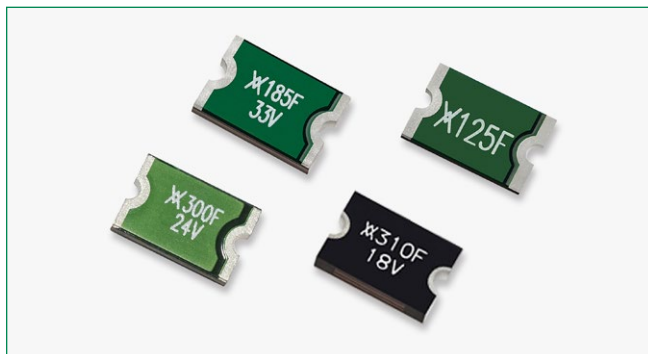


## SMDC Series



### Description

The SMDC series provides surface mount overcurrent protection for applications where space is at a premium and resettable protection is desired.

### Features

- Broadest range of resettable devices available in industry
- Low resistance
- Small 2920 footprint
- Fast time-to-trip
- RoHS compliant, lead-free and halogen-free

### Agency Approvals

Agency	Agency File Number
	E74889
	78165
	72161779

### Applications

- Mobile Electronics and Batteries
- Computer
- Portable electronics
- Multimedia
- Game machines
- Telephone and broadband
- Automotive
- Industrial controls
- Battery

### Additional Information



Datasheet



Resources



Samples

### Electrical Characteristics

Part Number	$I_H$	$I_T$	$V_{MAX}$	$I_{MAX}$	$P_{D MAX}$	Max Time-to-trip		$R_{MIN}$	$R_{1MAX}$
	(A)	(A)	(V <sub>DC</sub> )	(A)	(W)	(A)	(s)	(Ω)	(Ω)
SMDC Series — Size 7555mm/2920mils									
SMDC030F	0.30	0.60	60	10	1.50	1.50	3.00	0.300	3.400
SMDC050F	0.50	1.00	60	10	1.50	2.50	4.00	0.150	1.200
SMDC075F	0.75	1.5	33	40	1.50	8.00	0.30	0.100	0.610
SMDC125F/33	1.25	2.50	33	40	1.50	8.00	2.00	0.040	0.250
SMDC185F/33	1.85	3.70	33	40	1.70	8.00	2.50	0.050	0.150
SMDC300F/24	3.00	6.00	24	40	1.70	8.00	5.00	0.015	0.072
SMDC310F/18	3.10	6.00	18	50	1.50	8.00	25.00	0.013	0.036

#### Notes:

- $I_H$  : Hold current: maximum current device will pass without interruption in 20°C still air.  
 $I_T$  : Trip current: minimum current that will switch the device from low resistance to high resistance in 20°C still air.  
 $V_{MAX}$  : Maximum continuous voltage device can withstand without damage at rated current.  
 $I_{MAX}$  : Maximum fault current device can withstand without damage at rated voltage.  
 $P_D$  : Power dissipated from device when in the tripped state in 20°C still air.  
 $R_{MIN}$  : Minimum resistance of device as supplied at 20°C unless otherwise specified.  
 $R_{1MAX}$  : Maximum resistance measured one hour post-trip or post-reflow at 20°C.

## Temperature Derating

### Maximum Ambient Temperature

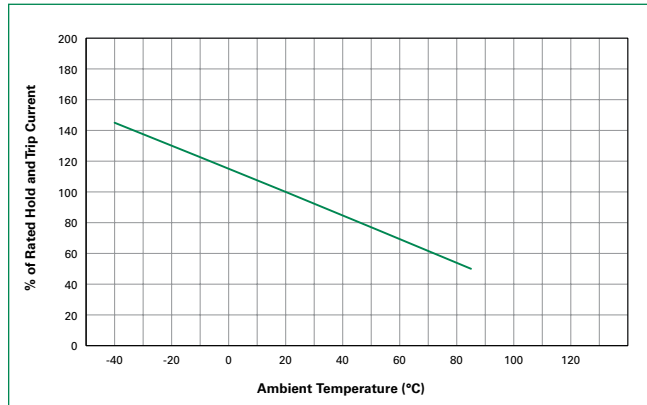
Part Number	-40°C	-20°C	0°C	20°C	25°C	40°C	50°C	60°C	70°C	80°C	85°C
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### Hold Current (A)

