

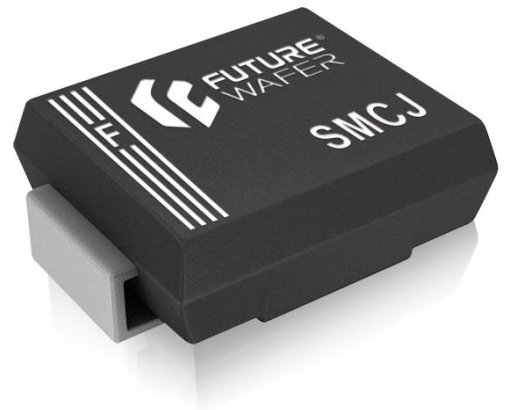
1. Synopsis

1-1. General Description

The 3.0SMCJ 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 3000 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.

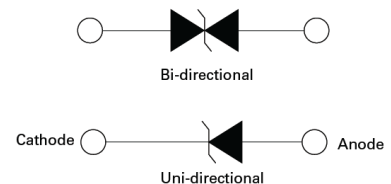
Packaged in SMCJ, This Minimizes PCB Space Consumption.



SMCJ

1-2. Feature List

- Bi / Uni-Directional Configurations
- Plastic Package Has Underwriters
- Glass Passivated Chip Junction in SMCJ Package
- 3000 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: $>\pm 30$ KV, Air: $>\pm 30$ KV
- 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



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 ($T_{amb}=25^{\circ}C$)	4
3-3. I-V Curve Characteristics	5
3-4. Ratings and Characteristics Curve ($T_A=25^{\circ}C$ unless otherwise noted)	5
3-4. Ratings and Characteristics Curve ($T_A=25^{\circ}C$ 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

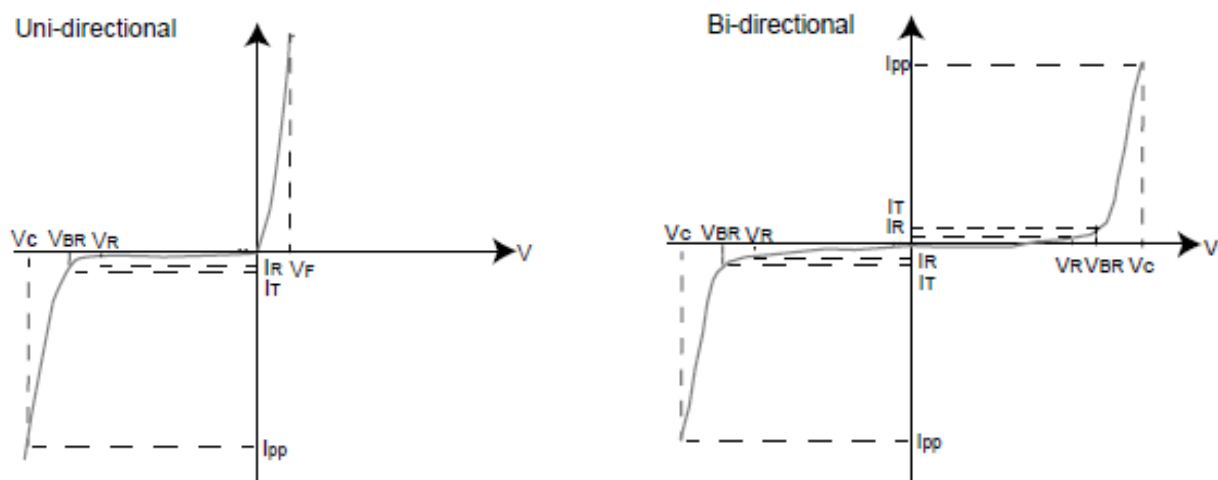
3-1. Absolute Maximum Ratings

Maximum Ratings@25°C Unless Otherwise Specified			
Parameter	Symbol	Value	Units
Peak Pulse Power (tp=10/1000us)	P_{PP}	3000	W
Power Dissipation On Infinite Heat Sink at $T_L = 50^{\circ}\text{C}$	P_D	6.5	
Peak Forward Surge Current, 8.3mS Signal Half Sine Wave Uni-Directional Only	I_{FSM}	300	A
Maximum instantaneous Forward Voltage at 100A For Uni-Direction Only	V_F	3.5	V
Operating Temperature	T_J	-55~+150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}		
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	15	$^{\circ}\text{C/W}$
Typical Thermal Resistance Junction to Ambient	$R_{\theta JA}$	75	

3-2. Electrical Characteristics (T_{amb}=25°C)

