

SUWR5

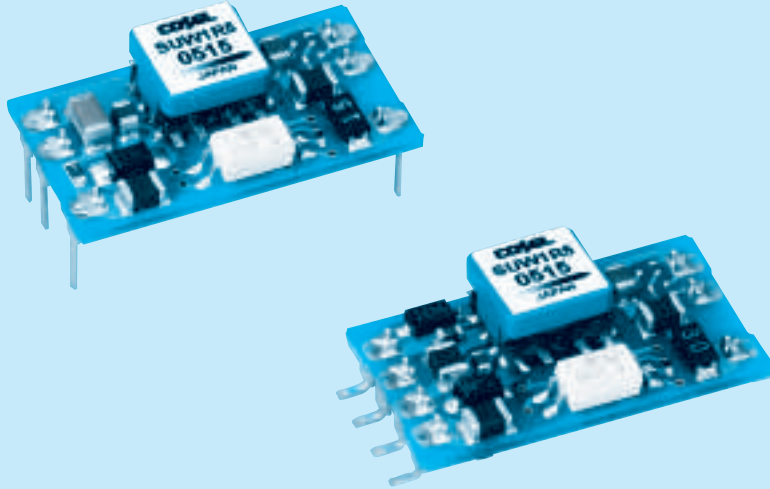
SU W 1R5 12 12 B

① ② ③ ④ ⑤ ⑥



*This product will be released in November 2004
Please see our HP for details when this product is released.

- ① Series name
- ② Dual output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type
B : SMD
C : DIP



MODEL	SUW1R50512	SUW1R50515	SUW1R51212	SUW1R51215	SUW1R52412	SUW1R52415	SUW1R54812	SUW1R54815	
MAX OUTPUT WATTAGE[W]	1.56	1.5	1.56	1.5	1.56	1.5	1.56	1.5	
DC OUTPUT	VOLTAGE[V] *1	±12 or +24	±15 or +30	±12 or +24	±15 or +30	±12 or +24	±15 or +30	±12 or +24	±15 or +30
	CURRENT[A]	0.065	0.05	0.065	0.05	0.065	0.05	0.065	0.05

SPECIFICATIONS

	MODEL	SUW1R50512	SUW1R50515	SUW1R51212	SUW1R51215	SUW1R52412	SUW1R52415	SUW1R54812	SUW1R54815	
INPUT	VOLTAGE[V]	DC4.5 - 9		DC9 - 18		DC18 - 36		DC36 - 76		
	CURRENT[A] *2	0.433typ	0.417typ	0.173typ	0.167typ	0.087typ	0.083typ	0.043typ	0.042typ	
	EFFICIENCY[%] *2	72typ	72typ	75typ	75typ	75typ	75typ	75typ	75typ	
OUTPUT	VOLTAGE[V]	±12(+24)	±15(+30)	±12(+24)	±15(+30)	±12(+24)	±15(+30)	±12(+24)	±15(+30)	
	CURRENT[A]	0.065	0.05	0.065	0.05	0.065	0.05	0.065	0.05	
	LINE REGULATION[mV]	60max	75max	60max	75max	60max	75max	60max	75max	
	LOAD REGULATION[mV]	600max	750max	600max	750max	600max	750max	600max	750max	
	RIPPLE[mVp-p]	-20 to +55°C *3	120max	120max	120max	120max	120max	120max	120max	120max
		-40 to -20°C *3	150max	150max	150max	150max	150max	150max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55°C *3	150max	150max	150max	150max	150max	150max	150max	150max
		-40 to -20°C *3	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55°C	150max	180max	150max	180max	150max	180max	150max	180max
		-40 to +55°C	240max	290max	240max	290max	240max	290max	240max	290max
DRIFT[mV] *4	50max	60max	50max	60max	50max	60max	50max	60max		
START-UP TIME[ms]	20max (Minimum input, I _o =100%)									
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	Fixed (TRM pin open) ±5% adjustable by external VR									
OUTPUT VOLTAGE SETTING[V]	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75		
OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically									
ISOLATION	INPUT-OUTPUT AC500V 1minute. Cutoff current = 10mA. DC500V 50MΩ min (20±15°C)									
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +71°C, 20 - 95%RH (Non condensing) (Required Derating), 3.000m (10.000feet) max								
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 9.000m (30.000feet) max								
	VIBRATION	10 - 55Hz, 98.0m/s ² (10G), 3minutes period, 60minutes each along X, Y and Z axis								
	IMPACT	490.3m/s ² (50G), 11ms, once each along X, Y and Z axis								
SAFETY	AGENCY APPROVALS UL60950-1, C-UL, EN60950-1									
OTHERS	CASE SIZE	21.4 × 6.5 × 12.2mm (W × H × D)								
	COOLING METHOD	Convection								

*1 Output pins can be connected in series to make a 24V/30V output.
 *2 Rated input 5V, 12V, 24V or 48V DC I_o=100%
 *3 Ripple and Ripple Noise is measured by using measuring board with capacitor with in 25mm from output terminal.
 *4 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
 * Parallel operation with other model is not possible.

