INDIVIDUAL SPECIFICATION SHEET

Product Name: 9550 Self Control Fuse

Part Number: WSFD Series

Revision: A

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

PREPARED BY	APPROVED BY
杨婷	

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

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)	c UL us	
WSFD3012	30	3	62	80	8.4-13.2	3.2-5.2	0.5-2.5	×	×
WSFD3014	30	4	62	80	11.1-18.4	6.3-9.3	0.5-2.5	×	×
WSFD3020	30	5	62	80	14.0-23.4	10.0-15.0	0.5-2.5	×	×
WSFD3030	30	6-7	62	80	20.2-31.5	18.8-31.2	0.5-2.5	×	×
WSFD3040	30	9-10	62	80	28.0-46.9	40.0-60.0	0.5-2.5	×	×
WSFD3050	30	12-14	62	80	39.6-62.0	72.4-120.6	0.5-2.5	×	×
WSFD4512	45	3	62	120	9.8-13.5	1.9-3.4	0.4-2.0	×	×
WSFD4514	45	4	62	120	13.0-18.4	3.4-6.0	0.4-2.0	×	×
WSFD4520	45	5	62	120	16.7-23.5	5.6-9.9	0.4-2.0	×	×
WSFD4530	45	6-7	62	120	22.3-31.5	10.0-17.7	0.4-2.0	×	×
WSFD4540	45	9-10	62	120	33.0-46.9	22.0-38.7	0.4-2.0	×	×
WSFD4550	45	12-14	62	120	43.7-62.0	38.5-68.0	0.4-2.0	×	×
Current Capacity	100% x I_{rated}, No Melting								
Cut Time	200% x I_{rated}, < 1 min								
Interrupting Current	100A, power on 5 ms, power off 995 ms, 10000 cycles (ITV9550 30A series) 150A, power on 5 ms, power off 995 ms, 10000 cycles (ITV9550 45A 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℃ 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.

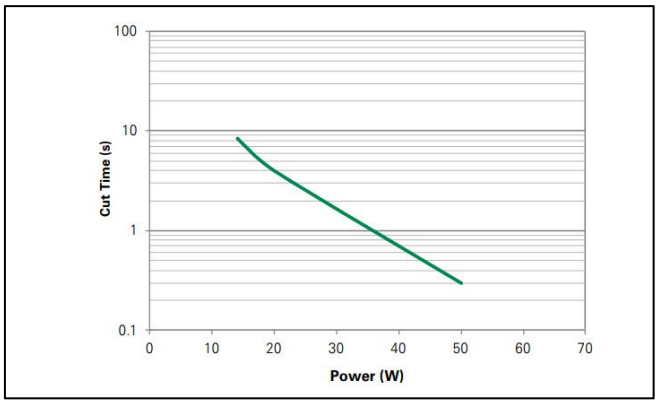
• Value specified is determined by using the PWB with 6mm*2oz copper traces, AWG10 covered wire, and 0.6mm glass epoxy PCB for WSFD 30A Series

• Value specified is determined by using the PWB with 25mm*2oz copper traces, AWG8 covered wire, and 0.6mm glass epoxy PCB for WSFD 45A Series

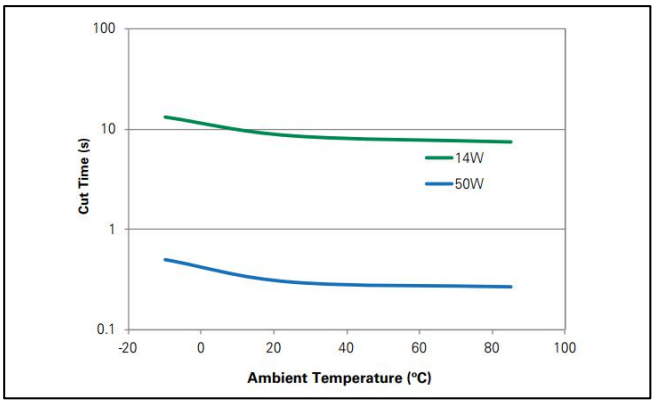
• Specifications are subject to change without notice.

