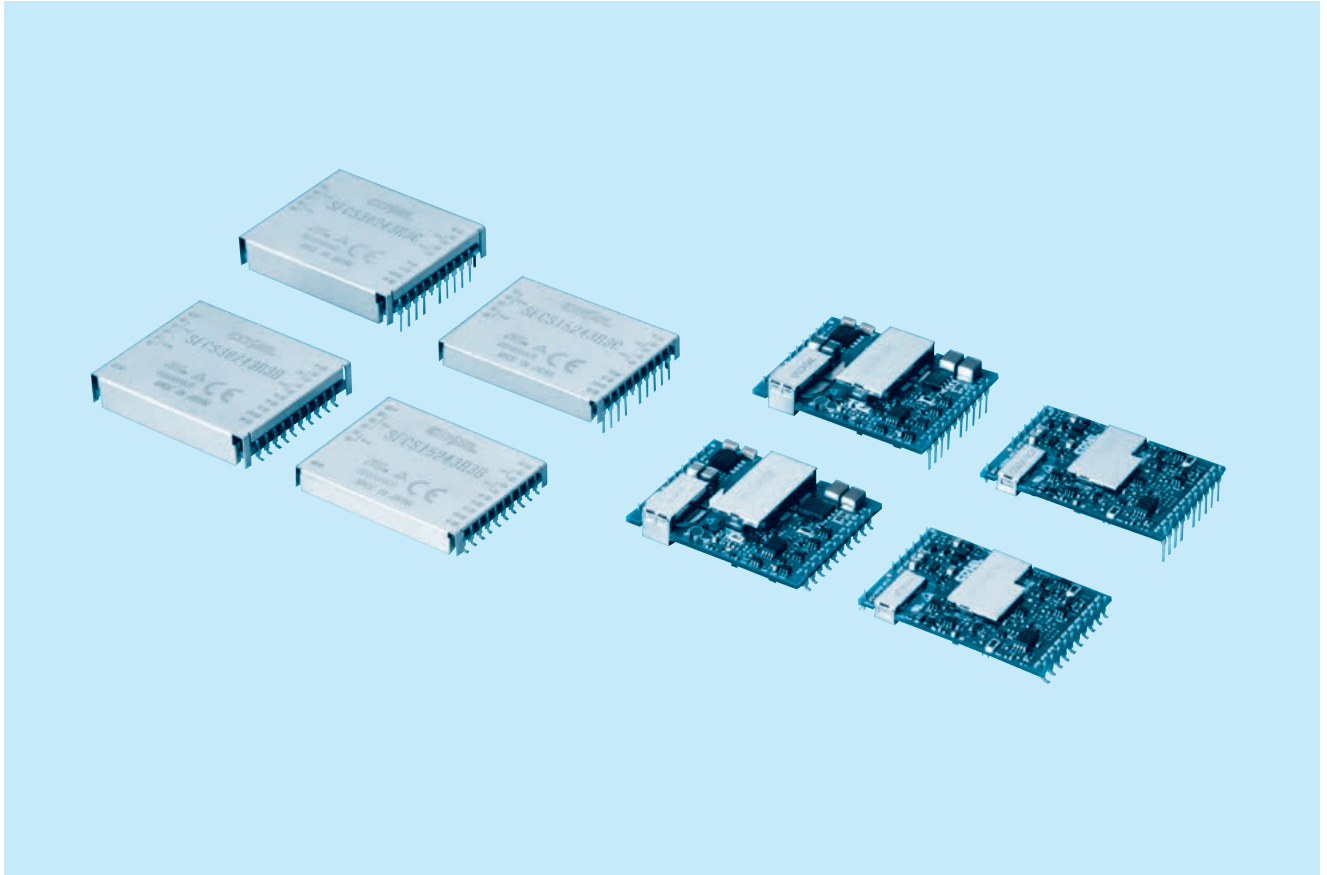




# SFS-series / SFCS-series



## ■ Feature

- SMD mounting type and through-hole mounting type
- High efficiency (synchronous rectifier circuit)
- Parallel operation is possible
- Built-in overcurrent, overvoltage and lowvoltage circuits
- Built-in remote ON/OFF, alarm
- High reliability : not built-in aluminum and tantalum electrolytic capacitor

## ■ CE marking

- Low Voltage Directive
- RoHS Directive

## ■ UKCA marking

- Electrical Equipment Safety Regulations
- RoHS Regulations

## ■ Safety agency approvals

- UL60950-1, C-UL, EN62368-1

## ■ 5-year warranty

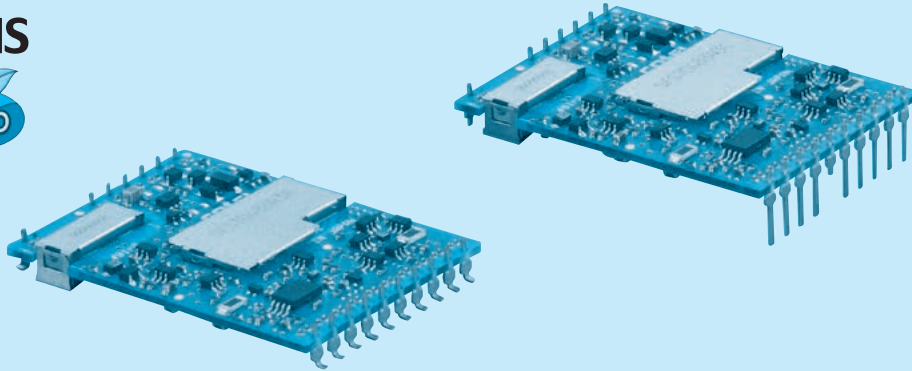
# SFS10

SF S 10 48 3R3 B

① ② ③ ④ ⑤ ⑥



RoHS



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage  
48:DC36 - 76V
- ⑤ Output voltage
- ⑥ Mounting type  
(Soldering process)  
B :SMD(Pb-free solder)  
C :DIP(Pb-free solder)

MODEL	SFS10481R2	SFS10481R5	SFS10481R8	SFS10482R5	SFS10483R3	SFS104805	SFS104812	SFS104815
MAX OUTPUT WATTAGE[W]	4.2	5.25	5.4	7.5	9.9	10.0	10.8	10.5
DC OUTPUT	1.2V 3.5A	1.5V 3.5A	1.8V 3A	2.5V 3A	3.3V 3A	5V 2A	12V 0.9A	15V 0.7A

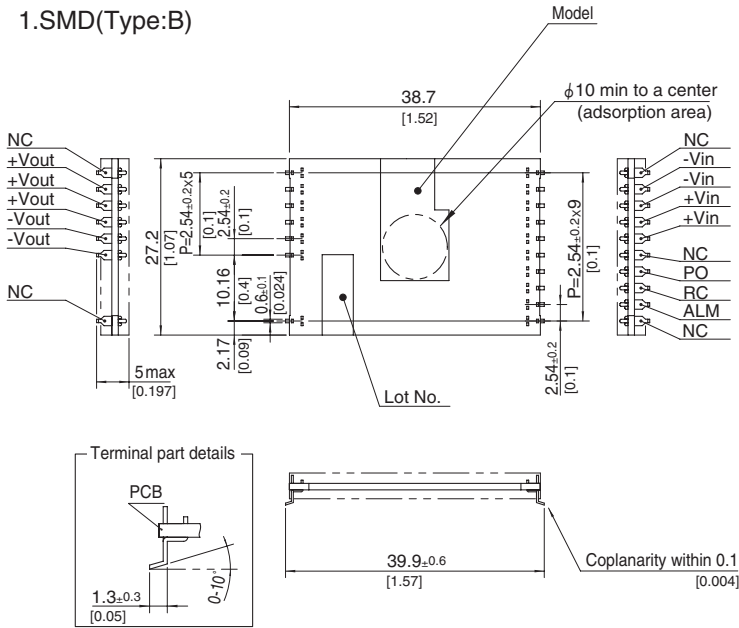
## SPECIFICATIONS

	MODEL	SFS10481R2	SFS10481R5	SFS10481R8	SFS10482R5	SFS10483R3	SFS104805	SFS104812	SFS104815	
INPUT	VOLTAGE[V]	DC36 - 76								
	CURRENT[A]	*1 0.11typ	0.13typ	0.13typ	0.18typ	0.23typ	0.23typ	0.26typ	0.25typ	
	EFFICIENCY[%]	*1 80typ	82typ	84typ	86typ	88typ	89typ	88typ	88typ	
	START-UP VOLTAGE[V]	DC32 - 36								
	HYSTERESIS VOLTAGE[V]	DC2 min								
OUTPUT	VOLTAGE[V]	1.2	1.5	1.8	2.5	3.3	5	12	15	
	CURRENT[A]	3.5	3.5	3	3	3	2	0.9	0.7	
	VOLTAGE ACCURACY[%]	+5, -3								
	RIPPLE[mVp-p]	25max						120max		
	RIPPLE NOISE[mVp-p]	50max						150max		
	START-UP TIME[ms]	20 - 200max (DCIN 48V, Io=100%)								
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING *1	±1% of rated output voltage								
	OVERCURRENT PROTECTION	Works over 103% of rating								
	OVERVOLTAGE PROTECTION	Works at 120 - 140% of rating								
	LOWVOLTAGE PROTECTION	Works at 90% max of rating								
ISOLATION	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)								
	INPUT-OUTPUT	DC1,500V 1minute, DC500V 50MΩ min (20±15°C)								
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 3,000m (10,000feet) max								
	STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max (SMD:Refer to the Instruction Manual)								
	VIBRATION	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis								
	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis								
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL (CSA60950-1), EN62368-1								
OTHERS	CASE SIZE/WEIGHT	38.7×5.0×27.2mm [1.52×0.197×1.07 inches] (W×H×D) /12g max								
	COOLING METHOD	Convection								

