

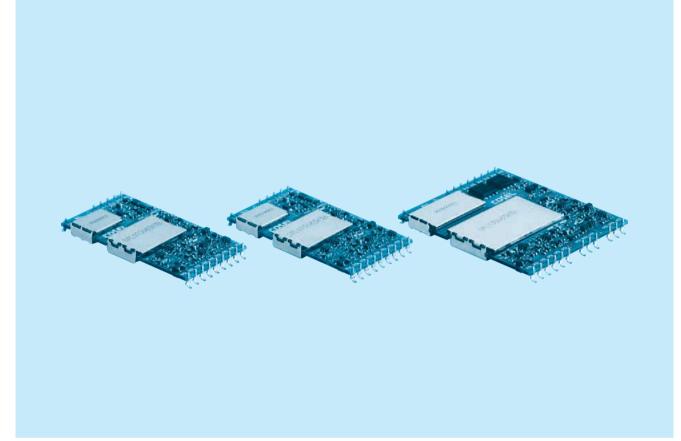
Approvals



# **SFLS-series**

ON/OFF

Operation



#### Feature

Low profile SMD mounting type High efficiency (synchronous rectifier circuit) Parallel operation is possible Built-in overcurrent, overvoltage and lowvoltage circuits Built-in remote ON/OFF, alarm Built-in Power ready / Sequence control

#### CE marking

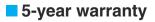
Low Voltage Directive RoHS Directive

#### UKCA marking

Electrical Equipment Safety Regulations RoHS Regulations

#### Safety agency approvals

UL60950-1, C-UL, EN62368-1





ODEL SFLS10482R5 S		SFLS10483R3	SFLS104805	
MAX OUTPUT WATTAGE[W]	7.5	9.9	10.0	
DC OUTPUT	2.5V 3A	3.3V 3A	5V 2A	

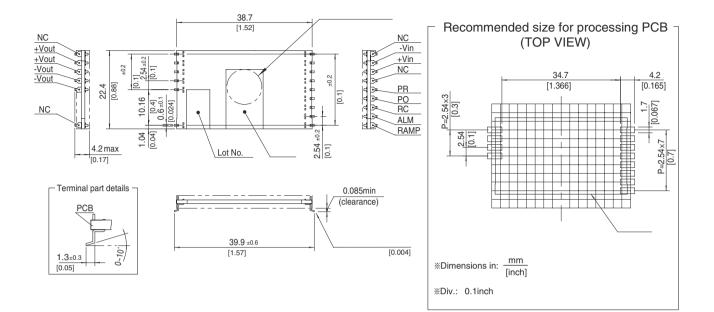
#### SPECIFICATIONS

	MODEL	SFLS10482R5	SFLS10483R3	SFLS104805					
	VOLTAGE[V]	DC36 - 76							
(	CURRENT[A] *1	0.18typ	0.24typ	0.24typ					
INPUT	EFFICIENCY[%] *1	86typ	87typ	88typ					
	START-UP VOLTAGE[V]	DC32 - 36							
	HYSTERESIS VOLTAGE[V]	DC2 min							
	VOLTAGE[V]	2.5	5 3.3 5						
	CURRENT[A]	3	3	2					
OUTPUT	VOLTAGE ACCURACY[%]	+5, -3							
0011-01	RIPPLE[mVp-p]	25max							
	RIPPLE NOISE[mVp-p]	50max							
	START-UP TIME[ms]	20 - 100max (DCIN 48V, lo=100%	)						
	OVERCURRENT PROTECTION	Works over 103% of rating							
PROTECTION CIRCUIT AND	OVERVOLTAGE PROTECTION	Works at 115 - 150% of rating							
OTHERS	LOWVOLTAGE PROTECTION	Works at 93% max of rating							
	REMOTE ON/OFF	Provided(RC open : ON, short betw	ween RC and +Vin : OFF)						
ISOLATION	INPUT-OUTPUT	DC1,500V 1minute, DC500V 50M	ດ min (20±15℃)						
	OPERATING TEMP.,HUMID.AND ALTITUDE	-40 to +85°C, 20 - 95%RH (Non co							
ENVIRONMENT	STORAGE TEMP.;HUMID.AND ALTITUDE	-40 to +100℃, 20 - 95%RH (Non c	condensing), 9,000m (30,000feet) m	nax (Refer to the Instruction Manual)					
	VIBRATION	10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 3minute	s period, 60minutes each along X,	Y and Z axis					
	IMPACT	196.1m/s <sup>2</sup> (20G), 11ms, once each	n X, Y and Z axis						
SAFETY	AGENCY APPROVALS	UL60950-1, C-UL (CSA60950-1), E	EN62368-1						
OTHERS	CASE SIZE/WEIGHT	38.7 × 4.2 × 22.4mm [1.52 × 0.166 >	<0.88 inches] (W×H×D) / 8g max						
	COOLING METHOD	Convection							

