50/60Hz on name plate.

(\*3) Please refer to Fig A for measurement determination of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(\*4) From 85-132VAC, constant load.

(\*5) From min load - full load (maximum power), constant input voltage.

(\*6) From -10 to +50°C constant input voltage and load.

(\*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for 30 seconds.

(\*8) Over voltage clamping by zener diode.

(\*9) At standard mounting method, Fig B.

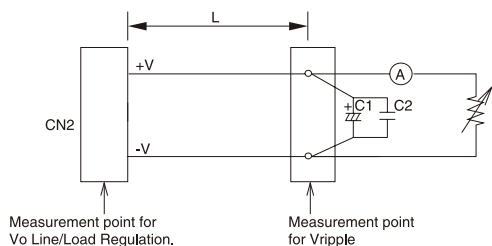
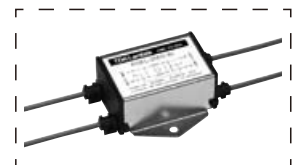


Fig A

L: 150mm AWG#22  
 C1: Elec. Cap 100uF  
 C2: Film Cap 0.1uF  
 Bandwidth of scope: 100MHz

● Recommended EMC Filter



RSEL-2001W

Please refer to "TDK-Lambda EMC Filters" catalog.

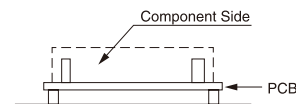
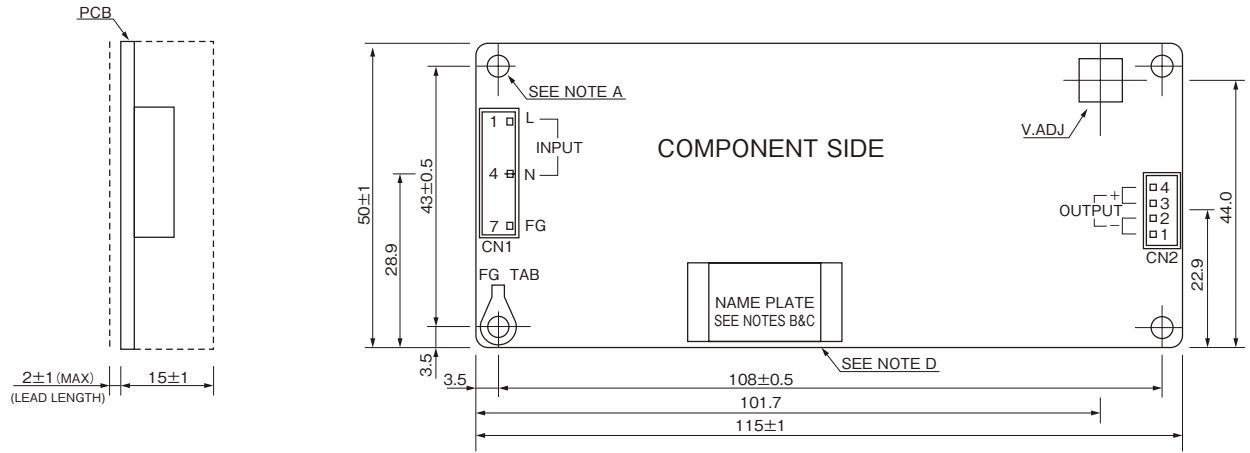


Fig B

Outline Drawing

[VS15C]



unit: mm

CONNECTORS USED :

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3(7.5)B-XH-A	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B4B-XH-A	J.S.T	1

MATCHING HOUSINGS & PINS :  
\* NOT INCLUDED WITH THE PRODUCT.

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN1)	XHP-7	J.S.T	1
SOCKET HOUSING (CN2)	XHP-4	J.S.T	1
TERMINAL PINS (CN1,2)	BXH-001T-P0.6 OR SXH-001T-P0.6	J.S.T	7

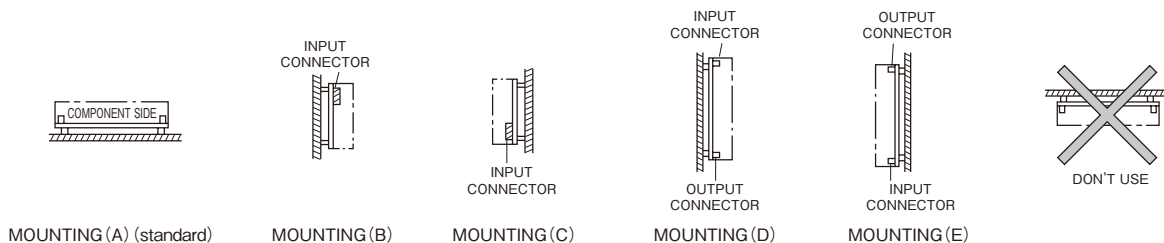
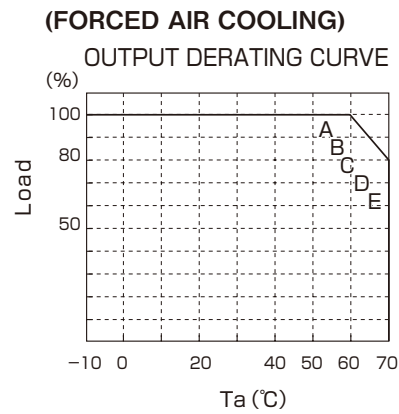
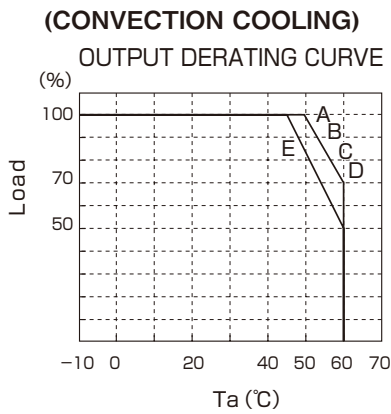
HAND CRIMPING TOOL : YC-110R CN1,2 MANUFACTURER : J.S.T  
: YRS-110 CN1,2 MANUFACTURER : J.S.T

NOTES :

- A: THE 4XΦ3.5 HOLES ARE CUSTOMER CHASSIS MOUNTING HOLES, ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D: TO KEEP THE DISTANCE MORE THAN 2mm BETWEEN PC-BOARD EDGE AND CUSTOMER CHASSIS.

PCB MATERIAL  
GASS COMPOSIE: CEM-3

Output Derating



# VS30C Specifications

ITEMS/UNITS		MODEL	VS30C-3	VS30C-5	VS30C-12	VS30C-15	VS30C-24	VS30C-36	VS30C-48
Input	Voltage Range (*2)	V	AC85-132 or DC110-175						
	Frequency (*2)	Hz	47-440						
	Efficiency (typ)	(*) %	69	75	80	81	82	80	
	Current (typ)	(*) A	0.7						
	Inrush Current (100VAC)(typ)	A	25A, cold start Ta=25°C						
Output	Nominal Voltage	VDC	3.3	5	12	15	24	36	48
	Minimum Current	A	0						
	Maximum Current	A	6.0		2.5	2.0	1.3	0.9	0.7
	Maximum Power	W	19.8	30.0		31.2		32.4	33.6
	Maximum Line Regulation(*3)(*4)	mV	20		48	60	96	144	192
	Maximum Load Regulation(*3)(*5)	mV	40		96	120	150	240	300
	Temperature Coefficient(*3)(*6)	mV	50		120	150	240	360	480
	Maximum Ripple & Noise (*3)	mVp-p	120		150		200	300	400
	Hold-up Time (typ)	(*) ms	20 at 30W						
	Voltage Adjustable Range		±10%						
Function	Over Current Protection (*7)		>105%						
	Over Voltage Protection (*8)		>115%						
	Parallel Operation		-						
	Series Operation		Possible						
Environment	Operating Temperature (*9)	°C	-10 to +50: 100%, +60: 70%						
	Storage Temperature	°C	-30 to 85						
	Operating Humidity	%RH	30 - 90						
	Storage Humidity	%RH	10 - 95						
	Vibration		10-55Hz amplitude (sweep 1min) less than 19.6m/s <sup>2</sup> X, Y, Z 1h each						
	Shock		Less than 196.1m/s <sup>2</sup>						
Isolation	Withstand Voltage		Input-Output: 2kVAC (20mA), Input-FG: 2kVAC (20mA) Output-FG: 500VAC (100mA) 1min						
	Isolation Resistance		More than 100MΩ at 25°C and 70% RH Output-FG 500VDC						
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1. Built to meet DENAN.						
	EMI		Built to meet VCCI-B & FCC class B						
Mechanical	Weight (typ)	g	150						
	Size (W x H x D)	mm	50 x 25 x 132.5						

(\*1) At 100VAC and maximum output power, Ta=25°C.

(\*2) For cases where conformance to various safety specs (UL, CSA, EN) are required to be described as 100-120VAC, 50/60Hz on name plate.

(\*3) Please refer to Fig A for measurement determination of line & load regulation and output ripple voltage. (Measure with JEITA RC-9131 probe.)

(\*4) From 85-132VAC, constant load.

(\*5) From min load - full load (maximum power), constant input voltage.

(\*6) From -10 to +50°C constant input voltage and load.

(\*7) Current limiting with automatic recovery. Avoid to operate over load or dead short for 30 seconds.

(\*8) Over voltage clamping by zener diode.

(\*9) At standard mounting method, Fig B.

● Recommended EMC Filter



RSEL-2001W

Please refer to "TDK-Lambda EMC Filters" catalog.