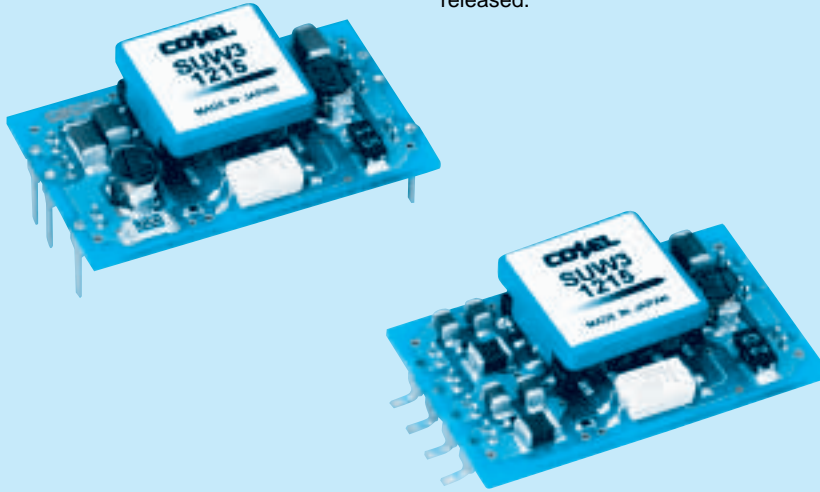
SUW3

SU W 3 12 12 B - □

① ② ③ ④ ⑤ ⑥ ⑦



*This product will be released in February 2005
Please see our HP for details when this product is released.



- ① Series name
- ② Dual output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type
B : SMD
C : DIP
- ⑦ Optional
G : Capacitor between Input and Output is removed.

MODEL	SUW30512	SUW30515	SUW31212	SUW31215	SUW32412	SUW32415	SUW34812	SUW34815	
MAX OUTPUT WATTAGE[W]	3.12	3	3.12	3	3.12	3	3.12	3	
DC OUTPUT	VOLTAGE[V] *1	±12 or +24	±15 or +30	±12 or +24	±15 or +30	±12 or +24	±15 or +30	±12 or +24	±15 or +30
	CURRENT[A]	0.13	0.1	0.13	0.1	0.13	0.1	0.13	0.1

SPECIFICATIONS

	MODEL	SUW30512	SUW30515	SUW31212	SUW31215	SUW32412	SUW32415	SUW34812	SUW34815	
INPUT	VOLTAGE[V]	DC4.5 - 9		DC9 - 18		DC18 - 36		DC36 - 76		
	CURRENT[A] *2	0.822typ	0.790typ	0.334typ	0.321typ	0.167typ	0.161typ	0.084typ	0.081typ	
	EFFICIENCY[%] *2	76typ	76typ	78typ	78typ	78typ	78typ	78typ	78typ	
OUTPUT	VOLTAGE[V]	±12(+24)	±15(+30)	±12(+24)	±15(+30)	±12(+24)	±15(+30)	±12(+24)	±15(+30)	
	CURRENT[A]	0.13	0.1	0.13	0.1	0.13	0.1	0.13	0.1	
	LINE REGULATION[mV]	60max	75max	60max	75max	60max	75max	60max	75max	
	LOAD REGULATION[mV]	600max	750max	600max	750max	600max	750max	600max	750max	
	RIPPLE[mVp-p]	-20 to +55°C *3	120max	120max	120max	120max	120max	120max	120max	120max
		-40 to -20°C *3	150max	150max	150max	150max	150max	150max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55°C *3	150max	150max	150max	150max	150max	150max	150max	150max
		-40 to -20°C *3	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55°C	150max	180max	150max	180max	150max	180max	150max	180max
		-40 to +55°C	240max	290max	240max	290max	240max	290max	240max	290max
DRIFT[mV] *4	50max	60max	50max	60max	50max	60max	50max	60max		
START-UP TIME[ms]	20max (Minimum input, Io=100%)									
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	Fixed (TRM pin open) ±5% adjustable by external VR									
OUTPUT VOLTAGE SETTING[V]	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically								
	REMOTE ON/OFF	Provided (Negative logic L : ON, H : OFF)								
ISOLATION	INPUT-OUTPUT	AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C)								
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +71°C, 20 - 95%RH (Non condensing) (Required Derating), 3.000m (10.000feet) max								
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 9.000m (30.000feet) max								
	VIBRATION	10 - 55Hz, 98.0m/s ² (10G), 3minutes period, 60minutes each along X, Y and Z axis								
	IMPACT	490.3m/s ² (50G), 11ms, once each along X, Y and Z axis								
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL, EN60950-1								
OTHERS	CASE SIZE	24 × 6.5 × 15.1mm (W × H × D)								
	COOLING METHOD	Convection								

*1 Output pins can be connected in series to make a 24V/30V output.
 *2 Rated input 5V, 12V, 24V or 48V DC Io=100%
 *3 Ripple and Ripple Noise is measured by using measuring board with capacitor with in 25mm from output terminal.
 *4 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
 * Parallel operation with other model is not possible.

