

1. Synopsis

1-1. General Description

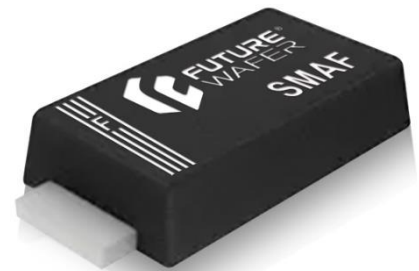
These Devices Employ The Schottky Barrier Principle in a Metal-to-Silicon Power Rectifier. Features Epitaxial Construction With Oxide Passivation and Metal Overlay Contact. Ideally Suited For Low Voltage, High Frequency Switching Power Supplies; Free Wheeling Diodes and Polarity Protection Diodes.



SMAJ

1-2. Feature List

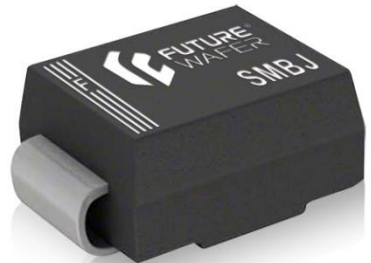
- High Surge Current Capability
- Low Power Loss, High Efficiency
- Low Forward Voltage
- Ultra Low Leakage Current
- Soft, Fast Switching Capability
- High Operating Junction Temperature



SMAF

1-3. Applications

- For Use In Low Voltage High Frequency Inverters, Freewheeling, DC/DC Converters, and Polarity Protection Applications.



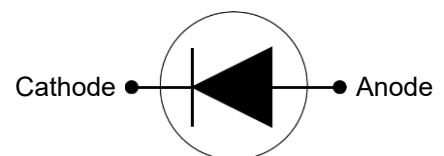
SMBJ

1-4. Benefits

- Essentially No Switching Losses
- Higher Efficiency
- Reduction Of Heat Sink Requirements
- Parallel Devices Without Thermal Runaway
- Higher System Reliability Due To Lower Operating Temperatures

1-5. Mechanical Characteristics

- Molded JEDEC Package: SMAJ / SMAF / SMBJ
- Packing: Tape and Reel
- Flammability rating UL 94V-0
- Halogen Free
- JEDEC MSL Classification: Level 1



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3. Electrical Property

3-1. Absolute Maximum Ratings

Maximum Ratings@25°C Unless Otherwise Specified			
Parameter	Symbol	Values	Units
Maximum Repetitive Peak Reverse Voltage	V_{RRM}	100	V
Maximum RMS Voltage	V_{RMS}	70	
Maximum DC Blocking Voltage	V_{DC}	100	
Maximum Average Forward Rectified Current, $T_L = 150^\circ\text{C}$	$I_{F(AV)}$	1	A
Peak Forward Surge Current, 10ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	50	
Repetitive Peak Avalanche Power (Rated V_R), $t_p = 10\mu\text{s}$	P_{TOT}	108	W
Operating Temperature	T_J	-65 ~ +175	°C
Storage Temperature	T_{STG}		

3-2. Electrical Characteristics (TA=25°C)

Maximum Ratings@25°C Unless Otherwise Specified							
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Units	
Maximum Forward Voltage	V_F	$I_F = 1\text{A}$	$T_J = 25^\circ\text{C}$	-	-	0.77	V
			$T_J = 125^\circ\text{C}$	-	0.58	0.62	
		$I_F = 2\text{A}$	$T_J = 25^\circ\text{C}$	-	-	0.86	
			$T_J = 125^\circ\text{C}$	-	0.65	0.70	
Maximum Reverse Current	I_R	$V_R = V_{RRM}$	$T_J = 25^\circ\text{C}$	60	-	-	uA
			$T_J = 125^\circ\text{C}$	30	-	-	mA

3-3. Thermal Characteristics

Maximum Ratings@25°C Unless Otherwise Specified				
Parameter	Symbol	Package	Max. Values	Units
Junction To Lead	$R_{\theta JL}$	SMAJ	100	°C/W
		SMAF	1	
		SMBJ	50	

3-4. Ratings and Characteristics Curve (TA=25°C unless otherwise noted)

