COSEL On-board type

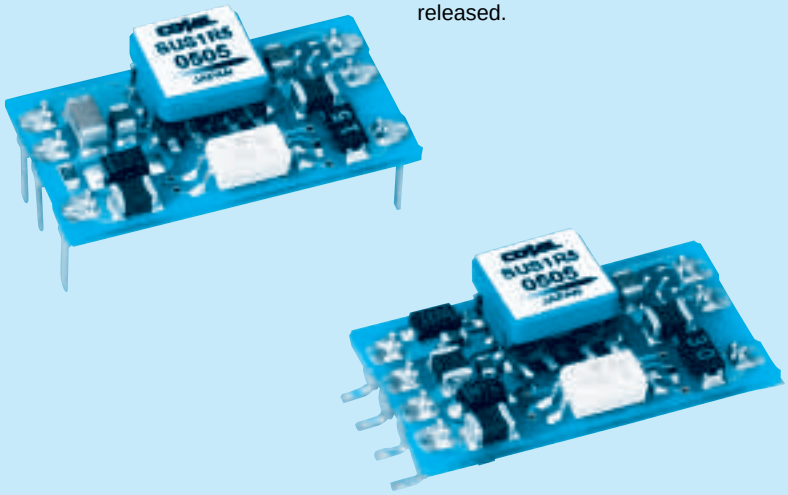
SUS1R5

Ordering information

SU	S	1R5	12	05	B
①	②	③	④	⑤	⑥

(LVD)

*This product will be released in November 2004 including 3.3V output model.
Please see our HP for details when this product is released.



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

MODEL		SUS1R50505	SUS1R50512	SUS1R50515	SUS1R51205	SUS1R51212	SUS1R51215	SUS1R52405	SUS1R52412	SUS1R52415	SUS1R54805	SUS1R54812	SUS1R54815
MAX OUTPUT WATTAGE[W]		1.5	1.56	1.5	1.5	1.56	1.5	1.5	1.56	1.5	1.5	1.56	1.5
DC OUTPUT	VOLTAGE[V] *1	5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]	0.3	0.13	0.1	0.3	0.13	0.1	0.3	0.13	0.1	0.3	0.13	0.1

SPECIFICATIONS

	MODEL		SUS1R50505	SUS1R50512	SUS1R50515	SUS1R51205	SUS1R51212	SUS1R51215	SUS1R52405	SUS1R52412	SUS1R52415	SUS1R54805	SUS1R54812	SUS1R54815
INPUT	VOLTAGE[V]		DC4.5 - 9			DC9 - 18			DC18 - 36			DC36 - 76		
	CURRENT[A]	*2	0.405typ	0.422typ	0.405typ	0.164typ	0.171typ	0.164typ	0.082typ	0.084typ	0.081typ	0.041typ	0.042typ	0.041typ
	EFFICIENCY[%]	*2	74typ	74typ	74typ	76typ	76typ	76typ	76typ	77typ	77typ	76typ	77typ	77typ
OUTPUT	VOLTAGE[V]		5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]		0.3	0.13	0.1	0.3	0.13	0.1	0.3	0.13	0.1	0.3	0.13	0.1
	LINE REGULATION[mV]		20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	60max
	LOAD REGULATION[mV]		40max	100max	120max	40max	100max	120max	40max	100max	120max	40max	100max	120max
	RIPPLE[mVp-p]	-20 to +55℃ *3	80max	120max	120max	80max	120max	120max	80max	120max	120max	80max	120max	120max
		-40 to -20℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
		-40 to -20℃ *3	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55℃	50max	150max	180max	50max	150max	180max	50max	150max	180max	50max	150max	180max
		-40 to +55℃	80max	240max	290max	80max	240max	290max	80max	240max	290max	80max	240max	290max
	DRIFT[mV]	*4	20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	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]		4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION		Works over 105% of rating and recovers automatically											
ISOLATION	INPUT-OUTPUT		AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15℃)											
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-40 to +71℃, 20 - 95%RH (Non condensing) (Required Derating), 3,000m (10,000feet) max											
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max											
	VIBRATION		10 - 55Hz, 98.0m/s² (10G), 3minutes period, 60minutes each along X, Y and Z axis											
	IMPACT		490.3m/s² (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 SUW1R5xx12/SUW1R5xx15 is available as single output, +24V/+30V.
*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℃.
* Parallel operation with other model is not possible.