Cut Time by Heater Operation (WSFD 30A series)

Various heater wattage at 25℃ ambient temperature

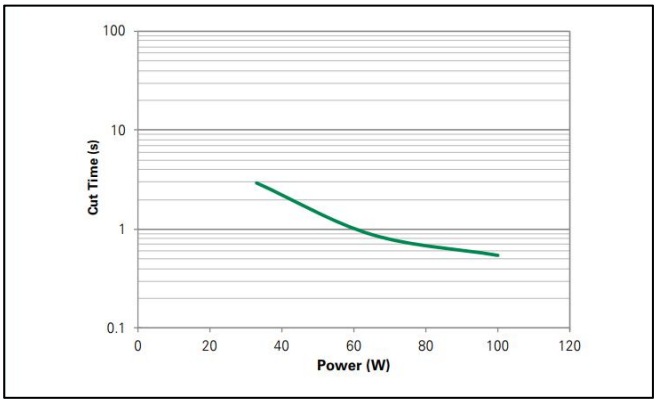


Constant heater wattage at various ambient temperature

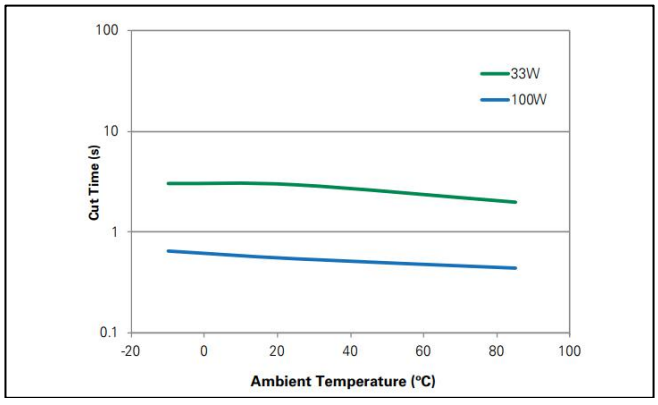


Cut Time by Heater Operation (WSFD 45A series)

Various heater wattage at 25℃ ambient temperature

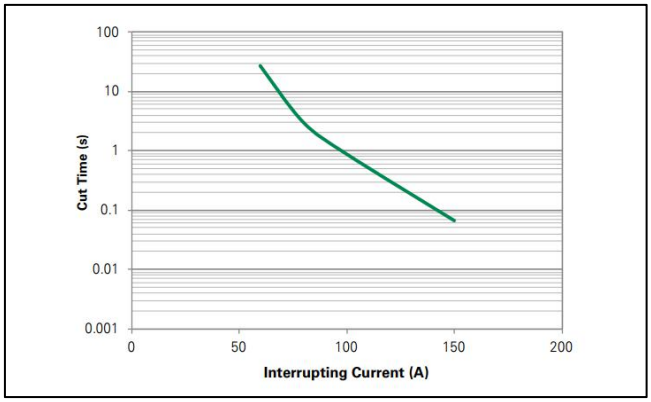


Constant heater wattage at various ambient temperature

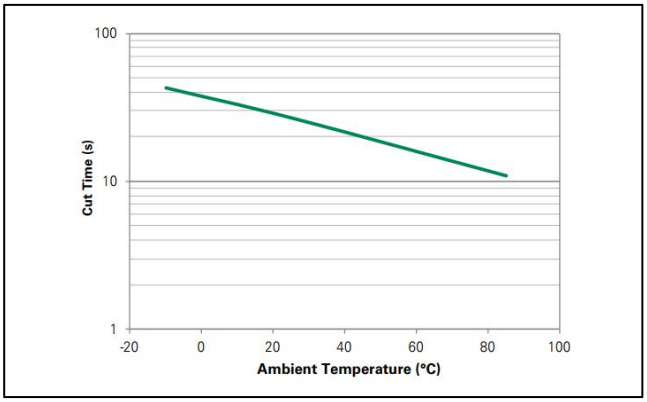


Cut Time by Current Operation (WSFD 30A series)