Fig 1. Maximum Forward Current Derating Curve

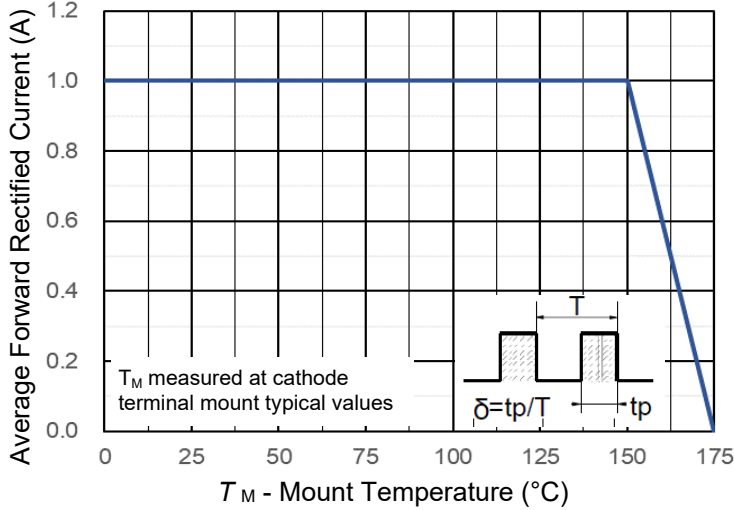


Fig 2. Typical Instantaneous Forward Characteristics

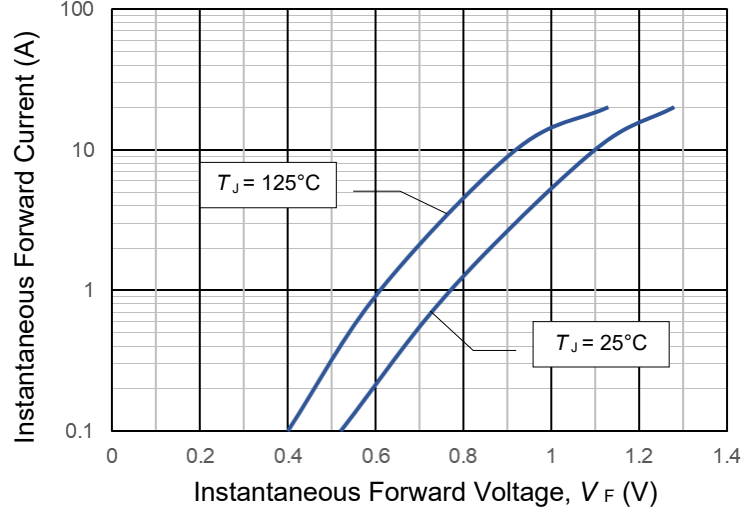


Fig 3. Typical Reverse Current Characteristics

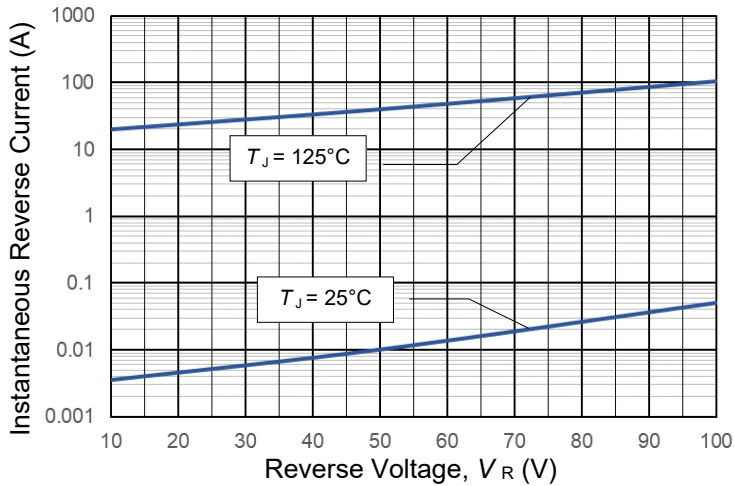


Fig 4. Typical Junction Capacitance

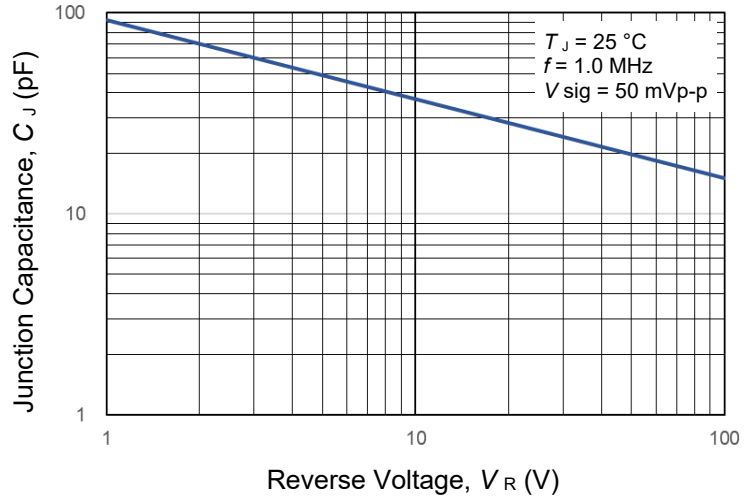
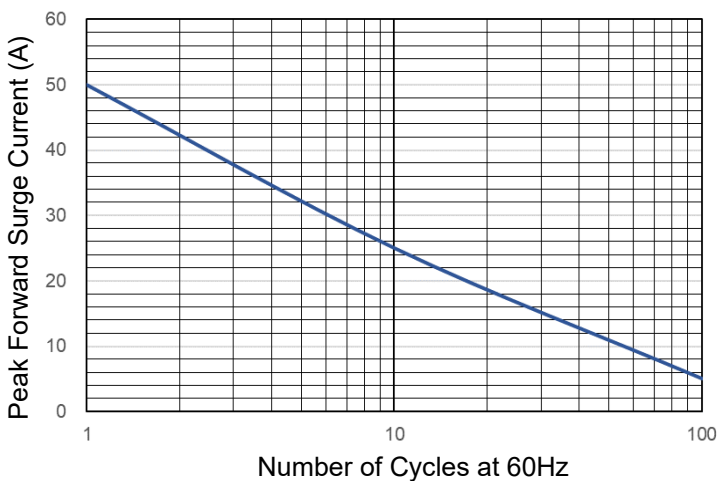