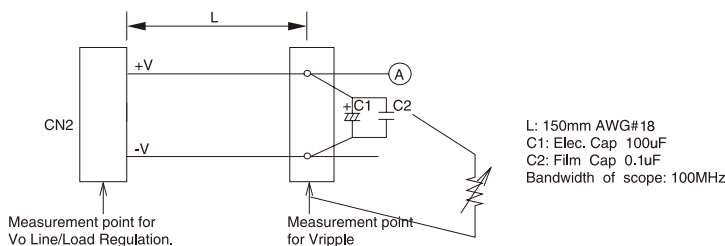


Fig A

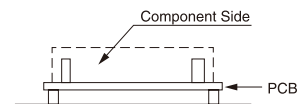
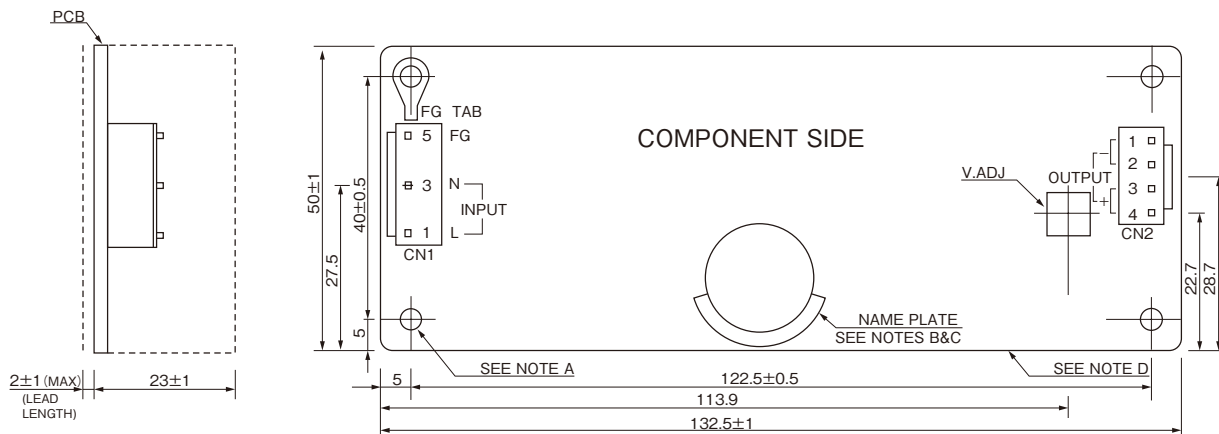


Fig B

VS

**Outline Drawing**

**[VS30C]**



**CONNECTORS USED:**

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P-5-VH	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B4P-VH	J.S.T	1

**MATCHING HOUSINGS AND PINS:**

\* NOT INCLUDED WITH THE PRODUCT.

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
SOCKET HOUSING (CN1)	VHR-5N	J.S.T	1
SOCKET HOUSING (CN2)	VHR-4N	J.S.T	1
TERMINAL PINS (CN1,2)	SVH-21T-P1.1	J.S.T	7

HAND CRIMPING TOOL : YC-160R CN1,2 MANUFACTURER : J.S.T

unit: mm

**NOTES**

- A: THE 4XΦ3.5 HOLES ARE CUSTOMER CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B: MODEL NAME, NOMINAL OUTPUT VOLTAGE, MAXIMUM OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D: TO KEEP THE DISTANCE MORE THAN 2mm BETWEEN PC-BOARD EDGE AND CUSTOMER CHASSIS.
- E: C-UL-US , TUV AND CE MARKS FOR 3.3V, 5V, 12V, 15V, 24V, 36V, 48V ONLY.

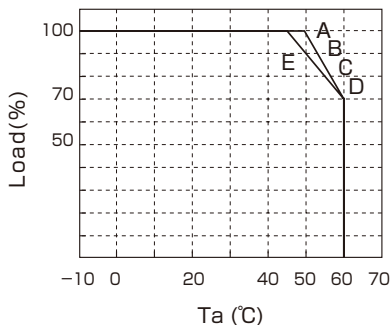
**PCB MATERIAL**

GLASS COMPOSITE : CEM-3

**Output Derating**

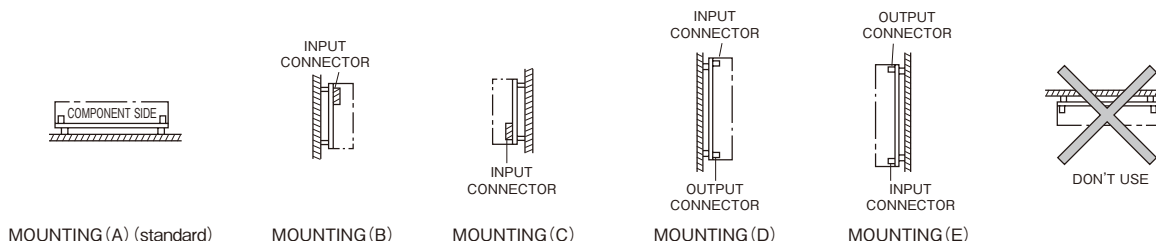
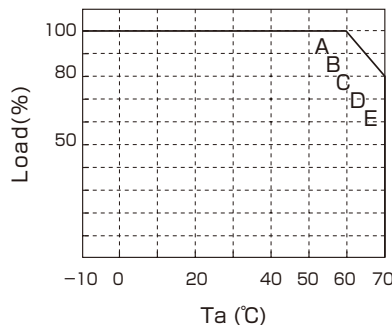
**(CONVECTION COOLING)**

**OUTPUT DERATING CURVE**



**(FORCED AIR COOLING)**

**OUTPUT DERATING CURVE**



# VS50B Specifications

ITEMS/UNITS		MODEL	VS50B-3	VS50B-5	VS50B-12	VS50B-15	VS50B-24
Input	Voltage Range (*3)	V	AC85-132 or DC110-175				
	Frequency (*3)	Hz	47-440				
	Efficiency (typ)	%	73	78	79	80	
	Current (typ)	A	1.0A	1.2			1.4A
	Inrush Current (100VAC)(typ)	A	cold start Ta=25°C				
Output	Nominal Voltage	VDC	3.3	5.0	12.0	15.0	24.0
	Minimum Current	A	0				
	Average Current	A	10.0		4.3	3.5	2.5
	Maximum Peak Current (*1)	A	12.0		5.16	4.2	3.0
	Average Power	W	33.0	50.0	51.6	52.5	60.0
	Maximum Peak Power (*1)	W	39.6	60.0	61.92	63.0	72.0
	Maximum Line Regulation(*4)(*5)	mV	20		48	60	96
	Maximum Load Regulation(*4)(*6)	mV	40		96	120	150
	Temperature Coefficient (*4)(*7)	mV	50		120	150	240
	Maximum Ripple & Noise (*4)	mVp-p	120		150		200
	Hold-up Time (typ)	ms	17 at 50W				
	Function	Voltage Adjustable Range		+/-10%			
Over Current Protection (*8)			>125%				
Over Voltage Protection (*9)			115% - 135%				
Parallel Operation			-				
Series Operation			Possible				
Environment	Operating Temperature (*10)	°C	-10 to 50: 100%, 60: 70%				40:100% 50: 88%, 60: 62%
	Storage Temperature	°C	-30 to 85				
	Operating Humidity	%RH	30 - 90				
	Storage Humidity	%RH	10 - 95				
	Vibration		10-55Hz amplitude (sweep 1min) less than 19.6m/s <sup>2</sup> X,Y,Z 1h each				
	Shock		Less than 196.1m/s <sup>2</sup>				
Isolation	Cooling		Convection cooling				
	Withstand Voltage		Input-Output: 2kVAC (20mA), Input-FG: 2kVAC (20mA) Output-FG: 500VAC (100mA) 1min.				
Standards	Isolation Resistance		More than 100MΩ at 25°C and 70%RH Output-FG 500VDC				
	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1, Built to meet DENAN.				
Mechanical	EMI		Built to meet VCCI-B & FCC class B				
	Weight (typ)	g	200				
	Size (W x H x D)	mm	50 x 25 x 195				

(\*1) Operating time at peak output is less than 10 sec. (Duty=0.35)

(\*2) At 100VAC and average output power, Ta=25°C.

(\*3) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.

(\*4) Please refer to Fig A for measurement determination of line & load regulation and output ripple voltage.

(\*5) From 85-132VAC, constant load.

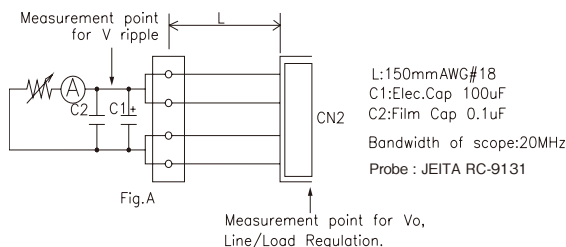
(\*6) From min load - full load (average power), constant input voltage.

(\*7) From -10~+50°C constant input voltage and load.

(\*8) Current limiting with automatic recovery. Avoid to operate over load or dead short for 30 seconds.

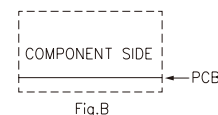
(\*9) OVP circuit will shutdown output, manual reset.

(\*10) At standard mounting method, Fig B.



**Recommended EMC Filter**

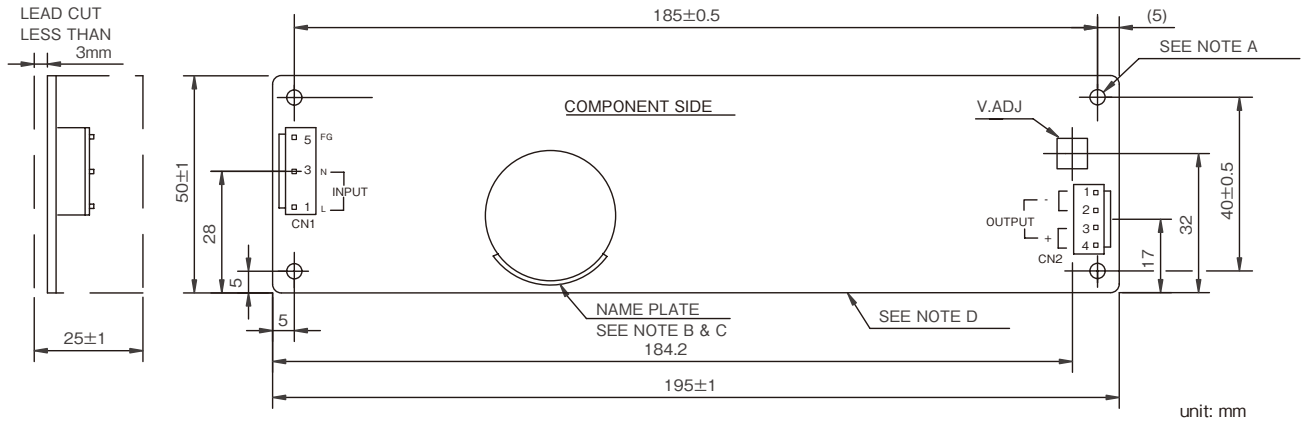
RSEL-2002W  
Please refer to "TDK-Lambda EMC Filters" catalog.