Part Number		Reverse Stand-off Voltage	Breakdown Voltage		Test Current	Reverse Leakage	Max. Clamp Voltage	Peak Pulse Current	Marking	
			V _{BR} @ I _T							
Uni	Bi	V _{RWM} V	Min V	Max V	I _T mA	I _R @ V _{RWM} μA	V _C @ I _{PP} V	I _{PP} (10/1000μs) A	Uni	Bi
3000 W Surface Mount Transient Voltage Suppressors 3.0SMCJ SERIES										
3.0SMCJ5.0A	3.0SMCJ5.0CA	5.0	6.40	7.07	10.0	200.0	9.2	326.0	HDE	IDE
3.0SMCJ6.0A	3.0SMCJ6.0CA	6.0	6.67	7.37	10.0	200.0	10.3	291.3	HDG	IDG
3.0SMCJ6.5A	3.0SMCJ6.5CA	6.5	7.22	7.98	10.0	100.0	11.2	267.9	HDK	IDK
3.0SMCJ7.0A	3.0SMCJ7.0CA	7.0	7.78	8.60	10.0	100.0	12.0	250.0	HDM	IDM
3.0SMCJ7.5A	3.0SMCJ7.5CA	7.5	8.33	9.21	1.0	100.0	12.9	232.6	HDP	IDP
3.0SMCJ8.0A	3.0SMCJ8.0CA	8.0	8.89	9.83	1.0	100.0	13.6	220.6	HDR	IDR
3.0SMCJ8.5A	3.0SMCJ8.5CA	8.5	9.44	10.40	1.0	20.0	14.4	208.4	HDT	IDT
3.0SMCJ9.0A	3.0SMCJ9.0CA	9.0	10.00	11.10	1.0	10.0	15.4	194.8	HDV	IDV
3.0SMCJ10A	3.0SMCJ10CA	10.0	11.10	12.30	1.0	10.0	17.0	176.4	HDX	IDX
3.0SMCJ11A	3.0SMCJ11CA	11.0	12.20	13.50	1.0	1.0	18.2	184.8	HDZ	IDZ
3.0SMCJ12A	3.0SMCJ12CA	12.0	13.30	14.70	1.0	1.0	19.9	150.6	HEE	IEE
3.0SMCJ13A	3.0SMCJ13CA	13.0	14.40	15.90	1.0	1.0	21.5	139.4	HEG	IEG
3.0SMCJ14A	3.0SMCJ14CA	14.0	15.60	17.20	1.0	1.0	23.2	129.4	HEK	IEK
3.0SMCJ15A	3.0SMCJ15CA	15.0	16.70	18.50	1.0	1.0	24.4	123.0	HEM	IEM
3.0SMCJ16A	3.0SMCJ16CA	16.0	17.80	19.70	1.0	1.0	26.0	115.4	HEP	IEP
3.0SMCJ17A	3.0SMCJ17CA	17.0	18.90	20.90	1.0	1.0	27.6	106.6	HER	IER
3.0SMCJ18A	3.0SMCJ18CA	18.0	20.00	22.10	1.0	1.0	29.2	102.8	HET	IET
3.0SMCJ20A	3.0SMCJ20CA	20.0	22.20	24.50	1.0	1.0	32.4	92.6	HEV	IEV
3.0SMCJ22A	3.0SMCJ22CA	22.0	24.40	26.90	1.0	1.0	35.5	84.4	HEX	IEX
3.0SMCJ24A	3.0SMCJ24CA	24.0	26.70	29.50	1.0	1.0	38.9	77.2	HEZ	IEZ
3.0SMCJ26A	3.0SMCJ26CA	26.0	28.90	31.90	1.0	1.0	42.1	71.2	HFE	IFE
3.0SMCJ28A	3.0SMCJ28CA	28.0	31.10	34.40	1.0	1.0	45.4	66.0	HFG	IFG
3.0SMCJ30A	3.0SMCJ30CA	30.0	33.30	36.80	1.0	1.0	48.4	62.0	HFK	IFK
3.0SMCJ33A	3.0SMCJ33CA	33.0	36.70	40.60	1.0	1.0	53.3	56.2	HFM	IFM
3.0SMCJ36A	3.0SMCJ36CA	36.0	40.00	44.20	1.0	1.0	58.1	51.6	HFP	IFP
3.0SMCJ40A	3.0SMCJ40CA	40.0	44.40	49.10	1.0	1.0	64.5	46.4	HFR	IFR
3.0SMCJ43A	3.0SMCJ43CA	43.0	47.80	52.80	1.0	1.0	69.4	43.2	HFT	IFT
3.0SMCJ45A	3.0SMCJ45CA	45.0	50.00	55.30	1.0	1.0	72.7	41.2	HFV	IFV
3.0SMCJ48A	3.0SMCJ48CA	48.0	53.30	58.90	1.0	1.0	77.4	38.8	HFX	IFX
3.0SMCJ51A	3.0SMCJ51CA	51.0	56.70	62.70	1.0	1.0	82.4	36.4	HFZ	IFZ
3.0SMCJ54A	3.0SMCJ54CA	54.0	60.00	66.30	1.0	1.0	87.1	34.4	HGE	IGE
3.0SMCJ58A	3.0SMCJ58CA	58.0	64.40	71.20	1.0	1.0	93.0	32.0	HGG	IGG
3.0SMCJ60A	3.0SMCJ60CA	60.0	66.70	73.70	1.0	1.0	96.0	31.0	HGK	IGK
3.0SMCJ64A	3.0SMCJ64CA	64.0	71.10	78.60	1.0	1.0	103.0	29.2	HGM	IGM
3.0SMCJ70A	3.0SMCJ70CA	70.0	77.80	86.00	1.0	1.0	113.0	26.6	HGP	IGP
3.0SMCJ75A	3.0SMCJ75CA	75.0	83.30	92.10	1.0	1.0	121.0	24.8	HGR	IGR
3.0SMCJ78A	3.0SMCJ78CA	78.0	86.70	95.80	1.0	1.0	126.0	22.8	HGT	IGT
3.0SMCJ85A	3.0SMCJ85CA	85.0	94.40	104.00	1.0	1.0	137.0	20.8	HGV	IGV
3.0SMCJ90A	3.0SMCJ90CA	90.0	100.00	111.00	1.0	1.0	146.0	20.6	HGX	IGX
3.0SMCJ100A	3.0SMCJ100CA	100.0	111.00	123.00	1.0	1.0	162.0	18.6	HGZ	IGZ
3.0SMCJ110A	3.0SMCJ110CA	110.0	122.00	135.00	1.0	1.0	177.0	16.8	HHE	IHE
3.0SMCJ120A	3.0SMCJ120CA	120.0	133.00	147.00	1.0	1.0	193.0	15.6	HHG	IHG
3.0SMCJ130A	3.0SMCJ130CA	130.0	144.00	159.00	1.0	1.0	209.0	14.4	HHK	IHK
3.0SMCJ150A	3.0SMCJ150CA	150.0	167.00	185.00	1.0	1.0	243.0	12.4	HHM	IHM
3.0SMCJ160A	3.0SMCJ160CA	160.0	178.00	197.00	1.0	1.0	259.0	11.6	HHP	IHP
3.0SMCJ170A	3.0SMCJ170CA	170.0	189.00	209.00	1.0	1.0	275.0	11.0	HHR	IHR
3.0SMCJ180A	3.0SMCJ180CA	180	200	220	1.0	1.0	291.6	10.3	HHT	IHT
3.0SMCJ190A	3.0SMCJ190CA	190	211	232	1.0	1.0	307.8	9.8	HHV	IHV