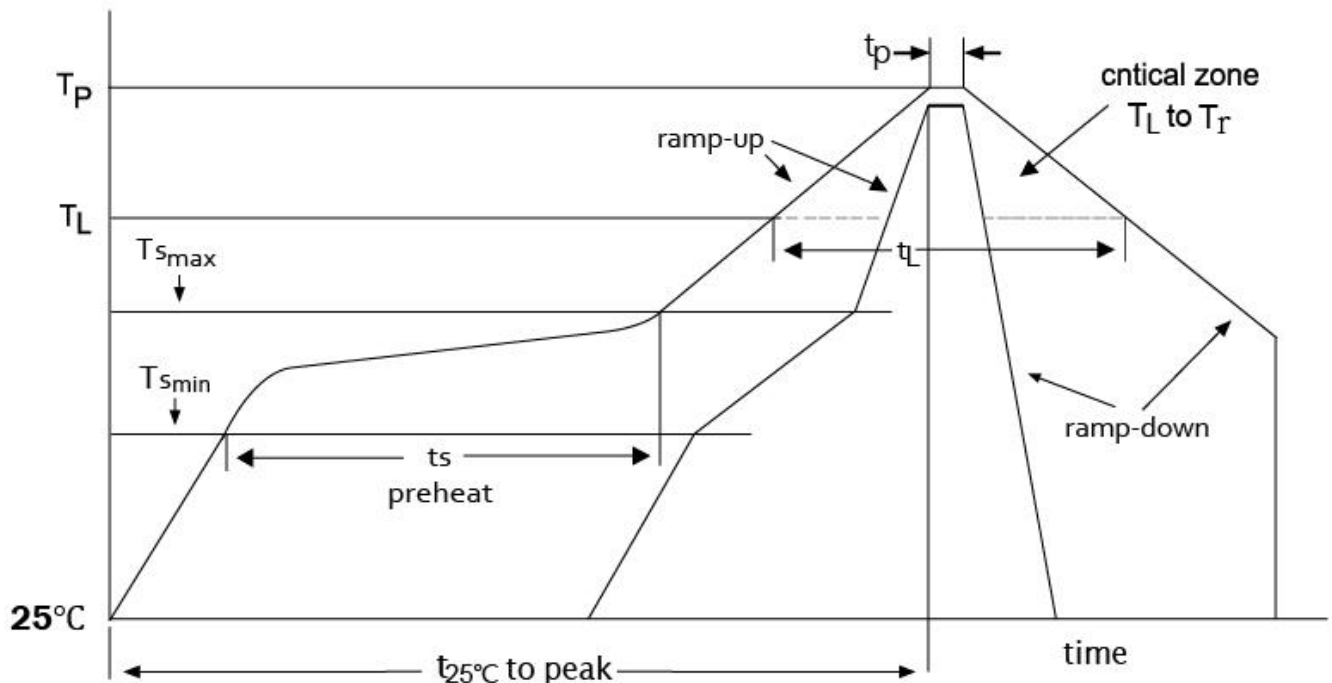
Fig 5. Maximum Non-repetitive Forward Surge Current