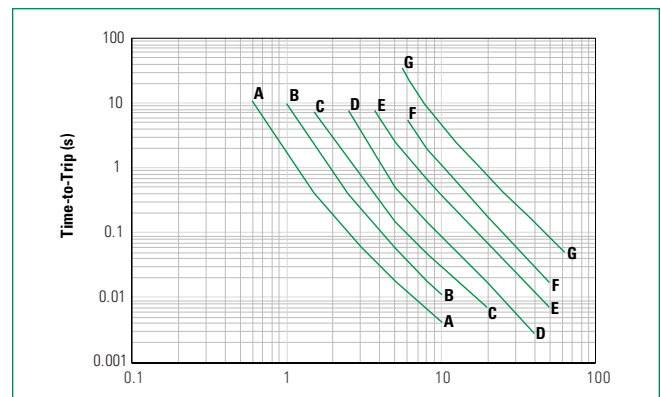
#### SMDC Series — Size 7555mm/2920mils

SMDC030F	0.490	0.430	0.370	0.310	0.300	0.250	0.220	0.190	0.160	0.141	0.120
SMDC050F	0.860	0.750	0.650	0.540	0.500	0.430	0.370	0.320	0.260	0.224	0.180
SMDC075F	1.170	1.040	0.900	0.770	0.750	0.640	0.570	0.500	0.440	0.323	0.340
SMDC125F/33	2.02	1.78	1.55	1.31	1.25	1.08	0.96	0.84	0.72	0.60	0.54
SMDC185F/33	2.83	2.50	2.20	1.85	1.74	1.53	1.37	1.22	1.04	0.88	0.80
SMDC300F/24	4.70	4.19	3.70	3.17	3.00	2.66	2.41	2.20	1.90	1.65	1.50
SMDC310F/18	4.50	4.06	3.78	3.19	3.10	2.75	2.54	2.32	2.10	1.88	1.76

## Temperature Derating Curve



## Typical Time-to-Trip Curves at 20°C



**A** = SMDC030F  
**B** = SMDC050F  
**C** = SMDC075F  
**D** = SMDC125F/33  
**E** = SMDC185F/33  
**F** = SMDC300F/24  
**G** = SMDC310F/18

## Physical Specifications

<b>Terminal Pad Material</b>	100% Matte Tin with Nickel Underplate
<b>Soldering Characteristics</b>	ANSI/J-STD-002 Category 3
<b>Solder Heat Withstand</b>	per IEC-STD 68-2-20, Test Tb, Section 5, Method 1a
<b>Flammability Resistance</b>	per IEC 695-2-2 Needle Flame Test for 20 seconds

## Environmental Specifications

Test	Test Method	Conditions	Resistance Change
<b>Storage Life</b>	PS300, Section 5.3.2	60°C, 1000 hrs, 85°C, 1000 hrs	±3% typ, ±5% typ
<b>Humidity Aging</b>	PS300, Section 5.3.1	85°C, 85% R.H., 100 hrs	±1.2% typ
<b>Thermal Shock</b>	MIL-STD-202, Method 107G	85°C, -40°C (20 Times)	-33% typ
<b>Vibration</b>	MIL-STD-883C	per MIL-STD-883C	No Change
<b>Solvent Resistance</b>	PS300, Section 5.2.2	Freon, Trichloroethane, Hydrocarbons	No Change
<b>Moisture Resistance Level</b>	Level 2a, J-STD-020		
<b>Storage Conditions</b>	40°C max, 70% RH max; devices should remain in original sealed bags prior to use. Devices may not meet specified values if these storage conditions are exceeded.		

