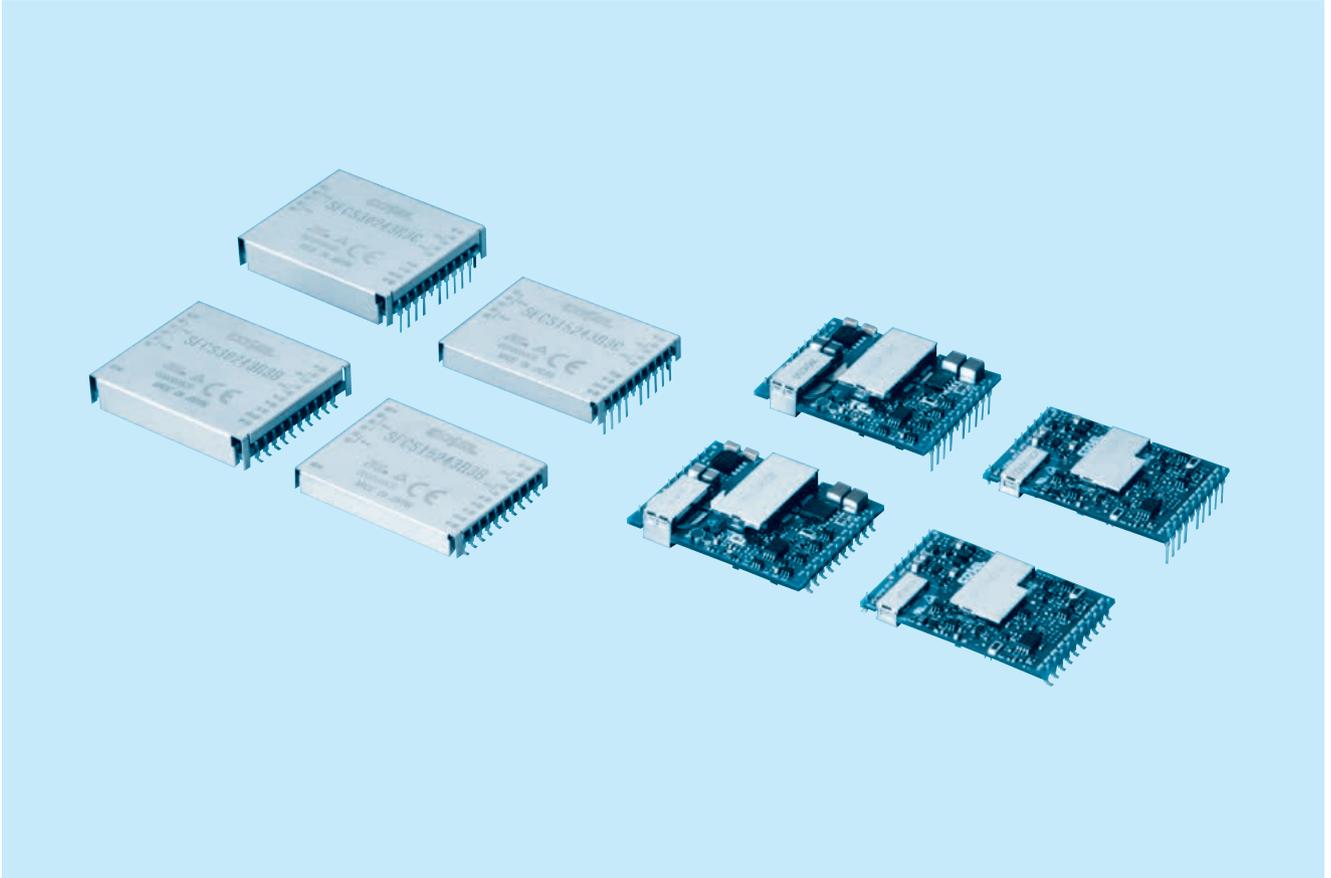




SFS-series / SFCS-series



■ 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

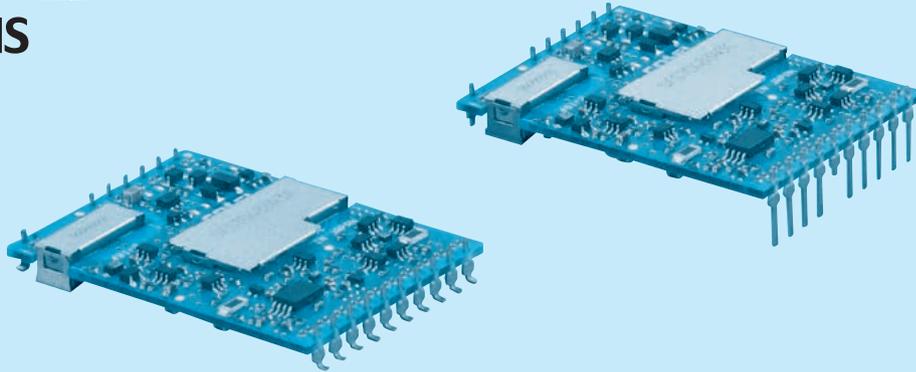
- UL60950-1, C-UL, EN62368-1

■ 5-year warranty

SFS10

SF S 10 48 3R3 B

① ② ③ ④ ⑤ ⑥



- 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

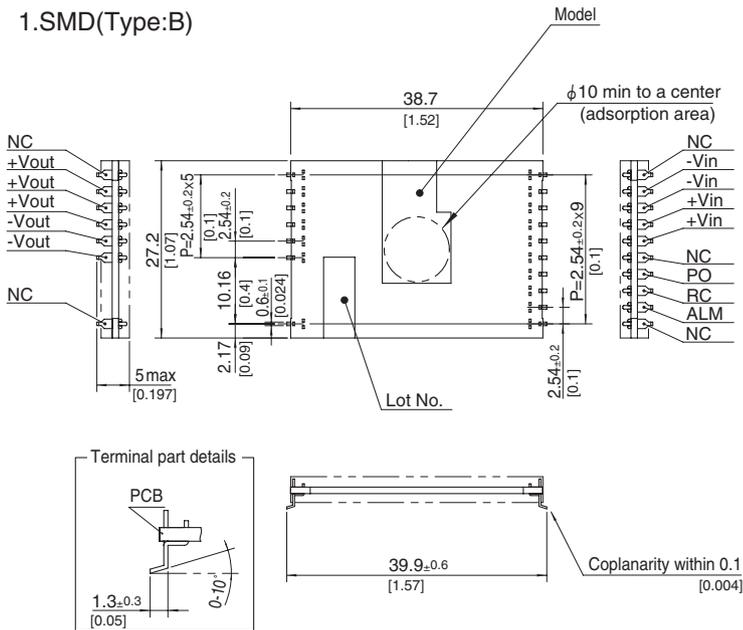
SPECIFICATIONS

	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)								
ENVIRONMENT	INPUT-OUTPUT	DC1,500V 1minute, 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 ² (5G), 3minutes period, 60minutes each along X, Y and Z axis								
SAFETY	IMPACT	196.1m/s ² (20G), 11ms, once each X, Y and Z axis								
	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								

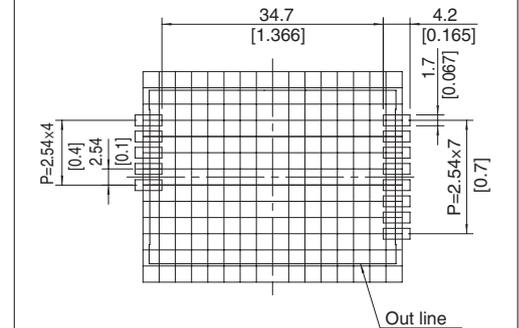
*1 At rated input(DC48V), rated load and 25°C

External view

1.SMD(Type:B)



