

1. Synopsis

1-1. General Description

The SMCJ Series Has Been Designed To Protect Sensitive Equipment Against Electro-Static Discharges According to IEC 61000-4-2, MIL STD 883 Method 3015, And Electrical Over Stress Such as IEC 61000-4-4 and 5. They Are Generally For Surges Below 1500 W (10/1000 μ s).

This Technology Makes It Compatible With High-End Equipment And SMPS Where Low Leakage Current And High Junction Temperature Are Required To Provide Reliability And Stability Over Time. Their Low Clamping Voltages Provide a Better Safety Margin to Protect Sensitive Circuits With Extended Life Time Expectancy.

Packaged in SMCJ, This Minimizes PCB Space Consumption.

1-2. Feature List

- Bi / Uni-Directional Configurations
- Plastic Package Has Underwriters
- Glass Passivated Chip Junction in SMCJ Package
- 1500 Watts Peak Pulse Power ($t_p = 10/1000\mu$ s)
- Halogen Free and RoHS Compliant
- Fast Response Time: Typically Less Than 1.0ps From 0 Volts to $V_{(BR)}$ For Uni-Directional and 5.0ns For Bi-Directional Types
- High Temperature Soldering Guaranteed: 250°C / 10 Seconds at Terminals

1-3. Applications

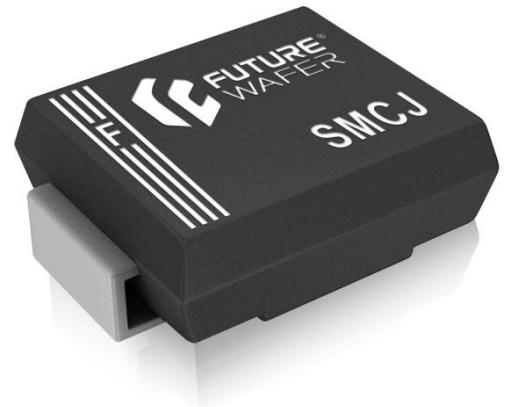
- Power Supply Protection
- Industrial Application
- Power Manager

1-4. IEC Compatibility

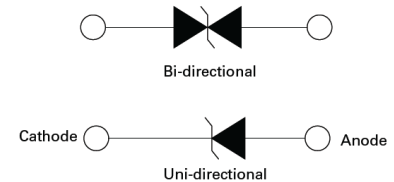
- EN61000-4
- 61000-4-2(ESD): Contact: $>\pm 30KV$, Air: $>\pm 30KV$
- 61000-4-4(EFT)
- 61000-4-5(Surge): 10/1000 μ s

1-5. Mechanical Characteristics

- Molded JEDEC SMCJ Package
- Packing: Tape and Reel
- Flammability Rating UL 94V-0
- Halogen Free
- JEDEC MSL Classification: Level 1



SMCJ



2. Contents

1. Synopsis	1
1-1. General Description	1
1-2. Feature List	1
1-3. Applications	1
1-4. IEC Compatibility	1
1-5. Mechanical Characteristics	1
2. Contents	2
3. Electrical Property	3
3-1. Absolute Maximum Ratings	3
3-2. Electrical Characteristics (TA=25°C unless otherwise noted)	4
3-3. I-V Curve Characteristics	5
3-4. Ratings and Characteristics Curve (TA=25°C unless otherwise noted)	6
4. Soldering Parameters	7
5. Package Information	8
5-1. Dimension	8
5-2. PCB Pad Layout Recommendation	8
6. Packing	9
6-1. Taping and Reel Specification	9
6-2. Embossed Carrier Tape Specification	9
6-3. Surface Mount Reel Specification	10
6-4. Tape Leader and Trailer Specification	10
7. Family Members	11
8. Ordering Information	12
9. Version	12
9-1. History	12
9-2. Company Profile	12