## Dimension Figures

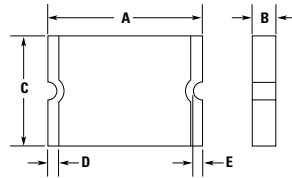


Figure 1

## Dimensions

Part Number	Dimensions in Millimeters (Inches)										Figure
	A		B		C		D		E		
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	
SMDC Series — Size 7555mm/2920mils											
SMDC030F	7.30	7.70	0.63	0.90	4.90	5.30	0.25	0.95	0.20	-	1
	(0.287)	(0.303)	(0.025)	(0.035)	(0.193)	(0.209)	(0.010)	(0.040)	(0.008)		
SMDC050F	7.30	7.70	0.63	0.90	4.90	5.30	0.25	0.95	0.20	-	1
	(0.287)	(0.303)	(0.025)	(0.035)	(0.193)	(0.209)	(0.010)	(0.040)	(0.008)		
SMDC075F	7.30	7.70	0.63	0.90	4.90	5.30	0.25	0.95	0.20	-	1
	(0.287)	(0.303)	(0.025)	(0.035)	(0.193)	(0.209)	(0.010)	(0.040)	(0.008)		
SMDC125F/33	7.30	7.70	0.45	0.71	4.90	5.30	0.25	0.95	0.20	—	1
	(0.287)	(0.303)	(0.018)	(0.028)	(0.193)	(0.209)	(0.010)	(0.040)	(0.008)		
SMDC185F/33	7.30	7.70	0.90	1.20	4.90	5.30	0.25	0.95	0.20	—	1
	(0.287)	(0.303)	(0.035)	(0.047)	(0.193)	(0.209)	(0.010)	(0.040)	(0.008)		
SMDC300F/24	7.30	7.70	0.80	1.10	4.90	5.30	0.25	0.95	0.20	—	1
	(0.287)	(0.303)	(0.031)	(0.043)	(0.193)	(0.209)	(0.010)	(0.040)	(0.008)		
SMDC310F/18	7.30	7.70	1.10	1.70	4.90	5.30	0.95	1.45	0.35	—	1
	(0.287)	(0.303)	(0.043)	(0.067)	(0.193)	(0.209)	(0.037)	(0.057)	(0.014)		

## Recommended Pad Layout

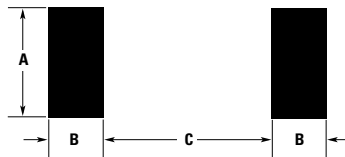
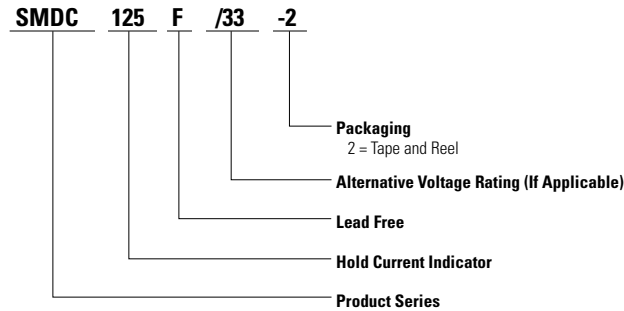