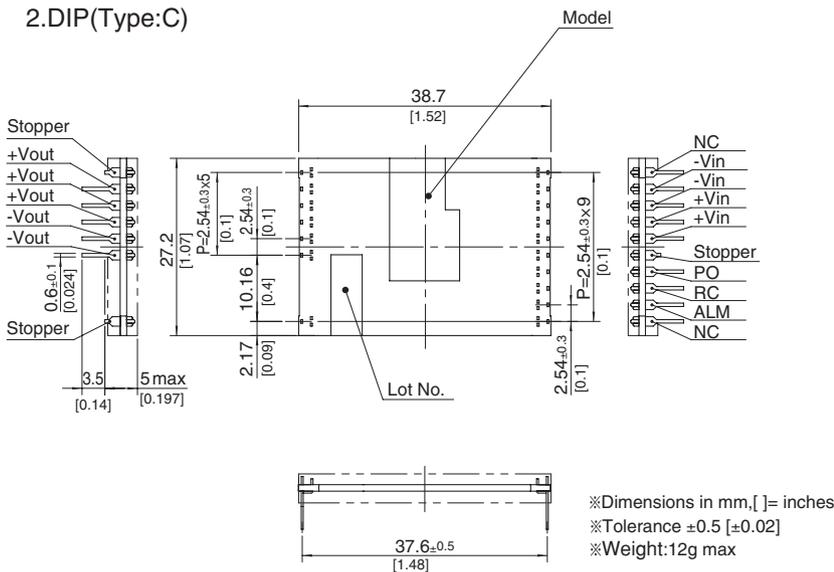
Recommended size for processing PCB (TOP VIEW)



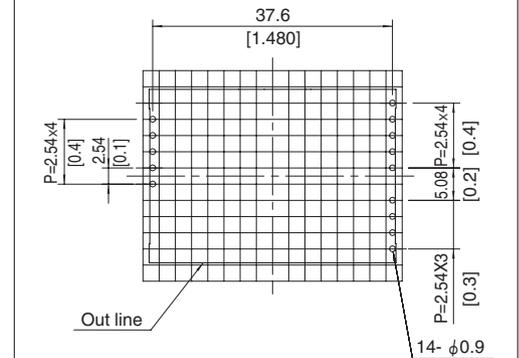
※Dimensions in: $\frac{\text{mm}}{[\text{inch}]}$

※Div.: 0.1inch

2.DIP(Type:C)



Recommended size for processing PCB (TOP VIEW)



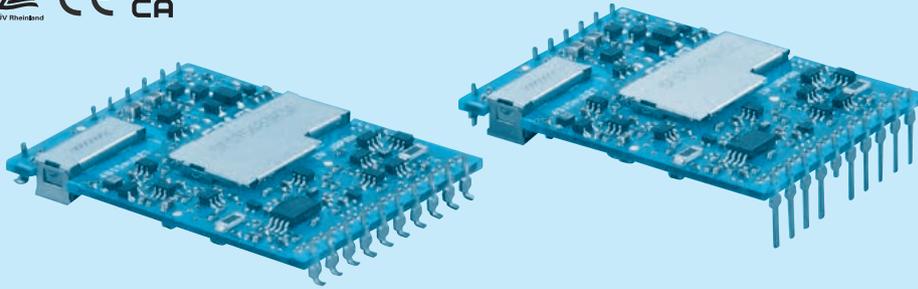
※Dimensions in: $\frac{\text{mm}}{[\text{inch}]}$

※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)								

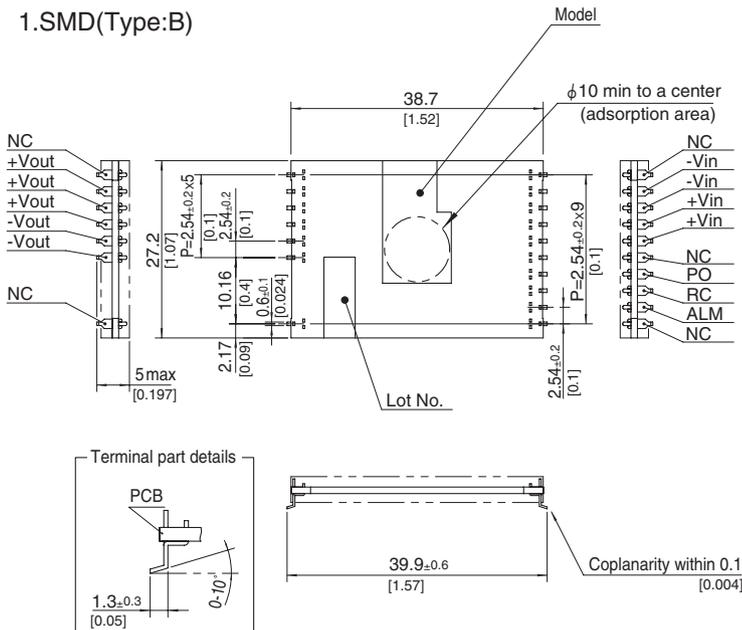
GENERAL SPECIFICATIONS

ISOLATION	INPUT-OUTPUT	DC1,500V 1minute, DC500V 50MΩ min (20±15°C)
ENVIRONMENT	OPERATING TEMP.,HUMID.AND ALTIUDE	-40 to +85°C, 20 - 95%RH (Non condensing), 3,000m (10,000feet) max
	STORAGE TEMP.,HUMID.AND ALTIUDE	-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 ² (5G), 3minutes period, 60minutes each along X, Y and Z axis
	IMPACT	196.1m/s ² (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

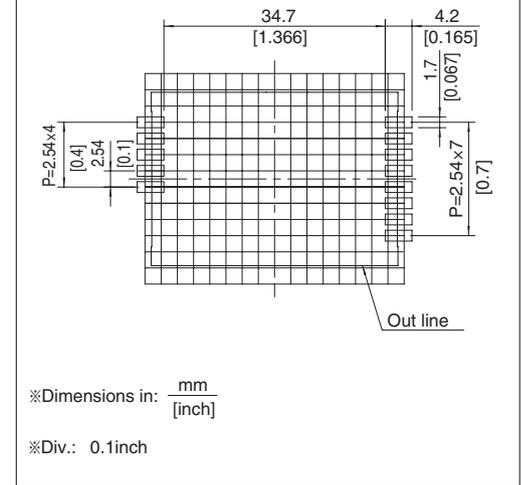
*1 At rated input(DC24V, DC48V), rated load and 25°C

External view

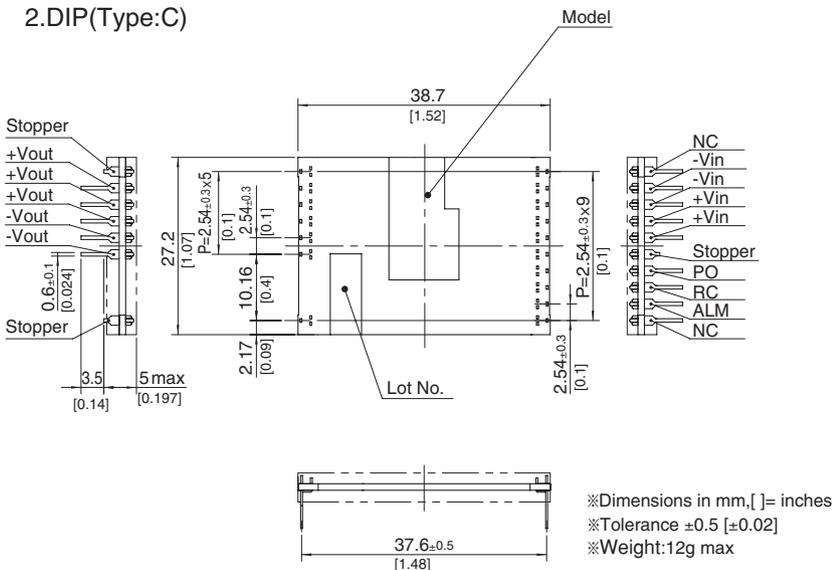
1.SMD(Type:B)



