

INDIVIDUAL SPECIFICATION SHEET

Product Name: 4030 Self Control Fuse

Part Number: WSFB Series

Revision: A



Dongguan TLC Electronic Technology Co., LTD

No.18,5th GaoLi Road,TangXia Town,DongGuan,GuangDong,P.R China 523710

TEL: 86-0769-3892 0511

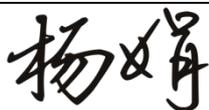
FAX: 86-0769-8793 2077

Http: www.tlcet.com.cn

Rev.	Effective Date	Changed Contents
A	2021-3-31	New Release

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PREPARED BY



APPROVED BY



Description

WSFB Series is a three terminals surface mountable battery protector that can protect against both overcurrent and overcharging. It comprises a fuse element to ensure stable operation under normal electrical current and to cut off the current when overcurrent occurs. It also comprises a resistive heating element that could be used in combination with a voltage detecting means, such as IC and FET. When overvoltage is detected, it will generate heat to blow the fuse to achieve overvoltage protection.

Features

- Halogen Free
- Protection for both overcurrent and overcharging
- Surface Mount
- Fast response

Electrical Characteristics

Part Number	I _{rated} (A)	Cell In Series	V _{max} (Vdc)	I _{break} (A)	V _{op} (V)	Resistance		Agency Approvals	
						R _{heater} (Ω)	R _{fuse} (mΩ)		
WSFB1204	12	1	36	50	3.0-4.5	0.6-1.5	1.5-3.5	×	×
WSFB1208	12	2	36	50	4.0-9.0	2.0-3.2	1.5-3.5	×	×
WSFB1212	12	3	36	50	7.4-13.8	5.7-9.9	1.5-3.5	×	×
WSFB1214	12	4	36	50	10.5-19.6	11.2-20.0	1.5-3.5	×	×
WSFB1504	15	1	36	50	3.0-4.5	0.6-1.5	1.0-3.0	×	×
WSFB1508	15	2	36	50	5.0-9.0	2.2-3.3	1.0-3.0	×	×
WSFB1512	15	3	36	50	7.4-13.8	5.5-8.4	1.0-3.0	×	×
WSFB1514	15	4	36	50	10.5-19.6	10.4-15.8	1.0-3.0	×	×
WSFB1520	15	5	36	50	14.4-23.5	17.9-29.1	1.0-3.0	×	×
Current Capacity	100% x I _{rated} , No Melting								
Cut Time	200% x I _{rated} , < 1 min								
Interrupting Current	5 x I _{rated} , power on 5 ms, power off 995 ms, 10000 cycles, No Melting								
Over Voltage Operation	In operation voltage range, the fusing time is <1min								

1) I_{rated} = Current carrying capacity that is measured at 40°C thermal equilibrium condition

2) I_{break} = The current that the fuse element is able to interrupt

3) V_{max} = The maximum voltage that can be cut off by fuse

4) V_{op} = Range of operation voltage

5) R_{heater} = The resistance of the heating element

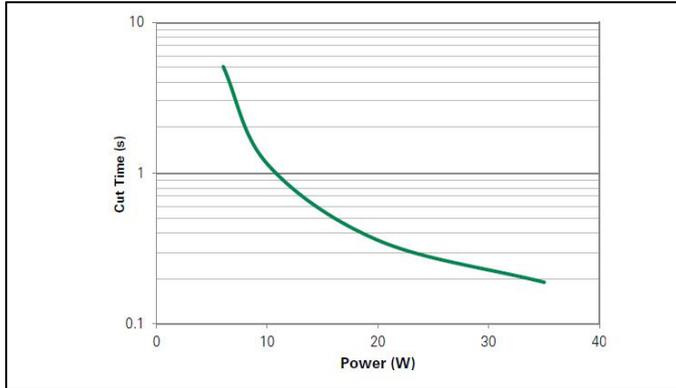
6) R_{fuse} = The resistance of the fuse element

7) Cells in series = Number of battery cells connected in series in the circuit for WSFB device to protect.