# Outline Drawing

## [VS50B]



**CONNECTORS USED:**

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P-5-VH	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B4P-VH	J.S.T	1

**ACCESSORIES**

SOCKET HOUSING (CN1)	VHR-5N	J.S.T	1
SOCKET HOUSING (CN2)	VHR-4N	J.S.T	1
TERMINAL PINS (CN1, 2)	SVH-21T-P1.1	J.S.T	7

HAND CRIMPING TOOL : YC-160R MANUFACTURER : J.S.T

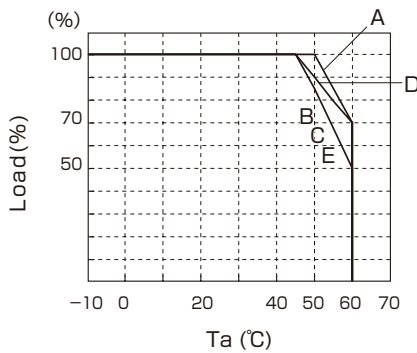
**NOTES**

- A: THE 4-φ3.5 HOLES ARE CUSTOMER CHASSIS MOUNTING HOLES, ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B: MODEL NAME, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT, PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D: TO KEEP THE DISTANCE MORE THAN 2mm BETWEEN PC-BOARD EDGE AND CUSTOMER CHASSIS.

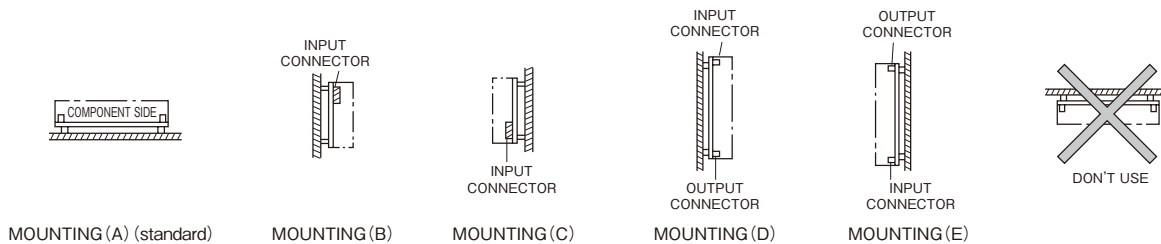
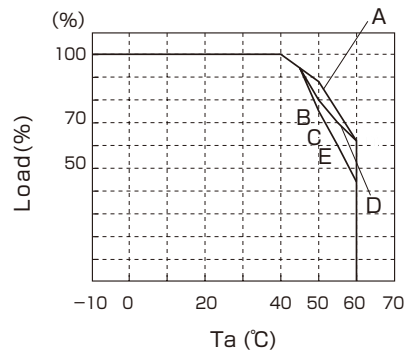
PCB MATERIAL  
GLASS COMPOSITE : CEM-3

# Output Derating

**OUTPUT DERATING CURVE (3V, 5V, 12V, 15V)**



**OUTPUT DERATING CURVE (24V)**



# VS75B Specifications

ITEMS/UNITS		MODEL	VS75B-3	VS75B-5	VS75B-12	VS75B-15	VS75B-24	VS75B-36	VS75B-48	
Input	Voltage Range (*3)	V	AC85-132 or DC110-175							
	Frequency (*3)	Hz	47-440							
	Efficiency (Typ)	(*) %	72.0	79.0	80.0		81.0			
	Current (Typ)	(*) A	1.6	2.0						
	Inrush Current (100VAC)(Typ)	A	30A, cold start Ta: 25°C							
Output	Nominal Voltage	VDC	3.3	5	12	15	24	36	48	
	Minimum Current	A	0							
	Average Current	A	15.0		6.3	5.0	3.2	2.1	1.6	
	Maximum Peak Current (*1)	A	18.0		7.56	6.0	3.84	2.52	1.92	
	Average Power	W	49.5	75.0	75.6	75.0	76.8	75.6	76.8	
	Maximum Peak Power (*1)	W	59.4	90.0	90.72	90	92.16	90.72	92.16	
	Maximum Line Regulation(*4)(*5)	mV	20		48	60	96	144	192	
	Maximum Load Regulation(*4)(*6)	mV	40		96	120	150	240	300	
	Temperature Coefficient (*4)(*7)	mV	50		120	150	240	360	480	
	Maximum Ripple & Noise (*4)	mVp-p	120		150		200	300	400	
	Hold-up Time (Typ) (*2)	ms	17 at 75W							
	Voltage Adjustable Range		±10%							
	Function	Over Current Protection (*8)		>125%						
Over Voltage Protection (*9)			115% - 135%							
Environment	Operating Temperature (*10)	°C	-10 to 50 : 100%, 60 : 70%							
	Storage Temperature	°C	-30 to 85							
	Operating Humidity	%RH	30 - 90							
	Storage Humidity	%RH	10 - 95							
	Vibration		10-55Hz (sweep 1 min) Less than 19.6m/s <sup>2</sup> X,Y,Z 1h each							
	Shock		Less than 196.1m/s <sup>2</sup>							
Isolation	Withstand Voltage		Input-Output: 2kVAC (20mA), Input-FG: 2kVAC (20mA) Output-FG: 500VAC (100mA) 1 min							
	Isolation Resistance		More than 100M ohm at 25°C and 70%RH Output-FG.. 500VDC							
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1. Built to meet DENAN.							
	EMI		Built to meet VCCI-B & FCC class B							
Mechanical	Weight	g	350							
	Size (W x H x D)	mm	50 x 32 x 222							

(\*1) Operating time at peak output current is less than 10 sec with average output power. (Duty: 0.35)

(\*2) At 100VAC and average output power, Ta: 25°C

(\*3) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.

(\*4) Please refer to Fig A for measurement determination of line & load regulation and output ripple voltage.

(\*5) From 85-132VAC, constant load.

(\*6) For min load - full load (average power), constant input voltage.

(\*7) From -10 to +50°C constant input voltage and load.

(\*8) Current limiting with automatic recovery. Avoid to operate over load or dead short for 30 seconds.

(\*9) OVP circuit will shutdown output, manual reset.

(\*10) At standard mounting method, Fig B.

● Recommended EMC Filter



RSEL-2003W

Please refer to "TDK-Lambda EMC Filters" catalog.

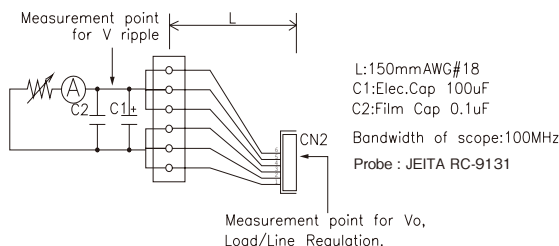


Fig.A

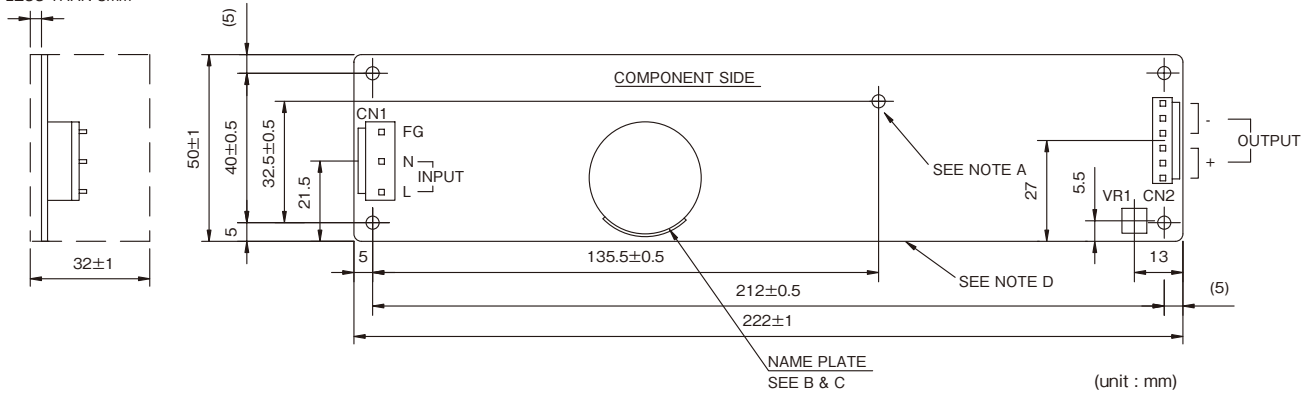


Fig.B

# Outline Drawing

## [VS75B]

LEAD CUT  
LESS THAN 3mm



**CONNECTORS USED:**

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P-5-VH	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B6P-VH	J.S.T	1

**ACCESSORIES:**

SOCKET HOUSING (CN1)	VHR-5N	J.S.T	1
SOCKET HOUSING (CN2)	VHR-6N	J.S.T	1
TERMINAL PINS (CN1,2)	SVH-21T-P1.1	J.S.T	9

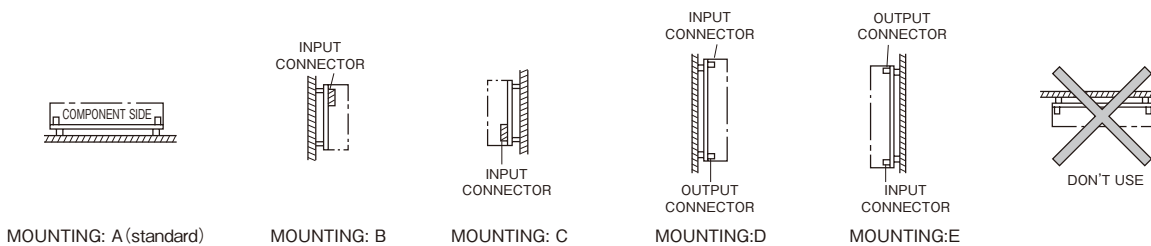
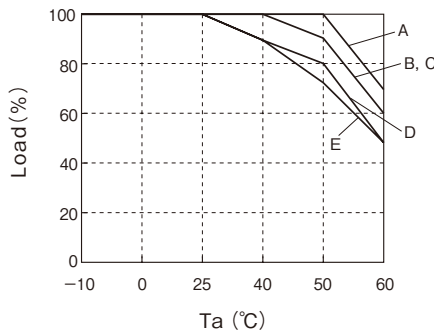
HAND CRIMPING TOOL : YC-160R MANUFACTURER : J.S.T

**NOTES**

- A : THE 5- 3.5 HOLES ARE CUSTOMER CHASSIS MOUNTING HOLES. ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B : MODEL NAME, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT, PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C : COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D : TO KEEP THE DISTANCE MORE THAN 2mm BETWEEN PC-BOARD EDGE AND CUSTOMER CHASSIS.