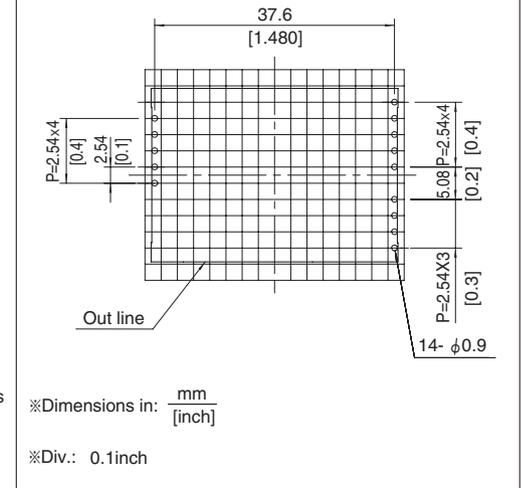
Recommended size for processing PCB (TOP VIEW)



2.DIP(Type:C)



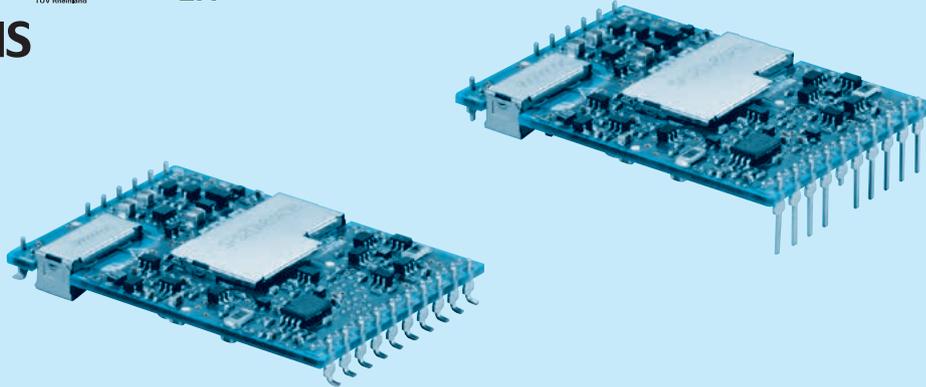
Recommended size for processing PCB (TOP VIEW)



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

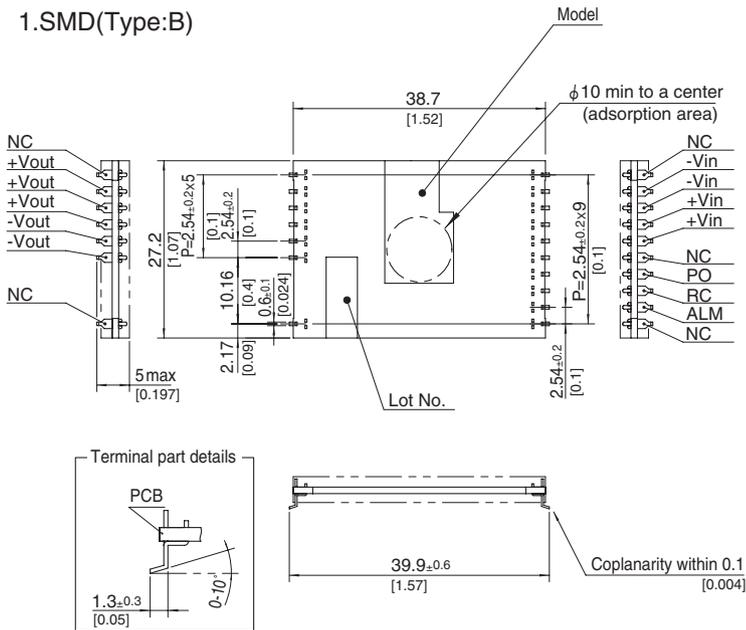
SPECIFICATIONS

	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 ² (5G), 3minutes period, 60minutes each along X, Y and Z axis				
	IMPACT	196.1m/s ² (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				

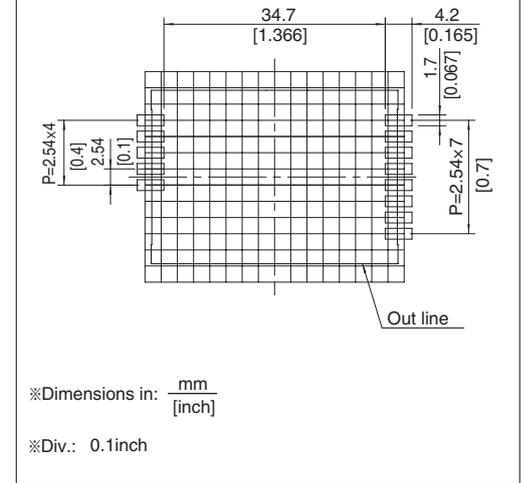
*1 At rated input(DC48V), rated load and 25°C

External view

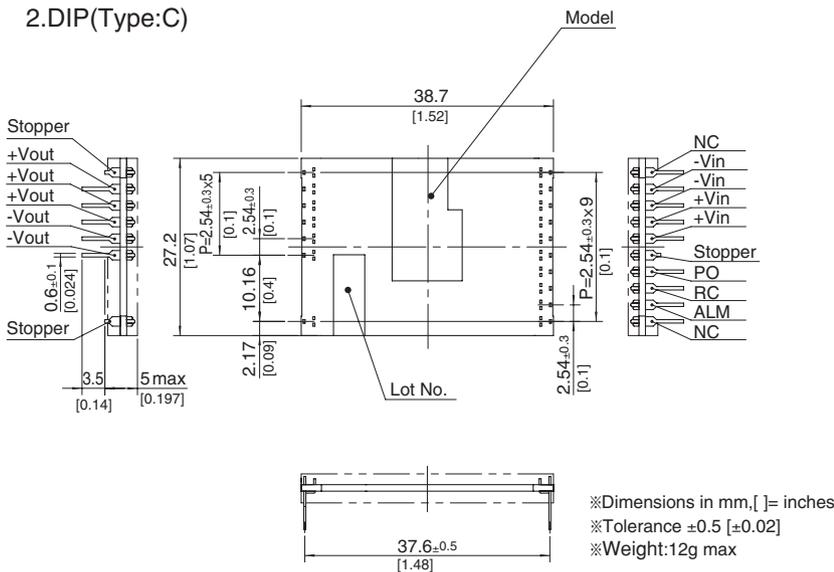
1.SMD(Type:B)



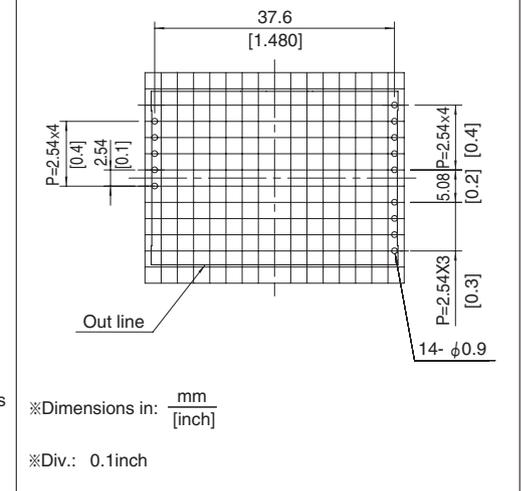
Recommended size for processing PCB (TOP VIEW)



2.DIP(Type:C)