SU

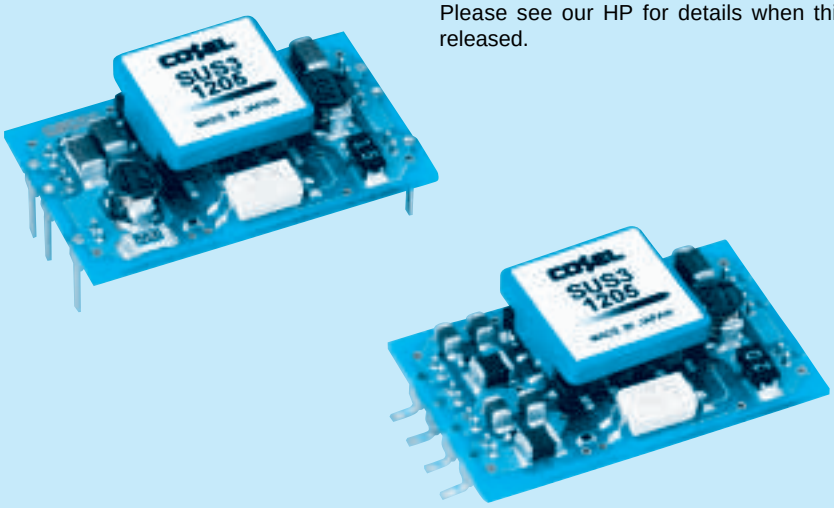
COSEL **On-board type**

SUS3

Ordering information

SU	S	3	12	05	B	-□
①	②	③	④	⑤	⑥	⑦

(LVD)



*This product will be released in February 2005 including 3.3V output model.
Please see our HP for details when this product is released.

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

MODEL		SUS30505	SUS30512	SUS30515	SUS31205	SUS31212	SUS31215	SUS32405	SUS32412	SUS32415	SUS34805	SUS34812	SUS34815
MAX OUTPUT WATTAGE[W]		3	3	3	3	3	3	3	3	3	3	3	3
DC OUTPUT	VOLTAGE[V] *1	5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]	0.6	0.25	0.2	0.6	0.25	0.2	0.6	0.25	0.2	0.6	0.25	0.2

SPECIFICATIONS

	MODEL		SUS30505	SUS30512	SUS30515	SUS31205	SUS31212	SUS31215	SUS32405	SUS32412	SUS32415	SUS34805	SUS34812	SUS34815
INPUT	VOLTAGE[V]		DC4.5 - 9			DC9 - 18			DC18 - 36			DC36 - 76		
	CURRENT[A]	*2	0.780typ	0.760typ	0.760typ	0.317typ	0.309typ	0.313typ	0.156typ	0.155typ	0.157typ	0.080typ	0.078typ	0.078typ
	EFFICIENCY[%]	*2	77typ	79typ	79typ	79typ	81typ	80typ	79typ	81typ	80typ	79typ	81typ	81typ
OUTPUT	VOLTAGE[V]		5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]		0.6	0.25	0.2	0.6	0.25	0.2	0.6	0.25	0.2	0.6	0.25	0.2
	LINE REGULATION[mV]		20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	60max
	LOAD REGULATION[mV]		40max	100max	120max	40max	100max	120max	40max	100max	120max	40max	100max	120max
	RIPPLE[mVp-p]	-20 to +55℃ *3	80max	120max	120max	80max	120max	120max	80max	120max	120max	80max	120max	120max
		-40 to -20℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
		-40 to -20℃ *3	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55℃	50max	150max	180max	50max	150max	180max	50max	150max	180max	50max	150max	180max
		-40 to +55℃	80max	240max	290max	80max	240max	290max	80max	240max	290max	80max	240max	290max
	DRIFT[mV]	*4	20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	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]		4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	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℃)											
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-40 to +71℃, 20 - 95%RH (Non condensing) (Required Derating), 3,000m (10,000feet) max											
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max											
	VIBRATION		10 - 55Hz, 98.0m/s² (10G), 3minutes period, 60minutes each along X, Y and Z axis											
	IMPACT		490.3m/s² (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 SUW3xx12/SUW3xx15 is available as single output, +24V/+30V.
*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℃.
* Parallel operation with other model is not possible.

