



TLC Electronic
莞沃电子

Self Control Fuse

DOC.No. :
ISS:WSFD4530

INDIVIDUAL SPECIFICATION SHEET

Product Name: Self Control Fuse

Part Number: WSFD4530

Revision: A/2



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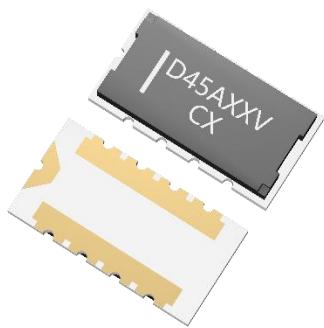
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Rev.	Effective Date	Changed Contents
A/0	2021-3-31	New Release
A/1	2022-6-11	Product picture change
A/2	2024-4-9	TUV certification

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PREPARED BY	APPROVED BY



Description

WSFD 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

Agency Approvals

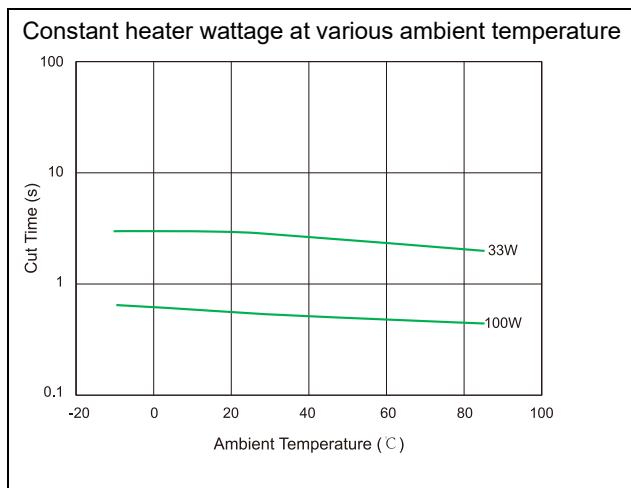
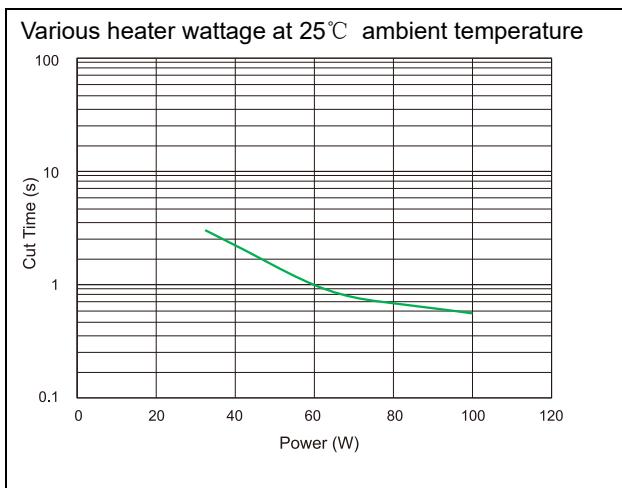
- UL file: E467707

Electrical Characteristics

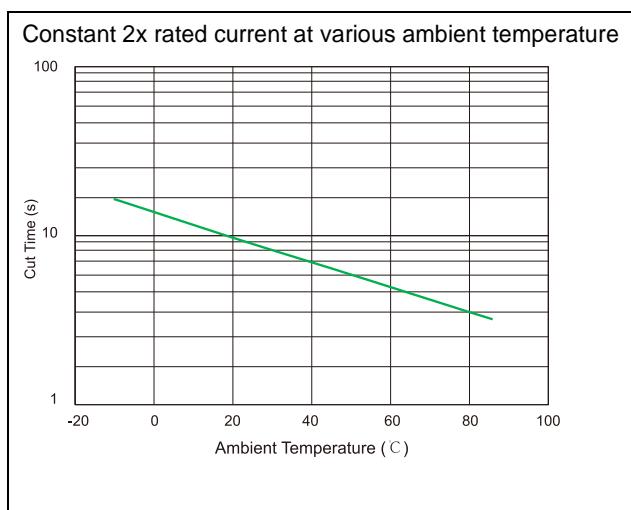
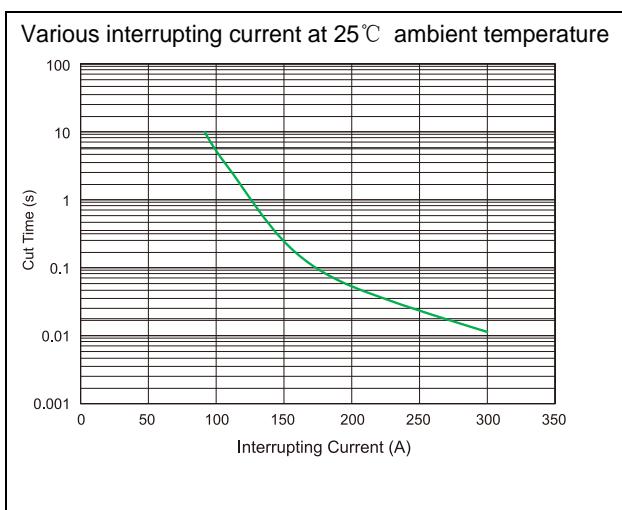
Part Number	I _{rated} (A)	Cell In Series	V _{max} (Vdc)	I _{break} (A)	V _{op} (V)	Resistance	Agency Approvals	
							UL	
WSFD4530	45	6-7	80	120	22.3-31.5	0.5-2.0	●	●
Current Capacity	100% x I _{rated} , No Melting							
Cut Time	200% x I _{rated} , < 1 min							
Interrupting Current	150A, power on 5 ms, power off 995 ms, 10000 cycles (WSFD9550 50A series), 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 WSFD device to protect.
 - Value specified is determined by using the PWB with 6mm*2oz copper traces, AWG10 covered wire, and 0.6mm glass epoxy PCB for WSFD 30A Series.
 - Value specified is determined by using the PWB with 25mm*2oz copper traces, AWG8 covered wire, and 0.6mm glass epoxy PCB for WSFD 50A Series.
 - Specifications are subject to change without notice.