Figure 2

## Recommended Pad Layout

Part Number	Tape and Reel Quantity	Standard Package	Part Marking	Recommended Pad Layout Figures [mm (in)]			Agency Recognition
				Dimension A (Nom)	Dimension B (Nom)	Dimension C (Nom)	
SMDC Series — Size 7555mm/2920mils							
SMDC030F	4,000	20,000	030F	5.30 (0.209)	2.00 (0.079)	4.60 (0.18)	-
SMDC050F	4,000	20,000	050F	5.30 (0.209)	2.00 (0.079)	4.60 (0.18)	-
SMDC075F	4,000	20,000	075F	5.30 (0.209)	2.00 (0.079)	4.60 (0.18)	-
SMDC125F/33	4,000	20,000	125F	5.30 (0.209)	2.00 (0.079)	4.60 (0.18)	UL
SMDC185F/33	4,000	20,000	185F 33V	5.30 (0.209)	2.00 (0.079)	4.60 (0.18)	UL, CSA, TÜV
SMDC300F/24	4,000	20,000	300F 24V	5.30 (0.209)	2.00 (0.079)	4.60 (0.18)	UL, CSA, TÜV
SMDC310F/18	3,000	15,000	310F 18V	5.30 (0.209)	2.00 (0.079)	4.60 (0.18)	UL, CSA, TÜV

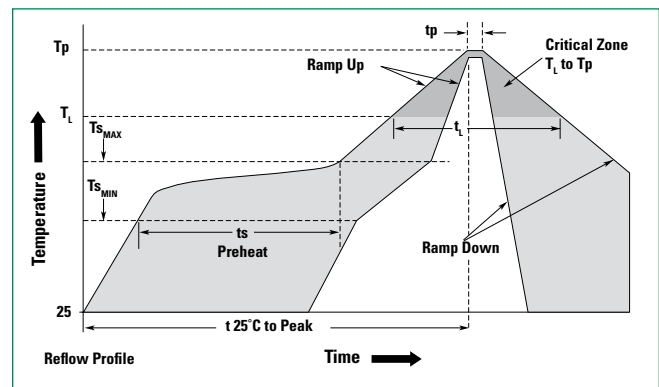
## Part Ordering Number System



## Solder Reflow Recommendations

Profile Feature	Pb-Free Assembly
Average ramp up rate ( $T_{s\_MAX}$ to $T_p$ )	3°C/s 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 s
Time maintained above:	-
• Temperature ( $T_L$ )	217°C
• Time ( $t_L$ )	60-150 s
Peak/Classification temperature ( $T_p$ )	260°C
Time within 5°C of actual peak temperature	-
Time ( $t_p$ )	30 s max
Ramp down rate	3°C/s max
Time 25°C to peak temperature	8 min max

**Note:** All temperatures refer to top side of the package, measured on the package body surface.



### Solder Reflow

- Recommended reflow method: IR, hot air, nitrogen.
- Recommended maximum paste thickness: 0.25mm (0.010in)
- Devices can be cleaned using standard methods and aqueous solvents.
- Experience has shown the optimum conditions for forming acceptable solder fillets occur when a reasonable amount of solder paste is placed underneath each device's termination. As such, we request that customers comply with our recommended solder pad layouts.
- Customer should validate that the solder paste amount and reflow recommendations meet its application.
- We request that customer board layouts refrain from placing raised features (e.g. vias, nomenclature, traces, etc.) underneath PolySwitch devices. It is possible that raised features could negatively impact solderability performance of our devices.

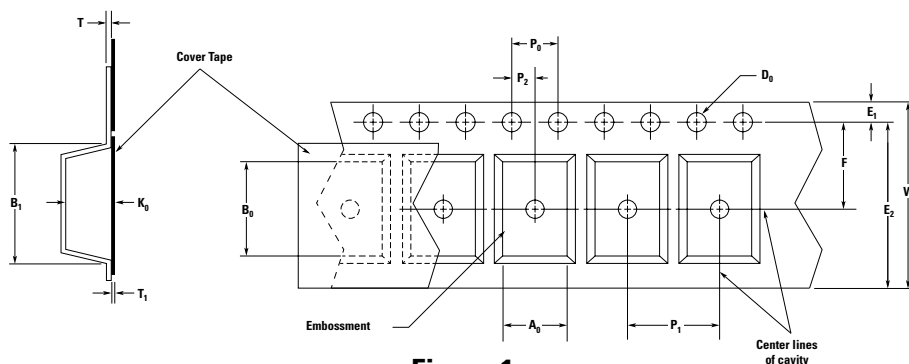
### Rework

- Standard industry practices. (Please also avoid direct contact to the device.)