PCB MATERIAL  
GLASS COMPOSITE : CEM-3

# Output Derating



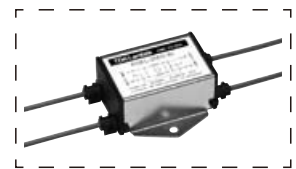
VS

# VS100B Specifications

ITEMS/UNITS		MODEL	VS100B-3	VS100B-5	VS100B-12	VS100B-15	VS100B-24	VS100B-36	VS100B-48
Input	Voltage Range (*3)	V	AC85-132 or DC110-175						
	Frequency (*3)	Hz	47-440						
	Efficiency (typ)	(%2)	72	79	80		81		
	Current (typ)	(%2)	1.8	2.2					
	Inrush Current (100VAC)(typ)	A	20						
Output	Nominal Voltage	VDC	3.3	5	12	15	24	36	48
	Minimum Current	A	0						
	Average Current	A	20.0		8.5	7.0	4.3	3.0	2.2
	Maximum Peak Current (*1)	A	24.0		10.2	8.4	5.16	3.6	2.64
	Average Power	W	66.0	100.0	102.0	105.0	103.2	108.0	105.6
	Maximum Peak Power (*1)	W	79.2	120.0	122.4	126.0	123.84	129.60	126.72
	Maximum Line Regulation(*4)(*5)	mV	20		48	60	96	144	192
	Maximum Load Regulation(*4)(*6)	mV	40		96	120	150	240	300
	Temperature Coefficient (*4)(*7)	mV	50		120	150	240	360	480
	Maximum Ripple & Noise (*4)	mVp-p	120		150		200	300	400
	Hold-up Time (typ)	(%2)	17 at 100W						
	Voltage Adjustable Range		+/-10%						
	Function	Over Current Protection (*8)		>125%					
Over Voltage Protection (*9)			115% - 135%						
Environment	Operating Temperature (*10)	°C	-10 to 50: 100%, 60: 70%						
	Storage Temperature	°C	-30 to +85						
	Operating Humidity	%RH	30 - 90						
	Storage Humidity	%RH	10 - 95						
	Vibration		10-55Hz (sweep 1min) Less than 19.6m/s <sup>2</sup> X, Y, Z 1h each						
	Shock		Less than 196.1m/s <sup>2</sup>						
	Cooling		Convection cooling						
Isolation	Withstand Voltage		Input-Output: 2kVAC(20mA), Input-FG: 2kVAC(20mA) Output-FG: 500VAC(100mA) 1min.						
	Isolation Resistance		More than 100MΩ at 25°C and 70%RH Output-FG 500VDC						
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1. Built to meet DENAN.						
	EMI		Built to meet VCCI-B & FCC class B						
Mechanical	Weight (typ)	g	420						
	Size (W x H x D)	mm	62 x 32 x 222						

- (\*1) Operating time at peak output current is less than 10 sec. with average output power. (Duty=0.35)
- (\*2) At 100VAC and average output power, Ta=25°C.
- (\*3) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.
- (\*4) Please refer to Fig A for measurement determination of line & load regulation and output ripple voltage.
- (\*5) From 85-132VAC, constant load.
- (\*6) From Min load - Full load (average power), constant input voltage.
- (\*7) From -10 to +50°C constant input voltage and load.
- (\*8) Current limiting with automatic recovery. Avoid to operate over load or dead short for 30 seconds.
- (\*9) OVP circuit will shutdown output, manual reset.
- (\*10) At standard mounting method, Fig B.

● Recommended EMC Filter



RSEL-2006W

Please refer to "TDK-Lambda EMC Filters" catalog.

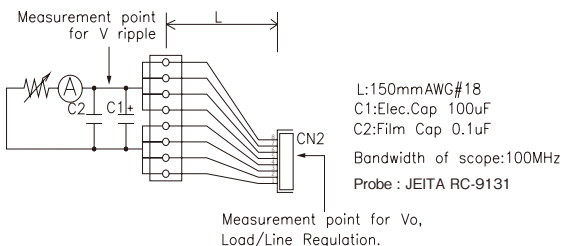


Fig.A

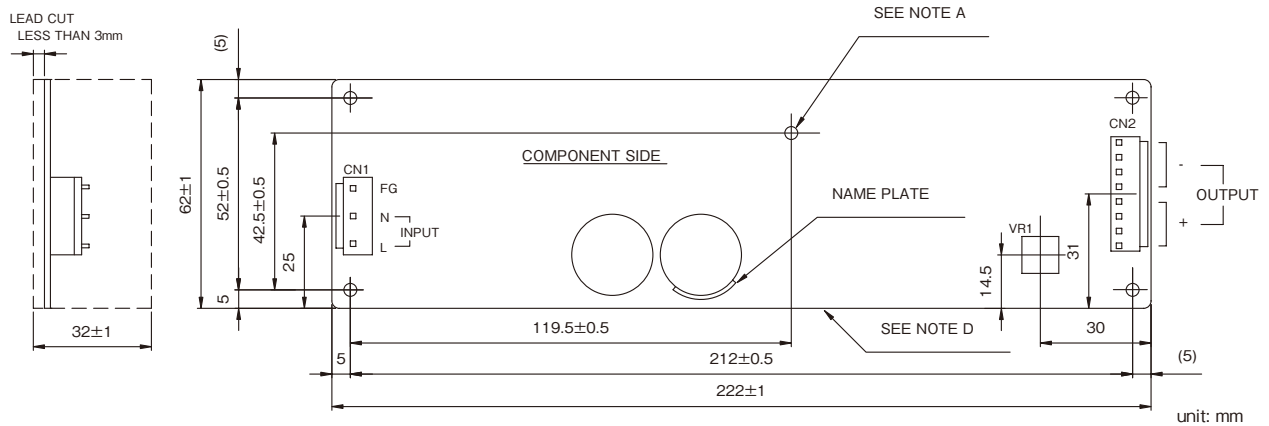


Fig.B

VS

# Outline Drawing

## [VS100B]



**CONNECTORS USED:**

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P-5-VH	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B8P-VH	J.S.T	1

**ACCESSORIES:**

SOCKET HOUSING (CN1)	VHR-5N	J.S.T	1
SOCKET HOUSING (CN2)	VHR-8N	J.S.T	1
TERMINAL PINS (CN1,2)	SVH-21T-P1.1	J.S.T	11

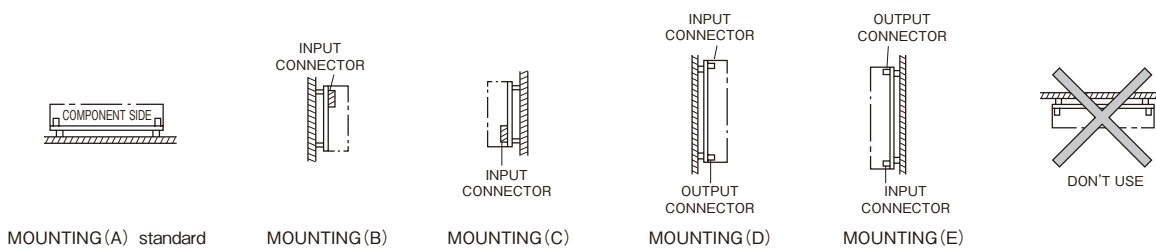
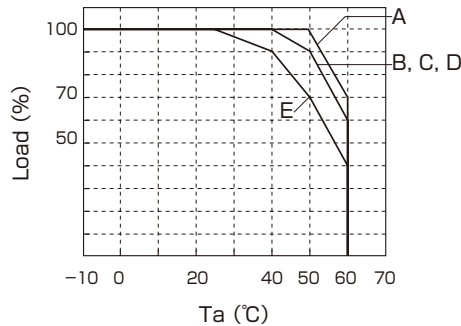
HAND CRIMPING TOOL : YC-160R      MANUFACTURER : J.S.T

**NOTES**

- A: THE 5-φ3.5 HOLES ARE CUSTOMER CHASSIS MOUNTING HOLES, ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B: MODEL NAME, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT, PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D: TO KEEP THE DISTANCE MORE THAN 2mm BETWEEN PC-BOARD EDGE AND CUSTOMER CHASSIS.