4. Soldering Parameters

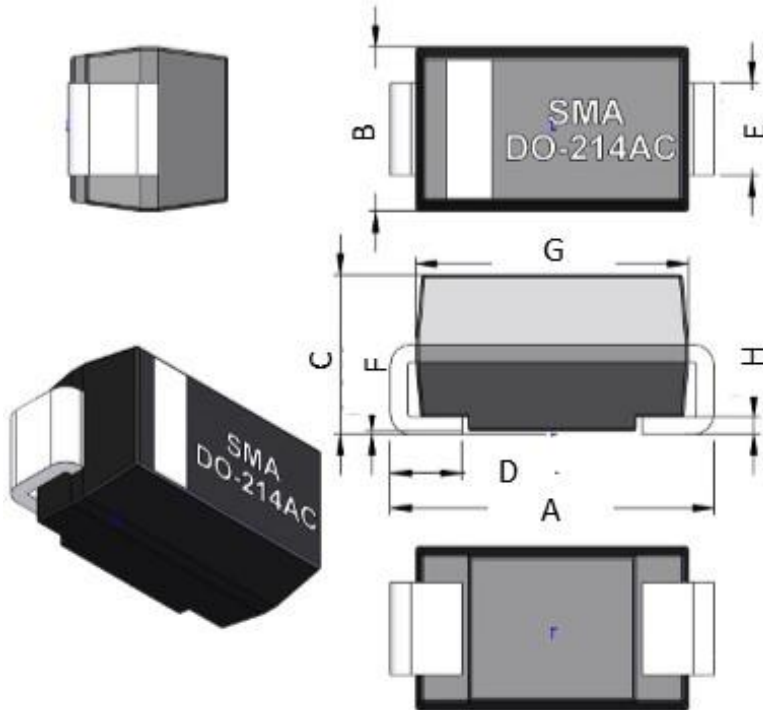
Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate (T _{smax} to T _p)	3 °C/s maximum	3 °C/s maximum
Preheat		
Temperature minimum (T _{smin})	100 °C	150 °C
Temperature maximum (T _{smax})	150 °C	200 °C
Time (t _{smin} to t _{smax})	60 s to 120 s	60 s to 180 s
Time maintained above		
Temperature (T _L)	183 °C	217 °C
Time (t _L)	60 s to 150 s	60 s to 150 s
Peak/classification temperature (T)	235 °C	260 °C
Number of allowed reflow cycles	3	3
Time within 5 °C of actual peak temperature (t _p)	10 s to 30 s	20 s to 40 s
Ramp-down rate	6 °C/s maximum	6 °C/s maximum
Time 25 °C to peak temperature	6 minutes maximum	8 minutes maximum

temperature



5. Package Information

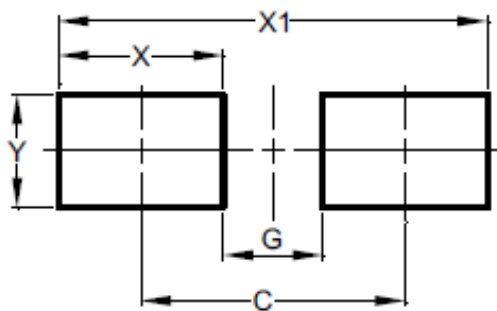
5-1. Dimension-SMAJ



SMAJ		
Symbol	Min.	Max.
A	4.75	5.25
B	2.55	2.85
C	2.00	2.50
D	0.85	1.55
E	1.35	1.65
F	-	0.40
G	4.25	4.55
H	0.15	0.30

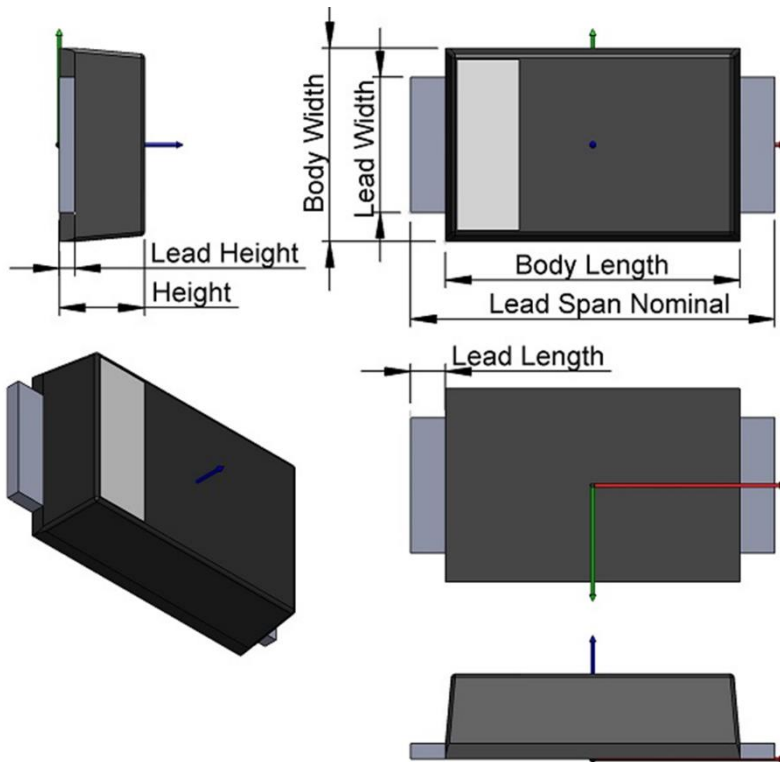
Unit:mm

5-2. PCB Pad Layout Recommendation-SMAJ



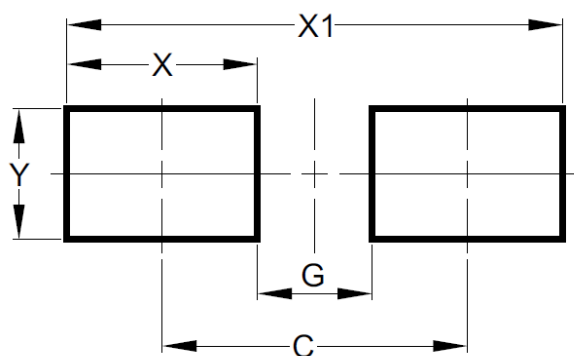
SMAJ	
Symbol	Values
C	4.00
G	1.50
X	2.50
X1	6.50
Y	1.70