Recommended size for processing PCB (TOP VIEW)



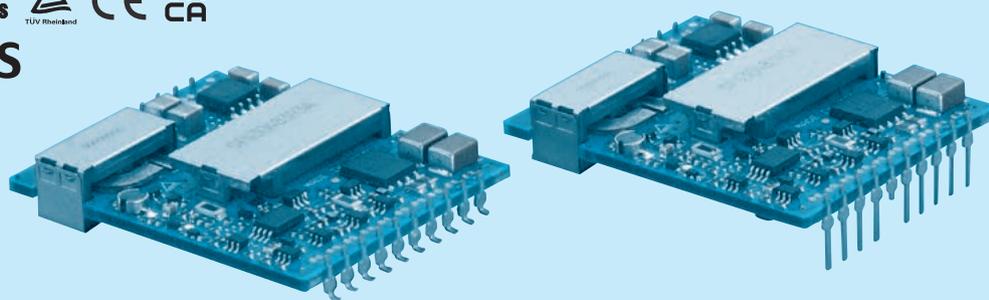
SFS30

SF S 30 48 3R3 B

① ② ③ ④ ⑤ ⑥



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
(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)								

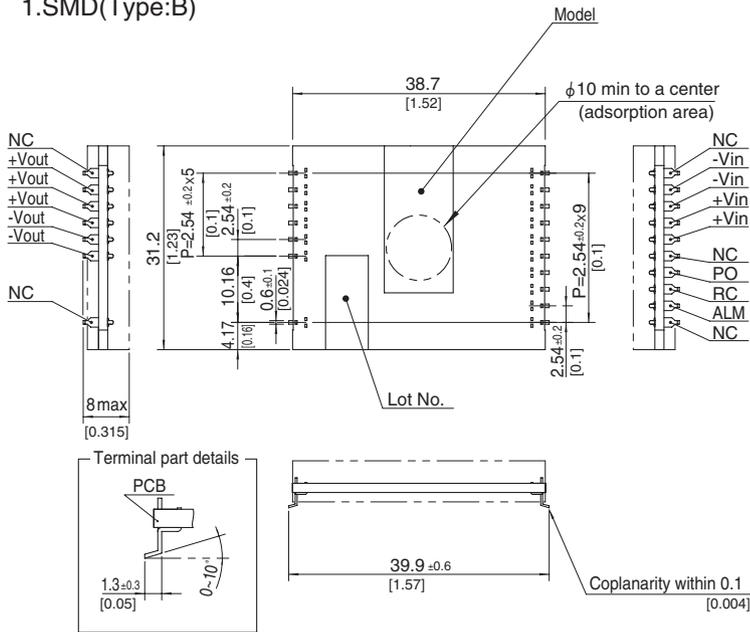
GENERAL SPECIFICATIONS

ISOLATION	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 ² (5G), 3minutes period, 60minutes each along X, Y and Z axis
	IMPACT	196.1m/s ² (20G), 11ms, once each X, Y and Z axis
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL (CSA60950-1), EN62368-1
OTHERS	CASE SIZE/WEIGHT	38.7×8.0×31.2mm [1.52×0.315×1.23 inches] (W×H×D) /20g max
	COOLING METHOD	Convection/Forced air

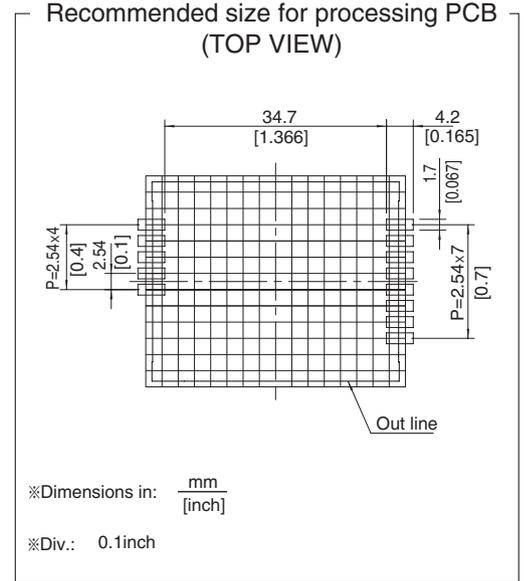
*1 At rated input(DC24V, DC48V), rated load and 25°C

External view

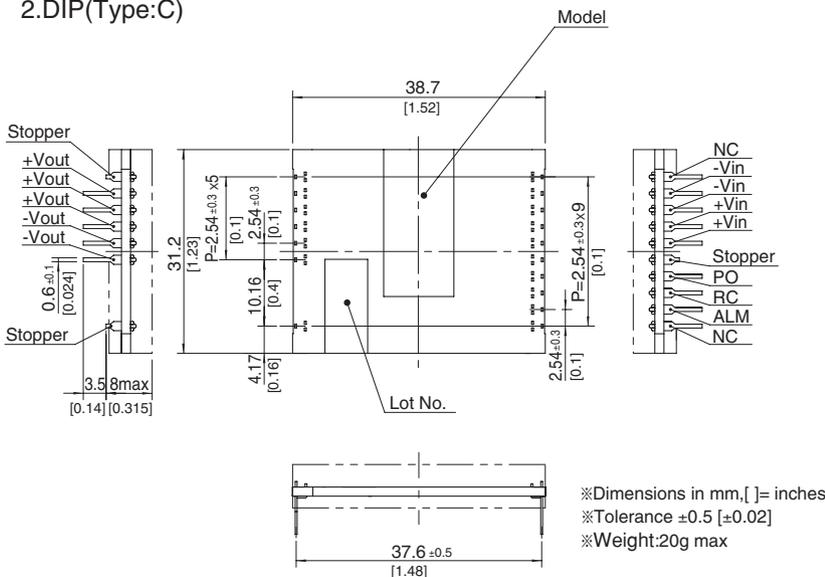
1.SMD(Type:B)



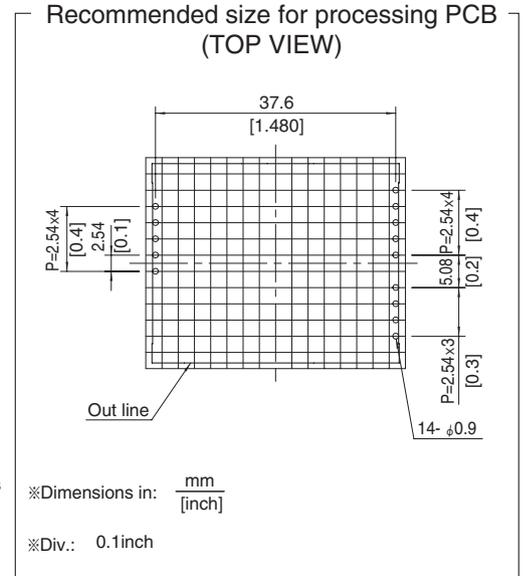
Recommended size for processing PCB (TOP VIEW)



2.DIP(Type:C)



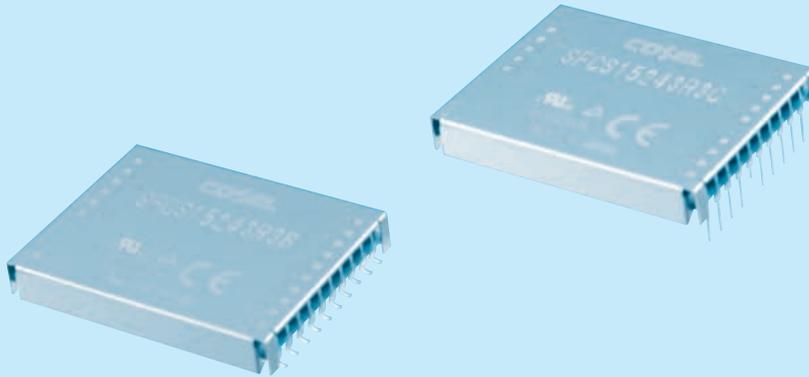
Recommended size for processing PCB (TOP VIEW)