PCB MATERIAL  
GLASS COMPOSITE : CEM-3

# Derating Curve



VS

# VS150B Specifications

ITEMS/UNITS		MODEL	VS150B-3	VS150B-5	VS150B-12	VS150B-15	VS150B-18	VS150B-24	VS150B-36	VS150B-48	
Input	Voltage Range (*3)	V	AC85-132 or DC110-175								
	Frequency (*3)	Hz	47-440								
	Efficiency (typ) (*2)	%	72	78.0	80				81		
	Current (typ) (*2)	A	2.5	3.2							
	Inrush Current (100VAC)(typ)	A	20								
Output	Nominal Voltage	V	3.3	5	12	15	18	24	36	48	
	Minimum Current	A	0								
	Average Current	A	30.0		12.5	10.0	8.5	6.3	4.2	3.2	
	Maximum Peak Current (*1)	A	36.0		15.0	12.0	10.2	7.56	5.04	3.84	
	Average Power	W	99.0		150.0		153.0	151.2		153.6	
	Maximum Peak Power (*1)	W	118.8		180.0		184.0	181.44		184.32	
	Maximum Line Regulation(*4)(*5)	mV	20		48	60	72	96	144	192	
	Maximum Load Regulation(*4)(*6)	mV	40		96	120	140	150	240	300	
	Temperature Coefficient(*4)(*7)	mV	50		120	150		240	360	480	
	Maximum Ripple & Noise (*4)	mVp-p	120		150		200	300	400		
	Hold-up Time (typ) (*2)	ms	17 at 150W								
	Voltage Adjustable Range		+/-10%								
	Function	Over Current Protection (*8)		>125%							
Over Voltage Protection (*9)			115% - 135%								
Environment	Operating Temperature (*10)	°C	Convection: -10 to 25: 100%, 35: 90%, 50: 80%, 60: 60% Forced Air: -10 to 50: 100%, 60: 70%								
	Storage Temperature	°C	-30 to +85								
	Operating Humidity	%RH	30 - 90								
	Storage Humidity	%RH	10 - 95								
	Vibration		10 - 55Hz (sweep 1min) Less than 19.6m/s <sup>2</sup> X, Y, Z 1h each								
	Shock		Less than 196.1m/s <sup>2</sup>								
	Cooling		Convection & forced air cooling (Depends on o/p loading)								
Isolation	Withstand Voltage		Input-Output: 2kVAC (20mA), Input-FG: 2kVAC (20mA) Output-FG: 500VAC (100mA) for 1min.								
	Isolation Resistance		More than 100MΩ at 25°C and 70%RH Output-FG 500VDC								
Standards	Safety Standards		Approved by UL60950-1, CSA C22.2 No.60950-1, EN60950-1. Built to meet DENAN.								
	EMI		Built to meet VCCI-B & FCC class B								
Mechanical	Weight (typ)	g	550								
	Size (W x H x D)	mm	75 x 36 x 222								

(\*1) Operating time at peak output current is less than 10sec. with average output power. (Duty=0.35)

(\*2) At 100VAC and average output power, Ta=25°C.

(\*3) For cases where conformance to various safety specs (UL, CSA) are required to be described as 100-120VAC, 50/60Hz on name plate.

(\*4) Please refer to Fig A for measurement determination of line & load regulation and output ripple voltage.

(\*5) From 85-132VAC, constant load.

(\*6) From Min load - Full load (average power), constant input voltage.

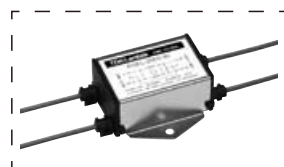
(\*7) From -10 to +50°C constant input voltage and load.

(\*8) Current limiting with automatic recovery. Avoid to operate over load or dead short for 30 seconds.

(\*9) OVP circuit will shutdown output, manual reset.

(\*10) At standard mounting method, Fig B.

● Recommended EMC Filter



RSEL-2006W  
Please refer to "TDK-Lambda EMC Filters" catalog.

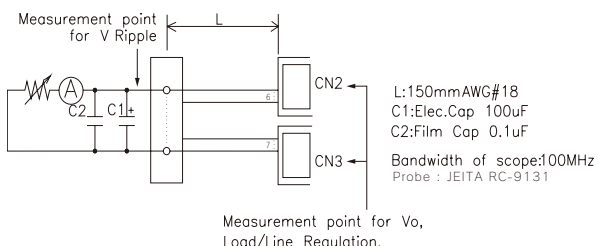


Fig.A

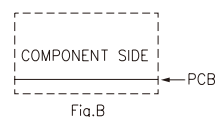
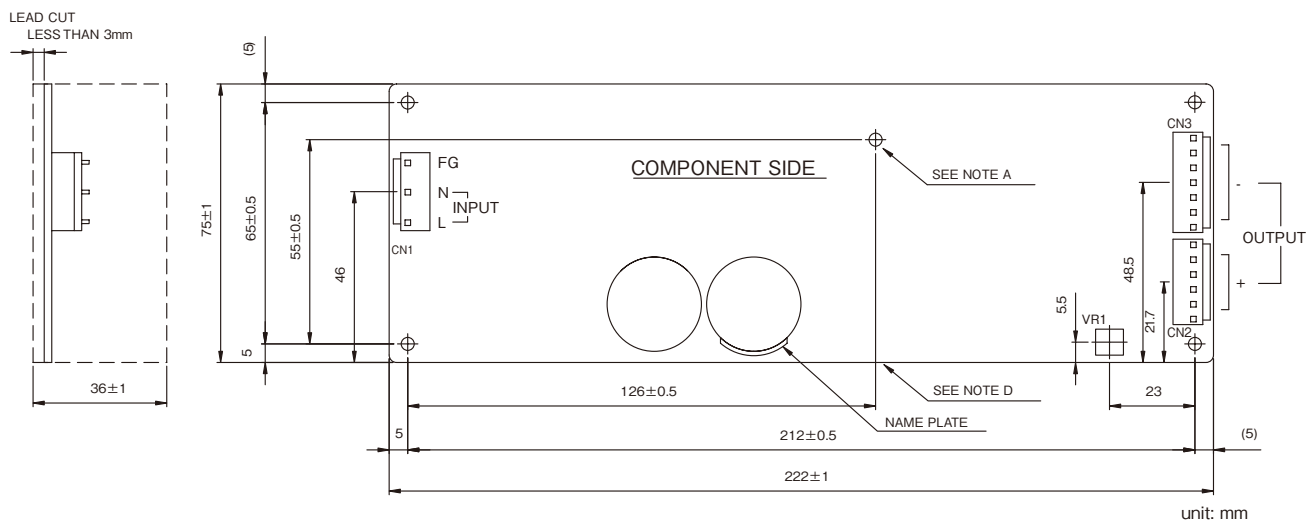


Fig.B

Outline Drawing

[VS150B]



CONNECTORS USED:

PART DESCRIPTION	PART NAME	MANUFACTURER	QTY
PIN HEADER (INPUT SIDE CN1)	B3P-5-VH	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B6P-VH	J.S.T	1
PIN HEADER (OUTPUT SIDE CN2)	B4P-VH	J.S.T	1

ACCESSORIES:

SOCKET HOUSING (CN1)	VHR-5N	J.S.T	1
SOCKET HOUSING (CN2)	VHR-6N	J.S.T	1
SOCKET HOUSING (CN3)	VHR-7N	J.S.T	1
TERMINAL PINS (CN1,2,3)	SVH-21T-P1.1	J.S.T	16

HAND CRIMPING TOOL : YC-160R MANUFACTURER : J.S.T

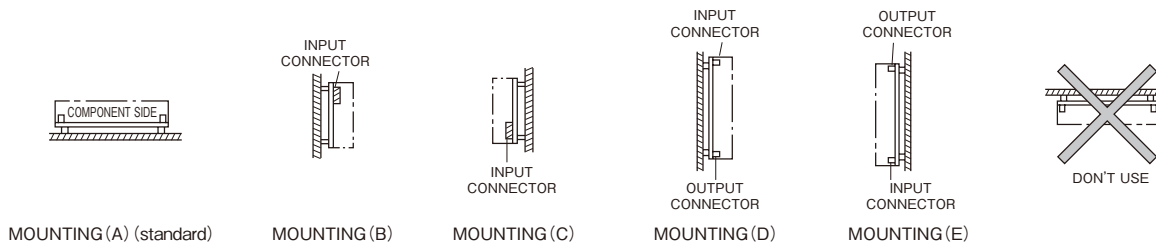
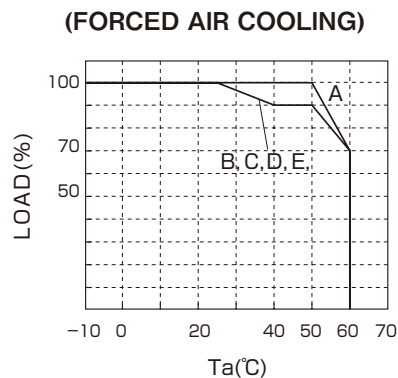
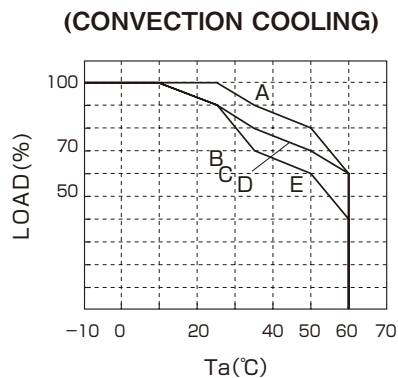
NOTES

- A: THE 5-φ3.5 HOLES ARE CUSTOMER CHASSIS MOUNTING HOLES, ALL MUST BE SCREWED IN ORDER TO CONFORM THE VIBRATION SPEC.
- B: MODEL NAME, NOMINAL OUTPUT VOLTAGE, AVERAGE OUTPUT CURRENT, PEAK OUTPUT CURRENT ARE SHOWN HERE IN ACCORDANCE WITH THE SPECIFICATIONS.
- C: COUNTRY OF MANUFACTURE WILL BE SHOWN HERE.
- D: TO KEEP THE DISTANCE MORE THAN 2mm BETWEEN PC-BOARD EDGE AND CUSTOMER CHASSIS.