Unit:mm

5-3. Dimension-SMAF


SMAF		
Symbol	Min.	Max.
Body Length	4.15	4.35
Lead Span Nominal	5.05	5.35
Lead Width	1.25	1.45
Body Width	2.50	2.70
Height	0.90	1.30
Lead Height	0.15	0.30
Lead Length	0.70	1.00

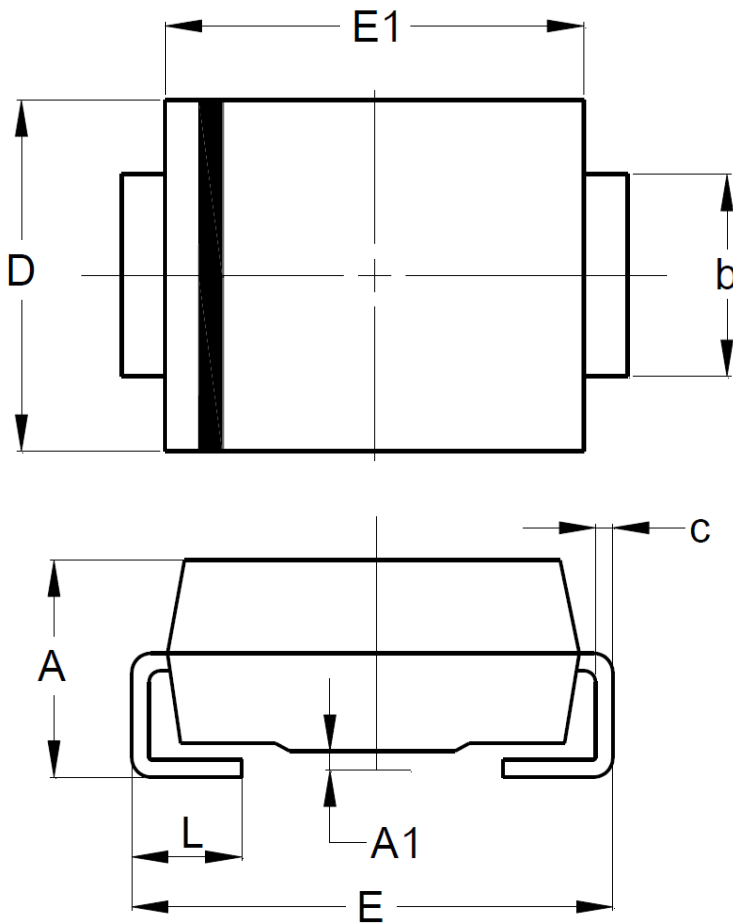
Unit:mm

5-4. PCB Pad Layout Recommendation-SMAF


SMAF	
Symbol	Values
C	4.32
G	3.12
X	1.20
X1	5.52
Y	1.52

Unit:mm

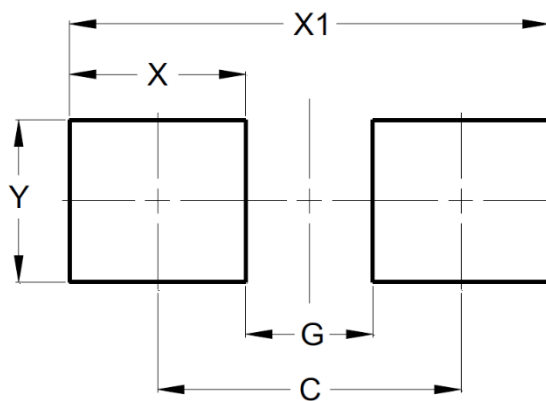
5-5. Dimension-SMBJ



SMBJ		
Dim	Min.	Max.
A	2.00	2.60
A1	0.05	0.20
b	1.85	2.20
c	0.15	0.31
D	3.30	3.94
E	5.00	5.59
E1	4.05	4.75
L	0.76	1.52