Various interrupting current at 25℃ ambient temperature

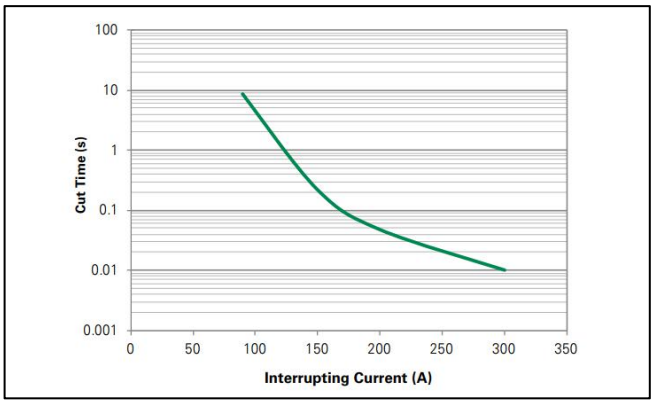


Constant 2x rated current at various ambient temperature

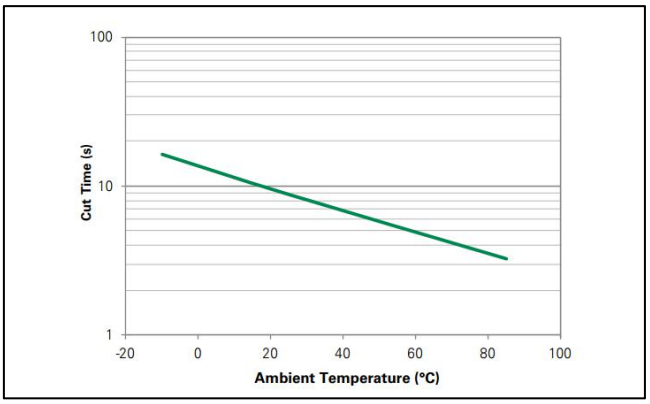


Cut Time by Current Operation (WSFD 45A series)

Various interrupting current at 25℃ ambient temperature



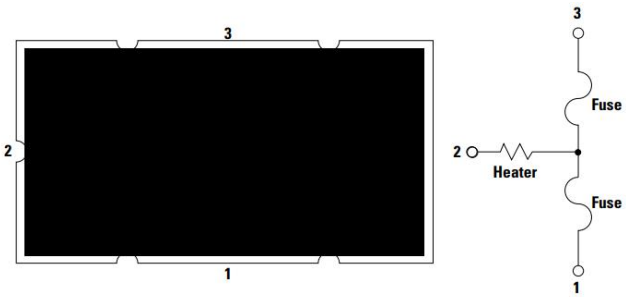
Constant 2x rated current at various ambient temperature



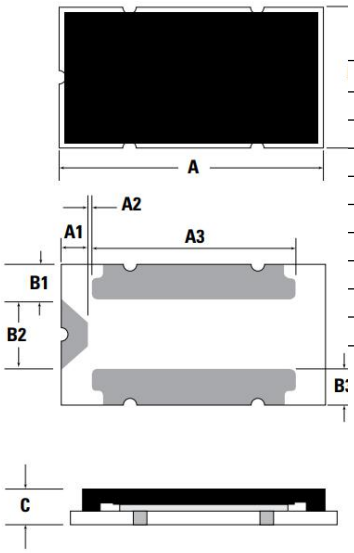
Environmental Specifications

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

Device Circuit

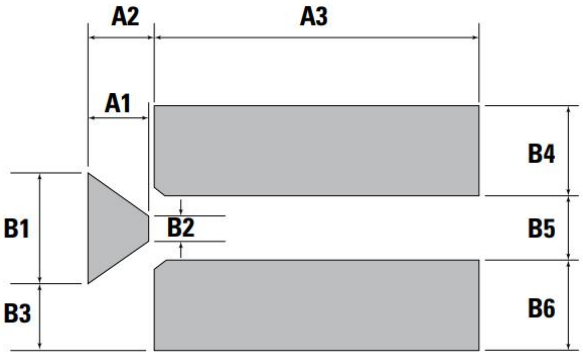


Physical Dimension (mm)



Symbol	Dimension
A	9.50±0.2
B	5.00±0.3
C	2.00max
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

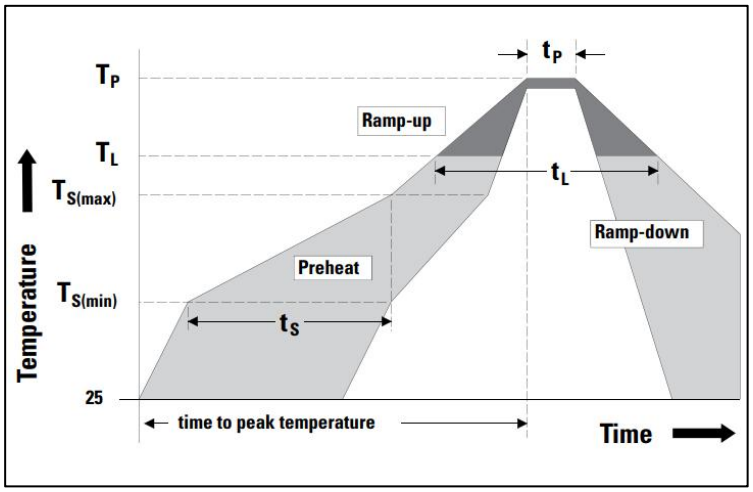
Board and Solder Layout Recommend (mm)