SFCS15

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

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
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

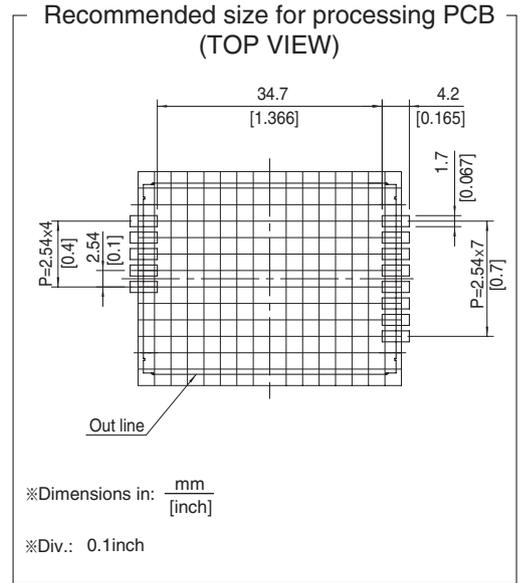
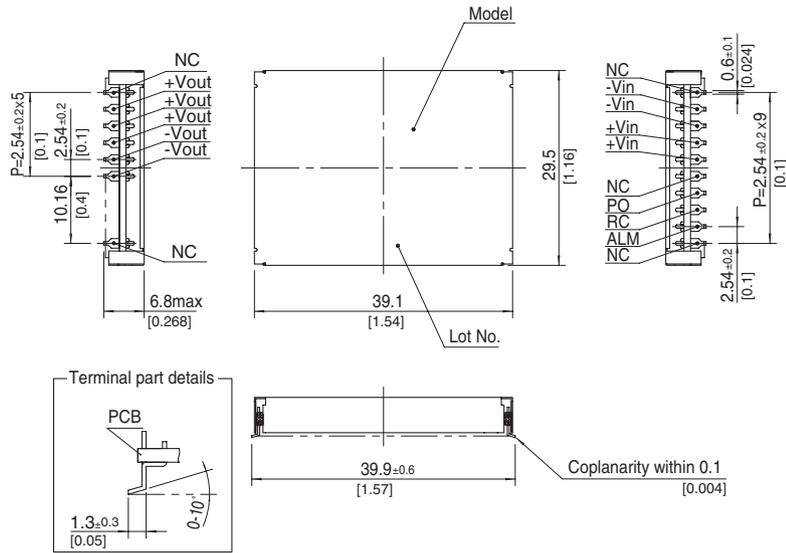
SPECIFICATIONS

	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 ² (5G), 3minutes period, 60minutes each along X, Y and Z axis								
SAFETY	IMPACT	196.1m/s ² (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								

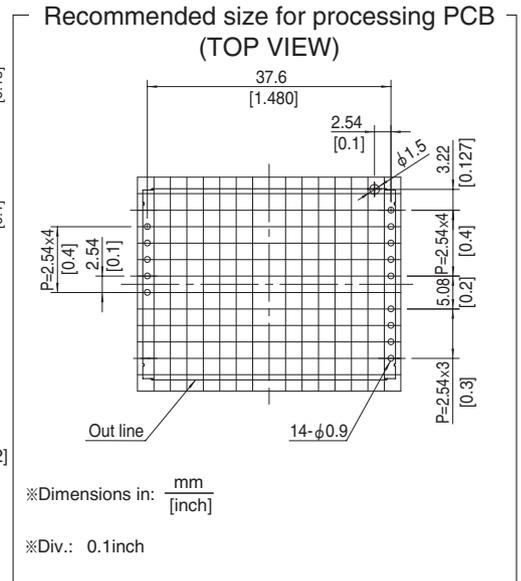
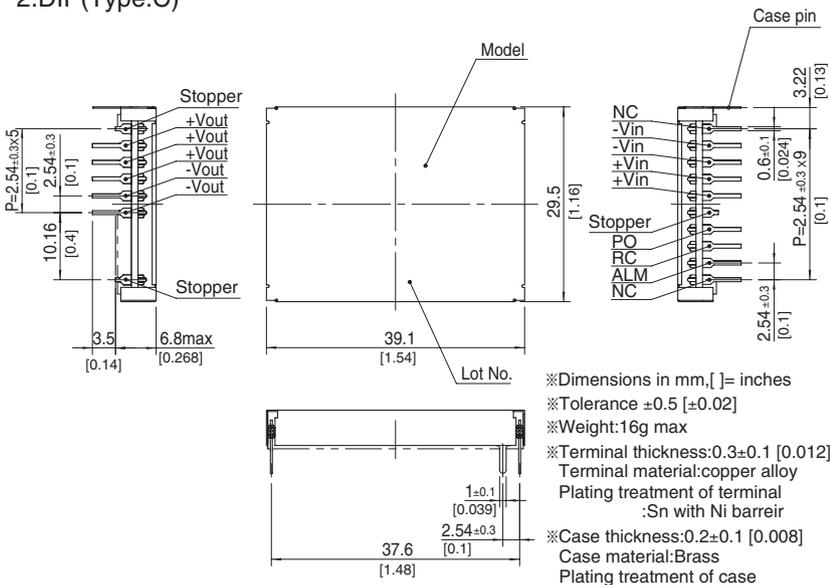
*1 At rated input(DC24V, DC48V), rated load and 25°C

External view

1.SMD(Type:B)



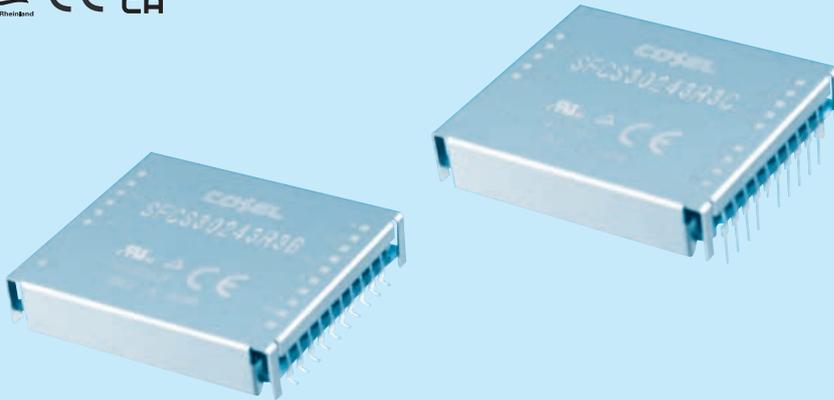
2.DIP(Type:C)



SFCS30

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

① ② ③ ④ ⑤ ⑥



- 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

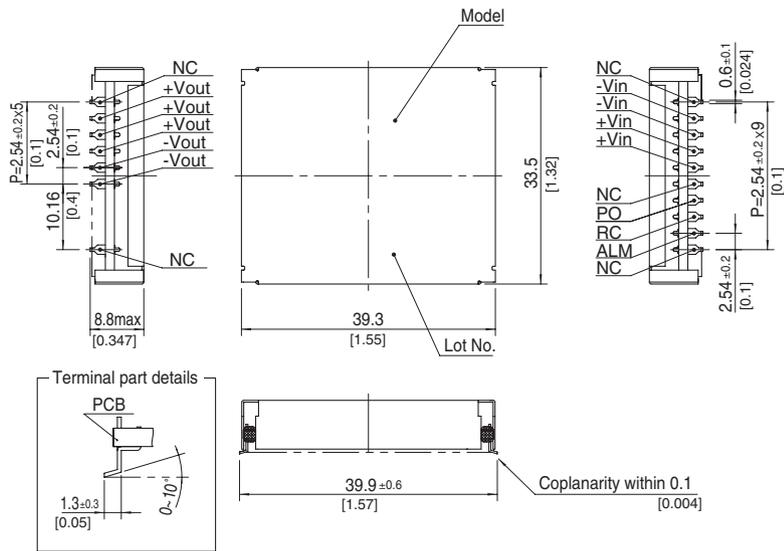
SPECIFICATIONS

	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 ² (5G), 3minutes period, 60minutes each along X, Y and Z axis								
	IMPACT	196.1m/s ² (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								