PCB MATERIAL

GLASS COMPOSITE : CEM-3

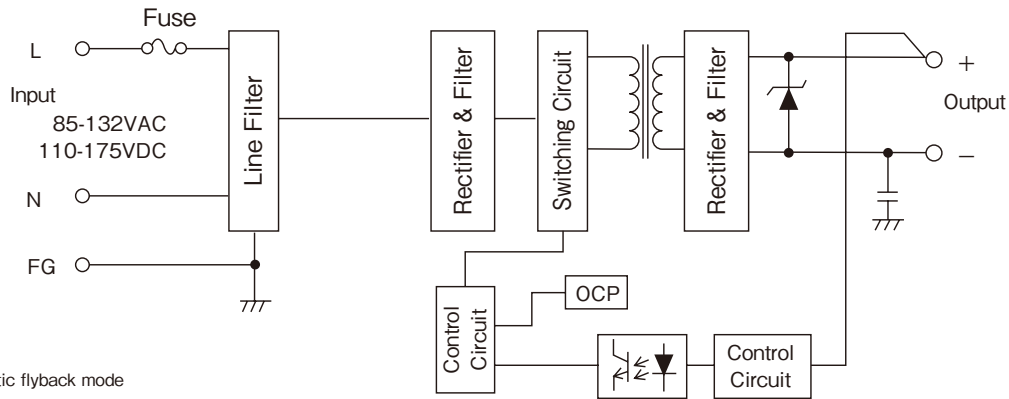
Output Derating



VS

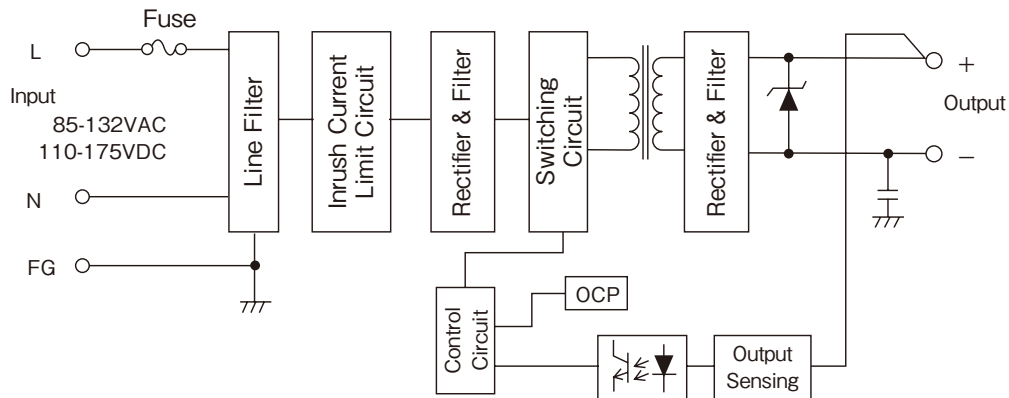
Block diagram

[VS10C, VS15C]



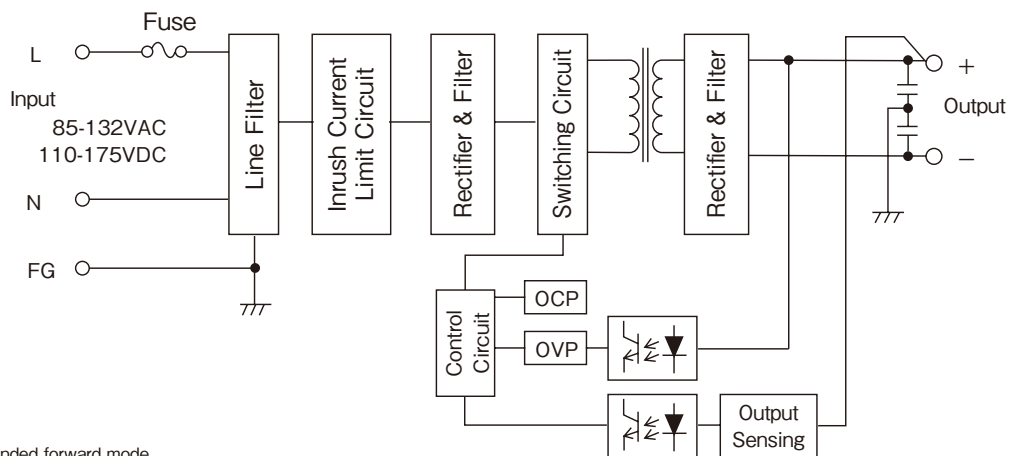
- \* Current mode: Automatic flyback mode
- \* Oscillation frequency: 60-400kHz
- \* Internal fuse value: VS10C: 1.5A, VS15C: 2A

[VS30C]



- \* Current mode: Automatic flyback mode
- \* Oscillation frequency: 60-400kHz
- \* Fuse rating: VS30C: 3A

[VS50B, VS75B, VS100B, VS150B]



- \* Current mode: Single-ended forward mode
- \* Oscillation frequency: VS50B: 200kHz (fixed)  
VS75B/VS100B/VS150B: 180kHz (fixed)
- \* Internal fuse value: VS50B: 4A  
VS75B/VS100B: 5A, VS150B: 6.3A

VS



# VS series Instruction Manual

## BEFORE USING THE POWER SUPPLY UNIT

Be sure to read this instruction manual thoroughly before using this product. Pay attention to all warnings and cautions before using the unit. Incorrect usage could lead to an electric shock, damage to the unit or a fire hazard.

### ⚠ WARNING

- Do not touch the internal components, they may have high voltage or high temperature.  
You may get electric shock or burned.
- When the unit is operating, keep your hands and face away from it, you may get injured by an accident.

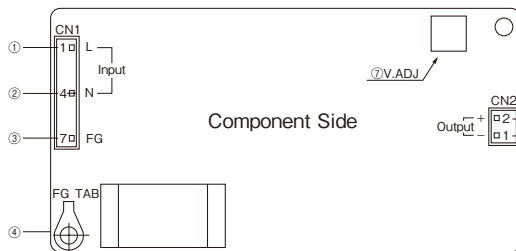
### ⚠ CAUTION

- Do not operate overload or dead short condition for more than 30 seconds which could result in damage or insulation failure.
- This power supply is PC board type unit. PCB stress such as bending, twisting could cause damage. Therefore, please handle with care.
- Do not modify the product. DENSEI-LAMBDA cannot be held responsible for the performance and safety if any modification is made to the product.
- Use this product in a condition within the specified operating ambient temperature.
- If a fuse in the product becomes burned out, it also causes damage to parts in the product. Be sure to request us to repair the unit.

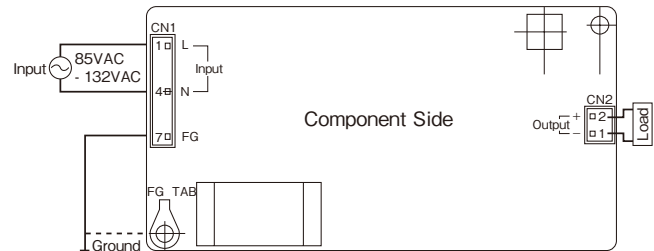
## 1. Terminal Explanation

### 1 VS10C

#### Terminal explanation



#### Basic connections



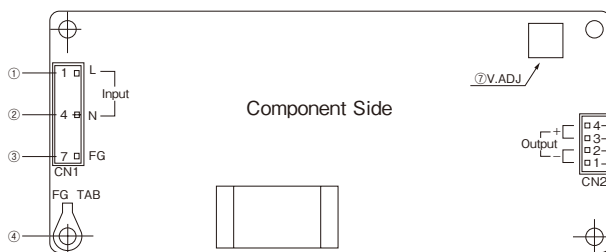
- (1) Input terminal (pin 1 of CN1) L: Live line (fuse in line)
- (2) Input terminal (pin 4 of CN1) N: Neutral line
- (3) FG terminal (pin 7 of CN1) FG: Frame ground
- (4) Frame ground (FG) (Connected to pin 7 of CN1)

Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers.  
The mounting surface of the spacer should be within MAX 6mm.  
(The area for locating a filler piece, should be within  $\phi$ 6mm.)

- (5) + Output terminal (pin 2 of CN2)
- (6) - Output terminal (pin 1 of CN2)
- (7) V.ADJ: Output voltage adjusting trimmer

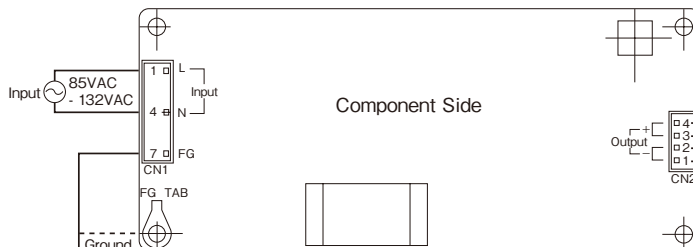
### 2 VS15C

#### Terminals



- (1) Input terminal (pin 1 of CN1) L: Live line (fuse in line)
- (2) Input terminal (pin 4 of CN1) N: Neutral line
- (3) FG terminal (pin 7 of CN1) FG: Frame ground
- (4) Frame ground (FG) (Connected to pin 7 of CN1)  
Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers.  
The mounting surface of the spacer should be within MAX 6mm.
- (5) + Output terminal (pins 3 and 4 of CN2)
- (6) - Output terminal (pins 1 and 2 of CN2)
- (7) V.ADJ: Output voltage adjusting trimmer

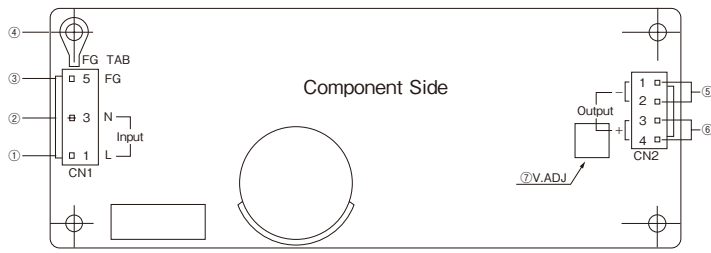
#### Basic connections



\* Output current of each terminal pin must be less than 3A. If output current of more than 3A is required, use multiple terminals simultaneously.