SUW6

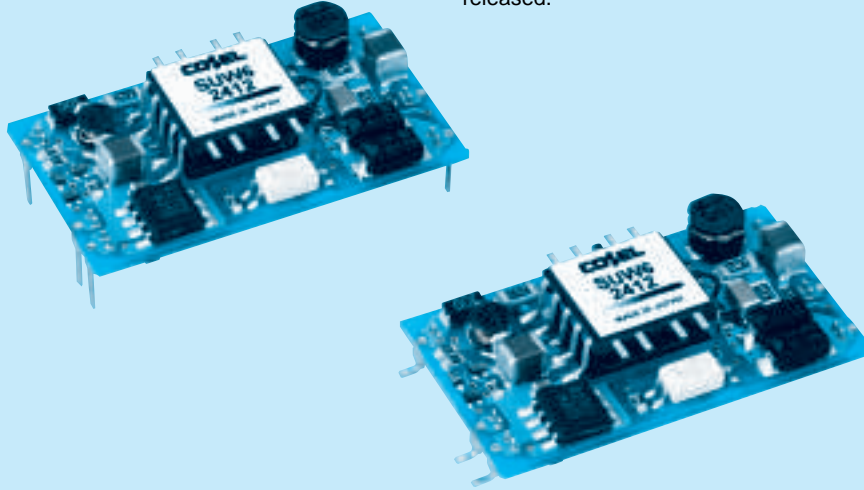
SU W 6 12 12 B - □

① ② ③ ④ ⑤ ⑥ ⑦



*This product will be released in February 2005
Please see our HP for details when this product is released.

- ① Series name
- ② Dual output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type
B : SMD
C : DIP
- ⑦ Optional
G : Capacitor between Input and Output is removed.



MODEL	SUW60512	SUW60515	SUW61212	SUW61215	SUW62412	SUW62415	SUW64812	SUW64815	
MAX OUTPUT WATTAGE[W]	6	6	6	6	6	6	6	6	
DC OUTPUT	VOLTAGE[V] *1	±12 or +24	±15 or +30	±12 or +24	±15 or +30	±12 or +24	±15 or +30	±12 or +24	±15 or +30
	CURRENT[A]	0.25	0.2	0.25	0.2	0.25	0.2	0.25	0.2

SPECIFICATIONS

	MODEL	SUW60512	SUW60515	SUW61212	SUW61215	SUW62412	SUW62415	SUW64812	SUW64815	
INPUT	VOLTAGE[V]	DC4.5 - 9		DC9 - 18		DC18 - 36		DC36 - 76		
	CURRENT[A] *2	1.538typ	1.538typ	0.588typ	0.588typ	0.291typ	0.291typ	0.145typ	0.145typ	
	EFFICIENCY[%] *2	78typ	78typ	85typ	85typ	86typ	86typ	86typ	86typ	
OUTPUT	VOLTAGE[V]	±12(+24)	±15(+30)	±12(+24)	±15(+30)	±12(+24)	±15(+30)	±12(+24)	±15(+30)	
	CURRENT[A]	0.25	0.2	0.25	0.2	0.25	0.2	0.25	0.2	
	LINE REGULATION[mV]	60max	75max	60max	75max	60max	75max	60max	75max	
	LOAD REGULATION[mV]	600max	750max	600max	750max	600max	750max	600max	750max	
	RIPPLE[mVp-p]	-20 to +55°C *3	120max	120max	120max	120max	120max	120max	120max	120max
		-40 to -20°C *3	150max	150max	150max	150max	150max	150max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55°C *3	150max	150max	150max	150max	150max	150max	150max	150max
		-40 to -20°C *3	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55°C	150max	180max	150max	180max	150max	180max	150max	180max
		-40 to +55°C	240max	290max	240max	290max	240max	290max	240max	290max
DRIFT[mV] *4	50max	60max	50max	60max	50max	60max	50max	60max		
START-UP TIME[ms]	20max (Minimum input, Io=100%)									
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	Fixed (TRM pin open) ±5% adjustable by external VR									
OUTPUT VOLTAGE SETTING[V]	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically								
	REMOTE ON/OFF	Provided (Negative logic L : ON, H : OFF)								
ISOLATION	INPUT-OUTPUT	AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C)								
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +71°C, 20 - 95%RH (Non condensing) (Required Derating), 3.000m (10.000feet) max								
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 9.000m (30.000feet) max								
	VIBRATION	10 - 55Hz, 98.0m/s ² (10G), 3minutes period, 60minutes each along X, Y and Z axis								
	IMPACT	490.3m/s ² (50G), 11ms, once each along X, Y and Z axis								
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL, EN60950-1								
OTHERS	CASE SIZE	31.6 × 6.5 × 18.1mm (W × H × D)								
	COOLING METHOD	Convection								