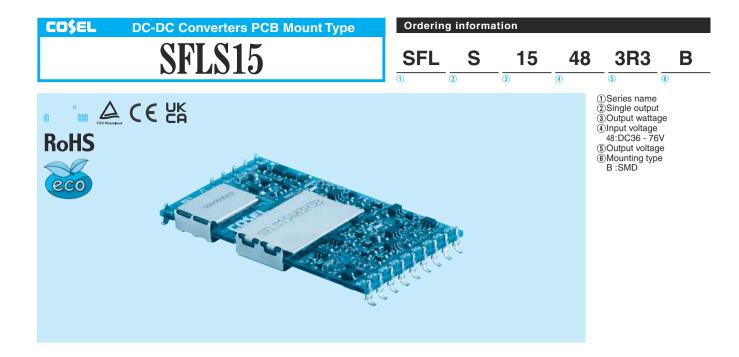
\*1 At rated input(DC48V), rated load and  $25^{\circ}$ C



#### External view



:Sn with Ni barreir



MODEL	SFLS15481R2	SFLS15481R5	SFLS15481R8	SFLS15482R5	SFLS15483R3	SFLS154805	SFLS15485R2	SFLS154812
MAX OUTPUT WATTAGE[W]	6.24	7.8	8.1	11.25	14.85	15.0	15.6	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	5.2V 3A	12V 1.25A