Unit:mm

5-6. PCB Pad Layout Recommendation-SMBJ

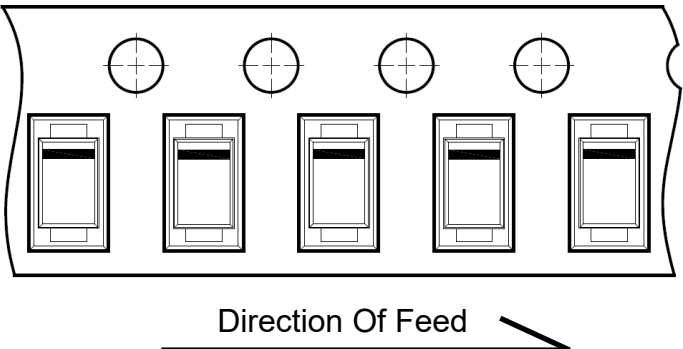


SMBJ	
Symbol	Values
C	4.30
G	1.80
X	2.50
X1	6.80
Y	2.30

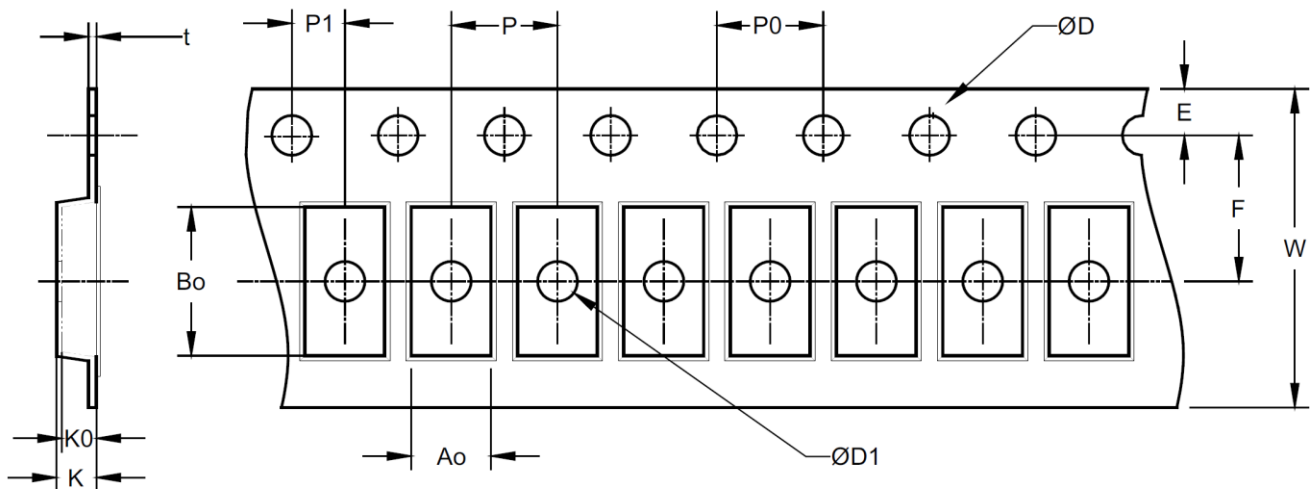