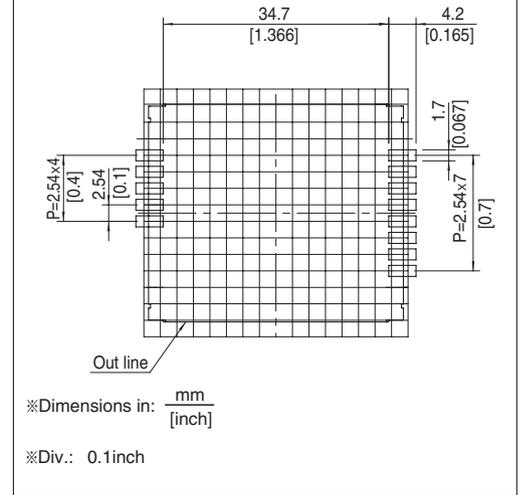
*1 At rated input(DC24V, DC48V), rated load and 25°C

External view

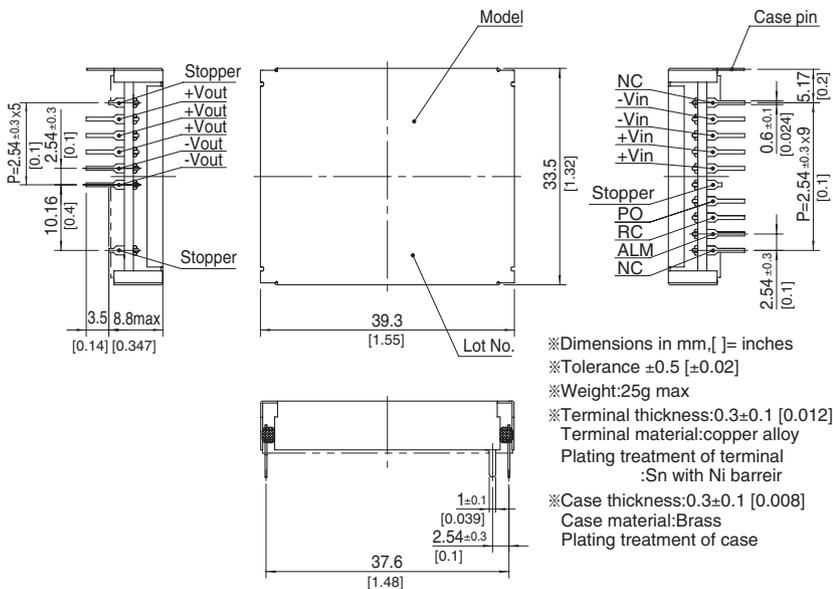
1.SMD(Type:B)



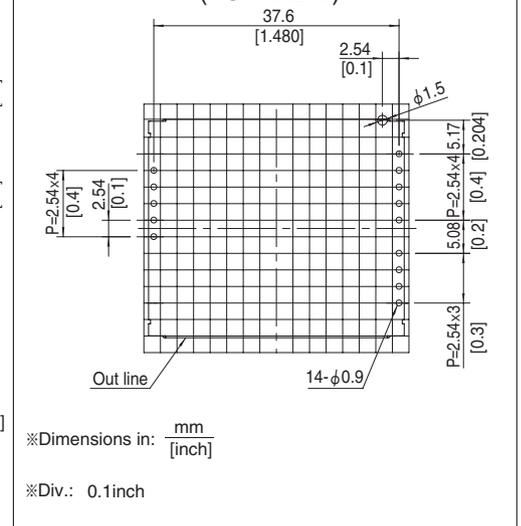
Recommended size for processing PCB (TOP VIEW)



2.DIP(Type:C)

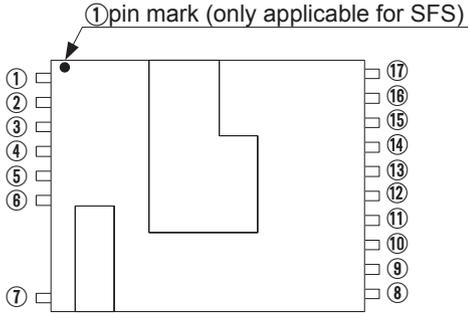


Recommended size for processing PCB (TOP VIEW)

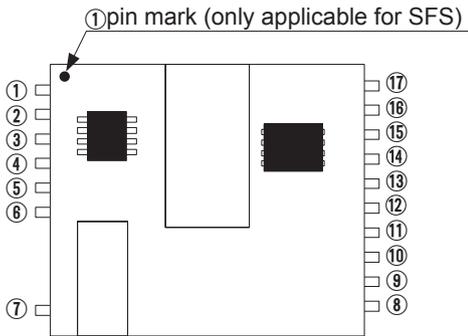


Pin Configuration

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

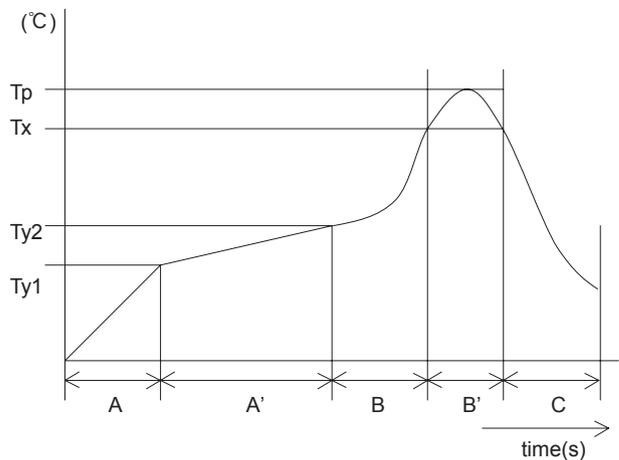
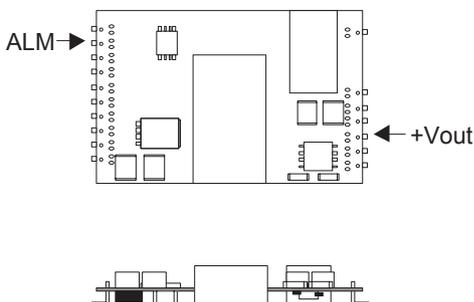
Automatic mounting

- 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.



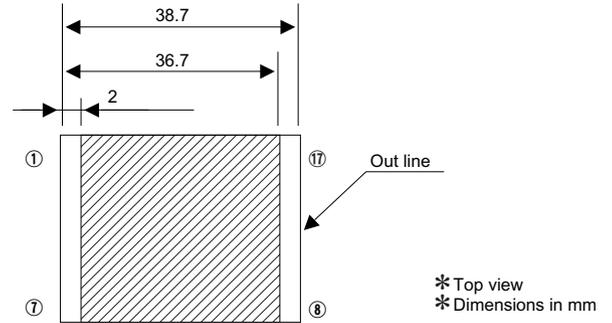
A	1.0 - 5.0°C / s
A'	Ty1 : 160±10°C Ty2 : 180±10°C Ty1 - Ty2 : 120s max
B	1.0 - 5.0°C / s
B'	Tp : Max245°C 10s max Tx : 220°C or more : 70s max
C	1.0 - 5.0°C / s

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.