*1 Output pins can be connected in series to make a 24V/30V output.
 *2 Rated input 5V, 12V, 24V or 48V DC Io=100%
 *3 Ripple and Ripple Noise is measured by using measuring board with capacitor with in 25mm from output terminal.
 *4 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
 * Parallel operation with other model is not possible.

SUW10

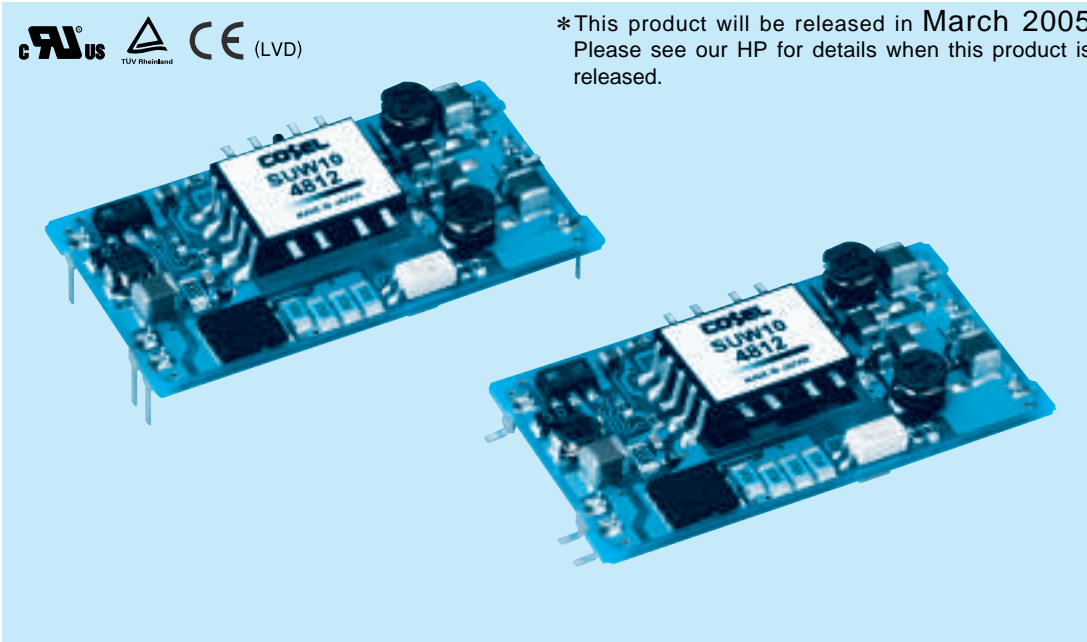
SU W 10 12 12 B - □

① ② ③ ④ ⑤ ⑥ ⑦



*This product will be released in March 2005
Please see our HP for details when this product is released.

- ① Series name
- ② Dual output
- ③ Output wattage
- ④ Input voltage
- ⑤ Output voltage
- ⑥ Mounting type
B : SMD
C : DIP
- ⑦ Optional
G : Capacitor between Input and Output is removed.



MODEL	SUW100512	SUW100515	SUW101212	SUW101215	SUW102412	SUW102415	SUW104812	SUW104815
MAX OUTPUT WATTAGE[W]	10.8	10.5	10.8	10.5	10.8	10.5	10.8	10.5
DC OUTPUT	VOLTAGE[V] *1	± 12 or +24	± 15 or +30	± 12 or +24	± 15 or +30	± 12 or +24	± 12 or +24	± 15 or +30
	CURRENT[A]	0.45	0.35	0.45	0.35	0.45	0.45	0.35