SU

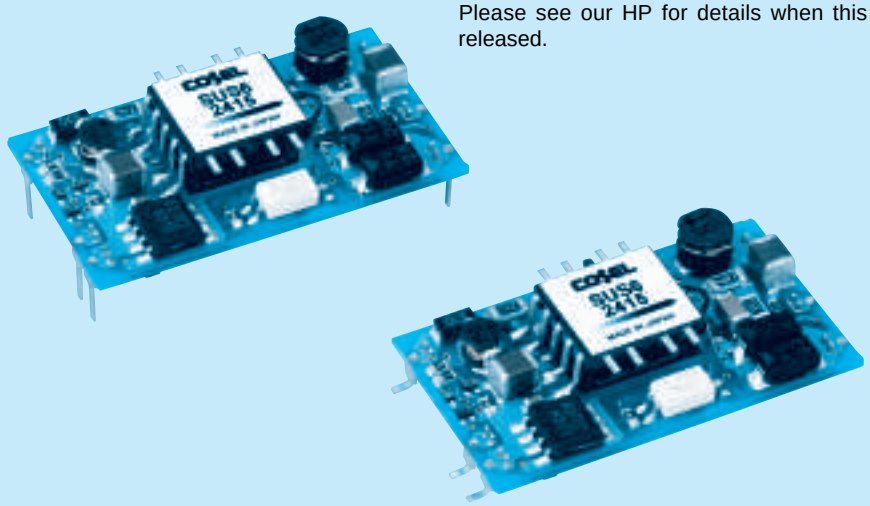
COSEL **On-board type**

SUS6

Ordering information

SU	S	6	12	05	B	-□
①	②	③	④	⑤	⑥	⑦

(LVD)



*This product will be released in February 2005 including 3.3V output model.
Please see our HP for details when this product is released.

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

MODEL		SUS60505	SUS60512	SUS60515	SUS61205	SUS61212	SUS61215	SUS62405	SUS62412	SUS62415	SUS64805	SUS64812	SUS64815
MAX OUTPUT WATTAGE[W]		5	6	6	6	6	6	6	6	6	6	6	6
DC OUTPUT	VOLTAGE[V] *1	5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]	1	0.5	0.4	1.2	0.5	0.4	1.2	0.5	0.4	1.2	0.5	0.4