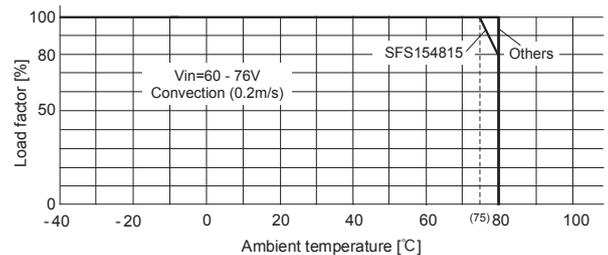
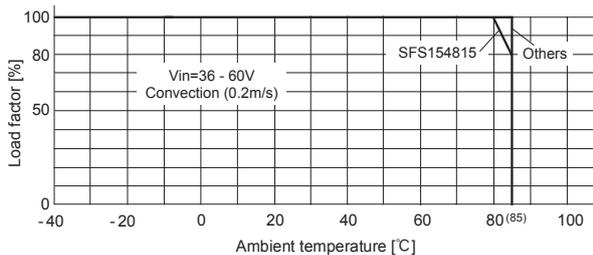
Derating

Ambient temperature derating curve

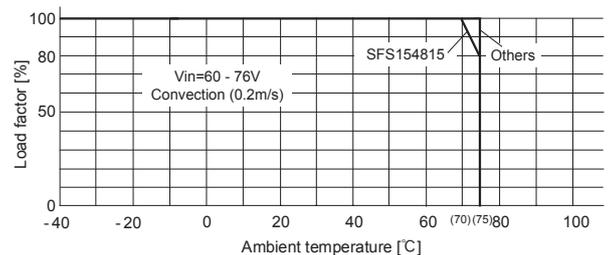
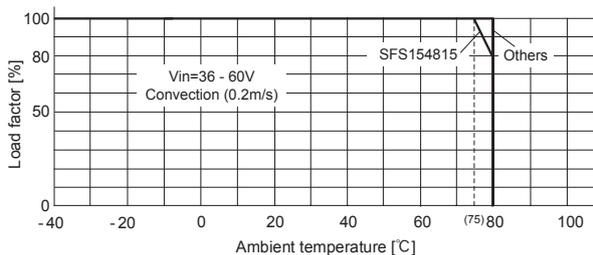
- It is necessary to note thermal fatigue life by power cycle. Please reduce the temperature fluctuation range as much as possible when the up and down of temperature are frequently generated.
- In case of forced air, ventilation must keep the temperature of point A and B below the temperatures shown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

SFS1048, SFS1548

(1) Single and series operation



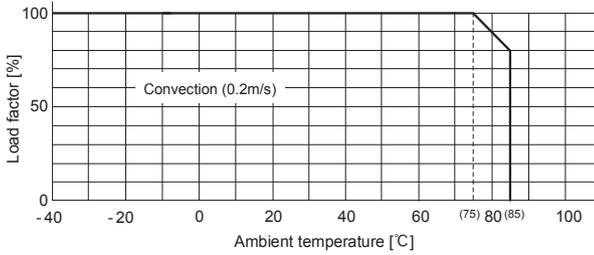
(2) Parallel operation



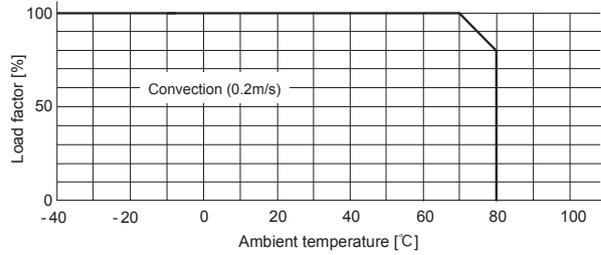
Derating

● SFS1524, SFCS15

(1) Single and series operation



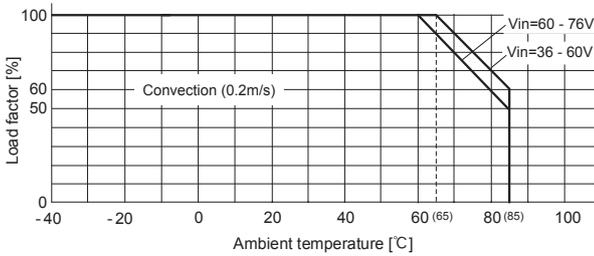
(2) Parallel operation



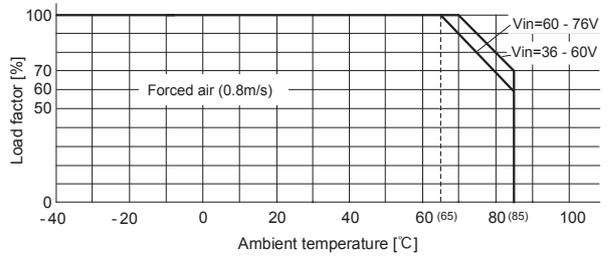
● SFS2048

(1) Single, series and parallel operation

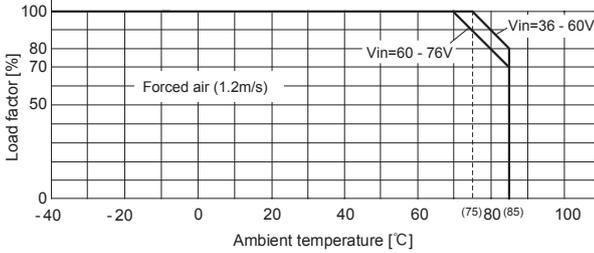
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



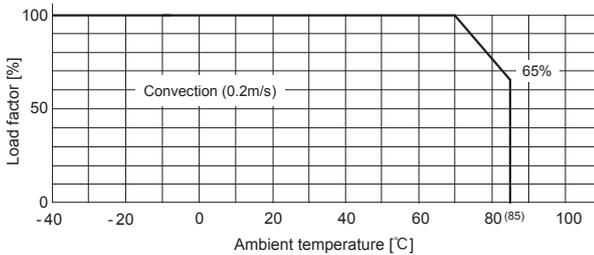
③ Forced air cooling (1.2m/s)



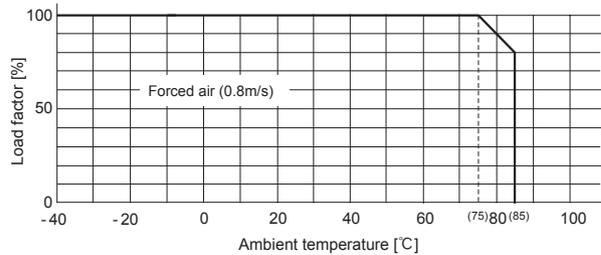
● SFS3024, SFCS30

(1) Single and series operation

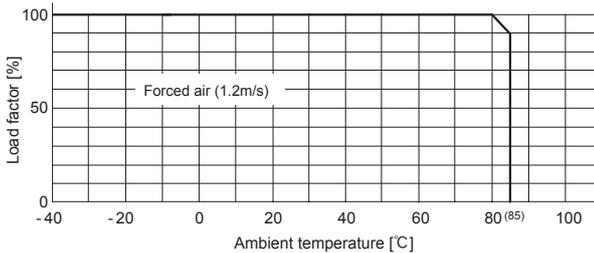
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



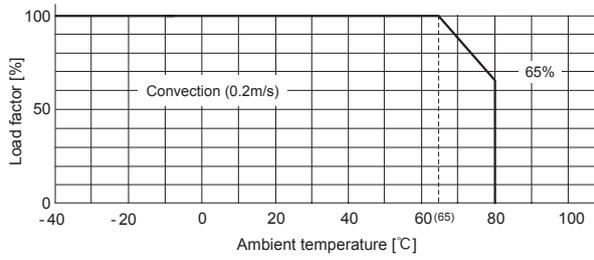
③ Forced air cooling (1.2m/s)