Unit:mm

6. Packing

6-1. Taping and Reel Specification-SMAJ & SMAF

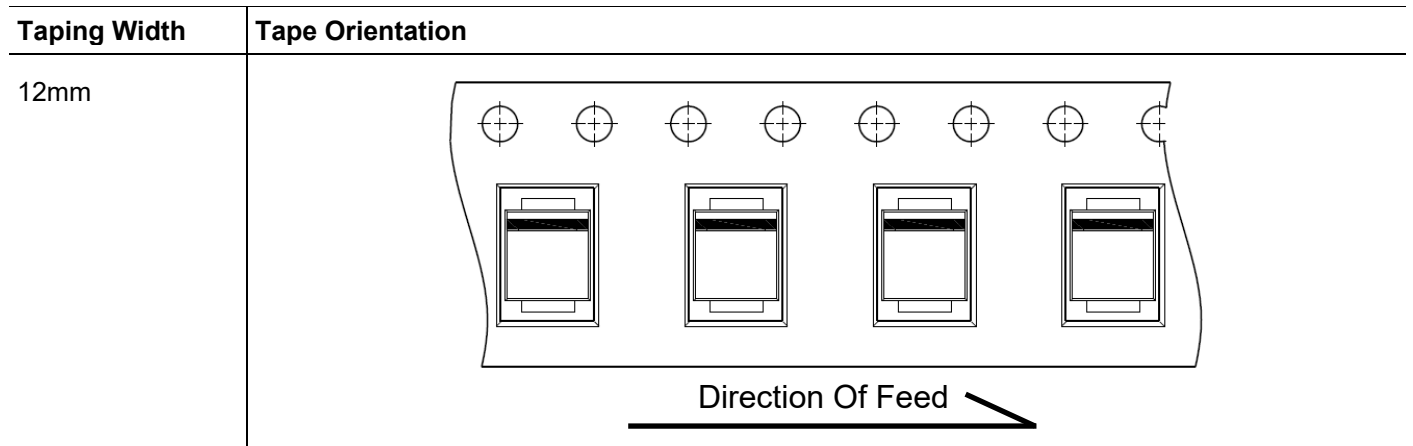
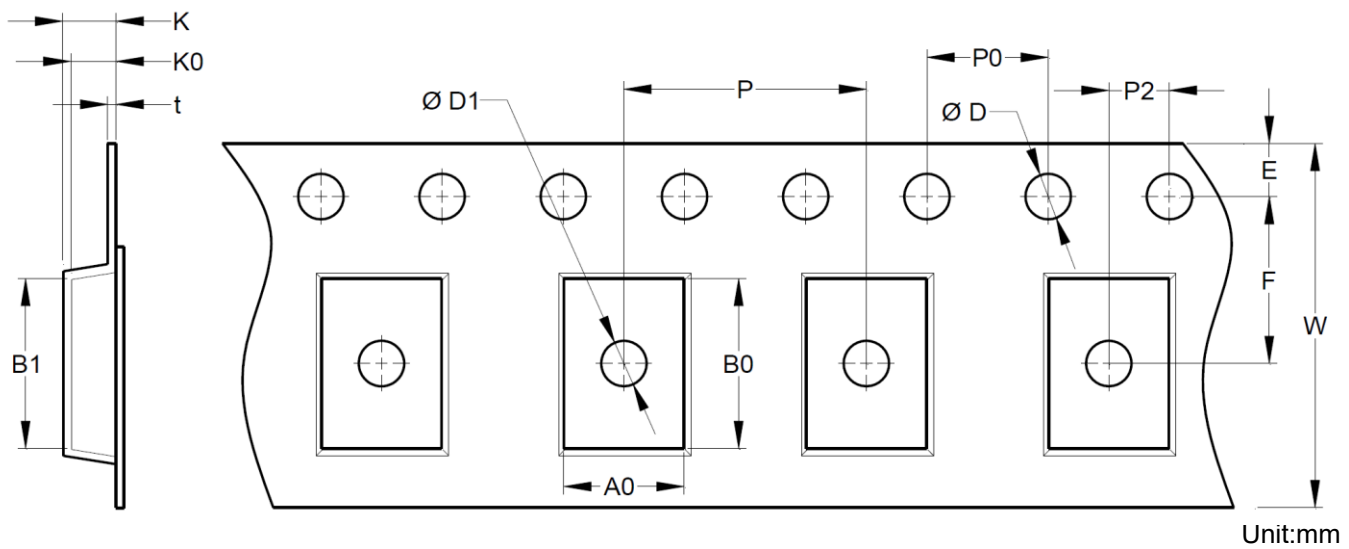
Taping Width	Tape Orientation
12mm	