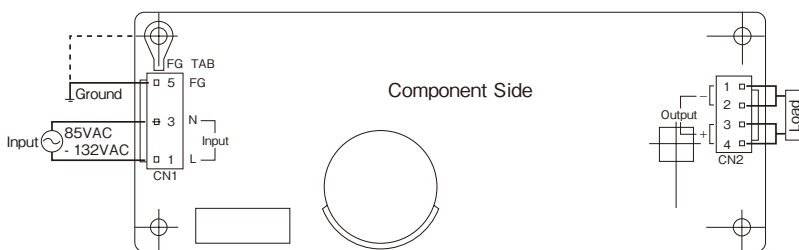
### 3 VS30C

#### Terminals



- (1) Input terminal (pin 1 of CN1)  
L: Live line (fuse in line)
- (2) Input terminal (pin 3 of CN1) N: Neutral line
- (3) FG terminal (pin 5 of CN1) FG: Frame ground
- (4) Frame ground (FG) (Connected to pin 5 of CN1)  
Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers.  
The mounting surface of the spacer should be within MAX 6mm.
- (5) - Output terminal (pins 1 and 2 of CN2)
- (6) + Output terminal (pins 3 and 4 of CN2)
- (7) V.ADJ: Output voltage adjusting trimmer

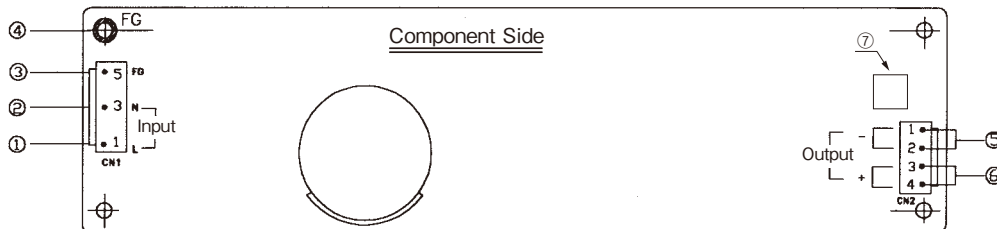
#### Basic connections



\* Output current of each terminal pin must be less than 5A. If output current of more than 3A is required, use multiple terminals simultaneously.

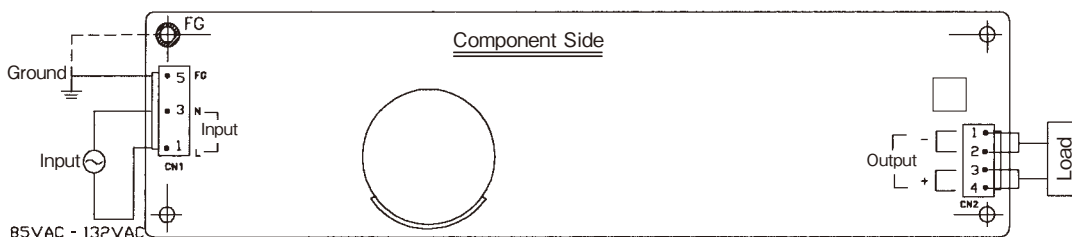
### 4 VS50B

#### Terminals



- (1) Input terminal (pin 1 of CN1) L: Live line (fuse in line)
- (2) Input terminal (pin 3 of CN1) N: Neutral line
- (3) FG terminal (pin 5 of CN1) FG: Frame ground
- (4) Frame ground (FG) (Connected to pin 5 of CN1)  
Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers.  
The mounting surface of the spacer should be within MAX 6mm.
- (5) - Output terminal (pins 1 and 2 of CN2)
- (6) + Output terminal (pins 3 and 4 of CN2)
- (7) Output voltage adjusting trimmer (VR1)

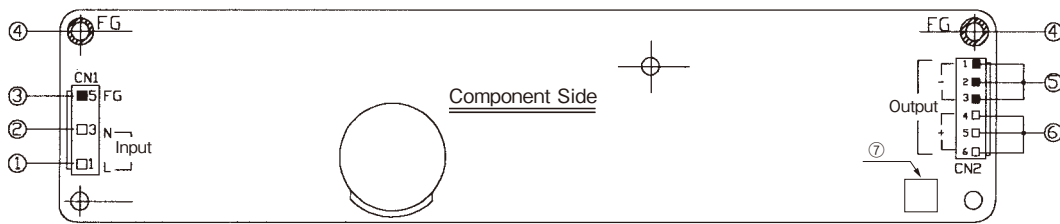
#### Basic connections



\* Output current of each terminal pin must be less than 5A.  
If output current of more than 3A is required, use multiple terminals simultaneously.

**5 VS75B**

**Terminals**

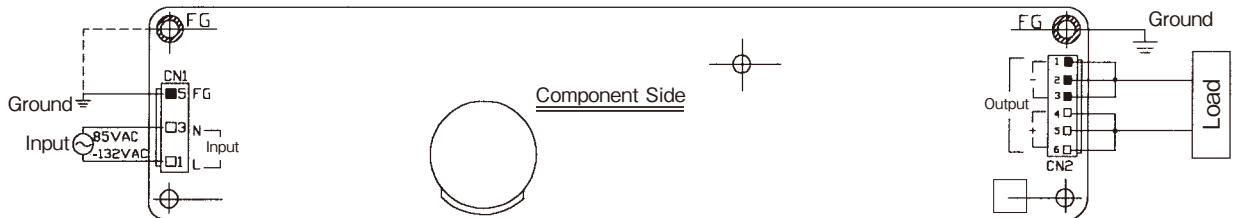


- (1) Input terminal (pin 1 of CN1) L: Live line (fuse in line)
- (2) Input terminal (pin 3 of CN1) N: Neutral line
- (3) FG terminal (pin 5 of CN1) FG: Frame ground
- (4) Frame ground (FG) (Connected to pin 5 of CN1)

Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers.  
The mounting surface of the spacer should be within MAX 6mm.

- (5) - Output terminal (pins 1 to 3 of CN2)
- (6) + Output terminal (pins 4 to 6 of Cn2)
- (7) Output voltage adjusting trimmer (VR1)

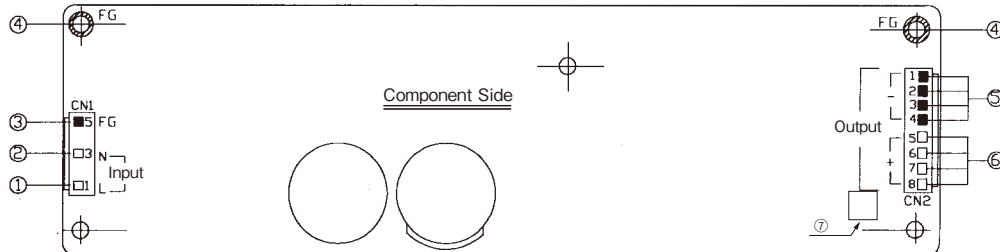
**Basic connections**



\* Output current of each terminal pin must be less than 5A.  
If output current of more than 3A is required, use multiple terminals simultaneously.

**6 VS100B**

**Terminals**

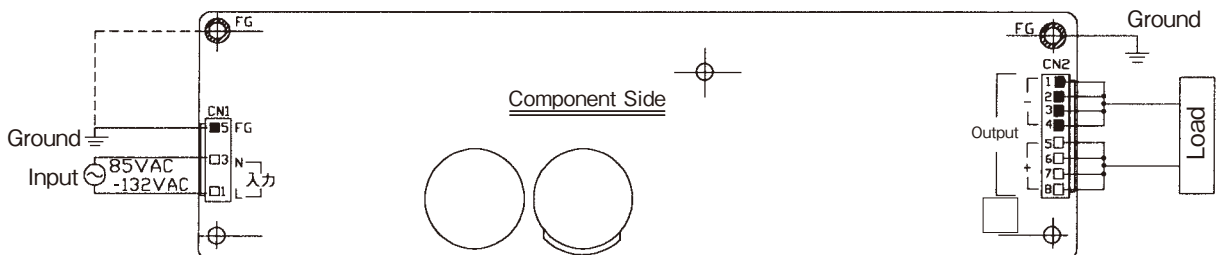


- (1) Input terminal (pin 1 of CN1) L: Live line (fuse in line)
- (2) Input terminal (pin 3 of CN1) N: Neutral line
- (3) FG terminal (pin 5 of CN1) FG: Frame ground
- (4) Frame ground (FG) (Connected to pin 5 of CN1)

Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers.  
The mounting surface of the spacer should be within MAX 6mm.

- (5) - Output terminal (pins 1 to 4 of CN2)
- (6) + Output terminal (pins 5 to 8 of CN2)
- (7) Output voltage adjusting trimmer (VR1)

**Basic connections**

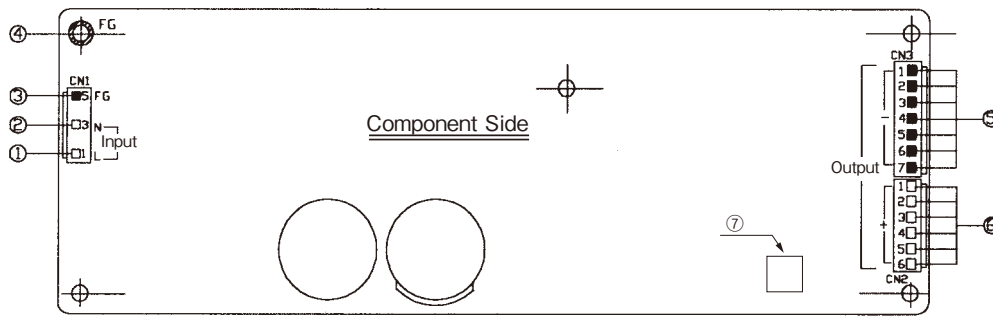


\* Output current of each terminal pin must be less than 5A.  
If output current of more than 3A is required, use multiple terminals simultaneously.