Symbol	Dimension
A1	1.30±0.1
A2	1.52±0.1
A3	7.60±0.1
B1	3.10±0.1
B2	0.75±0.1
B3	1.95±0.1
B4	2.50±0.1
B5	2.00±0.1
B6	2.50±0.1

Soldering Parameters

Average Ramp-Up Rate (Ts_{max} to TP)		3℃/second max.
Preheat	**Temperature Min (Ts_{min})**	150℃
	Temperature Max (Ts_{max})	200℃
	Time (Ts_{min} to Ts_{max})	60-120 seconds
Time maintained above:	**Temperature (T_L)**	217℃
	Time (t_L)	60-105 seconds
Peak Temperature (T_P)		255℃
Time within 5℃ of actual Peak Temperature (t_P)		5 seconds max.
Ramp-Down Rate		6℃/second max.
Time 25ºC to Peak Temperature		8 minutes max.

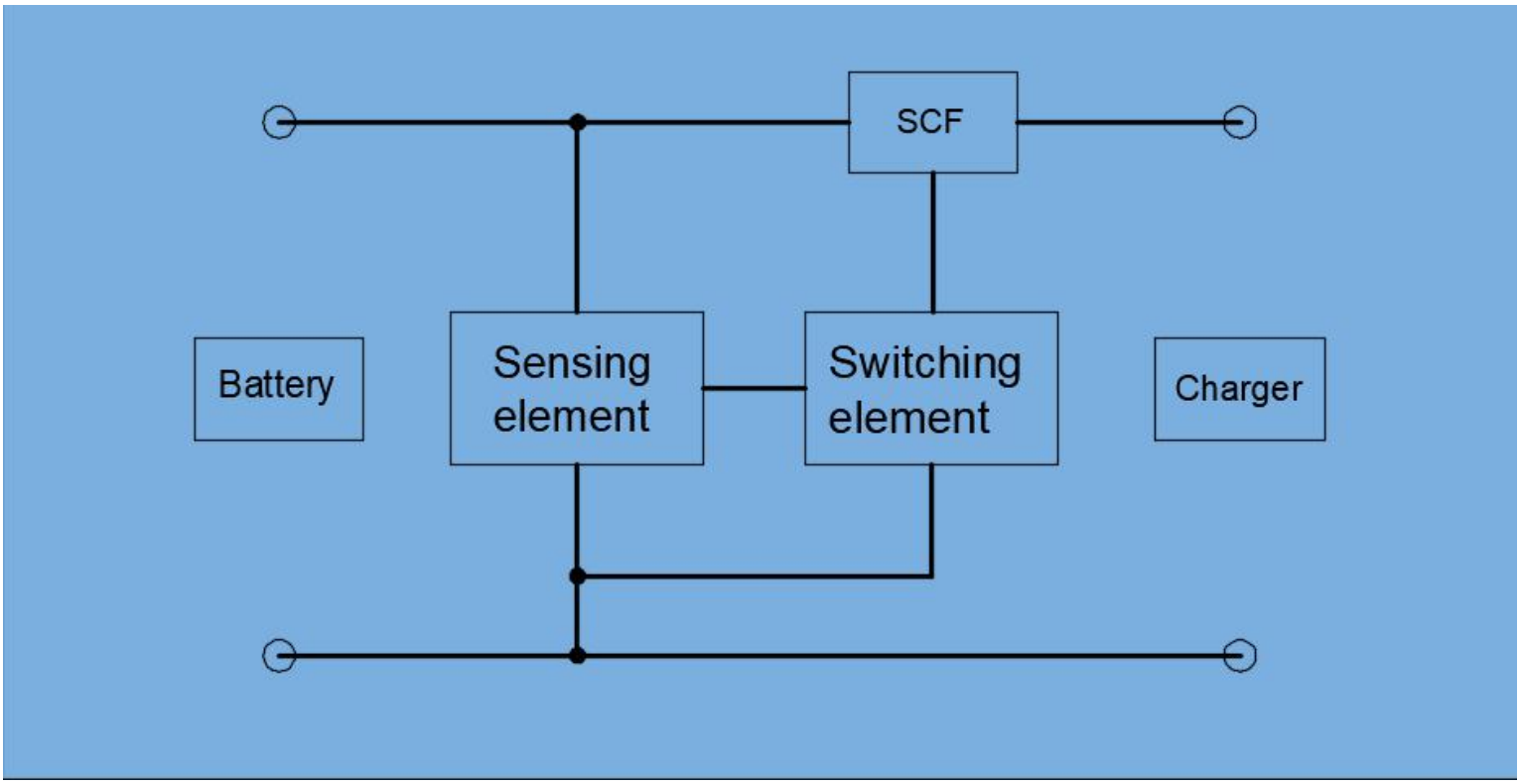


—All temperature refer to topside of the package, measured on the package body surface
—If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements