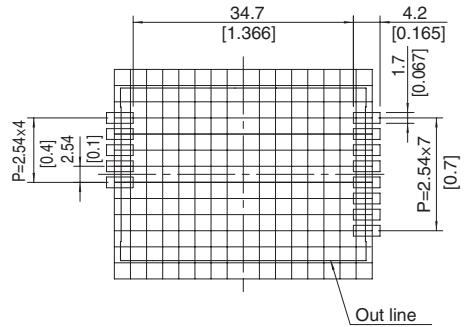
\*1 At rated input(DC48V), rated load and 25°C

External view

1.SMD(Type:B)



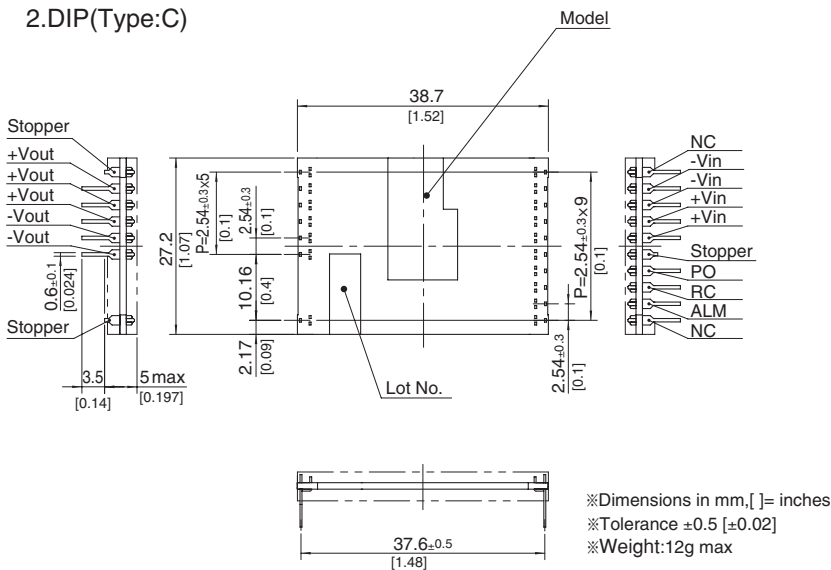
Recommended size for processing PCB (TOP VIEW)



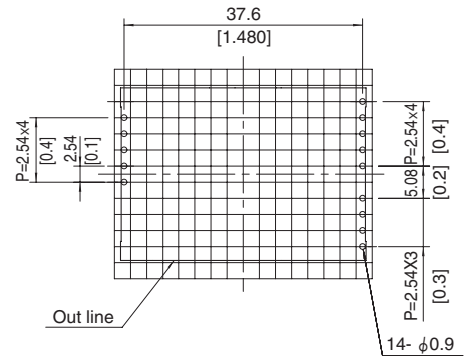
※Dimensions in:  $\frac{\text{mm}}{[\text{inch}]}$

※Div.: 0.1inch

2.DIP(Type:C)



Recommended size for processing PCB (TOP VIEW)



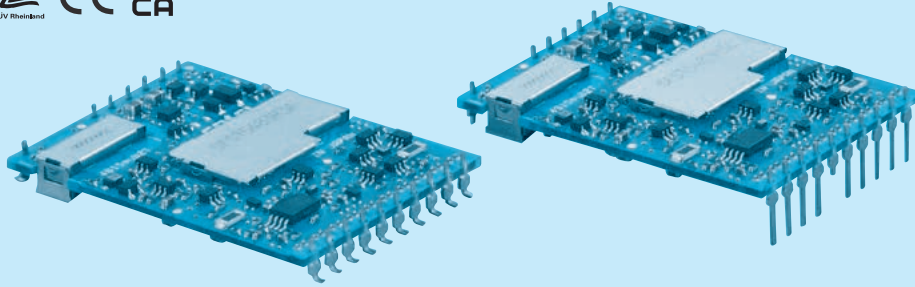
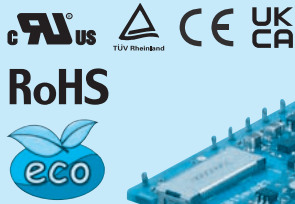
※Dimensions in:  $\frac{\text{mm}}{[\text{inch}]}$

※Div.: 0.1inch

# SFS15

SF S 15 48 3R3 B

① ② ③ ④ ⑤ ⑥



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage  
24:DC18 - 36V  
48:DC36 - 76V
- ⑤ Output voltage
- ⑥ Mounting type  
(Soldering process)  
B : SMD (Pb-free solder)  
C : DIP (Pb-free solder)

MODEL	SFS15242R5	SFS15243R3	SFS152405	SFS152412	SFS152415
MAX OUTPUT WATTAGE[W]	11.25	14.85	15.0	15.0	15.0
DC OUTPUT	2.5V 4.5A	3.3V 4.5A	5V 3A	12V 1.25A	15V 1A

## SPECIFICATIONS

	MODEL	SFS15242R5	SFS15243R3	SFS152405	SFS152412	SFS152415
INPUT	VOLTAGE[V]	DC18 - 36				
	CURRENT[A]	*1 0.54typ	0.7typ	0.69typ	0.7typ	0.7typ
	EFFICIENCY[%]	*1 87typ	89typ	90typ	89typ	89typ
	START-UP VOLTAGE[V]	DC16 - 18				
	HYSTERESIS VOLTAGE[V]	DC1 min				
OUTPUT	VOLTAGE[V]	2.5	3.3	5	12	15
	CURRENT[A]	4.5	4.5	3	1.25	1
	VOLTAGE ACCURACY[%]	+5, -3				
	RIPPLE[mVp-p]	25max			120max	
	RIPPLE NOISE[mVp-p]	50max			150max	
	START-UP TIME[ms]	20 - 200max (DCIN 24V, Io=100%)				
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING *1	±1% of rated output voltage				
	OVERCURRENT PROTECTION	Works over 103% of rating				
	OVERVOLTAGE PROTECTION	Works at 120 - 140% of rating				
	LOWVOLTAGE PROTECTION	Works at 90% max of rating				
	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)				

MODEL	SFS15481R2	SFS15481R5	SFS15481R8	SFS15482R5	SFS15483R3	SFS154805	SFS154812	SFS154815
MAX OUTPUT WATTAGE[W]	6.24	7.8	8.1	11.25	14.85	15.0	15.0	15.0
DC OUTPUT	1.2V 5.2A	1.5V 5.2A	1.8V 4.5A	2.5V 4.5A	3.3V 4.5A	5V 3A	12V 1.25A	15V 1A

## SPECIFICATIONS

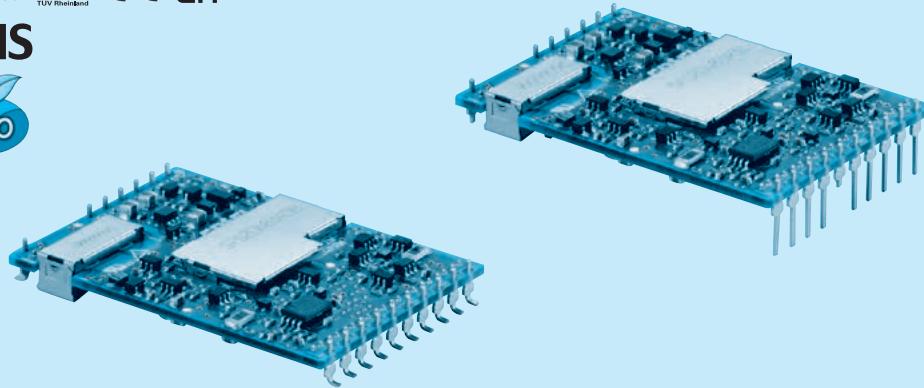
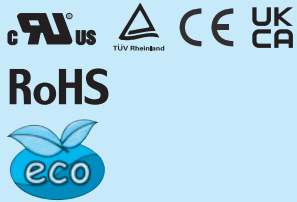
	MODEL	SFS15481R2	SFS15481R5	SFS15481R8	SFS15482R5	SFS15483R3	SFS154805	SFS154812	SFS154815
INPUT	VOLTAGE[V]	DC36 - 76							
	CURRENT[A]	*1 0.16typ	0.2typ	0.2typ	0.27typ	0.35typ	0.35typ	0.35typ	0.35typ
	EFFICIENCY[%]	*1 82typ	83typ	85typ	87typ	89typ	90typ	89typ	89typ
	START-UP VOLTAGE[V]	DC32 - 36							
	HYSTERESIS VOLTAGE[V]	DC2 min							
OUTPUT	VOLTAGE[V]	1.2	1.5	1.8	2.5	3.3	5	12	15
	CURRENT[A]	5.2	5.2	4.5	4.5	4.5	3	1.25	1
	VOLTAGE ACCURACY[%]	+5, -3							
	RIPPLE[mVp-p]	25max						120max	
	RIPPLE NOISE[mVp-p]	50max						150max	
	START-UP TIME[ms]	20 - 200max (DCIN 48V, Io=100%)							
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING *1	±1% of rated output voltage							
	OVERCURRENT PROTECTION	Works over 103% of rating							
	OVERVOLTAGE PROTECTION	Works at 120 - 140% of rating							
	LOWVOLTAGE PROTECTION	Works at 90% max of rating							
	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)							



# SFS20

SF S 20 48 3R3 B

① ② ③ ④ ⑤ ⑥



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage  
48:DC36 - 76V
- ⑤ Output voltage
- ⑥ Mounting type  
(Soldering process)  
B : SMD(Pb-free solder)  
C : DIP(Pb-free solder)

MODEL	SFS20481R5	SFS20481R8	SFS20482R5	SFS20483R3	SFS204805
MAX OUTPUT WATTAGE[W]	13.5	14.4	17.5	19.8	20.0
DC OUTPUT	1.5V 9A	1.8V 8A	2.5V 7A	3.3V 6A	5V 4A