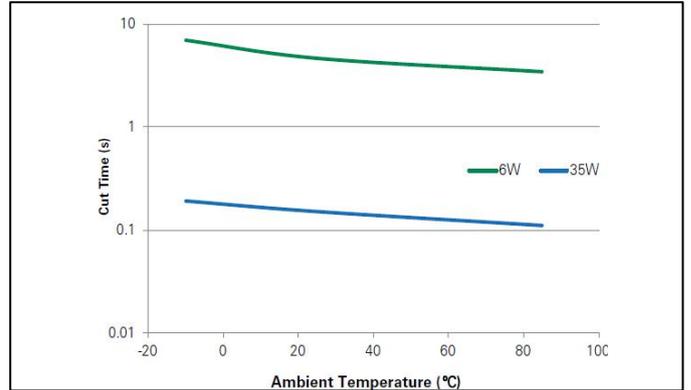
- Value specified is determined by using the PWB with 2mm*2oz copper traces, AWG18 covered wire, and 0.6mm glass epoxy PCB.
- Specifications are subject to change without notice.

Cut Time by Heater Operation (WSFB 12A series)

Various heater wattage at 25°C ambient temperature

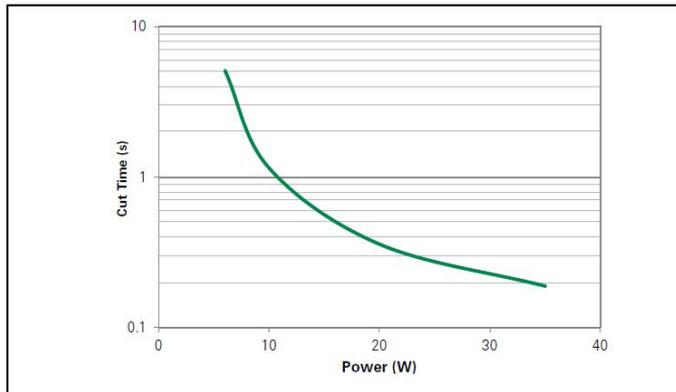


Constant heater wattage at various ambient temperature

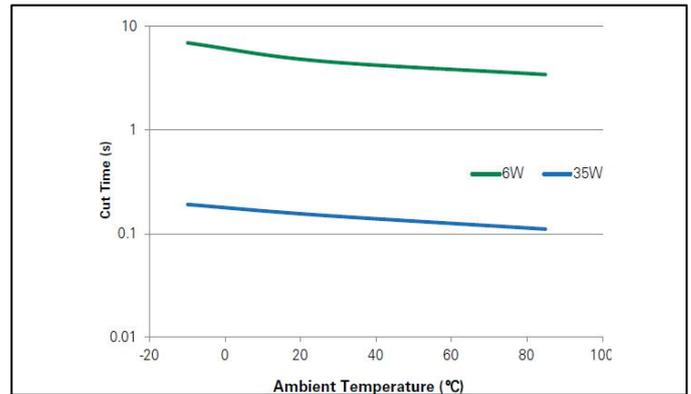


Cut Time by Heater Operation (WSFB 15A series)