6-2. Embossed Carrier Tape Specification-SMAJ & SMAF



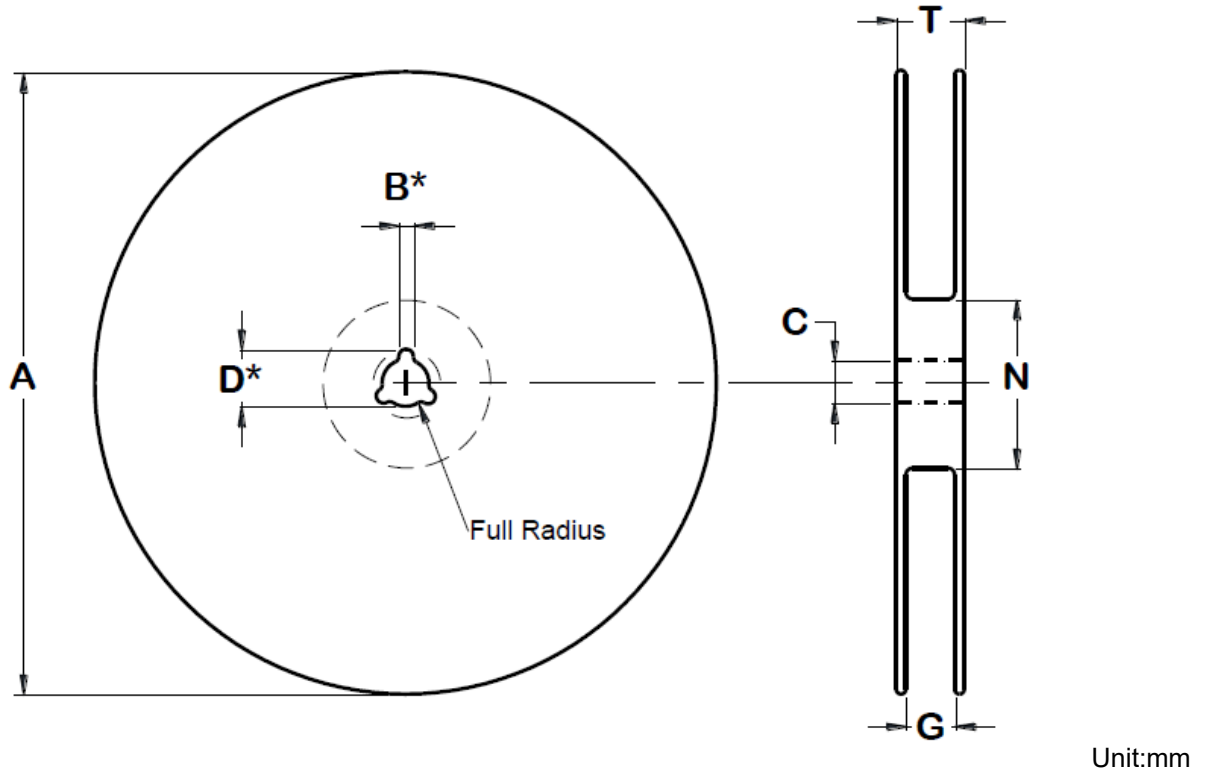
Unit:mm

Dimension	W	Ao	Bo	D	D1	E	F	K	P	P0	P1	t	W
Value	12 mm	3.0 ±0.10	5.6 ±0.10	1.5 ±0.10	1.5 Min	1.75 ±0.10	5.5 ±0.05	1.2 ±0.10	4.0 ±0.10	4.0 ±0.05	2.0 ±0.05	0.25 ±0.05	12 ±0.2
A0 / B0 / K0	Determined by Component Size. The Clearance Between the Component And The Cavity Must Comply to The Rotational And Lateral Movement Requirement Provided in Figures in The "Maximum Component Movement in Tape Pocket" Section.												

6-3. Taping and Reel Specification-SMBJ

6-4. Embossed Carrier Tape Specification-SMBJ


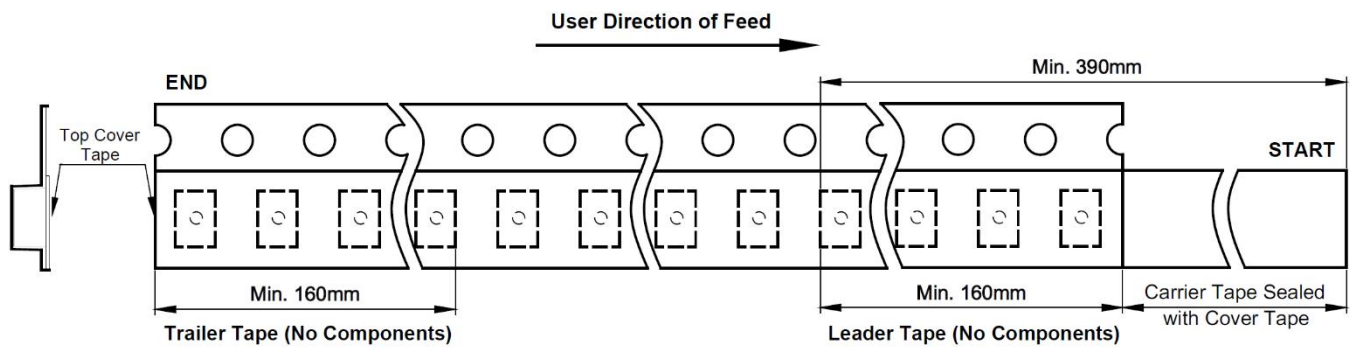
Dimension	W	B1	D	D1	E	F	K	P	P0	P2	t	W
Value	12 mm	8.2 Max	1.5+ 0.1/- 0.0	1.5 Min.	1.75 ±0.10	5.5 ±0.05	4.5 Max.	8.0 ±0.10	4.0 ±0.10	2.0 ±0.05	0.4 Max.	12 ±0.3
A0 / B0 / K0	Determined by Component Size. The Clearance Between the Component And The Cavity Must Comply to The Rotational And Lateral Movement Requirement Provided in Figures in The "Maximum Component Movement in Tape Pocket" Section.											

6-5. Surface Mount Reel Specification



Dimension	Tape Width	Reel Size	A	B	C	D	N	G	T
Value	12 mm	13"	330 ±2	2.0 +0.5-0	13 +0.5-0.2	20.5 ±0.2	100 ±2	12.4 +2.0 -0.0	18.4

6-6. Tape Leader and Trailer Specification



7. Ordering Information

Part Number	Marking Code	Quantity	Component Package	Packaging Option
SBR1H100A	FAGG	5,000PCS	SMAJ	Tape & Reel - 12mm tape / 13" reel
SBR1H100AF	FAGH		SMAF	
SBR1H100B	FAGI	3,000PCS	SMBJ	

8. Version

8-1. History

Version	Date	File No.	Recording	Basis
A	06-May-2018	F22108A	New Create	Market
B	13-Jun-2019		Update Company Info.	System
2.0	11-Mar-2021		Update Version	System
2.1	08-Nov-2021		Update Version	System