3. Electrical Property

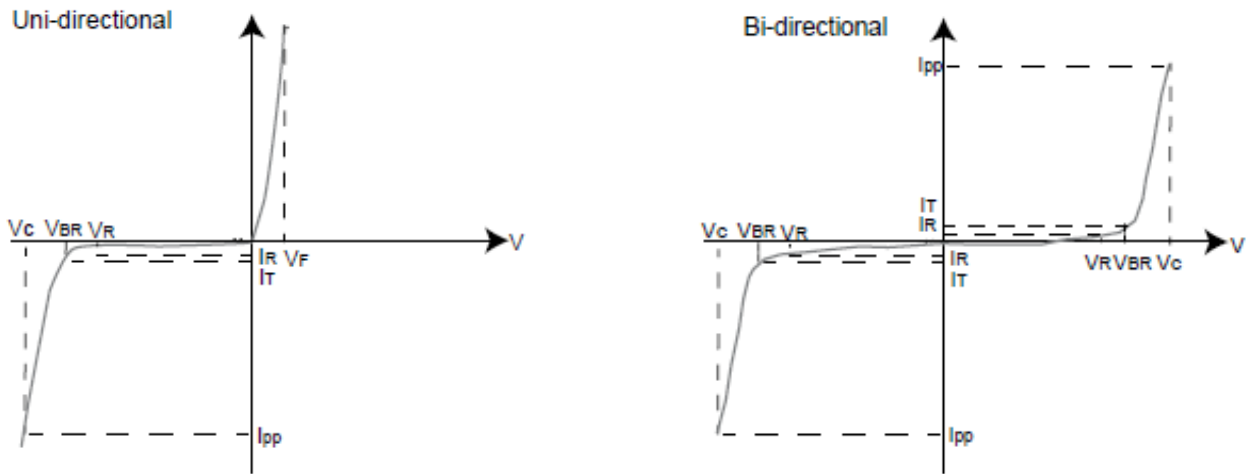
3-1. Absolute Maximum Ratings

Maximum Ratings@25°C Unless Otherwise Specified			
Parameter	Symbol	Value	Units
Peak Pulse Power (tp=10/1000us)	P_{PP}	1500	W
Peak Forward Surge Current, 8.3mS Signal Half Sine Wave Uni-Directional Only	I_{FSM}	200	A
Maximum instantaneous Forward Voltage at 100A For Uni-Direction Only	V_F	3.5	V
Operating Temperature	T_J	-55~+150	°C
Storage Temperature	T_{STG}		