Various heater wattage at 25°C ambient temperature

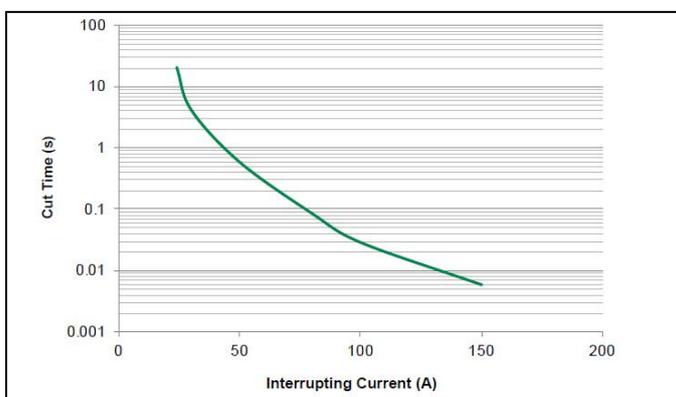


Constant heater wattage at various ambient temperature

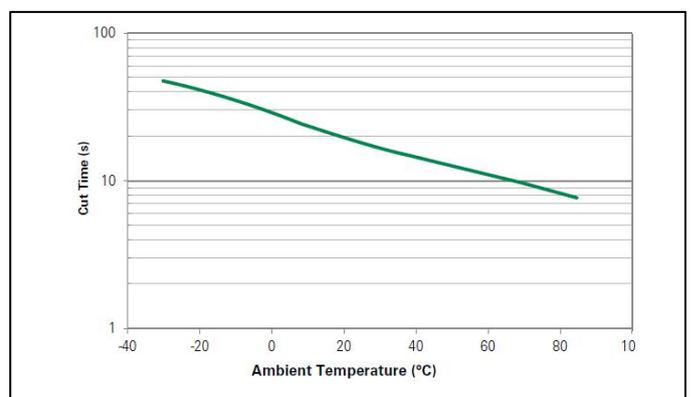


Cut Time by Current Operation (WSFB 12A series)

Various interrupting current at 25°C ambient temperature

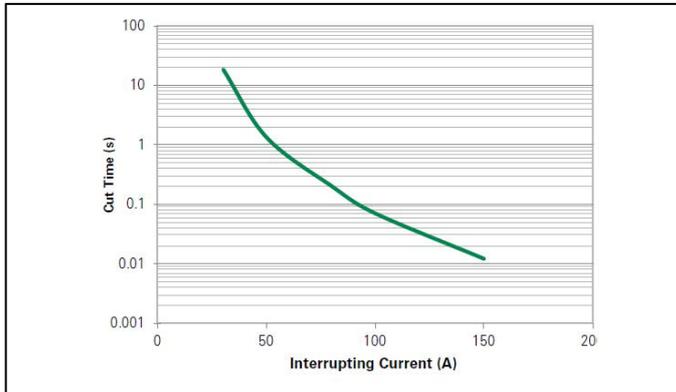


Constant 2x rated current at various ambient temperature

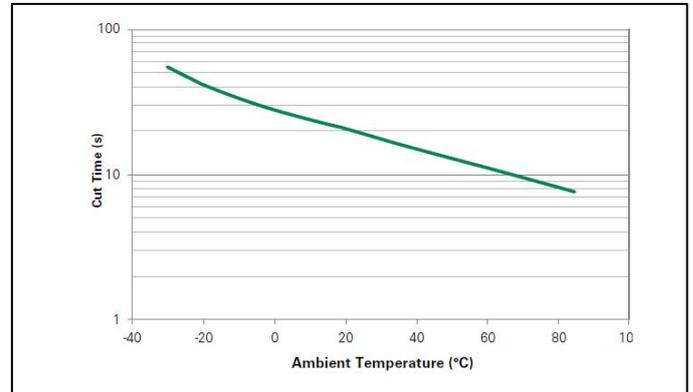


Cut Time by Current Operation (WSFB 15A series)

Various interrupting current at 25°C ambient temperature



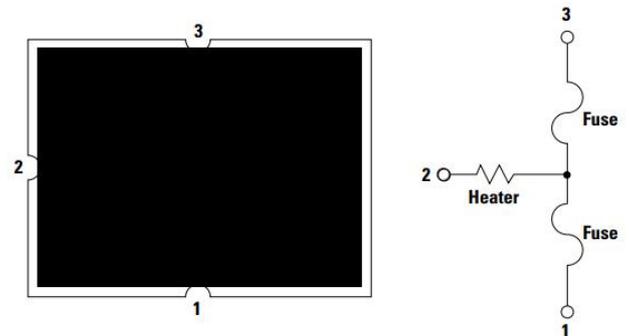
Constant 2x rated current at various ambient temperature