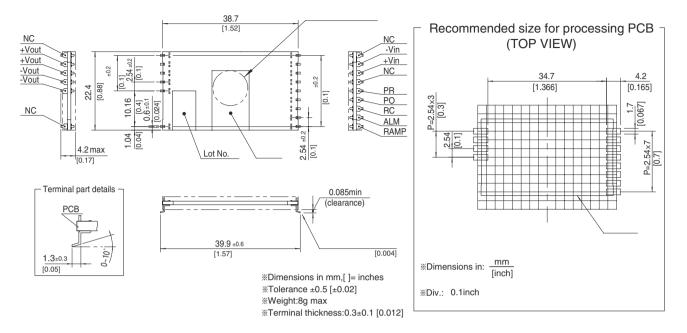
#### SPECIFICATIONS

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MODEL	SFLS15481R2	SFLS15481R5	SFLS15481R8	SFLS15482R5	SFLS15483R3	SFLS154805	SFLS15485R2	SFLS154812		
VOLTAGE[V]	DC36 - 76									
CURRENT[A] *1	0.16typ	0.20typ	0.20typ	0.27typ	0.35typ	0.35typ	0.37typ	0.35typ		
EFFICIENCY[%] *1	81typ	82typ	85typ	87typ	89typ	89typ	89typ	89typ		
START-UP VOLTAGE[V]	DC32 - 36									
HYSTERESIS VOLTAGE[V]	DC2 min	DC2 min								
VOLTAGE[V]	1.2	1.5	1.8	2.5	3.3	5	5.2	12		
CURRENT[A]	5.2	5.2	4.5	4.5	4.5	3	3	1.25		
VOLTAGE ACCURACY[%]	+5, -3									
RIPPLE[mVp-p]	25max	25max								
RIPPLE NOISE[mVp-p]	50max									
START-UP TIME[ms]	20 - 100max (DCIN 48V, Io=100%)									
OVERCURRENT PROTECTION	Works over 103% of rating									
OVERVOLTAGE PROTECTION	Works at 115 -	Works at 115 - 160% of rating Works at 115 - 150% of rating								
LOWVOLTAGE PROTECTION	Works at 93	Works at 93% max of rating								
REMOTE ON/OFF	Provided(RC open : ON, short between RC and +Vin : OFF)									
INPUT-OUTPUT	DC1,500V 1	minute, DC50	00V 50MΩ mi	n (20±15℃)						
OPERATING TEMP.,HUMID.AND ALTITUDE	-40 to +85℃	, 20 - 95%RH	I (Non conde	nsing), 3,000i	m (10,000feet	) max				
STORAGE TEMP.,HUMID.AND ALTITUDE	-40 to +100°	C, 20 - 95%R	H (Non conde	ensing), 9,000	)m (30,000fee	t) max (Refer	to the Instruct	tion Manual)		
VIBRATION	10 - 55Hz, 4	9.0m/s² (5G),	3minutes pe	riod, 60minut	es each along	, X, Y and Z a	axis			
IMPACT	196.1m/s² (2	20G), 11ms, o	nce each X,	Y and Z axis						
AGENCY APPROVALS	UL60950-1,	C-UL (CSA60	950-1), EN62	2368-1						
CASE SIZE/WEIGHT	38.7×4.2×2	22.4mm [1.52	×0.166×0.8	8 inches] (W >	<h×d) 8g="" n<="" th=""><th>nax</th><th></th><th></th></h×d)>	nax				
COOLING METHOD	Convection									
	VOLTAGE[V]         CURRENT[A]         EFFICIENCY[%]         START-UP VOLTAGE[V]         HYSTERESIS VOLTAGE[V]         START-UP TIME[ms]         OVERCURRENT PROTECTION         LOWVOLTAGE PROTECTION         LOWVOLTAGE PROTECTION         POPRATING TEMP.HUMID.AND ALTITUDE         STORAGE TEMP.HUMID.AND ALTITUDE         STORAGE TEMP.HUMID.AND ALTITUDE         VIBRATION         IMPACT         AGENCY APPROVALS         CASE SIZE/WEIGHT	VOLTAGE[V]         DC36 - 76           CURRENT[A]         0.16typ           EFFICIENCY[%]         81typ           START-UP VOLTAGE[V]         DC32 - 36           HYSTERESIS VOLTAGE[V]         DC2 min           VOLTAGE[V]         1.2           CURRENT[A]         5.2           VOLTAGE ACCURACY[%]         +5, -3           RIPPLE[mVp-p]         25max           RIPPLE[mVp-p]         20 - 100max           OVERCURRENT PROTECTION         Works over           OVERCURRENT PROTECTION         Works at 115 -           LOWVOLTAGE PROTECTION         Works at 93'           REMOTE ON/OFF         Provided(RC           INPUT-OUTPUT         DC1,500V 1           OPERATING TEMP.;HUMID.AND ALTITUDE         -40 to +85°C           STORAGE TEMP.;HUMID.AND ALTITUDE         -40 to +100°           VIBRATION         10 - 55Hz, 4           IMPACT         196.1m/s² (2           AGENCY APPROVALS         UL60950-1,           CASE SIZE/WEIGHT         38.7 x 4.2 x 3	VOLTAGE[V]         DC36 - 76           CURRENT[A]         10.16typ         0.20typ           EFFICIENCY[%]         81typ         82typ           START-UP VOLTAGE[V]         DC32 - 36           HYSTERESIS VOLTAGE[V]         DC2 min           VOLTAGE[V]         1.2         1.5           CURRENT[A]         5.2         5.2           VOLTAGE ACCURACY[%]         +5, -3         RIPPLE[mVp-p]           START-UP TIME[ms]         20 - 100max         DCIN 48V,           OVERCURRENT PROTECTION         Works over 103% of rating           OVERVOLTAGE PROTECTION         Works at 115 - 160% of rating           LOWVOLTAGE PROTECTION         Works at 93% max of rating           IDVIT-OUTPUT         DC1,500V 1minute, DC500           OPERATING TEMP,HUMID.AND ALTITUDE         -40 to $+100^{\circ}$ , 20 - 95% RH           STORAGE TEMP,HUMID.AND ALTITUDE         -40 to $+100^{\circ}$ , 20 - 95% RH           VIBRATION         10 - 55Hz, 49.0m/s <sup>2</sup> (5G), 11ms, o           AGENCY APPROVALS         UL60950-1, C-U	VOLTAGE[V]         DC36 - 76           CURRENT[A]         0.16typ         0.20typ         