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

Part Number		Reverse Stand-off Voltage	Breakdown Voltage	Test Current		Reverse Leakage	Max. Clamp Voltage	Peak Current	Pulse		Marking	
				I_T	I_R							
		V_{RWM}	$V_{BR} @ I_T$		I_T	$I_R @ V_{RWM}$	$V_C @ I_{PP}$	$I_{PP} (10/100\mu S)$			Uni	Bi
Uni	Bi	V	Min	Max	mA	μA	V	A			Uni	Bi
1500W Surface Mount Transient Voltage Suppressors SMCJ Series												
SMCJ5.0A	SMCJ5.0CA	5.0	6.40	7.07	10.0	200.0	9.2	163.0	GDE	BDE		
SMCJ6.0A	SMCJ6.0CA	6.0	6.67	7.37	10.0	200.0	10.3	145.6	GDG	BDG		
SMCJ6.5A	SMCJ6.5CA	6.5	7.22	7.98	10.0	100.0	11.2	133.9	GDK	BDK		
SMCJ7.0A	SMCJ7.0CA	7.0	7.78	8.60	10.0	100.0	12.0	125.0	GDM	BDM		
SMCJ7.5A	SMCJ7.5CA	7.5	8.33	9.21	1.0	100.0	12.9	116.3	GDP	BDP		
SMCJ8.0A	SMCJ8.0CA	8.0	8.89	9.83	1.0	100.0	13.6	110.3	GDR	BDR		
SMCJ8.5A	SMCJ8.5CA	8.5	9.44	10.40	1.0	20.0	14.4	104.2	GDT	BDT		
SMCJ9.0A	SMCJ9.0CA	9.0	10.00	11.10	1.0	10.0	15.4	97.4	GDV	BDV		
SMCJ10A	SMCJ10CA	10.0	11.10	12.30	1.0	10.0	17.0	88.2	GDX	BDX		
SMCJ11A	SMCJ11CA	11.0	12.20	13.50	1.0	1.0	18.2	82.4	GDZ	BDZ		
SMCJ12A	SMCJ12CA	12.0	13.30	14.70	1.0	1.0	19.9	75.4	GEE	BEE		
SMCJ13A	SMCJ13CA	13.0	14.40	15.90	1.0	1.0	21.5	69.8	GEG	BEG		
SMCJ14A	SMCJ14CA	14.0	15.60	17.20	1.0	1.0	23.2	64.7	GEK	BEK		
SMCJ15A	SMCJ15CA	15.0	16.70	18.50	1.0	1.0	24.4	61.5	GEM	BEM		
SMCJ16A	SMCJ16CA	16.0	17.80	19.70	1.0	1.0	26.0	57.7	GEP	BEP		
SMCJ17A	SMCJ17CA	17.0	18.90	20.90	1.0	1.0	27.6	54.3	GER	BER		
SMCJ18A	SMCJ18CA	18.0	20.00	22.10	1.0	1.0	29.2	51.4	GET	BET		
SMCJ20A	SMCJ20CA	20.0	22.20	24.50	1.0	1.0	32.4	46.3	GEV	BEV		
SMCJ22A	SMCJ22CA	22.0	24.40	26.90	1.0	1.0	35.5	42.3	GEX	BEX		
SMCJ24A	SMCJ24CA	24.0	26.70	29.50	1.0	1.0	38.9	38.6	GEZ	BEZ		
SMCJ26A	SMCJ26CA	26.0	28.90	31.90	1.0	1.0	42.1	35.6	GFE	BFE		