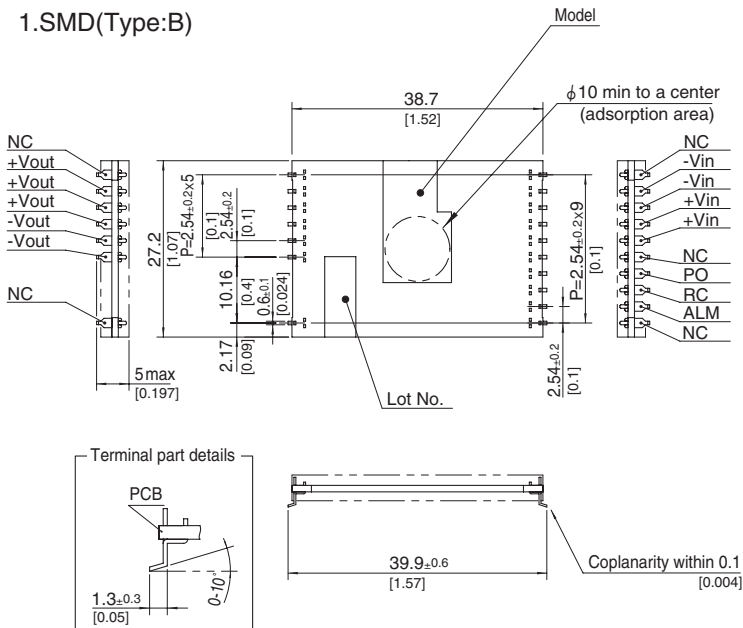
## SPECIFICATIONS

	MODEL	SFS20481R5	SFS20481R8	SFS20482R5	SFS20483R3	SFS204805
INPUT	VOLTAGE[V]	DC36 - 76				
	CURRENT[A]	*1 0.33typ	0.35typ	0.41typ	0.46typ	0.46typ
	EFFICIENCY[%]	*1 86typ	85typ	88typ	90typ	90typ
	START-UP VOLTAGE[V]	DC32 - 36				
	HYSTERESIS VOLTAGE[V]	DC2 min				
OUTPUT	VOLTAGE[V]	1.5	1.8	2.5	3.3	5
	CURRENT[A]	9	8	7	6	4
	VOLTAGE ACCURACY[%]	+5, -3				
	RIPPLE[mVp-p]	50max				
	RIPPLE NOISE[mVp-p]	50max				
	START-UP TIME[ms]	20 - 200max (DCIN 48V, Io=100%)				
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING *1	+2, -1% of rated output voltage				
	OVERCURRENT PROTECTION	Works over 103% of rating				
	OVERVOLTAGE PROTECTION	Works at 115 - 145% of rating				
	LOWVOLTAGE PROTECTION	Works at 95% max of rating				
ISOLATION	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)				
	INPUT-OUTPUT	DC1,500V 1minute, DC500V 50MΩ min (20±15°C)				
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 3,000m (10,000feet) max				
	STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max (SMD:Refer to the Instruction Manual)				
	VIBRATION	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis				
	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis				
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL(CSA60950-1), EN62368-1				
OTHERS	CASE SIZE/WEIGHT	38.7 × 5.0 × 27.2mm [1.52 × 0.197 × 1.07 inches] (W × H × D) /12g max				
	COOLING METHOD	Convection/Forced air				

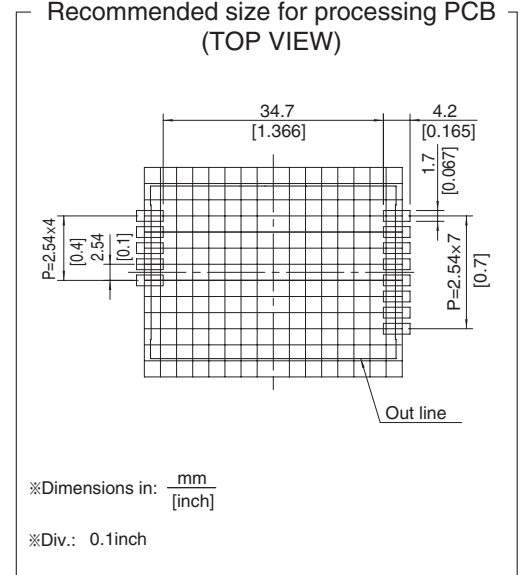
\*1 At rated input(DC48V), rated load and 25°C

External view

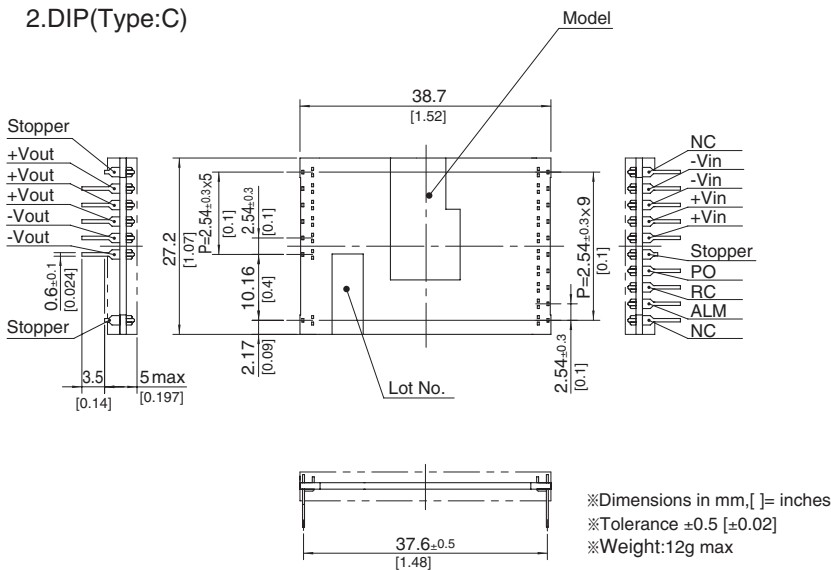
1.SMD(Type:B)



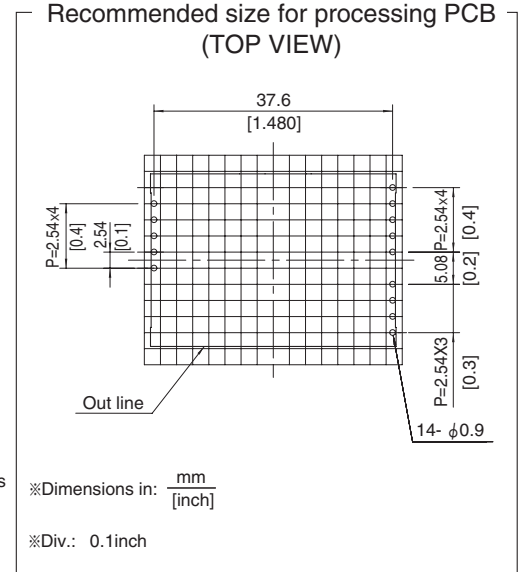
Recommended size for processing PCB (TOP VIEW)



2.DIP(Type:C)



Recommended size for processing PCB (TOP VIEW)

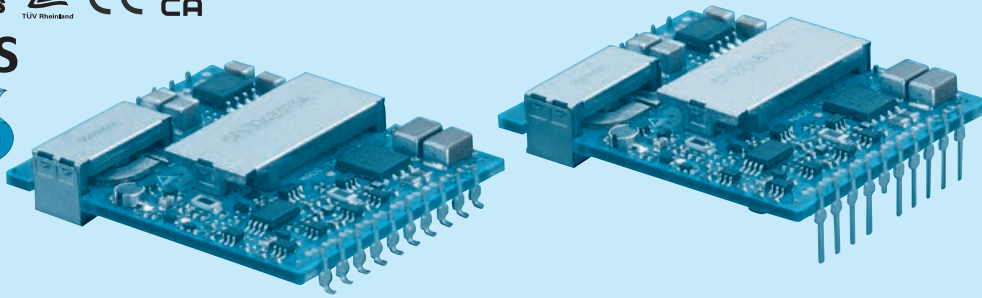
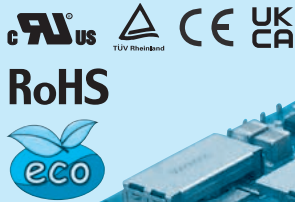




# SFS30

SF S 30 48 3R3 B

① ② ③ ④ ⑤ ⑥



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage  
24:DC18 - 36V  
48:DC36 - 76V
- ⑤ Output voltage
- ⑥ Mounting type  
(Soldering process)  
B : SMD (Pb-free solder)  
C : DIP (Pb-free solder)

MODEL	SFS30242R5	SFS30243R3	SFS302405	SFS302412	SFS302415
MAX OUTPUT WATTAGE[W]	22.5	29.7	30.0	30.0	30.0
DC OUTPUT	2.5V 9A	3.3V 9A	5V 6A	12V 2.5A	15V 2A

## SPECIFICATIONS

	MODEL	SFS30242R5	SFS30243R3	SFS302405	SFS302412	SFS302415
INPUT	VOLTAGE[V]	DC18 - 36				
	CURRENT[A]	*1 1.04typ	1.36typ	1.36typ	1.36typ	1.39typ
	EFFICIENCY[%]	*1 90typ	91typ	92typ	92typ	90typ
	START-UP VOLTAGE[V]	DC16 - 18				
	HYSTERESIS VOLTAGE[V]	DC1 min				
OUTPUT	VOLTAGE[V]	2.5	3.3	5	12	15
	CURRENT[A]	9	9	6	2.5	2
	VOLTAGE ACCURACY[%]	+5, -3				
	RIPPLE[mVp-p]	25max			120max	
	RIPPLE NOISE[mVp-p]	50max			150max	
	START-UP TIME[ms]	20 - 200max (DCIN 24V, Io=100%)				
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING *1	± 1% of rated output voltage				
	OVERCURRENT PROTECTION	Works over 103% of rating				
	OVERVOLTAGE PROTECTION	Works at 120 - 140% of rating				
	LOWVOLTAGE PROTECTION	Works at 90% max of rating				
	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)				