Cut Time by Heater Operation (WSFD 45A series)

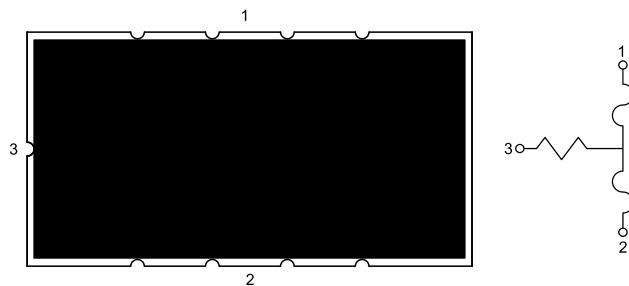
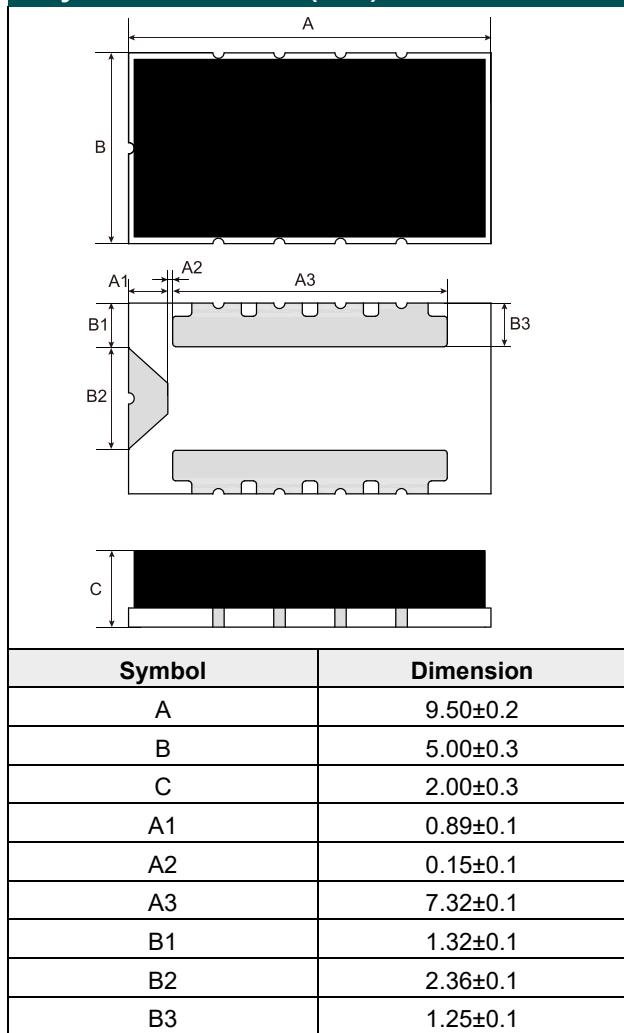


Cut Time by Current Operation (WSFD 45A series)