SMCJ28A	SMCJ28CA	28.0	31.10	34.40	1.0	1.0	45.4	33.0	GFG	BFG		
SMCJ30A	SMCJ30CA	30.0	33.30	36.80	1.0	1.0	48.4	31.0	GFK	BFK		
SMCJ33A	SMCJ33CA	33.0	36.70	40.60	1.0	1.0	53.3	28.1	GFM	BFM		
SMCJ36A	SMCJ36CA	36.0	40.00	44.20	1.0	1.0	58.1	25.80	GFP	BFP		
SMCJ40A	SMCJ40CA	40.0	44.40	49.10	1.0	1.0	64.5	23.30	GFR	BFR		
SMCJ43A	SMCJ43CA	43.0	47.80	52.80	1.0	1.0	69.4	21.60	GFT	BFT		
SMCJ45A	SMCJ45CA	45.0	50.00	55.30	1.0	1.0	72.7	20.60	GFV	BFV		
SMCJ48A	SMCJ48CA	48.0	53.30	58.90	1.0	1.0	77.4	19.40	GFX	BFX		
SMCJ51A	SMCJ51CA	51.0	56.70	62.70	1.0	1.0	82.4	18.20	GFZ	BFZ		
SMCJ54A	SMCJ54CA	54.0	60.00	66.30	1.0	1.0	87.1	17.20	GGE	BGE		
SMCJ58A	SMCJ58CA	58.0	64.40	71.20	1.0	1.0	93.0	16.00	GGG	BGG		
SMCJ60A	SMCJ60CA	60.0	66.70	73.70	1.0	1.0	96.0	15.50	GGK	BGK		
SMCJ64A	SMCJ64CA	64.0	71.10	78.60	1.0	1.0	103.0	14.60	GGM	BGM		
SMCJ70A	SMCJ70CA	70.0	77.80	86.00	1.0	1.0	113.0	13.30	GGP	BGP		
SMCJ75A	SMCJ75CA	75.0	83.30	92.10	1.0	1.0	121.0	12.40	GGR	BGR		
SMCJ78A	SMCJ78CA	78.0	86.70	95.80	1.0	1.0	126.0	11.90	GGT	BGT		
SMCJ85A	SMCJ85CA	85.0	94.40	104.00	1.0	1.0	137.0	10.90	GGV	BGV		
SMCJ90A	SMCJ90CA	90.0	100.00	111.00	1.0	1.0	146.0	10.30	GGX	BGX		
SMCJ100A	SMCJ100CA	100.0	111.00	123.00	1.0	1.0	162.0	9.26	GGZ	BGZ		
SMCJ110A	SMCJ110CA	110.0	122.00	135.00	1.0	1.0	177.0	8.47	GHE	BHE		
SMCJ120A	SMCJ120CA	120.0	133.00	147.00	1.0	1.0	193.0	7.77	GHG	BHG		
SMCJ130A	SMCJ130CA	130.0	144.00	159.00	1.0	1.0	209.0	7.18	GHK	BHK		
SMCJ150A	SMCJ150CA	150.0	167.00	185.00	1.0	1.0	243.0	6.17	GHM	BHM		
SMCJ160A	SMCJ160CA	160.0	178.00	197.00	1.0	1.0	259.0	5.79	GHP	BHP		
SMCJ170A	SMCJ170CA	170.0	189.00	209.00	1.0	1.0	275.0	5.45	GHR	BHR		
SMCJ180A	SMCJ180CA	180.0	200.00	220.00	1.0	1.0	292.0	5.14	GHT	BHT		
SMCJ190A	SMCJ190CA	190.0	211.00	232.00	1.0	1.0	308.0	4.87	GHV	BHV		