MODEL	SFS30481R2	SFS30481R5	SFS30481R8	SFS30482R5	SFS30483R3	SFS304805	SFS304810	SFS304812	SFS304815
MAX OUTPUT WATTAGE[W]	12.48	15.6	16.2	22.5	29.7	30.0	30.0	30.0	30.0
DC OUTPUT	1.2V 10.4A	1.5V 10.4A	1.8V 9A	2.5V 9A	3.3V 9A	5V 6A	10V 3A	12V 2.5A	15V 2A

## SPECIFICATIONS

	MODEL	SFS30481R2	SFS30481R5	SFS30481R8	SFS30482R5	SFS30483R3	SFS304805	SFS304810	SFS304812	SFS304815	
INPUT	VOLTAGE[V]	DC36 - 76									
	CURRENT[A]	*1 0.30typ	0.37typ	0.38typ	0.52typ	0.67typ	0.68typ	0.69typ	0.68typ	0.68typ	
	EFFICIENCY[%]	*1 86typ	87.5typ	89typ	91typ	92typ	92.5typ	91typ	92typ	92typ	
	START-UP VOLTAGE[V]	DC32 - 36									
	HYSTERESIS VOLTAGE[V]	DC2 min									
OUTPUT	VOLTAGE[V]	1.2	1.5	1.8	2.5	3.3	5	10	12	15	
	CURRENT[A]	10.4	10.4	9	9	9	6	3	2.5	2	
	VOLTAGE ACCURACY[%]	+5, -3									
	RIPPLE[mVp-p]	25max						120max			
	RIPPLE NOISE[mVp-p]	50max						150max			
	START-UP TIME[ms]	20 - 200max (DCIN 48V, Io=100%)									
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING *1	± 1% of rated output voltage									
	OVERCURRENT PROTECTION	Works over 103% of rating									
	OVERVOLTAGE PROTECTION	Works at 120 - 140% of rating									
	LOWVOLTAGE PROTECTION	Works at 90% max of rating									
	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)									



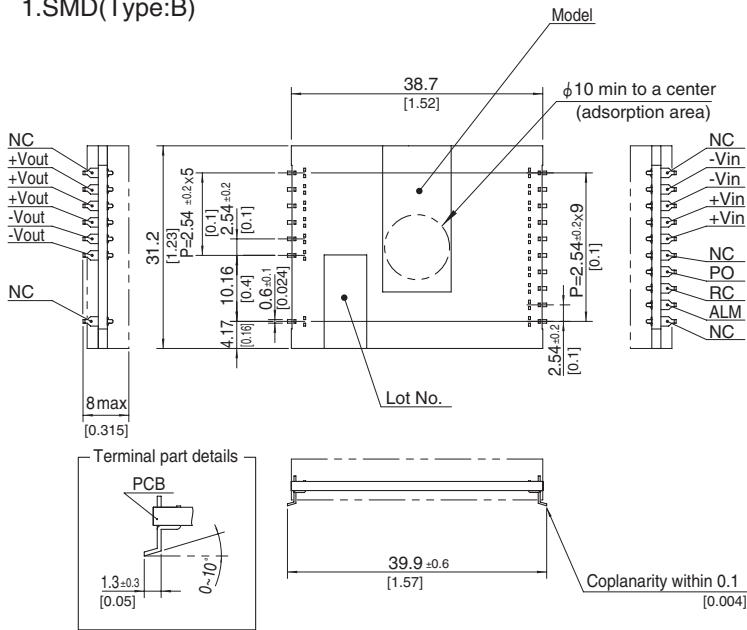
### GENERAL SPECIFICATIONS

<b>ISOLATION</b>	<b>INPUT-OUTPUT</b>	DC1,500V 1minute, DC500V 50MΩ min (20±15°C)
<b>ENVIRONMENT</b>	<b>OPERATING TEMP.,HUMID.AND ALTIITUDE</b>	-40 to +85°C, 20 - 95%RH (Non condensing), 3,000m (10,000feet) max
	<b>STORAGE TEMP.,HUMID.AND ALTIITUDE</b>	-40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max (SMD:Refer to the Instruction Manual)
	<b>VIBRATION</b>	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis
	<b>IMPACT</b>	196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis
<b>SAFETY</b>	<b>AGENCY APPROVALS</b>	UL60950-1, C-UL (CSA60950-1), EN62368-1
<b>OTHERS</b>	<b>CASE SIZE/WEIGHT</b>	38.7×8.0×31.2mm [1.52×0.315×1.23 inches] (W×H×D) /20g max
	<b>COOLING METHOD</b>	Convection/Forced air

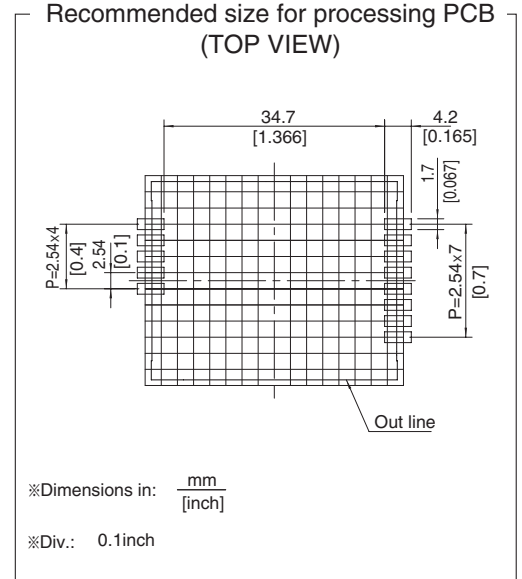
\*1 At rated input(DC24V, DC48V), rated load and 25°C

### External view

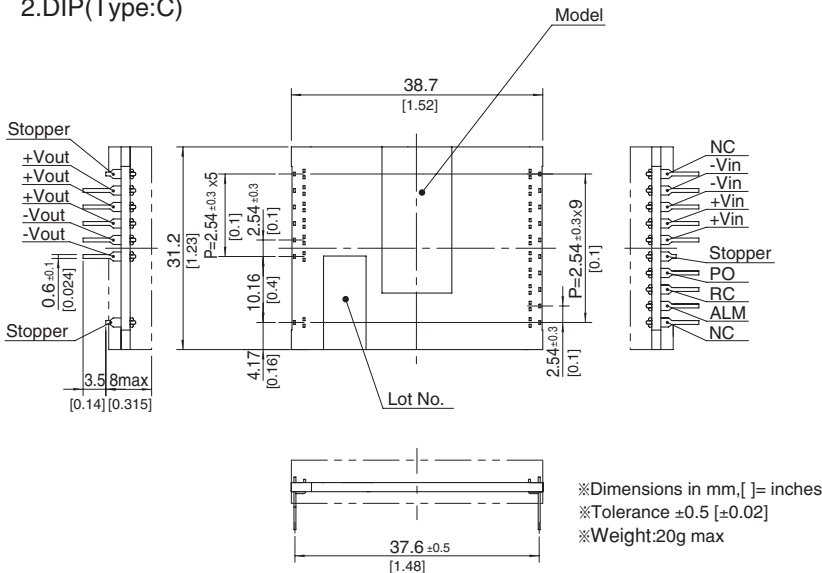
1.SMD(Type:B)



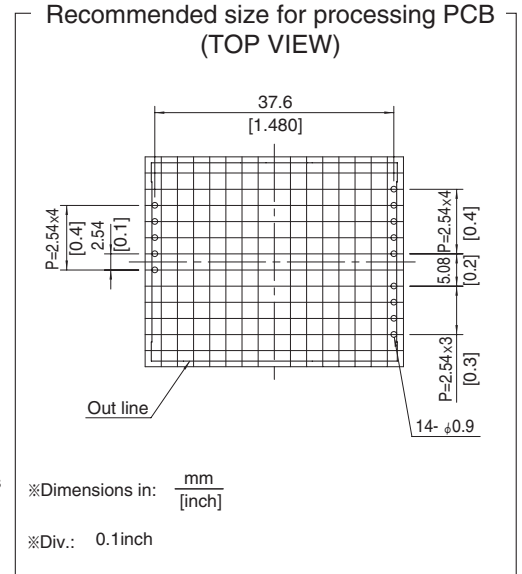
Recommended size for processing PCB (TOP VIEW)



2.DIP(Type:C)



Recommended size for processing PCB (TOP VIEW)



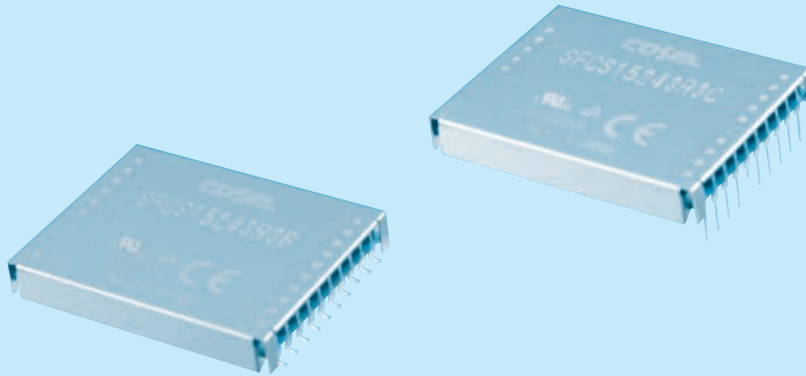
# SFCS15

**SFC**   **S**   **15**   **24**   **3R3**   **C**

①   ②   ③   ④   ⑤   ⑥



RoHS



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage  
24:DC18 - 36V  
48:DC36 - 76V
- ⑤ Output voltage
- ⑥ Mounting type  
B :SMD  
C :DIP