Physical Specifications

Material	Glass Epoxy PCB
Base Thickness	0.6mm
Copper Thickness	0.07mm
Covered Wire	AWG10 (WSFD 30A series)
	AWG8(WSFD 45A series)

Typical Application Circuit Diagram



Installation and Handling Guidelines

• Before and after mounted,the ultrasonic-cleaning or immersion-cleaning must not be done to WSFD 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 WSFD devices, and shall not be used or applied.

• Please Do Not reuse the WSFD device removed by the soldering process.

• WSFD 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 WSFD devices.

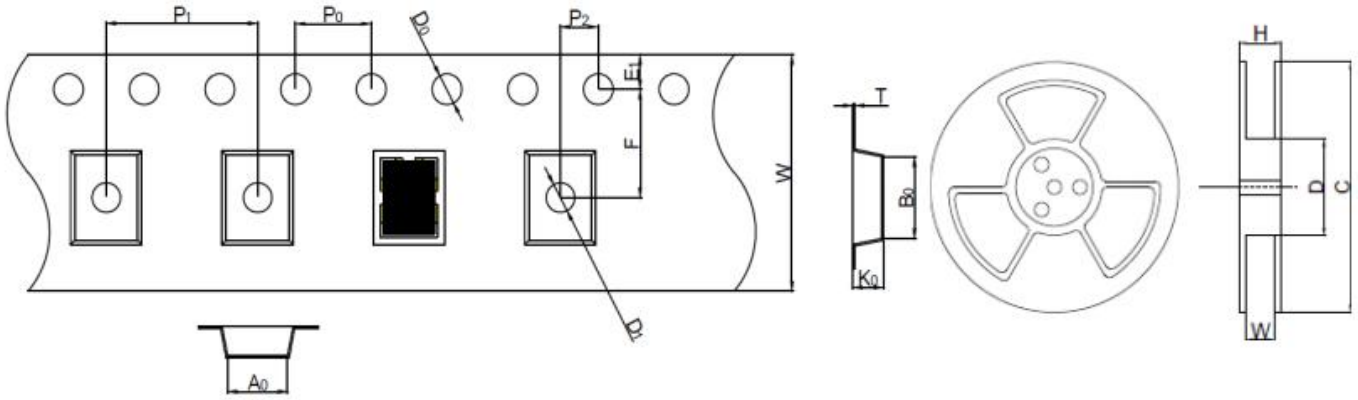
• The performance of WSFD devices will be adversely affected if they are improperly used under electronic, thermal and/or mechanical procedures and/or conditions non-conformant to those recommended by manufacturer.

• 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 WSFD devices.

• There should be minimum of 0.1mm spacing between WSFD 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)



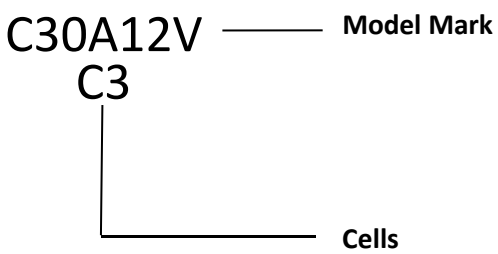
Part Numbering System

W SF D 30 12 - 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，9.5*5.0mm
④表示额定电流值为 30A
⑤表示工作电压为 12V
⑥表示特殊后缀

Symbol	Dimension
W	16.0±0.30
F	7.50±0.10
E1	1.75±0.10
D0	Φ1.50±0.10
D1	Φ1.50±0.10
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
A0	5.40±0.10
B0	9.85±0.10
T	0.30±0.05
K0	2.48±0.10
H	21.4±1.0
W	17.4±1.0
D	Φ99.0±0.5
C	Φ330.0±1.0

Part Marking System



Packaging

Part Number	Tape and Reel Quantity
WSFDXXXX	5,000