VS

**7 VS150B**

**Terminals**

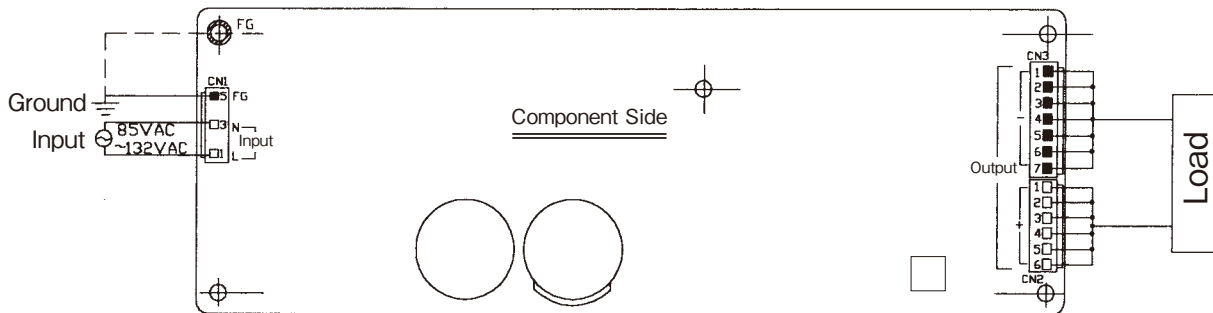


- (1) Input terminal (pin 1 of CN1) L: Live line (fuse in line)
- (2) Input terminal (pin 3 of CN1) N: Neutral line
- (3) FG terminal (pin 5 of CN1) FG: Frame ground
- (4) Frame ground (FG) (Connected to pin 1 of CN1)

Must be connected to electrically safe ground of apparatus or equipment by electrically conductive spacers.  
The mounting surface of the spacer should be within MAX 6mm.

- (5) - Output terminal (pins 1 to 7 of CN2)
- (6) + Output terminal (pins 1 to 6 of CN2)
- (7) Output voltage adjusting trimmer (VR1)

**Basic connections**



\* Output current of each terminal pin must be less than 5A.  
If output current of more than 3A is required, use multiple terminals simultaneously.

## 2. Explanation of functions and notes

### 1 Input Voltage Range

The input voltage range is single phase AC 85-132VAC (47-440Hz) or DC110-175VDC. Input voltage which is out of specification may cause unit damage.

### 2 Output Voltage Range

The output voltage is set to the nominal DC output voltage value in the factory when shipping. V.ADJ trimmer near output connector can adjust the output voltage within the range. To turn the trimmer clockwise, the output voltage will be increased. Output voltage range is within  $\pm 10\%$  of the nominal output voltage. Note over voltage protection (OVP) function may trigger if the output voltage is increased excessively.

### 3 Over Voltage Protection (OVP)

VS10C-VS30C:

Zener clamp method is provided. OVP function clamps over 115% of nominal output voltage. If the over voltage is applied and the output voltage goes down, the output will not recover. Request us to repair the unit (charged service).

VS50B-VS150B:

Output shutdown method, manual reset type is provided. OVP function operates within 115-135% of nominal output voltage. When OVP triggers, the output will be shut down. The input shall be removed for a few minutes, and then re-input for recovery of the output. OVP setting shall be fixed and not to be adjusted externally.

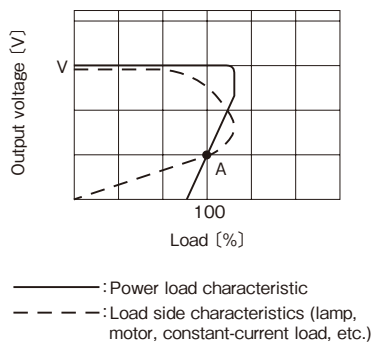
### 4 Over Current Protection (OCP)

Primary side power detection system automatic resume type is employed.

OCP function operates when the output current exceeds 125% (VS10C-30C: 105%) of maximum output current of specification. The output will be automatically recovered when the overload condition is canceled. Do not operate overload or dead short conditions for more than 30 seconds, which could result in damage or insulation failure.

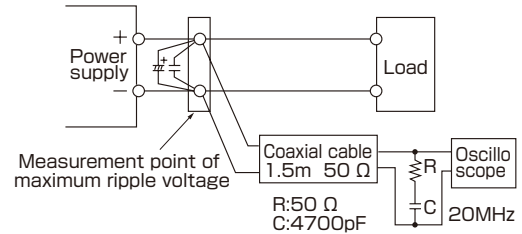
\* OCP in VS10C/VS15C/VS30C is: fold back type.

Note that if nonlinear loading such as lamp load, motor load, and constant current load is connected, output may not be generated when starting up (for example, latching may occur at the point A in the figure below).



### 5 Ripple

The standard specification for maximum ripple value is measured according to measurement circuit specified by JEITA-RC9131. When load lines are longer, ripple becomes larger. In this case, electrolytic capacitor, film capacitor, etc., might be necessary to use across the load terminal. The output ripple cannot be measured accurately if the probe ground lead of oscilloscope is too long.



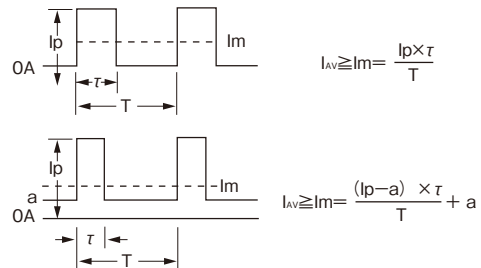
### 6 Inrush current (except VS10C/VS150C)

The inrush current protection circuit is provided. VS30C-VS75B use power thermistor to protect the circuit from inrush current. Suppressed current will vary depending on the temperature or when restarting input soon after stopping it. VS100B/VS150B use thyristor method. Please be careful to select input switch and fuse.

### 7 Peak output current (VS50B-VS150B)

Output current accommodates peak load. Relation between average output current and peak output current must satisfy formulas below.

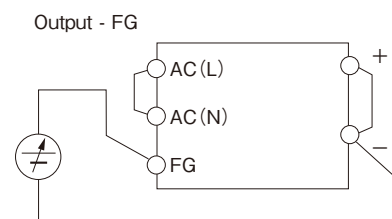
Use the unit under the conditions where operating time at peak output is less than 10 sec, the period is more than 10ms, and the duty is less than 0.35 ( $\tau \leq 10$  seconds).



- Ip: Peak output current (A)
- I<sub>av</sub>: Maximum average output current of specification (A)
- I<sub>m</sub>: Average output current (A)
- τ: Pulse width of peak output current (sec)
- T: Pulse (sec)

### 8 Isolation Test

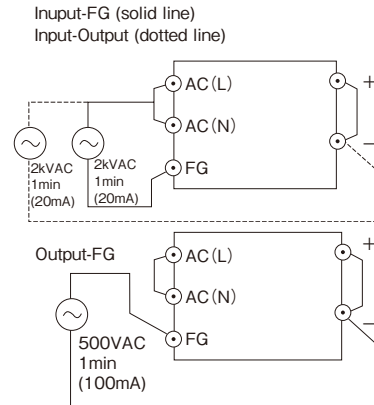
Isolation resistance between output and FG (chassis) shall be more than 100MΩ at 500VDC. For safety operation, voltage setting of DC isolation tester must be done before the test. Ensure that it is fully discharged after the test.



### 9 Withstand Voltage

This series is designed to withstand 2kVAC between input and output, 2kVAC between input and FG, and 500VAC between output and FG, each for 1 minute. When testing withstand voltage, set current limit of withstand voltage test equipment at 20mA (Output-FG: 100mA).

The applied voltage must be gradually increased from zero to testing value and then gradually decreased for shut down. When timer is used, the power supply may be damaged by high impulse voltage at timer switch on and off. Connect input and output as follows.



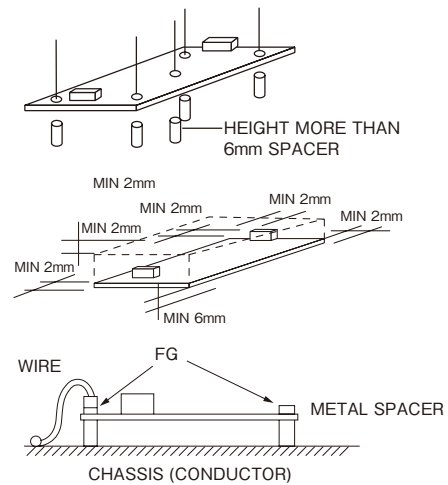
## 3. Mounting Method

Insert the spacer (Max  $\phi$ 8mm) of height over 8mm to lift the unit. The vibration and shock spec. is the value taken when the unit is raised by 8mm spacers.

- VS10C : 2 pcs ( $\phi$ 3.5)
- VS15C/30C/50B : 4 pcs ( $\phi$ 3.5)
- VS75B-VS150B : 5 pcs ( $\phi$ 3.5)

Please leave 2mm space from the surfaces and the sides of PCB, especially from the solder surface, 6mm space is necessary. If the space is not enough, the specification of insulation and withstand will not be satisfied.

FG should be connected to the earth terminal of the apparatus. If not, the conducted noise and output noise will increase.



## 4. Wiring Method

The output load line and input line shall be separated and twisted to improve noise sensitivity. Noise can be eliminated by attaching a capacitor with small capacitance to the load terminals.

- Input: VS10C/VS15C : AWG#30-#22
- VS30C - VS150B : AWG#22-#18
- Output: VS10C/VS15C : AWG#30-#22
- VS30C - VS150B : AWG#22-#18

## 5. External Fuse Rating

Refer to the following fuse rating when selecting the external fuses that are to be used on input line. Therefore use slow-blow fuse or time-lag fuse. Do not use fast-blow fuse. Fuse rating is specified by inrush current value at line turn-on. Do not select the fuse according to input current (rms) values under the actual load condition.

Model	Fuse Value	Model	Fuse Value
VS10C	1.5A	VS75B	5A
VS15C	2A	VS100B	5A
VS30C	3A	VS150B	6.3A
VS50C	4A		

## 6. Before concluding that the unit is at fault...

- Check if the rated input voltage is connected.
- Check if the wiring of input and output is correct.
- Ensure the input and output connectors are firmly attached, and the connector pins are firmly crimped.
- Check if the wire material is not too thin.
- Check if the output voltage control (V.ADJ) is properly adjusted.
- Ensure that a large capacitor is not connected on the output side.

Model	Capacitance by Output Voltage						
	3V	5V	12V	15V	24V	36V	48V
VS10C			5,000 $\mu$ F				—
VS15C			5,000 $\mu$ F				—
VS30C		5,000 $\mu$ F		10,000 $\mu$ F			
VS50B		10,000 $\mu$ F					—
VS75B		5,000 $\mu$ F		30,000 $\mu$ F			
VS100B		5,000 $\mu$ F		30,000 $\mu$ F			
VS150B		5,000 $\mu$ F		30,000 $\mu$ F			

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