MODEL	SFCS15243R3	SFCS152405	SFCS152412	SFCS152415	SFCS15483R3	SFCS154805	SFCS154812	SFCS154815
MAX OUTPUT WATTAGE[W]	14.85	15.0	15.0	15.0	14.85	15.0	15.0	15.0
DC OUTPUT	3.3V 4.5A	5V 3A	12V 1.25A	15V 1A	3.3V 4.5A	5V 3A	12V 1.25A	15V 1A

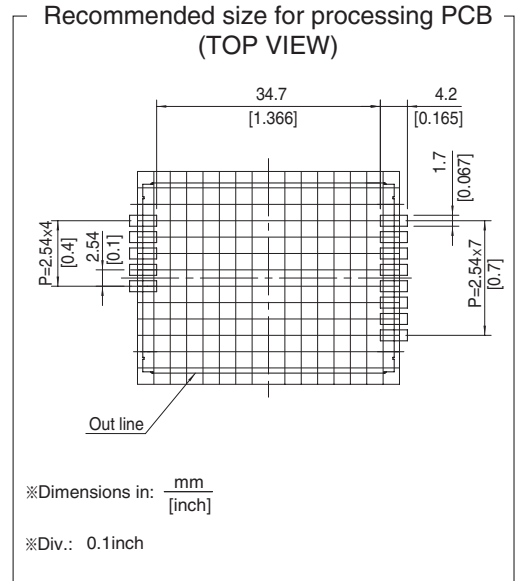
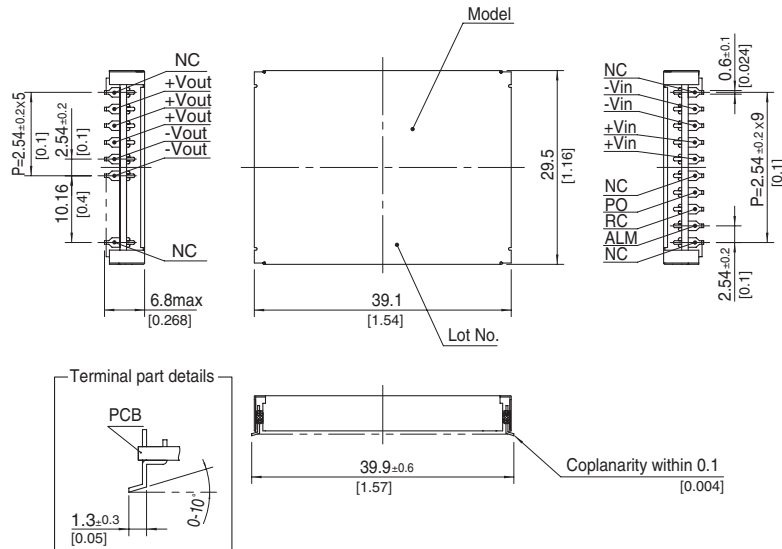
## SPECIFICATIONS

	MODEL	SFCS15243R3	SFCS152405	SFCS152412	SFCS152415	SFCS15483R3	SFCS154805	SFCS154812	SFCS154815	
INPUT	VOLTAGE[V]	DC18 - 36				DC36 - 76				
	CURRENT[A]	*1 0.7typ	0.69typ	0.7typ	0.7typ	0.35typ	0.35typ	0.35typ	0.35typ	
	EFFICIENCY[%]	*1 89typ	90typ	89typ	89typ	89typ	90typ	89typ	89typ	
	START-UP VOLTAGE[V]	DC16 - 18				DC32 - 36				
	HYSTERESIS VOLTAGE[V]	DC1 min				DC2 min				
OUTPUT	VOLTAGE[V]	3.3	5	12	15	3.3	5	12	15	
	CURRENT[A]	4.5	3	1.25	1	4.5	3	1.25	1	
	VOLTAGE ACCURACY[%]	+5, -3								
	RIPPLE[mVp-p]	25max			120max		25max		120max	
	RIPPLE NOISE[mVp-p]	50max			150max		50max		150max	
	START-UP TIME[ms]	20 - 200max (DCIN 24V, Io=100%)					20 - 200max (DCIN 48V, Io=100%)			
PROTECTION CIRCUIT AND OTHERS	OUTPUT VOLTAGE SETTING *1	±1% of rated output voltage								
	OVERCURRENT PROTECTION	Works over 103% of rating								
	OVERVOLTAGE PROTECTION	Works at 120 - 140% of rating								
	LOWVOLTAGE PROTECTION	Works at 90% max of rating								
ISOLATION	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)								
	INPUT-OUTPUT	DC1,000V or AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (20±15°C)								
	INPUT-CASE	DC500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C)								
ENVIRONMENT	OUTPUT-CASE	DC500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C)								
	OPERATING TEMP.,HUMID.AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 3,000m (10,000feet) max								
	STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max (SMD:Refer to the Instruction Manual)								
	VIBRATION	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis								
SAFETY	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis								
	AGENCY APPROVALS	UL60950-1, C-UL (CSA60950-1), EN62368-1								
OTHERS	CASE SIZE/WEIGHT	39.1 × 6.8 × 29.5mm [1.54 × 0.268 × 1.16 inches] (W × H × D) /16g max								
	COOLING METHOD	Convection								

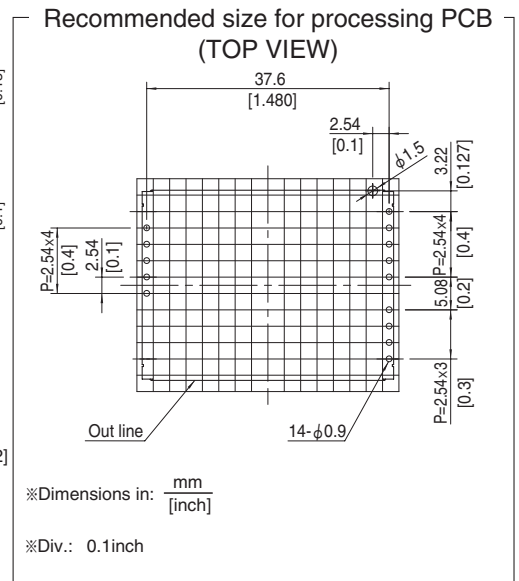
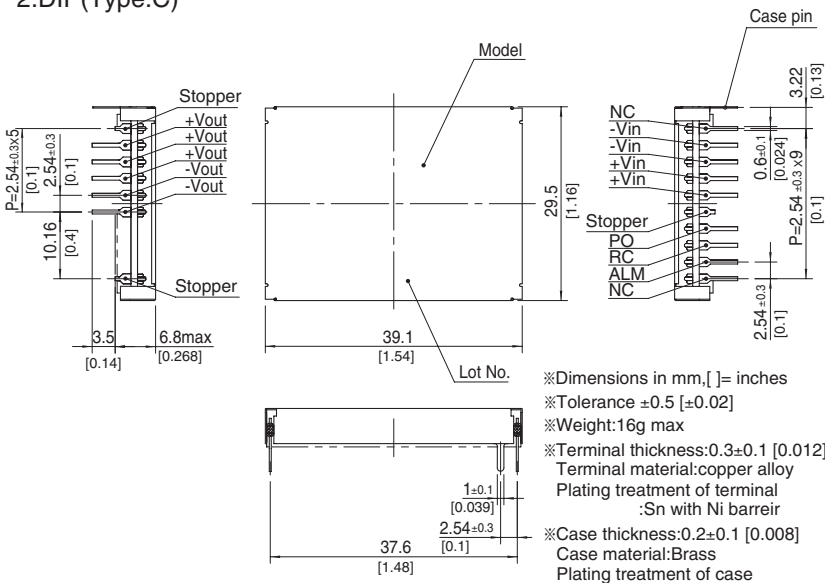
\*1 At rated input(DC24V, DC48V), rated load and 25°C

External view

1.SMD(Type:B)



2.DIP(Type:C)



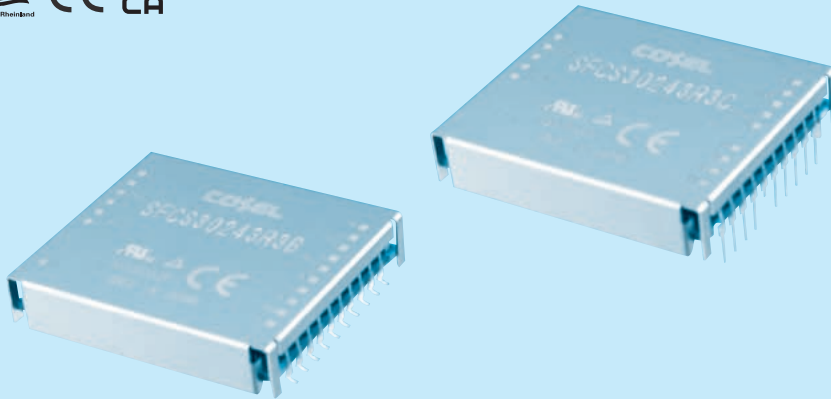
# SFCS30

**SFC**   **S**   **30**   **24**   **3R3**   **C**

①   ②   ③   ④   ⑤   ⑥



RoHS



- ① Series name
- ② Single output
- ③ Output wattage
- ④ Input voltage  
24:DC18 - 36V  
48:DC36 - 76V
- ⑤ Output voltage
- ⑥ Mounting type  
B :SMD  
C :DIP

MODEL	SFCS30243R3	SFCS302405	SFCS302412	SFCS302415	SFCS30483R3	SFCS304805	SFCS304812	SFCS304815
MAX OUTPUT WATTAGE[W]	29.7	30.0	30.0	30.0	29.7	30.0	30.0	30.0
DC OUTPUT	3.3V 9A	5V 6A	12V 2.5A	15V 2A	3.3V 9A	5V 6A	12V 2.5A	15V 2A