SPECIFICATIONS

	MODEL	SUW100512	SUW100515	SUW101212	SUW101215	SUW102412	SUW102415	SUW104812	SUW104815	
INPUT	VOLTAGE[V]	DC4.5 - 9		DC9 - 18		DC18 - 36		DC36 - 76		
	CURRENT[A] *2	2.51typ	2.44typ	1.05typ	1.02typ	0.523typ	0.509typ	0.262typ	0.254typ	
	EFFICIENCY[%] *2	86typ	86typ	86typ	86typ	86typ	86typ	86typ	86typ	
OUTPUT	VOLTAGE[V]	± 12(+24)	± 15(+30)	± 12(+24)	± 15(+30)	± 12(+24)	± 15(+30)	± 12(+24)	± 15(+30)	
	CURRENT[A]	0.45	0.35	0.45	0.35	0.45	0.35	0.45	0.35	
	LINE REGULATION[mV]	60max	75max	60max	75max	60max	75max	60max	75max	
	LOAD REGULATION[mV]	600max	750max	600max	750max	600max	750max	600max	750max	
	RIPPLE[mVp-p]	-20 to +55°C *3	120max	120max	120max	120max	120max	120max	120max	120max
		-40 to -20°C *3	150max	150max	150max	150max	150max	150max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55°C *3	150max	150max	150max	150max	150max	150max	150max	150max
		-40 to -20°C *3	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55°C	150max	180max	150max	180max	150max	180max	150max	180max
		-40 to +55°C	240max	290max	240max	290max	240max	290max	240max	290max
	DRIFT[mV] *4	50max	60max	50max	60max	50max	60max	50max	60max	
START-UP TIME[ms]	20max (Minimum input, I _o =100%)									
OUTPUT VOLTAGE ADJUSTMENT RANGE[V]	Fixed (TRM pin open) ±5% adjustable by external VR									
OUTPUT VOLTAGE SETTING[V]	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75	11.40 - 12.60	14.25 - 15.75		
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 105% of rating and recovers automatically								
	REMOTE ON/OFF	Provided (Negative logic L : ON, H : OFF)								
ISOLATION	INPUT-OUTPUT	AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C)								
ENVIRONMENT	OPERATING TEMP., HUMID. AND ALTITUDE	-40 to +71°C, 20 - 95%RH (Non condensing) (Required Derating), 3.000m (10.000feet) max								
	STORAGE TEMP., HUMID. AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 9.000m (30.000feet) max								
	VIBRATION	10 - 55Hz, 98.0m/s ² (10G), 3minutes period, 60minutes each along X, Y and Z axis								
	IMPACT	490.3m/s ² (50G), 11ms, once each along X, Y and Z axis								
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL, EN60950-1								
OTHERS	CASE SIZE	39.2 × 6.5 × 21.7mm (W × H × D)								
	COOLING METHOD	Convection								

*1 Output pins can be connected in series to make a 24V/30V output.
 *2 Rated input 5V, 12V, 24V or 48V DC I_o=100%
 *3 Ripple and Ripple Noise is measured by using measuring board with capacitor with in 25mm from output terminal.
 *4 Drift is the change in DC output for an eight hour period after a half-hour warm-up at 25°C.
 * Parallel operation with other model is not possible.

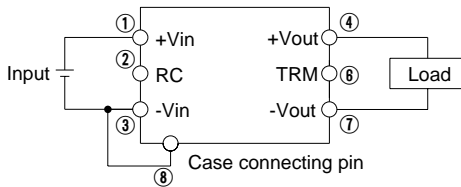
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1 Pin Configuration

Table 1.1 Pin configuration and function

No.	Pin connection	Function
①	+Vin	+DC input
②	RC	Remote ON/OFF (excluding 1R5)
③	-Vin	-DC input
④	+Vout	+DC output
⑤	COM	GND of output voltage (Only applicable for Dual output)
⑥	TRM	Adjustment voltage range
⑦	-Vout	-DC output
⑧	Case connecting pin	If connected to -side of input, the case potential can be fixed and the value of radiation noise can be reduced. (only applicable for SUC)

●Single Output



●Dual(±)Output

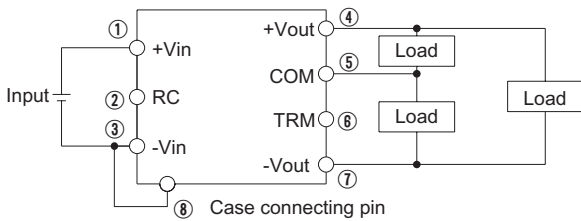


Fig.1.1 Pin configuration

●Case connecting pin

Case connecting pin is available. By connecting the pin to -side of input, the radiation noise from main body can be reduced. Solder the case connecting pin with the substrate for the reliability improvement.

2 Function

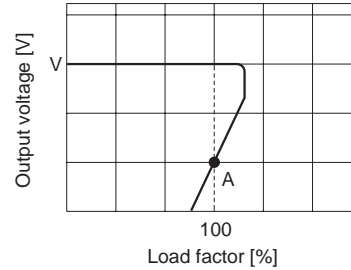
2.1 Input voltage range

■ If the wrong input is applied, the unit will not operate properly and/or may be damaged.