3-3. I-V Curve Characteristics



P_{PPM} Peak Pulse Power Dissipation-Max Power Dissipation

V_R Stand-off Voltage-Maximum Voltage That Can be Applied to The TVS Without Operation

I_R Reverse Leakage Current-Current Measured at V_R

V_F Forward Voltage Drop for Uni-directional

V_{BR} Breakdown Voltage-Maximum Voltage that Flows Though the TVS at a Specified Test Current (I_T)

V_C Clamping Voltage-Peak Voltage Measured Across the Suppressor at a Specified I_{ppm}
(Peak Impulse Current)

3-4. Ratings and Characteristics Curve ($T_A=25^\circ\text{C}$ unless otherwise noted)

Fig 1. Peak Pulse Power Rating Curve

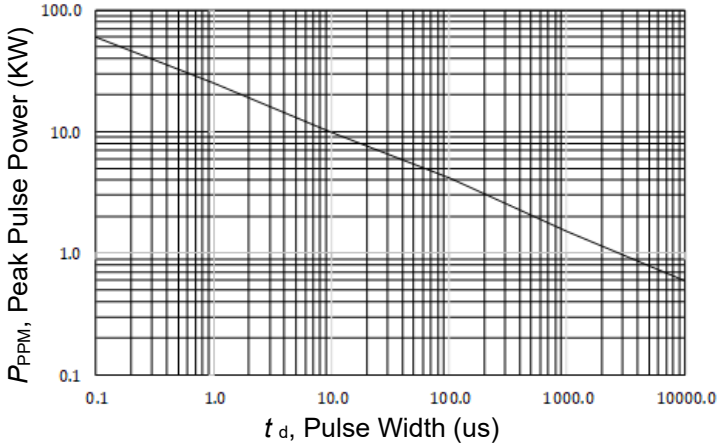


Fig 2. Pulse Derating Curve

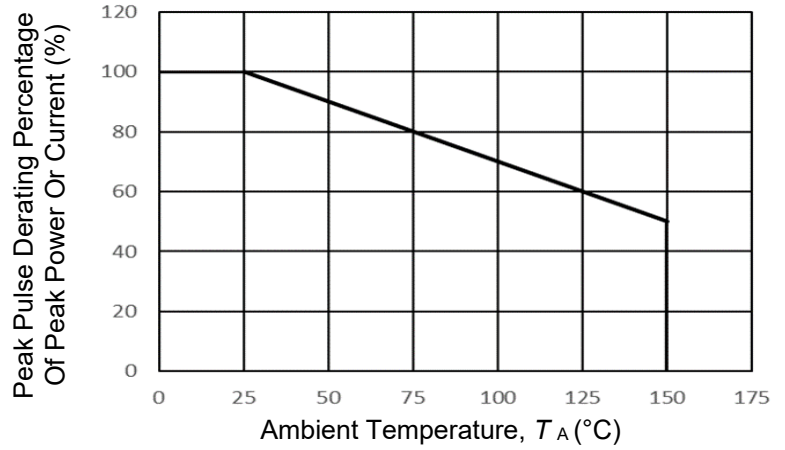


Fig 3. Maximum Non-repetitive Forward Surge Current Uni-direction Only

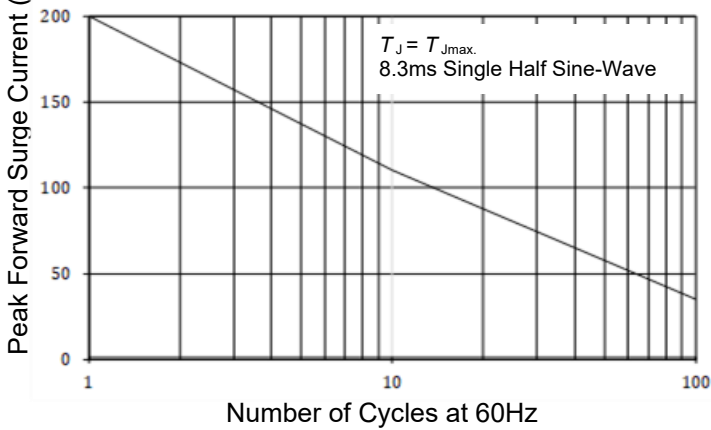
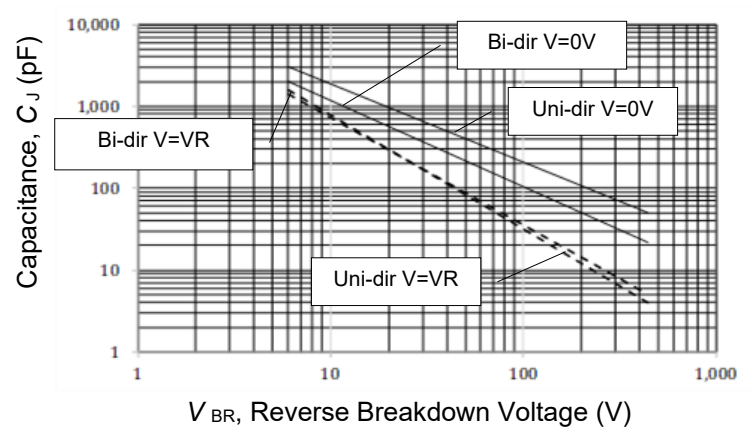