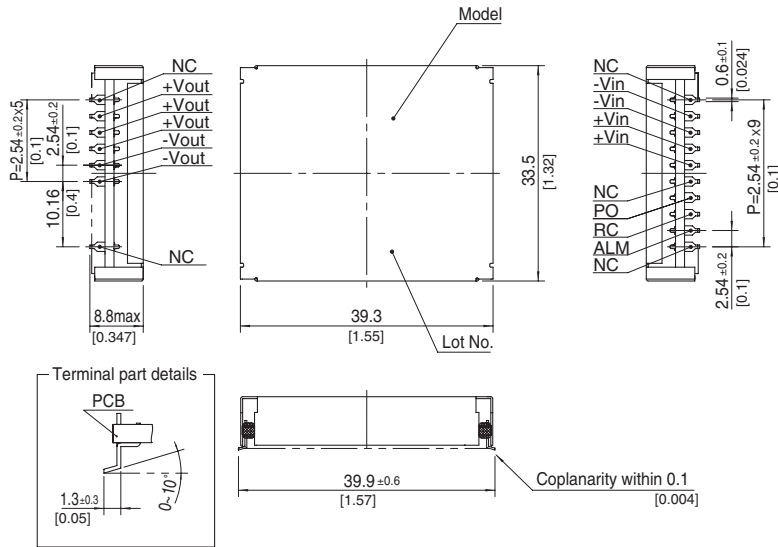
## SPECIFICATIONS

	MODEL	SFCS30243R3	SFCS302405	SFCS302412	SFCS302415	SFCS30483R3	SFCS304805	SFCS304812	SFCS304815	
INPUT	VOLTAGE[V]	DC18 - 36				DC36 - 76				
	CURRENT[A]	*1 1.36typ	1.36typ	1.36typ	1.39typ	0.67typ	0.68typ	0.68typ	0.68typ	
	EFFICIENCY[%]	*1 91typ	92typ	92typ	90typ	92typ	92.5typ	92typ	92typ	
	START-UP VOLTAGE[V]	DC16 - 18				DC32 - 36				
	HYSTERESIS VOLTAGE[V]	DC1 min				DC2 min				
OUTPUT	VOLTAGE[V]	3.3	5	12	15	3.3	5	12	15	
	CURRENT[A]	9	6	2.5	2	9	6	2.5	2	
	VOLTAGE ACCURACY[%]	+5, -3								
	RIPPLE[mVp-p]	25max			120max		25max		120max	
	RIPPLE NOISE[mVp-p]	50max			150max		50max		150max	
	START-UP TIME[ms]	20 - 200max (DCIN 24V, Io=100%)					20 - 200max (DCIN 48V, Io=100%)			
	OUTPUT VOLTAGE SETTING *1	±1% of rated output voltage								
PROTECTION CIRCUIT AND OTHERS	OVERCURRENT PROTECTION	Works over 103% of rating								
	OVERVOLTAGE PROTECTION	Works at 120 - 140% of rating								
	LOWVOLTAGE PROTECTION	Works at 90% max of rating								
	REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)								
ISOLATION	INPUT-OUTPUT	DC1,000V or AC500V 1minute, Cutoff current = 100mA, DC500V 50MΩ min (20±15°C)								
	INPUT-CASE	DC500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C)								
	OUTPUT-CASE	DC500V or AC500V 1minute, Cutoff current = 10mA, DC500V 50MΩ min (20±15°C)								
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 3,000m (10,000feet) max								
	STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100°C, 20 - 95%RH (Non condensing), 9,000m (30,000feet) max (SMD:Refer to the Instruction Manual)								
	VIBRATION	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minutes period, 60minutes each along X, Y and Z axis								
	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, once each X, Y and Z axis								
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL (CSA60950-1), EN62368-1								
OTHERS	CASE SIZE/WEIGHT	39.3 × 8.8 × 33.5mm [1.55 × 0.347 × 1.32 inches] (W × H × D) /25g max								
	COOLING METHOD	Convection / Forced air								

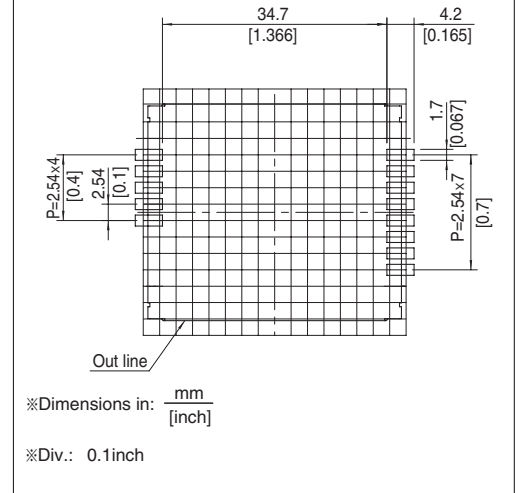
\*1 At rated input(DC24V, DC48V), rated load and 25°C

External view

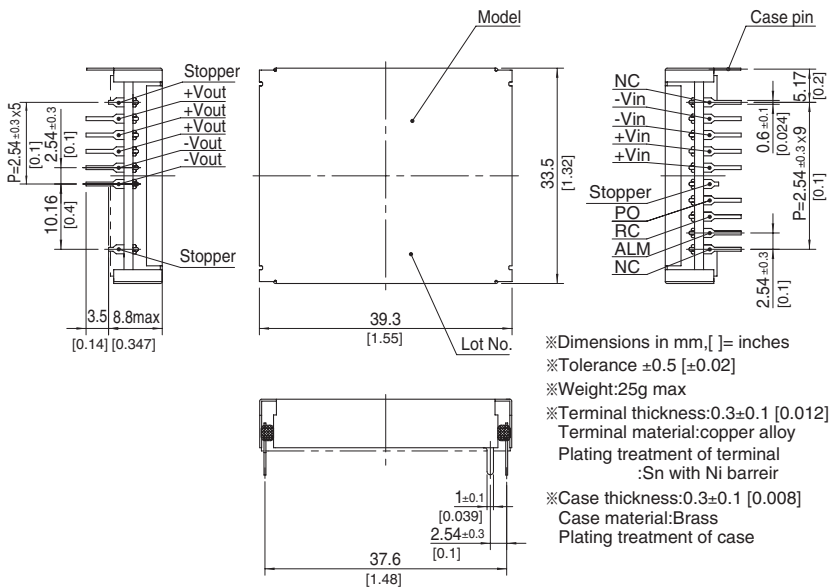
1.SMD(Type:B)



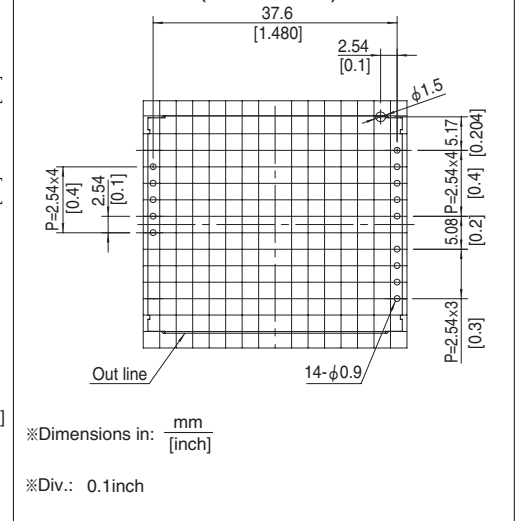
Recommended size for processing PCB (TOP VIEW)



2.DIP(Type:C)

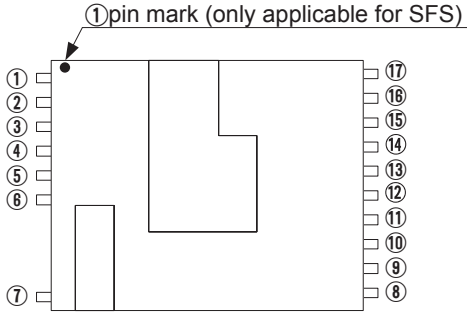


Recommended size for processing PCB (TOP VIEW)

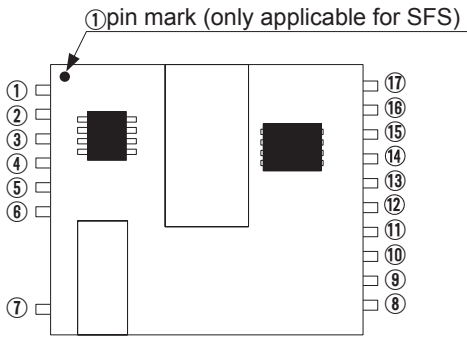


## Pin Configuration

### SFS10 / SFS15 / SFS20 / SFCS15



### SFS30 / SFCS30



No.	Pin Name	Function
①	NC(SMD)	Not connected / Adhesive dispensing
	Stopper(DIP)	Stopper
②	+Vout	+DC output
③	+Vout	+DC output
④	+Vout	+DC output
⑤	-Vout	-DC output
⑥	-Vout	-DC output
⑦	NC(SMD)	Not connected / Adhesive dispensing
	Stopper(DIP)	Stopper
⑧	NC(SMD)	Not connected / Adhesive dispensing
	NC(DIP)	Not connected
⑨	ALM	Alarm
⑩	RC	Remote ON / OFF
⑪	PO	Start in / out
⑫	NC(SMD)	Not connected
	Stopper(DIP)	Stopper
⑬	+Vin	+DC input
⑭	+Vin	+DC input
⑮	-Vin	-DC input
⑯	-Vin	-DC input
⑰	NC(SMD)	Not connected / Adhesive dispensing
	NC(DIP)	Not connected
Case connecting pin		Isolated from internal circuit Only applicable for SFCS type C (DIP)

## Implementation · Mounting Method

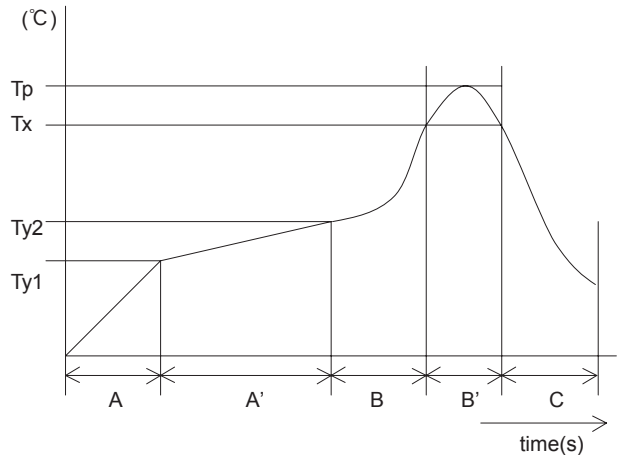
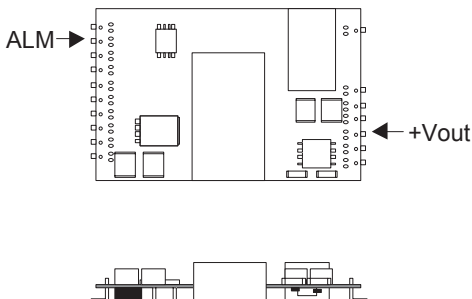
### Automatic mounting

- SFS / SFCS series 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 of SFS series during mounting, causing cracked core. So during mounting, take enough care.