2.2 Overcurrent protection

■ Overcurrent protection circuit is built-in and comes into effect at over 105% of the rated current. Overcurrent protection prevents the unit from short circuit and over current condition of less than 20 sec. The unit automatically recovers when the fault condition is cleared.

■ The power supply has a current foldback characteristics, it may not start up when connected to nonlinear load such as a lamp, motor or constant current load. See the characteristics below.



——: Load characteristics of power supply.
 - - - - -: Characteristics of load (lamp, motor, constant current load, etc.).
 Note: In case of nonlinear load, the output is locked out at A point.

Fig.2.1 Current foldback characteristics

2.3 Isolation

■ For a receiving inspection, such as Hi-Pot test, gradually increase (decrease) the voltage for the start (shut down). Avoid using Hi-Pot tester with the timer because it may generate voltage a few times higher than the applied voltage, at ON/OFF of a timer.

2.4 Adjustable voltage range

■ The output voltage is adjustable by external potentiometer (Refer to Table 2.1).

■ Output voltage is increased by turning potentiometer clockwise and is decreased by turning potentiometer counterclockwise.

■ The wiring to the potentiometer should be as short as possible. The temperature coefficient varies depending on the type of resistor and potentiometer.

It is recommended that the following types be used.

Resistor.....Metal film type, coefficient of less than $\pm 300\text{ppm}/^\circ\text{C}$

Potentiometer.....Cermet type, coefficient of less than $\pm 100\text{ppm}/^\circ\text{C}$

■ When the output voltage adjustment is not used, open the TRM pin.

■ Dual output is simultaneously adjustment of \pm .

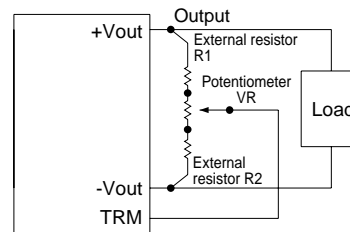


Fig.2.2 Connection devices outside the power supply

Table 2.1 Devices outside the power supply (Adjustable ±5%)

No.	Output voltage	The constant value of devices outside the power supply (Unit:Ω)		
		VR	R1	R2
1	5V	1K	100	270
2	12V	5K	10K	1.2K
3	15V	5K	10K	470
4	±12V	5K	18K	470
5	±15V	5K	18K	470

2.5 Remote ON/OFF(excluding 1R5)

Remote ON / OFF circuits is built-in on input side.

●SU3/SUC3, SU6/SUC6

Remote ON / OFF connection and specification refer to below.

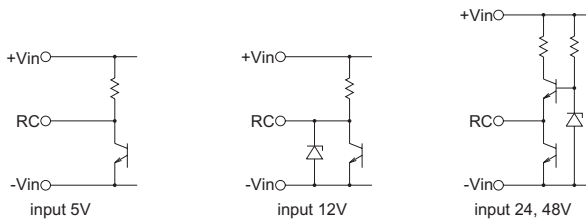


Fig.2.3 RC connection example

Table 2.2 Specification of Remote ON / OFF

Between RC and -Vin (VRC)	Output voltage
Short or $0V \leq VRC \leq 0.4V$	ON
$1.0V \leq VRC \leq 9.0V$	OFF

When remote ON / OFF function is not used, please short between RC and -Vin.

●SU10,SUC10

Remote ON / OFF connection and specification refer to below.

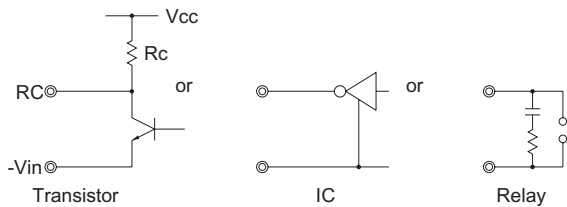


Fig.2.4 RC connection example

Table 2.3 Specification of Remote ON / OFF

Between RC and -Vin (VRC)	Output voltage
Short or $0V \leq VRC \leq 1.2V$	ON
Open or $2.4V \leq VRC \leq 7.0V$	OFF

When RC pin is "Low" level, fan out current is 0.5mA typ. When Vcc is applied, use $Vcc \leq 7V$.

When remote ON/OFF function is not used, please short between RC and -Vin.

3 Wiring to Input/Output Pin

Basically, SU / SUC series do not require any external capacitor. However, as pi filter is composed by connecting capacitor: C_i close to the input pin, reflected input noise from converter can be reduced.

It is recommended to use high performance (temperature compensation and high frequency characteristics) capacitor.

If abnormal voltage like a high surge is applied to the input side, C_i is effective to reduce its level. However, C_i life time should be considered.

When the external filter which contains L(inductance) is installed on input line, or the length of wire from input source to converter is greatly long, the reflected input noise might be increased, the input voltage might get several times higher than a normal level and also output voltage might be unstable when turned on. In this case, C_i should be connected to the input pin.