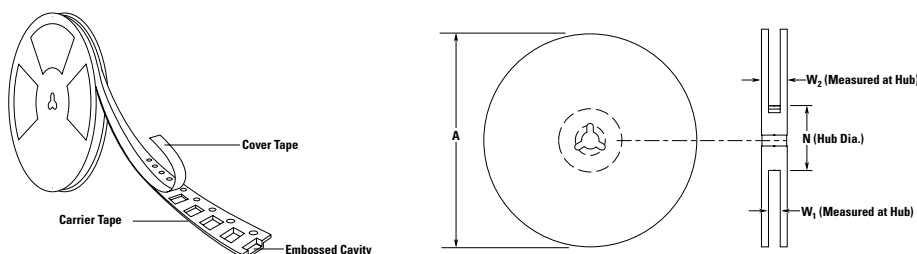
## Tape and Reel Specifications

Description	SMDC, EIA 481-1		
	SMDC030F, SMDC050F, SMDC075F, SMDC125F/33	SMDC185F/33, SMDC300F/24	SMDC310F/18
<b>W</b>	16.0 ± 0.30	16.0 ± 0.30	16.0 ± 0.30
<b>P<sub>0</sub></b>	4.0 ± 0.10	4.0 ± 0.10	4.0 ± 0.10
<b>P<sub>1</sub></b>	8.0 ± 0.10	8.0 ± 0.10	8.0 ± 0.10
<b>P<sub>2</sub></b>	2.0 ± 0.10	2.0 ± 0.10	2.0 ± 0.10
<b>A<sub>0</sub></b>	5.5 ± 0.1	5.35 ± 0.1	5.5 ± 0.1
<b>B<sub>0</sub></b>	7.9 ± 0.1	7.85 ± 0.1	8.0 ± 0.1
<b>B<sub>1</sub> max</b>	12.1	12.1	12.1
<b>D<sub>0</sub></b>	1.5 + 0.10/ -0.00	1.5 + 0.10/ -0.00	1.5 + 0.10/ -0.00
<b>F</b>	7.50 ± 0.10	7.50 ± 0.10	7.50 ± 0.10
<b>E<sub>1</sub></b>	1.75 ± 0.10	1.75 ± 0.10	1.75 ± 0.10
<b>E<sub>2</sub> min</b>	14.25	14.25	14.25
<b>T max</b>	0.35	0.35	0.35
<b>T<sub>1</sub> max</b>	0.1	0.1	0.1
<b>K<sub>0</sub></b>	0.9 ± 0.1	1.45 ± 0.1	2.0 ± 0.1
<b>A max</b>	330	330	330
<b>N min</b>	50	50	50
<b>W<sub>1</sub></b>	16.4 + 2.0/-0.00	16.4 + 2.0/-0.00	16.4 + 2.0/-0.00
<b>W<sub>2</sub> max</b>	22.4	22.4	22.4

## Tape and Reel Diagrams



**Figure 1**



**Figure 2**

### WARNING

- Users should independently evaluate the suitability of and test each product selected for their own application.
- Operation beyond the maximum ratings or improper use may result in device damage and possible electrical arcing and flame.
- These devices are intended for protection against damage caused by occasional overcurrent or overtemperature fault conditions and should not be used when repeated fault conditions or prolonged trip events are anticipated.
- Contamination of the PPTC material with certain silicone-based oils or some aggressive solvents can adversely impact the performance of the devices.
- Device performance can be impacted negatively if devices are handled in a manner inconsistent with recommended electronic, thermal, and mechanical procedures for electronic components.
- PPTC devices are not recommended for installation in applications where the device is constrained such that its PTC properties are inhibited, for example in rigid potting materials or in rigid housings, which lack adequate clearance to accommodate device expansion.
- Operation in circuits with a large inductance can generate a circuit voltage ( $L di/dt$ ) above the rated voltage of the device.

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