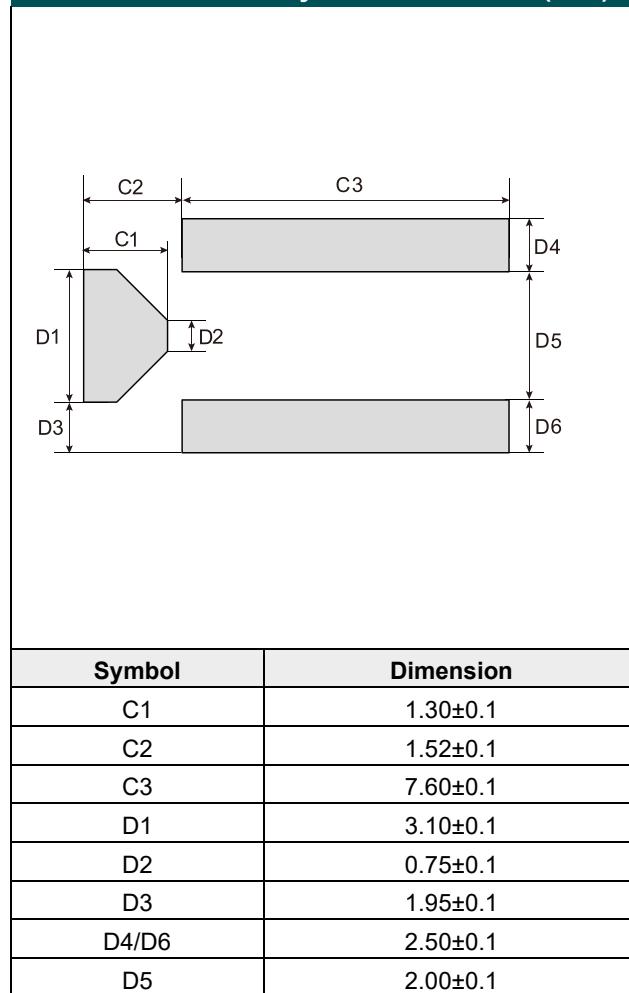


Environmental Specifications

Storage Temperature	0~35°C, ≤70%RH 1 year 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

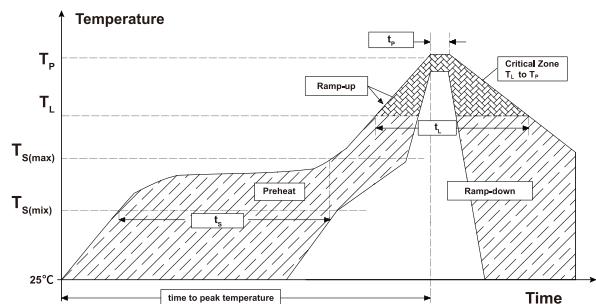
Device Circuit

Physical Dimension (mm)


Symbol	Dimension
A	9.50±0.2
B	5.00±0.3
C	2.00±0.3
A1	0.89±0.1
A2	0.15±0.1
A3	7.32±0.1
B1	1.32±0.1
B2	2.36±0.1
B3	1.25±0.1

Board and Solder Layout Recommend (mm)


Soldering Parameters

Average Ramp-Up Rate ($T_{S\max}$ to TP)		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 (TP)		255°C
Time within 5°C of actual Peak Temperature (tP)		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	AWG10 (WSFD 30A series)
	AWG8(WSFD 50A series)

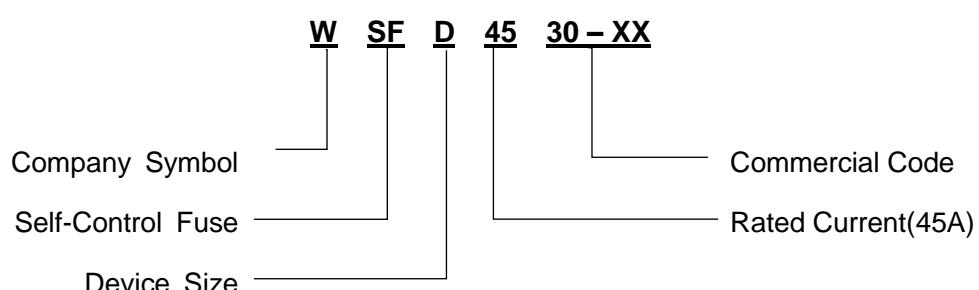
Packaging

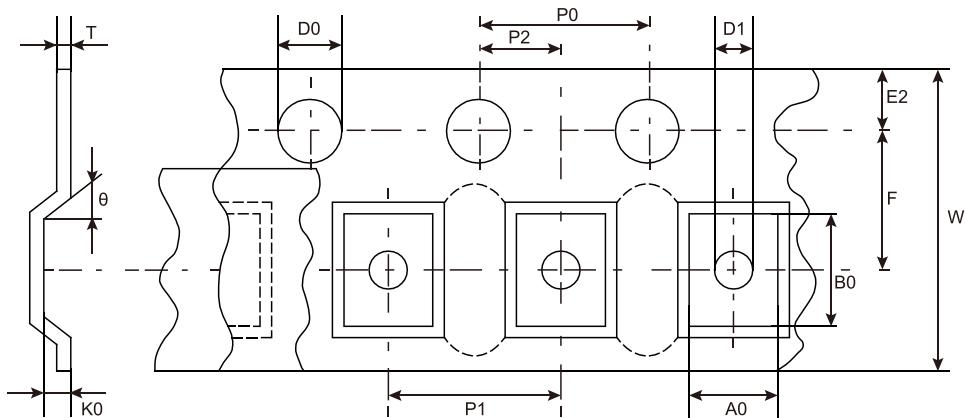
Part Number	Tape and Reel Quantity
WSFDXXXX	3,000