### Soldering temperature

#### (1) Reflow soldering

- Below and right figure show the conditions of reflow soldering. Please verify the temperature of the ALM pin and +Vout pin satisfy to reflow condition.
- Improper reflow condition may degrade the reliability of the internal components.
- While soldering, having vibration or impact on the unit should be avoided, because of solder melting.



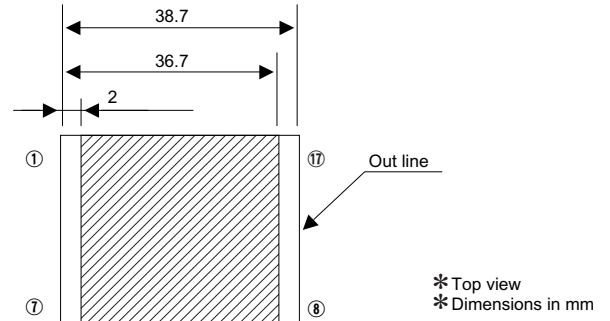
A	1.0 - 5.0°C / s
A'	Ty1 : 160 ± 10°C Ty2 : 180 ± 10°C Ty1 - Ty2 : 120s max
B	1.0 - 5.0°C / s
B'	Tp : Max245°C 10s max Tx : 220°C or more : 70s max
C	1.0 - 5.0°C / s

Implementation · Mounting Method

- (2) Flow soldering
  - 260°C, less than 15 seconds.
- (3) Soldering iron
  - 340°C to 360°C, less than 5 seconds.

Mounting method

- Avoid placing pattern layout in hatched area in right figure to insulate between pattern and power supply.



Stress to the product

- SFS/SFCS series transformer core and choke coil core are attached by glue, and there is a cover over the core, which is attached by a clasp. There is a possibility that the core will be removed and power supply will be damaged when it took stress by the fall or some kind of stress.

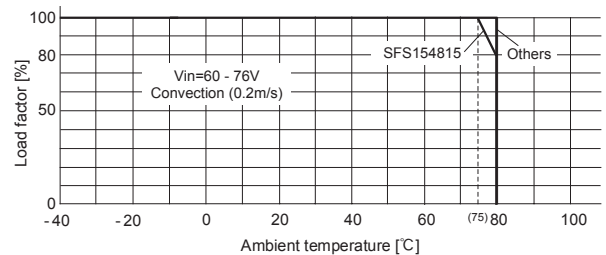
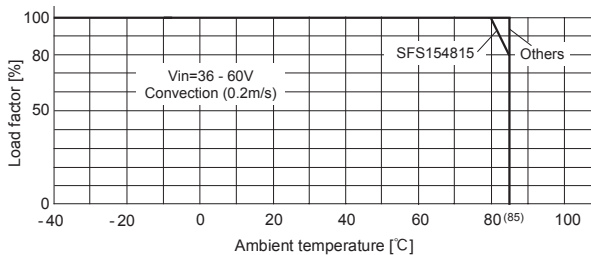
Derating

Ambient temperature derating curve

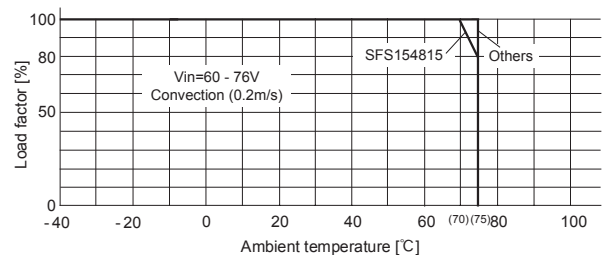
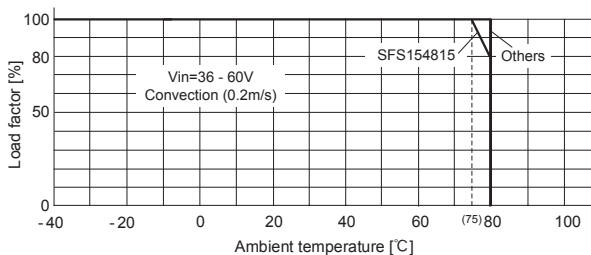
- It is necessary to note thermal fatigue life by power cycle. Please reduce the temperature fluctuation range as much as possible when the up and down of temperature are frequently generated.
- In case of forced air, ventilation must keep the temperature of point A and B below the temperatures shown in Instruction Manual 8.

● SFS1048, SFS1548

(1) Single and series operation



(2) Parallel operation

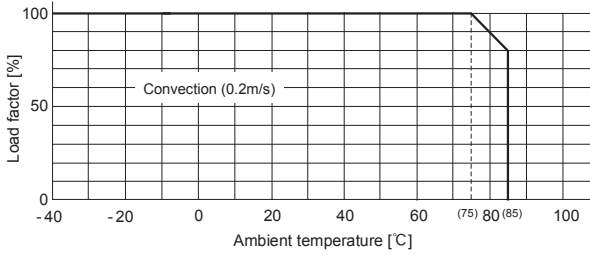




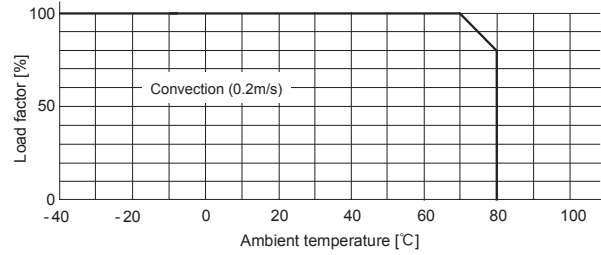
Derating

SFS1524, SFCS15

(1) Single and series operation



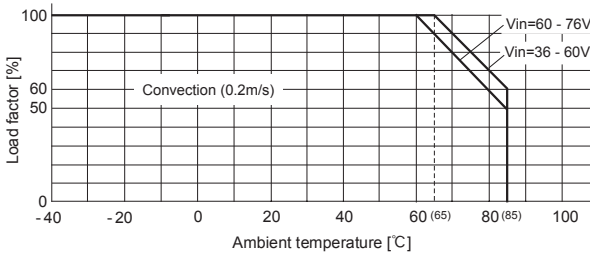
(2) Parallel operation



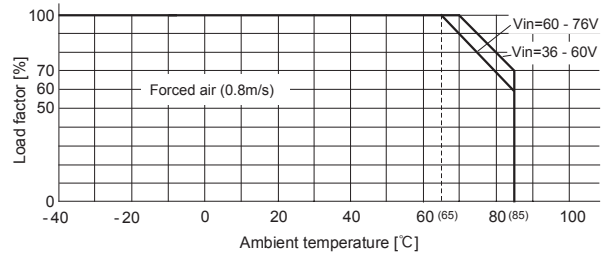
SFS2048

(1) Single, series and parallel operation

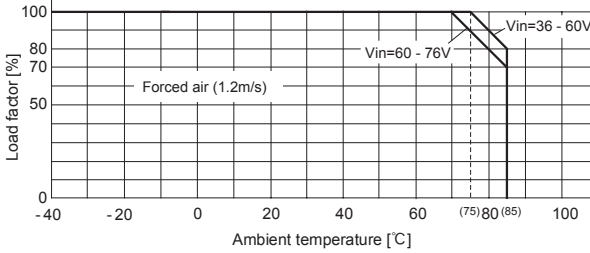
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



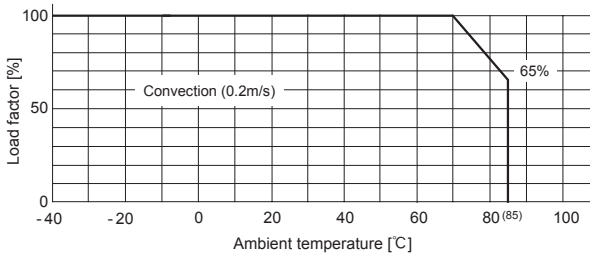
③ Forced air cooling (1.2m/s)



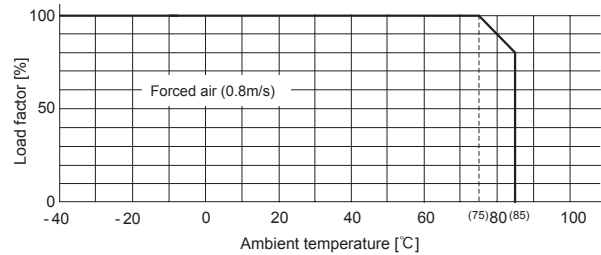
SFS3024, SFCS30

(1) Single and series operation

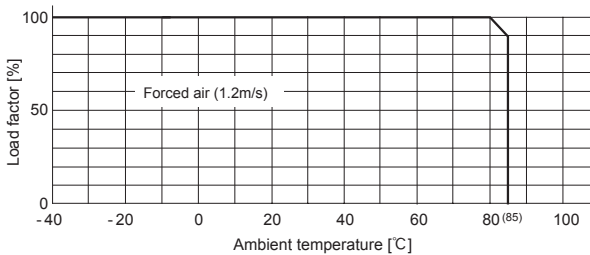
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