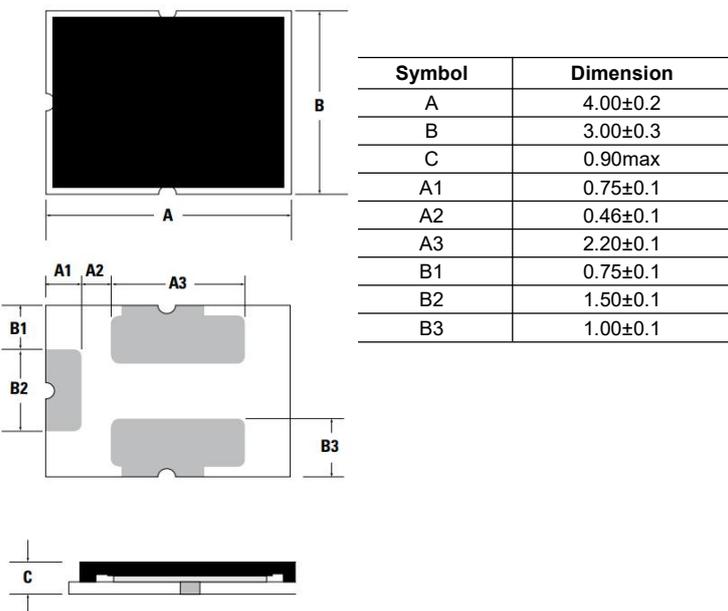
Environmental Specifications

Storage Temperature	0~35°C, ≤70%RH 3 months after shipment
Operating Temperature	-10°C to +65°C
Hot Passive Aging	100±5°C, 250 hours No structural damage and functional failure
Humidity Aging	60°C±2°C, 90~95% R.H. 250 hours No structural damage and functional failure
Cold Passive Aging	-20±3°C, 500 hours No structural damage and functional failure
Thermal Shock	MIL-STD-202 Method 107G +125°C/-55°C, 100 times No structural damage and functional failure

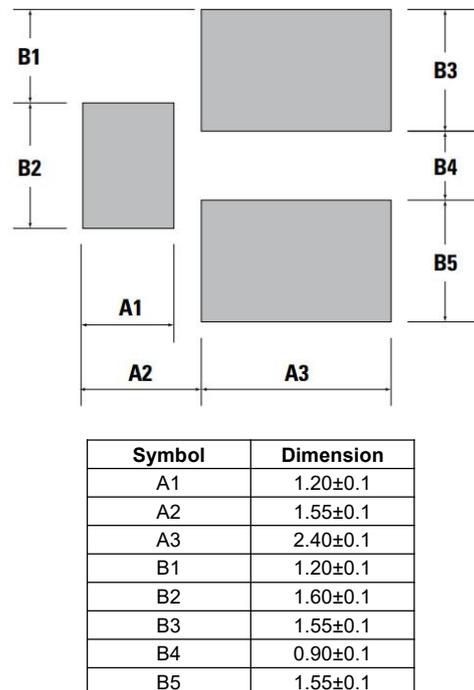
Device Circuit



Physical Dimension (mm)

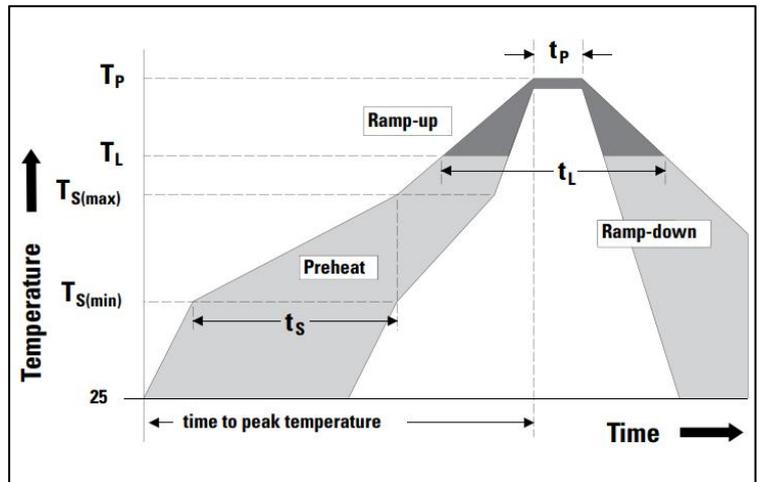


Board and Solder Layout Recommend (mm)