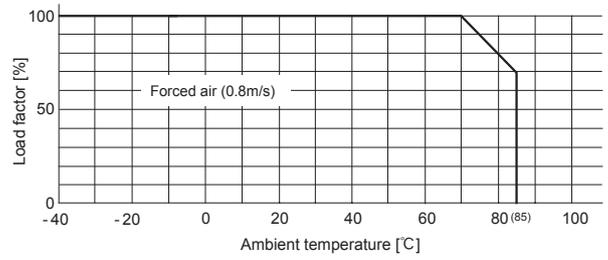
Derating

(2) Parallel operation

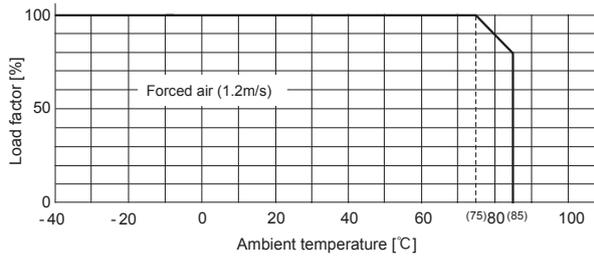
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



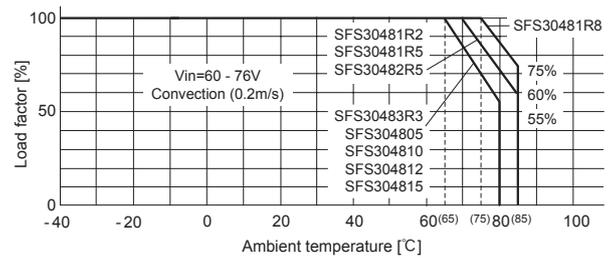
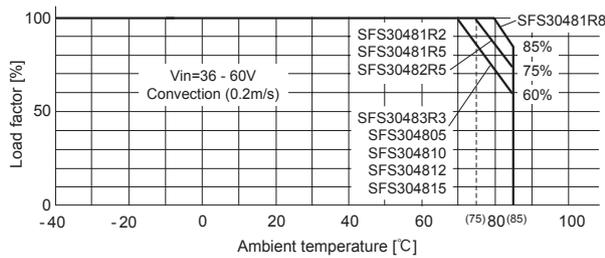
③ Forced air cooling (1.2m/s)



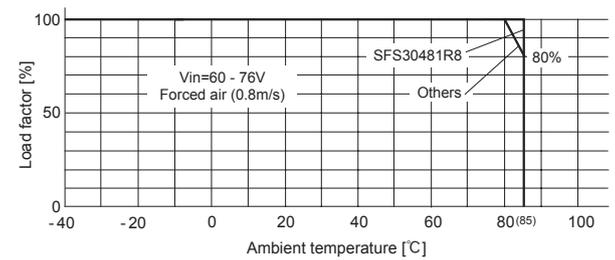
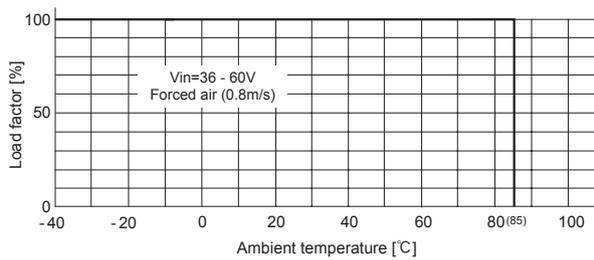
SFS3048

(1) Single and series operation

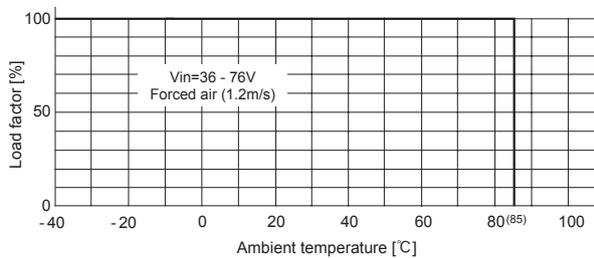
① Natural convection cooling (0.2m/s)



② Forced air cooling (0.8m/s)



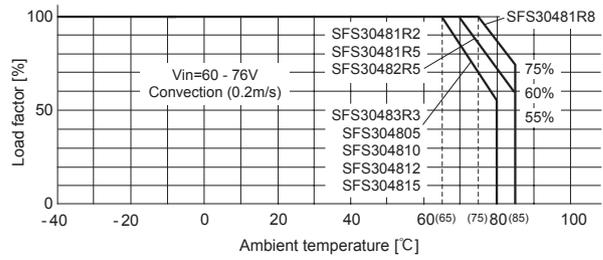
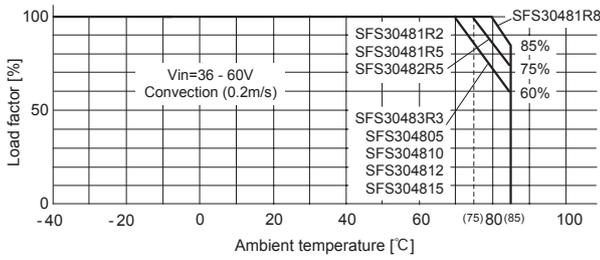
③ Forced air cooling (1.2m/s)



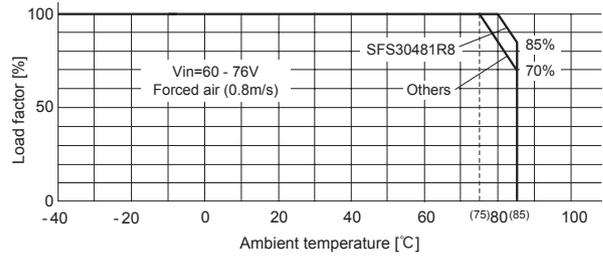
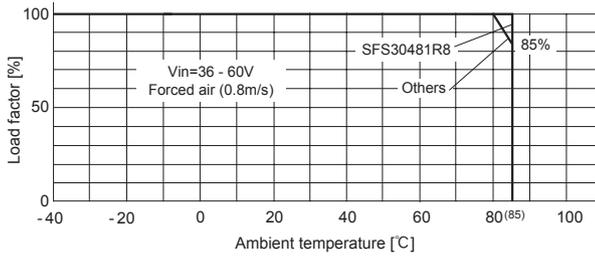
Derating

(2) Parallel operation

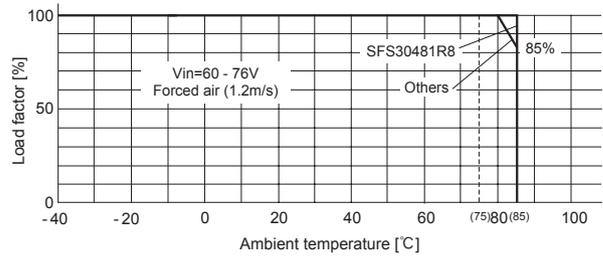
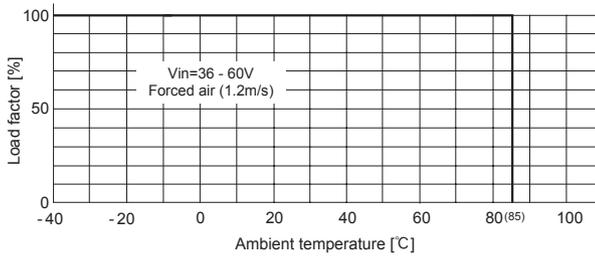
① Natural convection cooling (0.2m/s)



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.

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.