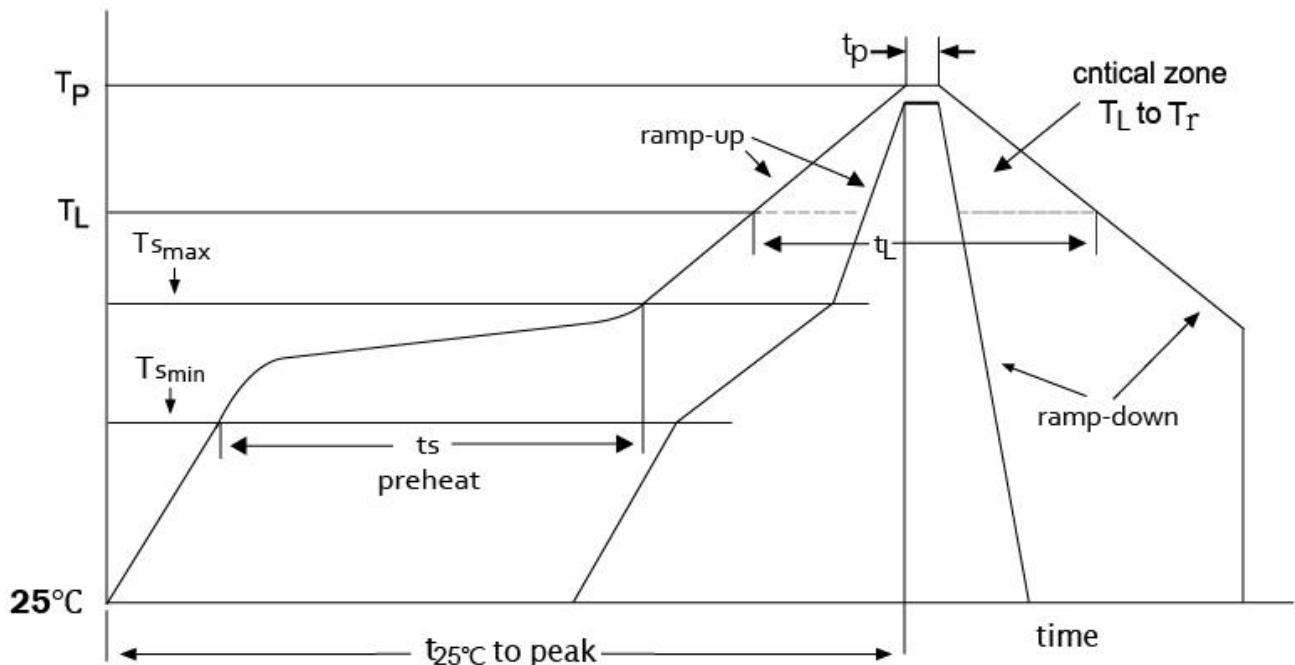
Fig 4. Typical Junction Capacitance



4. Soldering Parameters

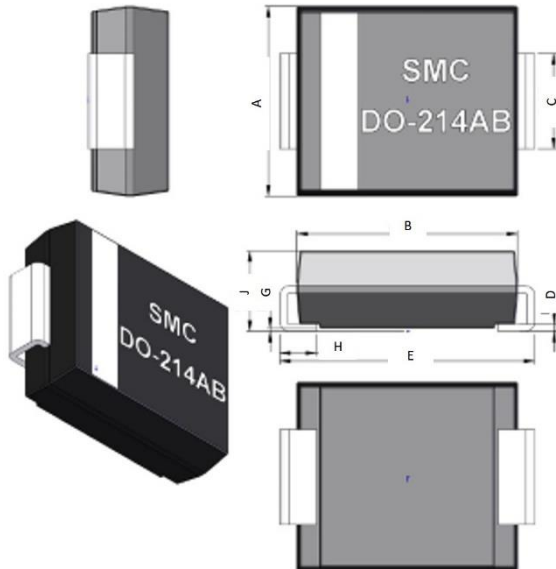
Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate (T _{smax} to T _p)	3 °C/s maximum	3 °C/s maximum
Preheat		
Temperature minimum (T _{smin})	100 °C	150 °C
Temperature maximum (T _{smax})	150 °C	200 °C
Time (t _{smin} to t _{smax})	60 s to 120 s	60 s to 180 s
Time maintained 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

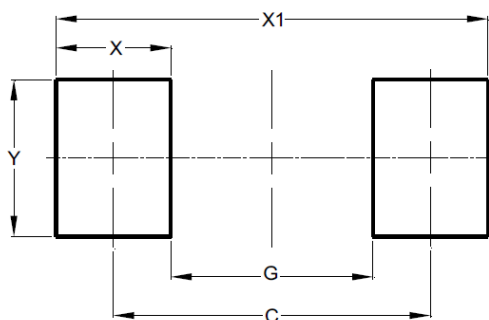
5-1. Dimension



SMCJ		
Dim	Min.	Max.
A	5.67	6.15
B	6.75	7.05
C	2.80	3.10
D	0.10	0.20
E	7.65	8.15
G	0.04	0.16
H	0.90	1.60
J	2.05	2.95