Soldering Parameters

Average Ramp-Up Rate ($T_{S_{max}}$ to T_P)		3°C/second max.
Preheat	Temperature Min ($T_{S_{min}}$)	150°C
	Temperature Max ($T_{S_{max}}$)	200°C
	Time ($T_{S_{min}}$ to $T_{S_{max}}$)	60-120 seconds
Time maintained above:	Temperature (T_L)	217°C
	Time (t_L)	60-105 seconds
Peak Temperature (T_P)		255°C
Time within 5°C of actual Peak Temperature (t_p)		5 seconds max.
Ramp-Down Rate		6°C/second max.
Time 25°C to Peak Temperature		8 minutes max.

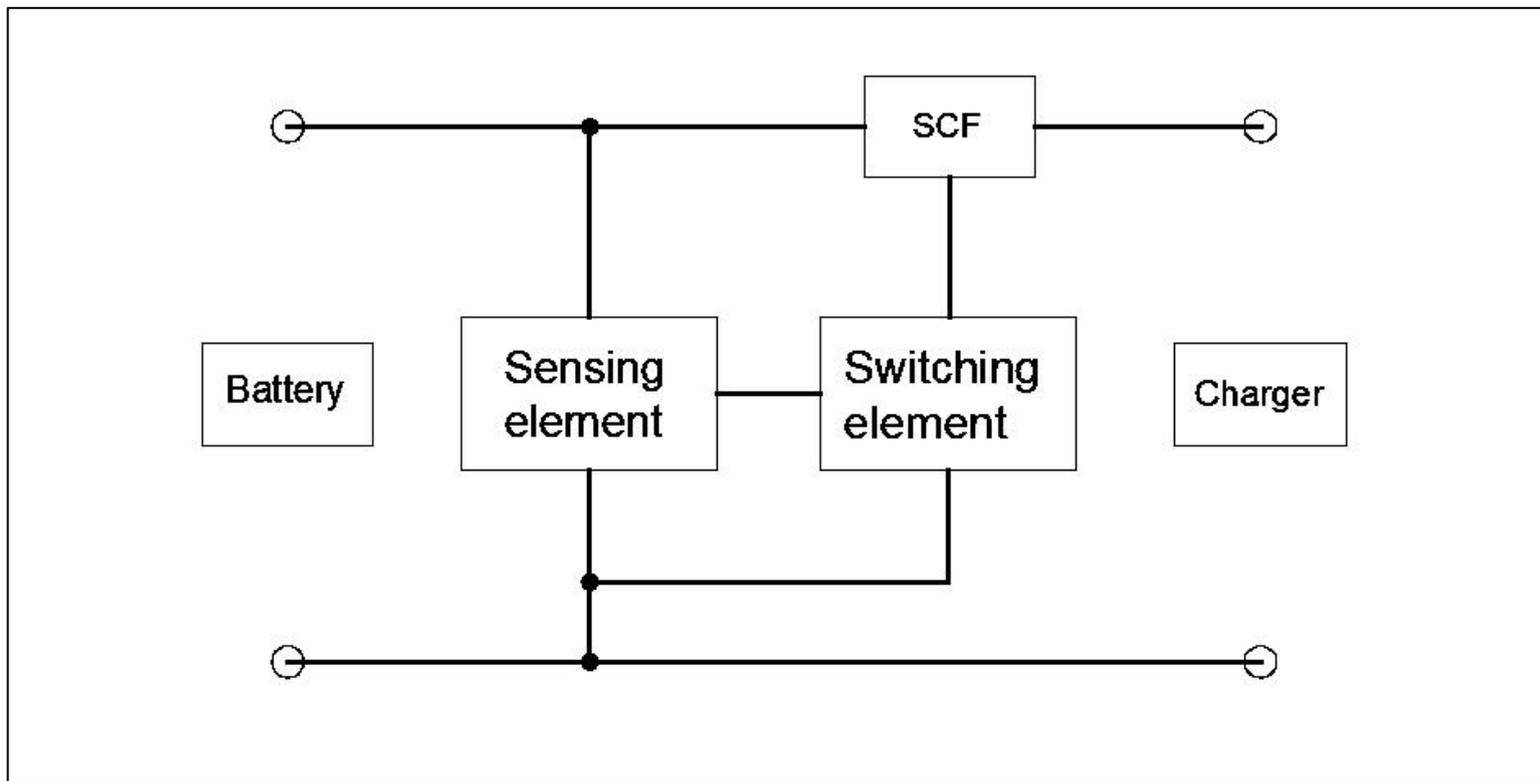


—All temperature refer to topside of the package, measured on the package body surface
 —If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements

Physical Specifications

Material	Glass Epoxy PCB
Base Thickness	0.6mm
Copper Thickness	0.07mm
Covered Wire	AWG18