SPECIFICATIONS

	MODEL		SUS60505	SUS60512	SUS60515	SUS61205	SUS61212	SUS61215	SUS62405	SUS62412	SUS62415	SUS64805	SUS64812	SUS64815
INPUT	VOLTAGE[V]		DC4.5 - 9			DC9 - 18			DC18 - 36			DC36 - 76		
	CURRENT[A]	*2	1.316typ	1.500typ	1.500typ	0.617typ	0.588typ	0.588typ	0.301typ	0.291typ	0.291typ	0.154typ	0.145typ	0.145typ
	EFFICIENCY[%]	*2	76typ	80typ	80typ	81typ	85typ	85typ	83typ	86typ	86typ	81typ	86typ	86typ
OUTPUT	VOLTAGE[V]		5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]		1	0.5	0.4	1.2	0.5	0.4	1.2	0.5	0.4	1.2	0.5	0.4
	LINE REGULATION[mV]		20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	60max
	LOAD REGULATION[mV]		40max	100max	120max	40max	100max	120max	40max	100max	120max	40max	100max	120max
	RIPPLE[mVp-p]	-20 to +55℃ *3	80max	120max	120max	80max	120max	120max	80max	120max	120max	80max	120max	120max
		-40 to -20℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
		-40 to -20℃ *3	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55℃	50max	150max	180max	50max	150max	180max	50max	150max	180max	50max	150max	180max
		-40 to +55℃	80max	240max	290max	80max	240max	290max	80max	240max	290max	80max	240max	290max
	DRIFT[mV]	*4	20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	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]		4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	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℃)											
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-40 to +71℃, 20 - 95%RH (Non condensing) (Required Derating), 3,000m (10,000feet) max											
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max											
	VIBRATION		10 - 55Hz, 98.0m/s² (10G), 3minutes period, 60minutes each along X, Y and Z axis											
	IMPACT		490.3m/s² (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 SUW6xx12/SUW6xx15 is available as single output, +24V/+30V.
*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℃.
* Parallel operation with other model is not possible.

SU

COSEL **On-board type**

SUS10

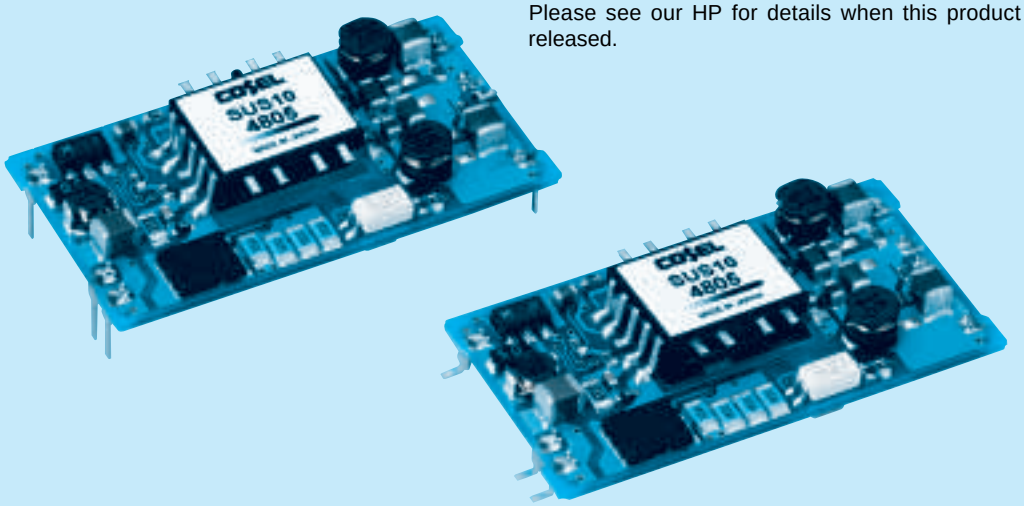
Ordering information

SU	S	10	12	05	B	-□
①	②	③	④	⑤	⑥	⑦

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

cULus TÜV Rheinland CE (LVD)

*This product will be released in March 2005 including 3.3V output model.
Please see our HP for details when this product is released.