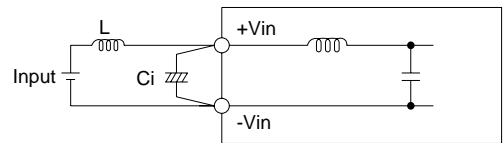


Fig.3.1 Connection method of capacitor at input pin

Table 3.1 Recommended capacitance C_i [μF]

Model Input voltage(V)	SU/SUC1R5	SU/SUC3	SU/SUC6	SU/SUC10
5	100	220	470	470
12	47	100	220	220
24	33	47	100	100
48	10	22	47	47

The capacitance can be increased and decreased depending on effect.

Avoid the reverse polarity input voltage. It will damage the power supply.

It is possible to protect the unit from the reverse input voltage by installing an external diode as shown in Fig.3.2.

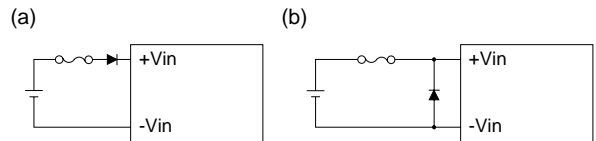


Fig.3.2 Reverse input voltage protection

Basically, SU / SUC series do not require any external capacitor. However, the output ripple voltage can be reduced by connecting capacitor : C_o to the output pin as follows.

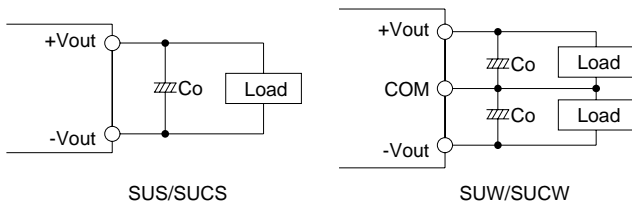


Fig.3.3 Connection method of external capacitor at output pin

Table 3.2 Recommended capacitance Co [μ F]

Model Output voltage(V)	SU/SUC1R5	SU/SUC3	SU/SUC6	SU/SUC10
5	100	220	220	220
12	100	100	100	100
15	100	100	100	100

*The capacitance can be increased and decreased depending on effect.

■When the distance between load and DC output is long, please install capacitor at load as shown below.

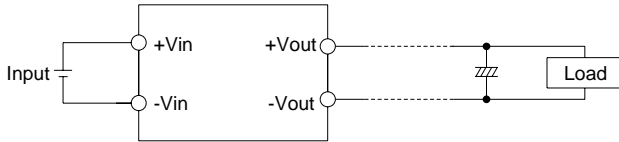


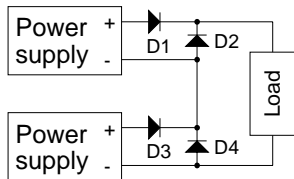
Fig.3.4 Connection method of capacitor at load

4 Series and Parallel Operation

4.1 Series operation

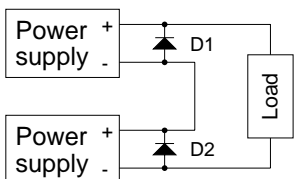
■Series operation is available by connecting the outputs of two or more power supplies, as shown below. Output currents in series connection should be lower than the lowest rated current in each unit.

(a) When the output voltage is less than 5V.



D1 - D4: Please use Schottky Barrier Diode.

(b) When the output voltage is more than 12V.



D1, D2: Please use Schottky Barrier Diode.

(c)

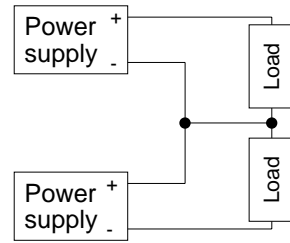


Fig.4.1 Series operation

4.2 Parallel redundancy operation

■Parallel redundancy operation is available by connecting the units as shown below.

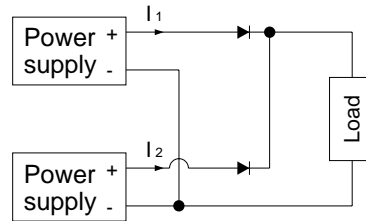


Fig.4.2 Parallel redundancy operation

■Values of I_1 and I_2 become unbalanced by a slight different of the output voltage. Make sure that the output voltage of units is of equal value and the output current from each power supply does not exceed the rated current.

$$I_1, I_2 \leq \text{the rated current value}$$

5 Input Voltage/ Current Range

■When a non-regulated source is used as a front end, make sure that the voltage fluctuation together with the ripple voltage will not exceed the input voltage range.

■Select the converter that is able to handle the start-up current (I_p).