Part Marking System

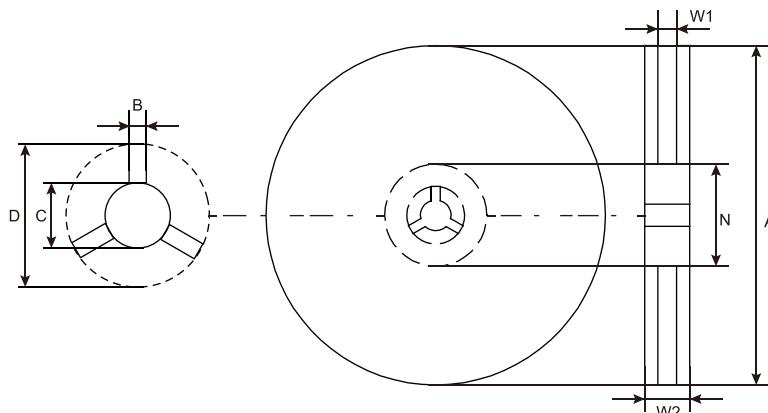
D45A30V —— Model Mark
C6-7 —— Commercial Code

Part Numbering System

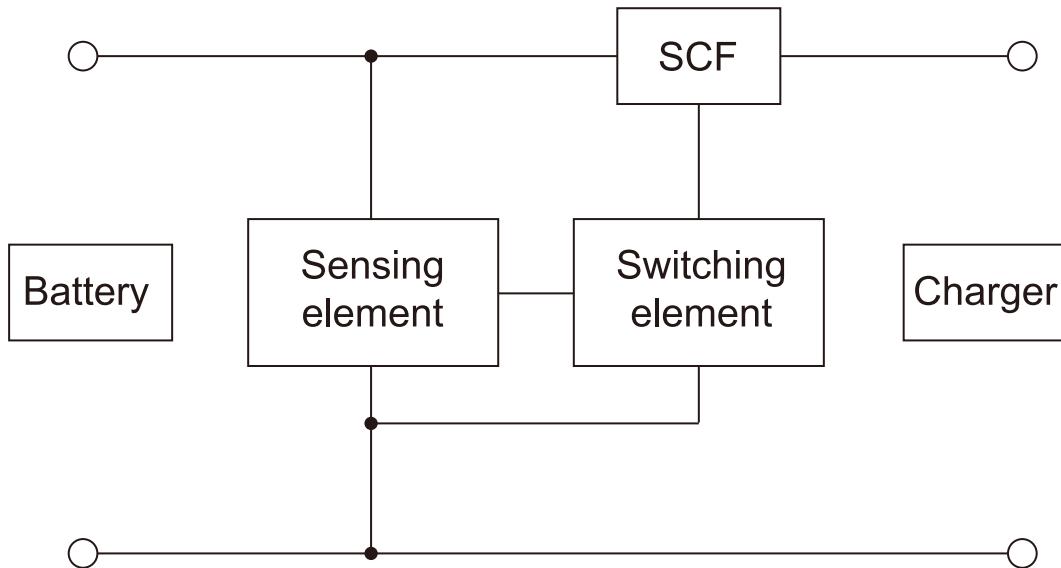


Tape and Reel Specification


Item	A0	B0	D0	D1	E2	F	K0
Spec.(mm)	5.40±0.1	9.85±0.1	Φ1.50±0.05	Φ1.50±0.05	1.75±0.10	7.50±0.05	2.48±0.10
Item	P0	P1	P2	T	W	θ	
Spec.(mm)	4.00±0.10	8.00±0.10	2.00±0.10	0.30±0.05	16.00±0.30	MAX6°	



Item	A	B	C	D	N	W1	W2
Spec.(mm)	φ330±0.1	2.50±0.05	13.60±0.05	22.60±0.05	φ99±0.05	17.00±0.1	20.8±0.1

Typical Application Circuit Diagram

Installation and Handling Guidelines

- Before and after mounted, the ultrasonic-cleaning or immersion-cleaning must not be done to WSF 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 WSF devices, and shall not be used or applied.
- Please Do Not reuse the WSF device removed by the soldering process.
- WSF 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 WSF devices.
- The performance of WSF 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 WSF devices.
- There should be minimum of 0.1mm spacing between WSF 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.