Unit:mm

5-2. PCB Pad Layout Recommendation

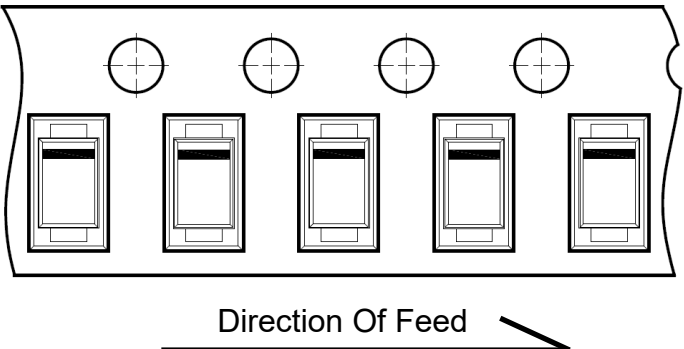


Dimensions	Value
C	6.90
G	4.40
X	2.50
X1	9.40
Y	3.30

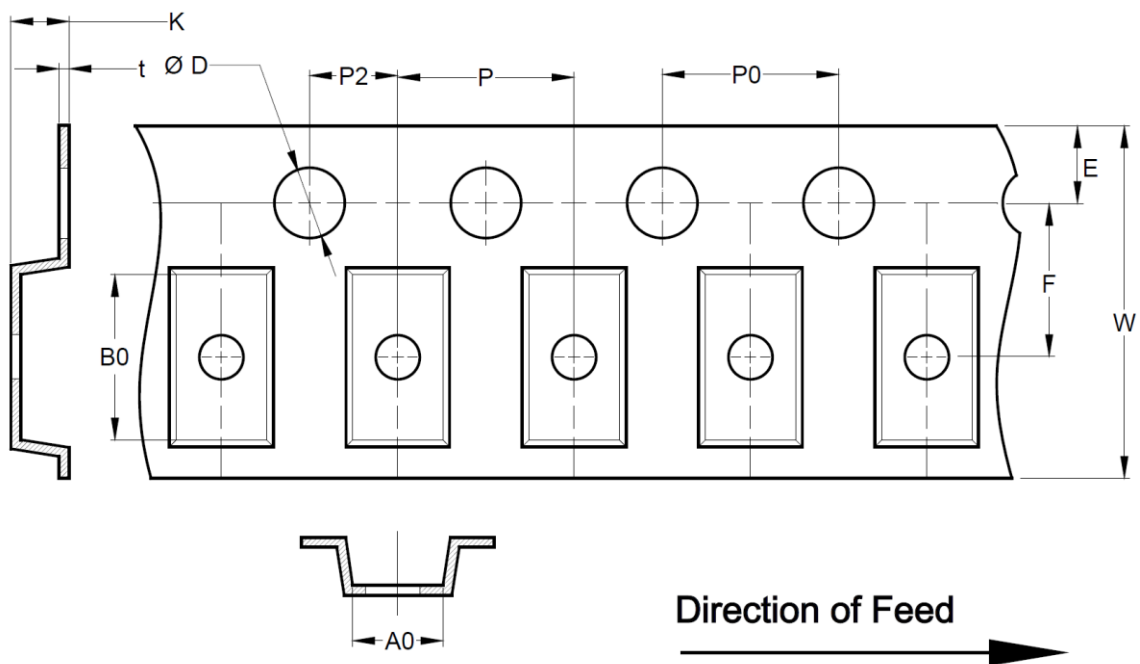
Unit:mm

6. Packing

6-1. Taping and Reel Specification

Taping Width	Tape Orientation
16mm	

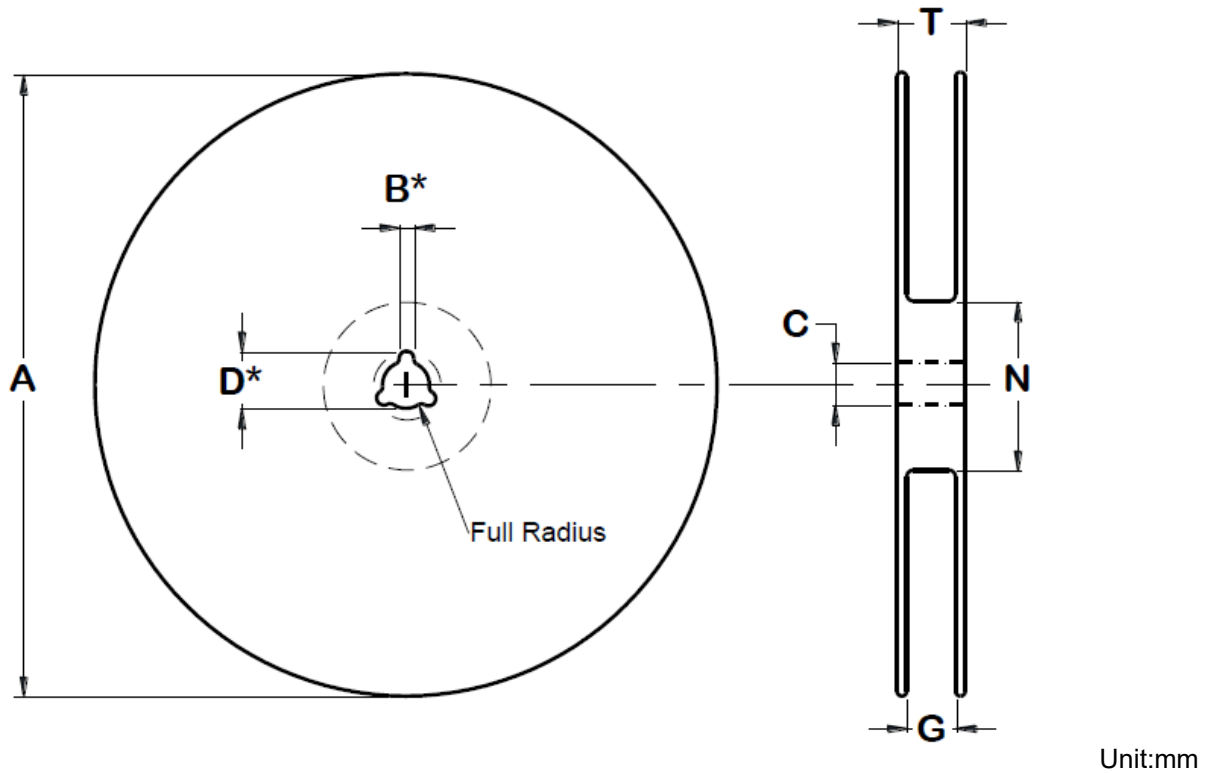
6-2. Embossed Carrier Tape Specification