0.20typ           EFFICIENCY[%]         81typ         82typ         85typ           START-UP VOLTAGE[V]         DC32 - 36             HYSTERESIS VOLTAGE[V]         DC2 min             VOLTAGE[V]         1.2         1.5         1.8           CURRENT[A]         5.2         5.2         4.5           VOLTAGE ACCURACY[%]         +5, -3             RIPPLE [mVp-p]         25max             START-UP TIME[ms]         20 - 100max (DCIN 48V, Io=100%)            OVERCURRENT PROTECTION         Works over 103% of rating         Works at 11           LOWVOLTAGE PROTECTION         Works at 93% max of rating            REMOTE ON/OFF         Provided(RC open : ON, short betweer            INPUT-OUTPUT         DC1,500V 1minute, DC500V 50MΩ mi            OPERATING TEMP,HUMDAND ALTITUDE         -40 to +85°C, 20 - 95% RH (Non conde            STORAGE TEMP,HUMDAND ALTITUDE         -40 to +100°C, 20 - 95% RH (Non conde            VIBRATION         10 - 55Hz, 49.0m/s² (5G), 3minutes pe	VOLTAGE[V]         DC36 - 76           CURRENT[A]         *1         0.16typ         0.20typ         0.20typ         0.27typ           EFFICIENCY[%]         *1         81typ         82typ         85typ         87typ           START-UP VOLTAGE[V]         DC32 - 36         HYSTERESIS VOLTAGE[V]         DC2 min         V           VOLTAGE[V]         DC2 min         V         1.8         2.5           CURRENT[A]         5.2         5.2         4.5         4.5           VOLTAGE ACCURACY[%]         +5, -3         1.8         2.5           CURRENT[A]         50max         50max         Start-UP TIME[ms]         20 - 100max (DCIN 48V, Io=100%)           OVERCURRENT PROTECTION         Works over 103% of rating         Works at 115 - 150% of r         1.50% of r           OVERVOLTAGE PROTECTION         Works at 115 - 160% of rating         Works at 115 - 150% of r         1.00WOLTAGE PROTECTION         Works at 93% max of rating           REMOTE ON/OFF         Provided(RC open : ON, short between RC and +Vi         INPUT-OUTPUT         DC1,500V 1minute, DC50V 50MΩ min (20±15°C)           OPERATING TEMP,HUMID.AND ALTITUDE         -40 to +85°C, 20 - 95% RH (Non condensing), 3.0000         STORAGE TEMP,HUMID.AND ALTITUDE         -40 to +100°C, 20 - 95% RH (Non condensing), 9.0000         VIBRATION         10 - 55Hz, 49.0	VOLTAGE[V]         DC36 - 76           CURRENT[A]         I         0.16typ         0.20typ         0.20typ         0.27typ         0.35typ           EFFICIENCY[%]         I         81typ         82typ         85typ         87typ         89typ           START-UP VOLTAGE[V]         DC32 - 36         HYSTERESIS VOLTAGE[V]         DC2 min         V           VOLTAGE[V]         1.2         1.5         1.8         2.5         3.3           CURRENT[A]         5.2         5.2         4.5         4.5         4.5           VOLTAGE ACCURACY[%]         +5, -3         Start-UP voltage Accuracy[%]         +5, -3         Start-UP voltage Accuracy[%]         +5, -3           RIPPLE NOISE[mVp-p]         25max         Start-UP voltage Accuracy[%]         +5, -3         Start-UP voltage Accuracy[%]         +5, -3           START-UP TIME[ms]         20 - 100max (DCIN 48V, lo=100%)         OVERCURRENT PROTECTION         Works over 103% of rating           OVERCURRENT PROTECTION         Works at 115 - 160% of rating         Works at 115 - 150% of rating           OVERVOLTAGE PROTECTION         Works at 93% max of rating         Emote Add +Vin : OFF)           INPUT-OUTPUT         DC1,500V 1minute, DC500V 50MΩ min (20±15°C)         OPERATING TEMP.HUMID.AND ALITIVDE         -40 to +85°C, 20 - 95% RH (Non condensing	VOLTAGE[V]         DC36 - 76           CURRENT[A]         0.16typ         0.20typ         0.20typ         0.27typ         0.35typ         0.35typ           EFFICIENCY[%]         81typ         82typ         85typ         87typ         89typ         89typ           START-UP VOLTAGE[V]         DC32 - 36	VOLTAGE[V]         DC36 - 76           CURRENT[A]         0.16typ         0.20typ         0.27typ         0.35typ         0.35typ         0.37typ           EFFICIENCY[%]         81typ         82typ         85typ         87typ         89typ         89typ         89typ           START-UP VOLTAGE[V]         DC32 - 36		