MODEL		SUS100505	SUS100512	SUS100515	SUS101205	SUS101212	SUS101215	SUS102405	SUS102412	SUS102415	SUS104805	SUS104812	SUS104815
MAX OUTPUT WATTAGE[W]		10	10.8	10.5	10	12	12	10	12	12	10	12	12
DC OUTPUT	VOLTAGE[V] *1	5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]	2	0.9	0.7	2	1	0.8	2	1	0.8	2	1	0.8

SPECIFICATIONS

	MODEL		SUS100505	SUS100512	SUS100515	SUS101205	SUS101212	SUS101215	SUS102405	SUS102412	SUS102415	SUS104805	SUS104812	SUS104815
INPUT	VOLTAGE[V]		DC4.5 - 9			DC9 - 18			DC18 - 36			DC36 - 76		
	CURRENT[A]	*2	2.41typ	2.54typ	2.47typ	0.980typ	1.15typ	1.15typ	0.490typ	0.575typ	0.575typ	0.245typ	0.287typ	0.287typ
	EFFICIENCY[%]	*2	83typ	85typ	85typ	85typ	87typ	87typ	85typ	87typ	87typ	85typ	87typ	87typ
OUTPUT	VOLTAGE[V]		5	12	15	5	12	15	5	12	15	5	12	15
	CURRENT[A]		2	0.9	0.7	2	1	0.8	2	1	0.8	2	1	0.8
	LINE REGULATION[mV]		20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	60max
	LOAD REGULATION[mV]		40max	100max	120max	40max	100max	120max	40max	100max	120max	40max	100max	120max
	RIPPLE[mVp-p]	-20 to +55℃ *3	80max	120max	120max	80max	120max	120max	80max	120max	120max	80max	120max	120max
		-40 to -20℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
	RIPPLE NOISE[mVp-p]	-20 to +55℃ *3	120max	150max	150max	120max	150max	150max	120max	150max	150max	120max	150max	150max
		-40 to -20℃ *3	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max	200max
	TEMPERATURE REGULATION[mV]	-20 to +55℃	50max	150max	180max	50max	150max	180max	50max	150max	180max	50max	150max	180max
		-40 to +55℃	80max	240max	290max	80max	240max	290max	80max	240max	290max	80max	240max	290max
	DRIFT[mV]	*4	20max	48max	60max	20max	48max	60max	20max	48max	60max	20max	48max	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]		4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	11.40 - 12.60	14.25 - 15.75	4.85 - 5.25	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℃)											
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE		-40 to +71℃, 20 - 95%RH (Non condensing) (Required Derating), 3,000m (10,000feet) max											
	STORAGE TEMP.,HUMID.AND ALTITUDE		-40 to +85℃, 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 SUW10xx12/SUW10xx15 is available as single output, +24V/+30V.
*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℃.
* Parallel operation with other model is not possible.

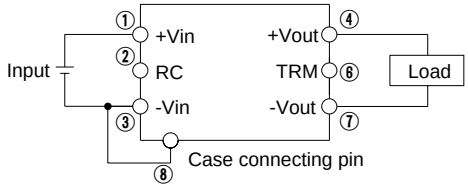
SU

1 Pin Cofiguration

Table1.1 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

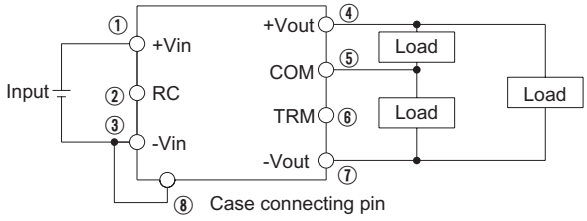


Fig.1.1 Pin configuration

●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

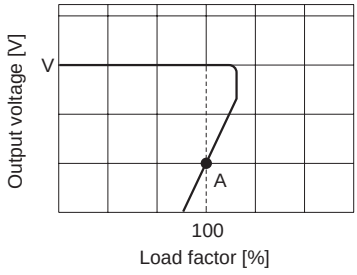
2.1 Input voltage range

■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 ±300ppm/℃
Potentiometer·····Cermet type, coefficient of less than ±100ppm/℃
■When the output voltage adjustment is not used, open the TRM pin.
■Dual output is simultaneously adjustment of ±.