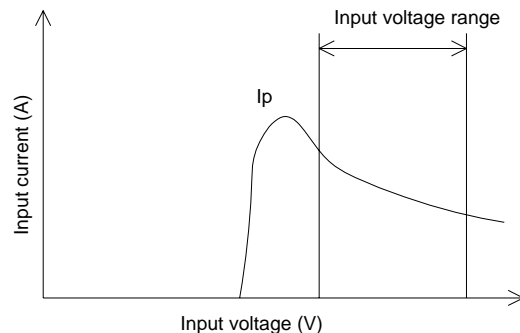


Fig.5.1 Input current characteristics

6 Implementation · Mounting Method

6.1 Installation method

- The unit can be mounted in any direction. Position them with proper intervals to allow enough air ventilation. Ambient temperature around each power supply should not exceed the temperature range shown in derating curve.
- Avoid placing pattern layout in hatched area in Fig.6.1 to insulate between pattern and power supply.

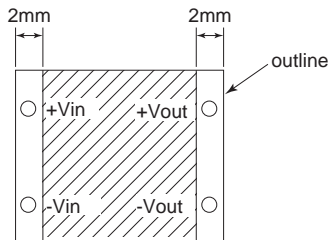


Fig.6.1 Prohibition area of pattern layout

6.2 Automatic mounting

- SU/SUC series (TYPE:B) is designed to have a large flat area in the center of the top surface to serve as a pick up point for automated vacuum pick and place equipment.
- An excessively low bottom dead point of the suction nozzle imposes great force on the core during mounting, causing cracked core. So during mounting, take enough care. Refer to External view.

6.3 Input/Output Pin

- When too much stress is applied on the input/output pins of the unit, the internal connection may be weakened. As below Fig. 6.2, avoid applying stress of more than 19.6N (2kgf) vertically.
- The input/output pins are soldered on PCB internally, therefore, do not pull or bend them with abnormal forces.
- When additional stress is expected to be put on the input/output pins because of vibration or impacts, fix the unit on PCB (using silicone rubber or fixing fittings) to reduce the stress onto the input/output pins.

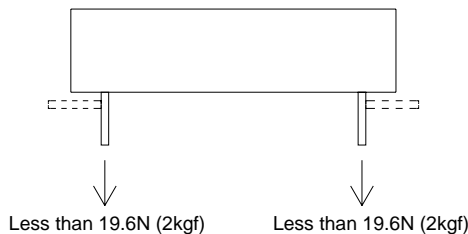


Fig.6.2 Stress onto the pins

6.4 Cleaning

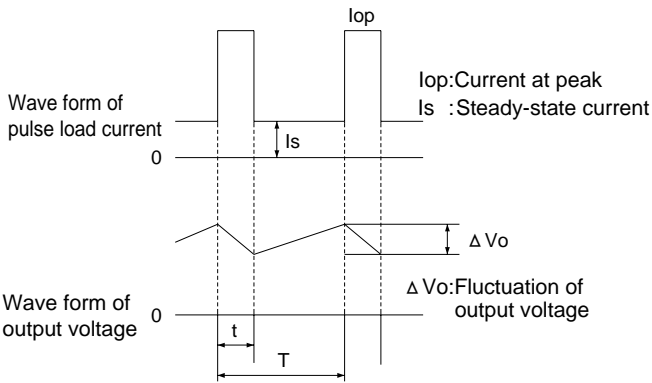
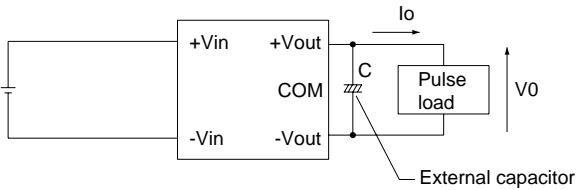
- When cleaning is necessary, follow the undermentioned condition.
 - Method: Varnishing, ultrasonic wave and vapor
 - Cleaning agents: IPA (Solvent type)
 - Total time: 2 minutes or less
- After cleaning, dry them enough.
- In case of ultrasonic wave cleaning, the ultrasonic should be less than 15kw/m³

7 Safety Considerations

- To apply for safety standard approval using this power supply, the following conditions must be met.
 - This unit must be used as a component of the end-use equipment.
 - The equipment does neither contain any basic nor double / reinforced insulation between input and output. If the input voltage is greater than 60VDC, this has to be provided by the end-use equipment according to the final build in condition.

8 Peak Current (Pulse Load)

■ It is possible to supply the pulse current for the pulse load by connecting the capacitor externally at the output side.



■ The average current I_{av} of output is shown in below formula.

$$I_{av} = I_s + \frac{(I_{op} - I_s)t}{T}$$

■ The required electrolytic capacitor C is found by below formula.

$$C = \frac{(I_{op} - I_{av})t}{\Delta V_o}$$