\*1 At rated input(DC48V), rated load and  $25^{\circ}$ C



#### External view



:Sn with Ni barreir



14.4	16.5	19.8	25.0	29.7	30.0
1.2V 12A	1.5V 11A	1.8V 11A	2.5V 10A	3.3V 9A	5V 6A

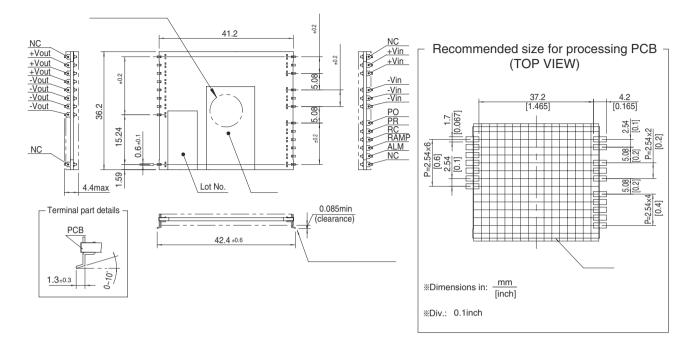
#### **SPECIFICATIONS**

	MODEL	SFLS30481R2	SFLS30481R5	SFLS30481R8	SFLS30482R5	SFLS30483R3	SFLS304805				
	VOLTAGE[V]	DC36 - 76									
	CURRENT[A] *1	0.36typ	0.40typ	0.47typ	0.58typ	0.68typ	0.69typ				
OUTPUT	EFFICIENCY[%] *1	84typ	86typ	88typ	90typ	91typ	91typ				
	START-UP VOLTAGE[V]	DC32 - 36									
	HYSTERESIS VOLTAGE[V]	DC2 min									
	VOLTAGE[V]	1.2	1.5	1.8	2.5	3.3	5				
OUTPUT	CURRENT[A]	12	11	11	10	9	6				
	VOLTAGE ACCURACY[%]	+5, -3									
OUTFUT	RIPPLE[mVp-p]	25max	25max								
	RIPPLE NOISE[mVp-p]	50max									
START-UP TIME[ms]         20 - 100max (DCIN 48V, Io=100%)											
	OVERCURRENT PROTECTION	Works over 103%	% of rating								
		Works at 115 - 1	60% of rating	Works at 115 - 1	150% of rating						
OTHERS	LOWVOLTAGE PROTECTION	Works at 93% m	ax of rating								
	REMOTE ON/OFF	Provided(RC ope	rks at 115 - 160% of rating     Works at 115 - 150% of rating       rks at 93% max of rating     vided(RC open : ON, short between RC and +Vin : OFF)								
ISOLATION	INPUT-OUTPUT	DC1,500V 1minu	ute, DC500V 50M	Ω min (20±15℃)							
	OPERATING TEMP., HUMID.AND ALTITUDE			ondensing), 3,000							
	STORAGE TEMP., HUMID. AND ALTITUDE			-		ax (Refer to the In	struction Manual)				
	VIBRATION	10 - 55Hz, 49.0n	n/s² (5G), 3minute	es period, 60minut	es each along X,	Y and Z axis					
	IMPACT	196.1m/s <sup>2</sup> (20G)	, 11ms, once eac	h X, Y and Z axis							
SAFETY	AGENCY APPROVALS	UL60950-1, C-U	L (CSA60950-1),	EN62368-1							
OTHERS	CASE SIZE/WEIGHT	41.2 × 4.4 × 36.2	mm [1.62 × 0.174]	×1.43 inches] (W	×H×D) / 16g ma	x					
UTIENS	COOLING METHOD	Convection									