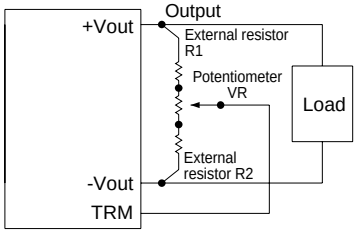


Fig.2.2 Connection devices outside the power supply

Table 2.1 Devises 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.

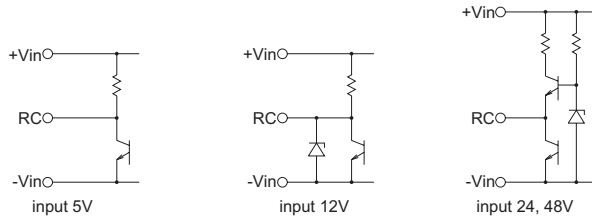


Fig.2.3 RC connection example

Table 2.2 Specification of Remote ON / OFF

Between RC and -Vin (VRC)	Output voltage
Short or 0V≦VRC≦0.4V	ON
1.0V≦VRC≦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.

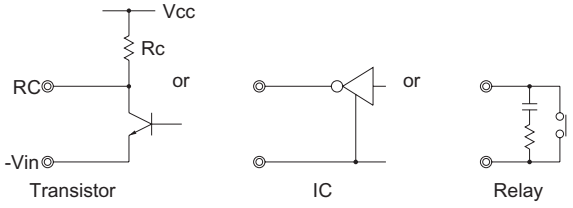


Fig.2.4 RC connection example

Table 2.3 Specification of Remote ON / OFF

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

■When RC pin is "Low" level, fan out current is 0.5mA typ. When Vcc is applied, use Vcc ≦ 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:Ci 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, Ci is effective to reduce its level. However, Ci 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, Ci should be connected to the input pin.

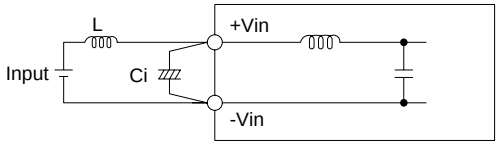


Fig.3.1 Connection method of capacitor at input pin

Table 3.1 Recommended capacitance Ci [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.

(a) (b)

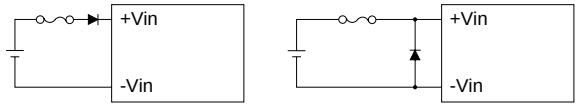
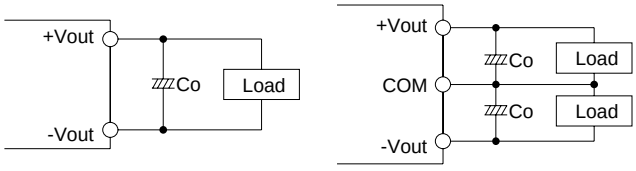


Fig.3.2 Reverse input voltage protection

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

SU



SUS/SUCS SUW/SUCW

Fig.3.3 Connection method of external capacitor at output pin

Table 3.2 Recommended capacitance Co [μF]

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.

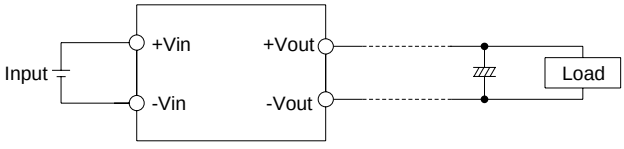


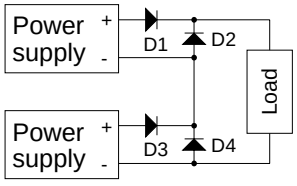
Fig.3.4 Connection method of capacitor at load

4 Series and Parallel Operation

4.1 Series operation

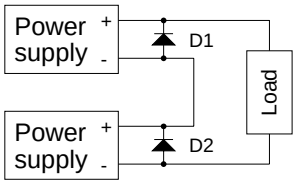
■Series operation is available by connecting the outputs of two or more power supplies, as shown below. Output currents in series connection should be lower than the lowest rated current in each unit.