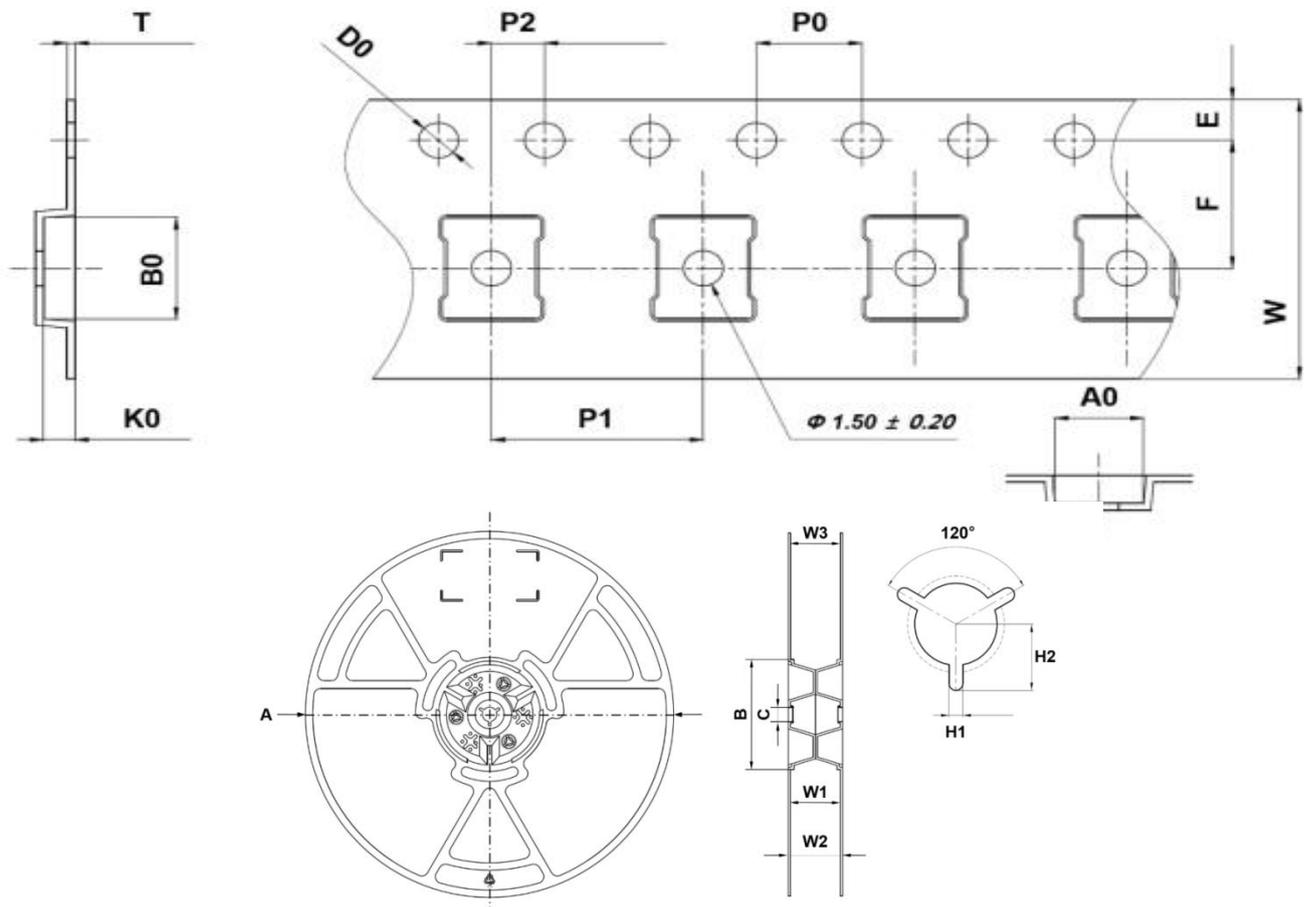
Typical Application Circuit Diagram



Installation and Handling Guidelines

- Before and after mounted, the ultrasonic-cleaning or immersion-cleaning must not be done to WSFB device. The flux on element would flow, and it would not be satisfied its specification when cleaning is done. In addition, a similar influence happens when the product comes in contact with cleaning-solution. These products after cleaning will not be guaranteed.
- Silicone-based oils, oils, solvents, gels, electrolytes, fuels, acids, and the like will adversely affect the properties of WSFB devices, and shall not be used or applied.
- Please Do Not reuse the WSFB device removed by the soldering process.
- WSFB devices are secondary protection devices and are used solely for sporadic, accidental over-current or over-temperature error condition, and shall NOT be used if or when constant or repeated fault conditions (such fault conditions may be caused by, among others, incorrect pin-connection of a connector) or over-extensive trip events may occur.
- Operation over the maximum rating or other forms of improper use may cause failure, arcing, flame and/or other damage to the WSFB devices.
- The performance of WSFB devices will be adversely affected if they are improperly used under electronic, thermal and/or mechanical procedures and/or conditions non-conformant to those recommended by manufacturer.