Unit:mm

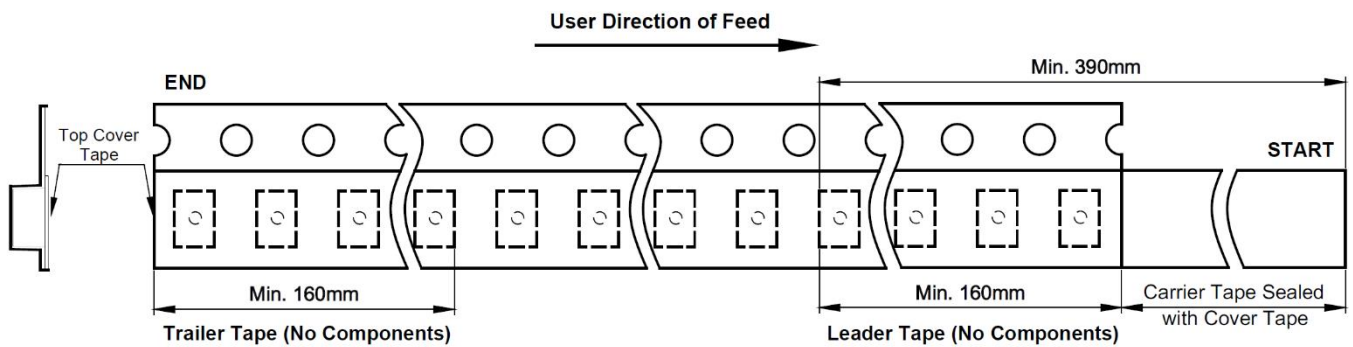
Dimension	W	D	D1	E	F	K	P	P0	P2	t
Value	16 mm	1.5 +0.1/-0.0	1.4 mm	1.75 ±0.10	7.5 ±0.10	3.7 Max.	8.0 ±0.10	4.0 ±0.10	2.0 ±0.10	0.4 Max.
A0 / B0 / K0	Determined by Component Size. The Clearance Between The Component And The Cavity Must Comply to The Rotational and Lateral Movement Requirement Provided in Figures in The "Maximum Component Movement in Tape Pocket" Section.									

6-3. Surface Mount Reel Specification



Dimension	Tape Width	Reel Size	A	B	C	D	N	G	T
Value	16 mm	13"	330 ±2	2.0 +0.5-0	13 +0.5-0.2	20.5 ±0.2	100 ±5	16.4 +1.5/-0.0	22.4

6-4. Tape Leader and Trailer Specification



7. Family Members

Part Number	Component Package	Watts	Working Voltage $V_{RWM}(V)$	
SMF Series	SOD-123FL	300W	5.0V ~ 190V	
NVS4M Series		400W	5.0V ~ 58V	
NVS4D Series	DFN2020-3L	400W	3.3V ~ 58V	
SMAJ Series	SMAJ	400W	5.0V ~ 190V	
SMA6J Series		600W	12V ~ 58V	
NVS6A Series	SMAF	600W	12V ~ 58V	
SMBJ Series	SMBJ	600W	5.0V ~ 190V	
SMB10J Series		1000W		
NVS15B Series	SMBF	1500W	5.0V ~ 58V	
SMPJ Series	TO-277	1500W	5.0V ~ 200V	
SMCJ Series	SMCJ	1500W	5.0V ~ 190V	
2.0SMCJ Series		2000W		
3.0SMCJ Series		3000W		
4.0SMCJ Series		4000W		12V ~ 58V
5.0SMCJ Series		5000W		12V ~ 170V
6KA Series		6600W		21V ~ 58V
5KP Series		P600		5000W
10KP Series	10000W		17V ~ 180V	
15KP Series	15000W			
20KP Series	20000W		20V ~ 180V	

8. Ordering Information

Part Number	Marking Code	Quantity	Component Package	Packaging Option
SMCJxxA	Series	3,000PCS	SMCJ	13"reel
SMCJxxCA				

9. Version

9-1. History

Version	Date	File No.	Recording	Basis
A	01-Dec-2017	F11807A	New Create	Market
B	30-Jan-2018		Add marking rule	System
C	04-Jul-2018		Outlook PCN	Engineer
D	25-Feb-2019		Update company info.	System
2.0	20-Jul-2021		Update Version	System