(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)

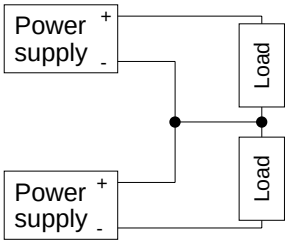


Fig.4.1 Series operation

4.2 Parallel redundancy operation

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

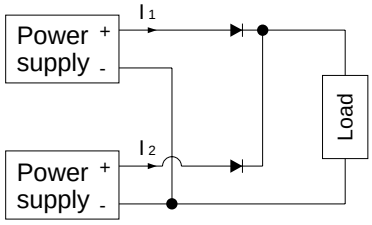


Fig.4.2 Parallel redundancy operation

■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 ≦ 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 (Ip).

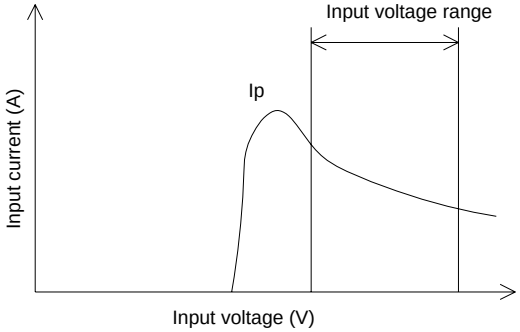


Fig.5.1 Input current characteristics

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.

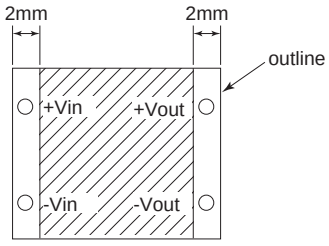


Fig.6.1 Prohibition area of pattern layout

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.

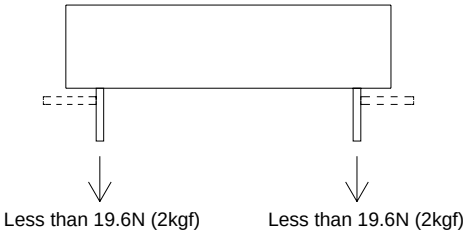


Fig.6.2 Stress onto the pins

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/m^3

7 Safety Considerations

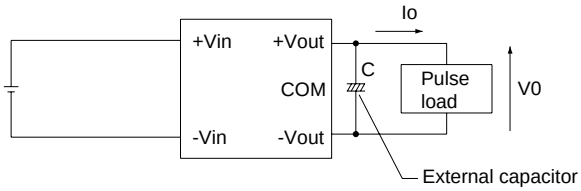
■To apply for safety standard approval using this power supply, the following conditions must be met.

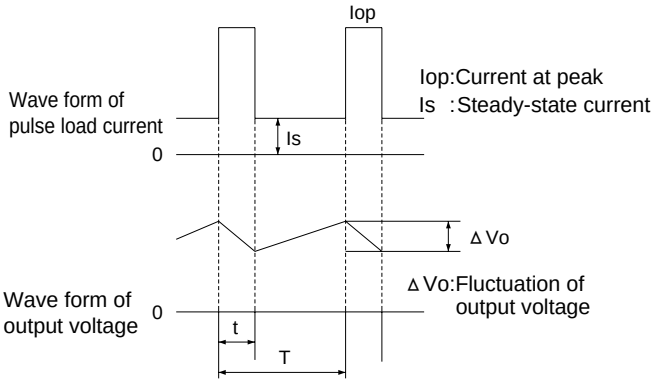
●This unit must be used as a component of the end-use equipment.

●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 Iav of output is shown in below formula.

$$Iav = Is + \frac{(Iop - Is)t}{T}$$

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

$$C = \frac{(Iop - Iav)t}{\Delta Vo}$$

SU