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



#### External view



:Sn with Ni barreir

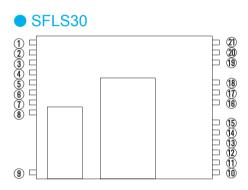
# **COȘEL** | SFLS-series

### Pin Configuration

#### SFLS10 / SFLS15

① □	□ (15)
$\check{2}$	
3 <b>□</b>	□ ( <b>13</b> )
ă 🗆	Þ 12
5	ÞŌ
	<b>□</b> (9)
6	

No.	Pin Name	Function
1	NC	Not connected / Adhesive dispensing
2,3	+Vout	+DC output
(4),(5)	-Vout	-DC output
6	NC	Not connected / Adhesive dispensing
$\bigcirc$	RAMP	Ramp-rate control
8	ALM	Alarm
9	RC	Remote ON/OFF
10	PO	Start in/out
1	PR	Power ready / Sequence control
(12)	NC	Not connected
(13)	+Vin	+DC input
14	-Vin	-DC input
(15)	NC	Not connected / Adhesive dispensing



No.	Pin Name	Function
1	NC	Not connected / Adhesive dispensing
2,3,4	+Vout	+DC output
5,6,7,8	-Vout	-DC output
9,10	NC	Not connected / Adhesive dispensing
1	ALM	Alarm
(12)	RAMP	Ramp-rate control
(13)	RC	Remote ON/OFF
14	PR	Power ready / Sequence control
(15)	PO	Start in/out
16, 17, 18	-Vin	-DC input
(19), 20)	+Vin	+DC input
21)	NC	Not connected / Adhesive dispensing

#### **Assembling and Installation Method**

#### Automatic mounting

- SFLS 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 during mounting, causing cracked core. So during mounting, take enough care.

SFLS-series | COSEL

#### Implementation · Mounting Method

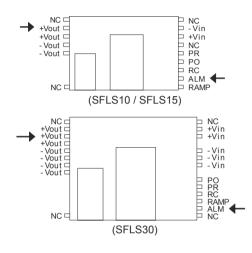
#### Soldering temperature

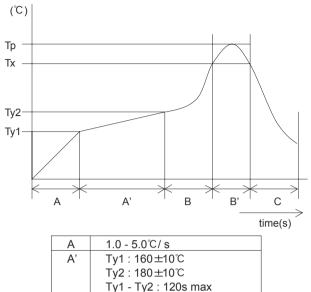
#### (1) Reflow soldering

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.





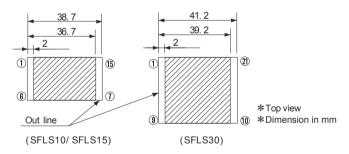
	Ty1 - Ty2 : 120s max
В	1.0 - 5.0°C/ s
B'	Tp : Max245℃ 10s max Tx : 220℃ or more : 70s max
С	1.0 - 5.0℃/ s

(2) 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

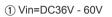
SFLS series transformer core and choke coil core are attached by glue, and there is a cover over the core, which is attached by a clasp. There is a possibility that the core will be removed and power supply will be damaged when it took stress by the fall or some kind of stress.

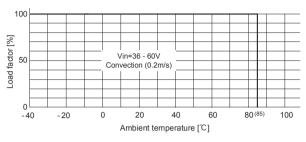
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#### Derating

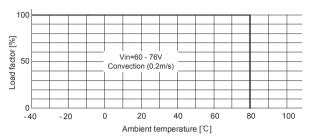
#### Ambient temperature derating curve

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.





② Vin=DC60V - 76V



#### **Instruction Manuals**

Please see catalog and instructionmanual before you use.

 Instruction Manuals
 https://www.cosel.co.jp/redirect/catalog/en/SFLS/

 Before using our product
 https://en.cosel.co.jp/technical/caution/index.html



#### **Basic Characteristics Data**

			Input		Inrush	PCB/Pattern			Series/Parallel operation availability	
		[kHz]	current		current protection	Material	Single sided	Double sided	Series operation	
	Single ended forward converter	630 - 710	*1	-	-	glass fabric base,epoxy resin		Multilayer	Yes	Yes
SFLS15	Single ended forward converter	630 - 710	*1	-	-	glass fabric base,epoxy resin		Multilayer	Yes	Yes
SFLS30	Single ended forward converter	480 - 540	*1	-	-	glass fabric base,epoxy resin		Multilayer	Yes	Yes

\*1 Refer to Specification.