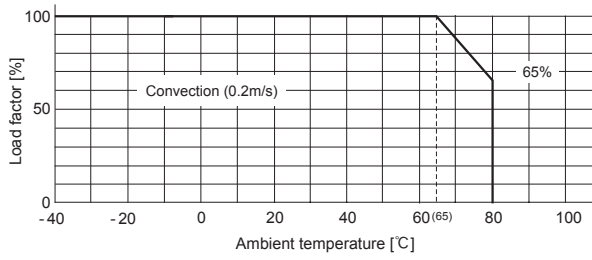
③ Forced air cooling (1.2m/s)



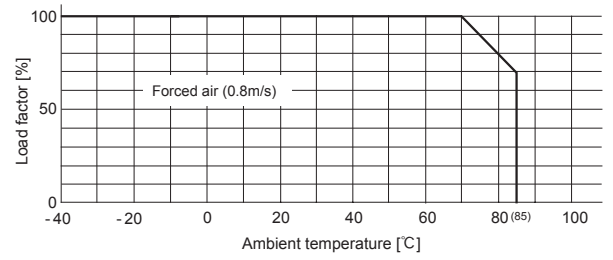
Derating

(2) Parallel operation

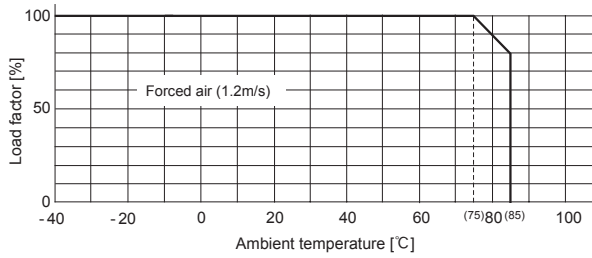
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



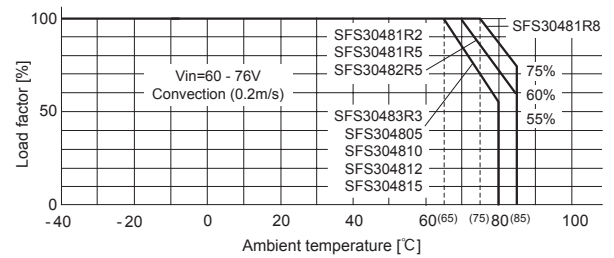
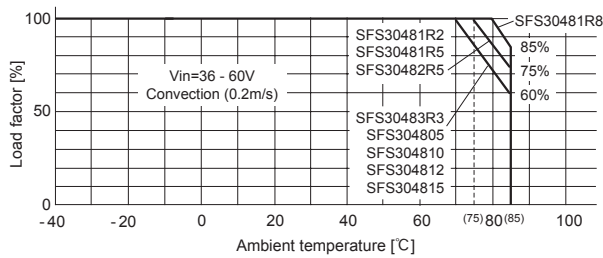
③ Forced air cooling (1.2m/s)



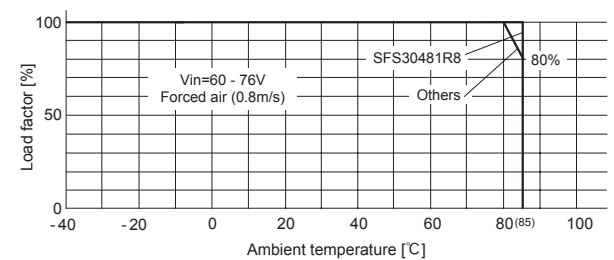
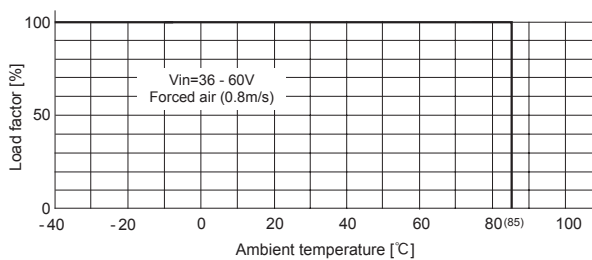
SFS3048

(1) Single and series operation

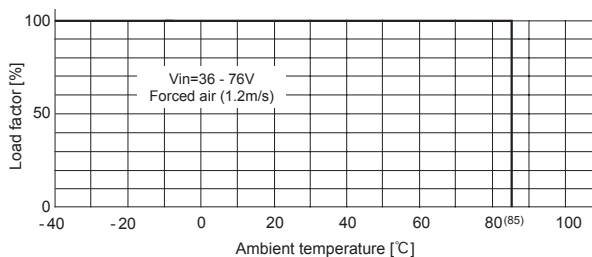
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



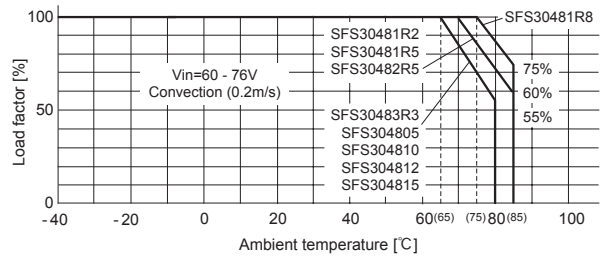
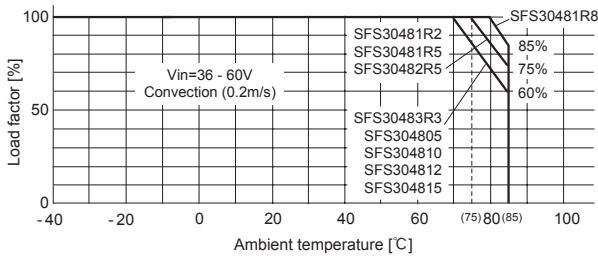
③ Forced air cooling (1.2m/s)



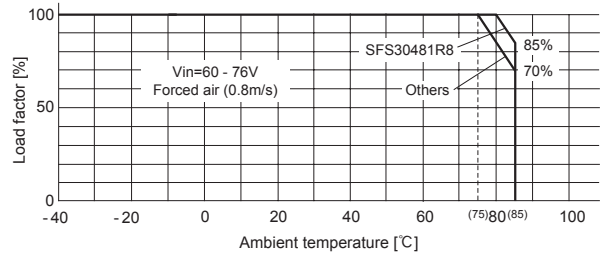
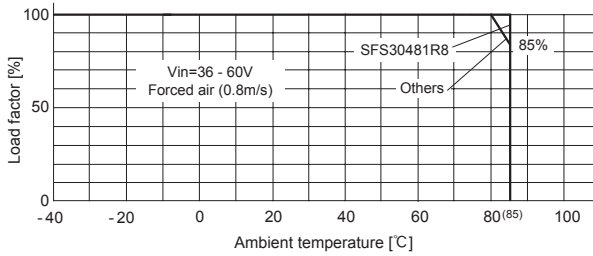
## Derating

### (2) Parallel operation

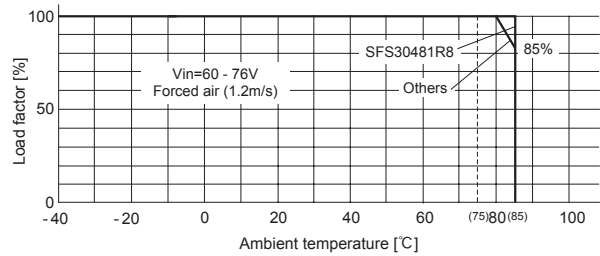
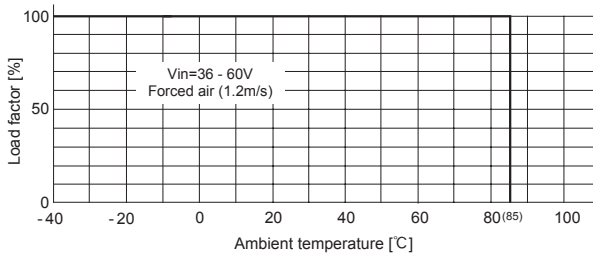
#### ① Natural convection cooling (0.2m/s)



#### ② Forced air cooling (0.8m/s)



#### ③ Forced air cooling (1.2m/s)



## Instruction Manual

◆ It is necessary to read the "Instruction Manual" and "Before using our product" before you use our product.

Instruction Manual <https://www.cosel.co.jp/redirect/catalog/en/SFS/>  
 Instruction Manual <https://www.cosel.co.jp/redirect/catalog/en/SFCS/>  
 Before using our product <https://en.cosel.co.jp/technical/caution/index.html>

SFS



SFCS



NOTICE



## Basic Characteristics Data

Model	Circuit method	Switching frequency [kHz]	Input current [A]	Rated input fuse	Inrush current protection	PCB/Pattern			Series/Parallel operation availability	
						Material	Single sided	Double sided	Series operation	Parallel operation
SFS10	Single ended forward converter	570 - 670	*1	-	-	glass fabric base,epoxy resin		Multilayer	Yes	Yes
SFS15 SFCS15	Single ended forward converter	570 - 670	*1	-	-	glass fabric base,epoxy resin		Multilayer	Yes	Yes
SFS20	Single ended forward converter	570 - 670	*1	-	-	glass fabric base,epoxy resin		Multilayer	Yes	Yes
SFS30 SFCS30	Single ended forward converter	440 - 530	*1	-	-	glass fabric base,epoxy resin		Multilayer	Yes	Yes

\*1 Refer to Specification.