- Customers shall be responsible for determining whether it is necessary to have back-up, failsafe and/or fool-proof protection to avoid or minimize damage that may result from extra-ordinary, irregular function or failure of WSFB devices.
- There should be minimum of 0.1mm spacing between WSFB and surrounding compounds, to maintain the product characteristics and avoid damage other surrounding compounds.
- This product is designed and manufactured only for general-use of electronics devices. We do not recommend that it is used for the applications Military, Medical and so on which may cause direct damages on life, bodies or properties.

Tape and Reel Specifications (mm)



Symbol	Dimension(mm)
W	12.00±0.30
F	5.50±0.05
E	1.75±0.10
D0	Φ1.50±0.05
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
A0	3.35±0.10
B0	4.35±0.10
T	0.30±0.05
K0	1.20±0.10
A	Φ330.0±2.0
B	Φ100.0±1.0
C	Φ13.0±0.2
W1	12.4±1.5
W2	16.4±2.0
W3	13.65±1.5
H1	2.0±0.5
H2	10.5±1.0

Part Numbering System

W SF B 12 04 - XX

① ② ③ ④ ⑤ ⑥

①表示公司标志

②表示三端产品系列, Self-Control Fuse

③表示产品尺寸, 4.0*3.0mm

④表示额定电流值为 12A

⑤表示工作电压为 4V

⑥表示特殊后缀

Part Marking System

B12A04V ——— Model Mark

C1

Cells

Packaging

Part Number	Tape and Reel Quantity
WSFBXXXX	5,000