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 (TA=25°C unless otherwise noted)

Fig 1. Peak Pulse Power Rating Curve

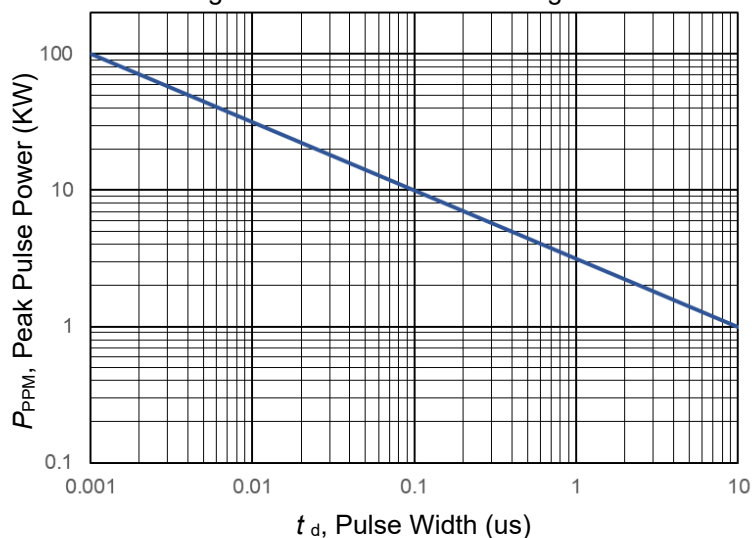
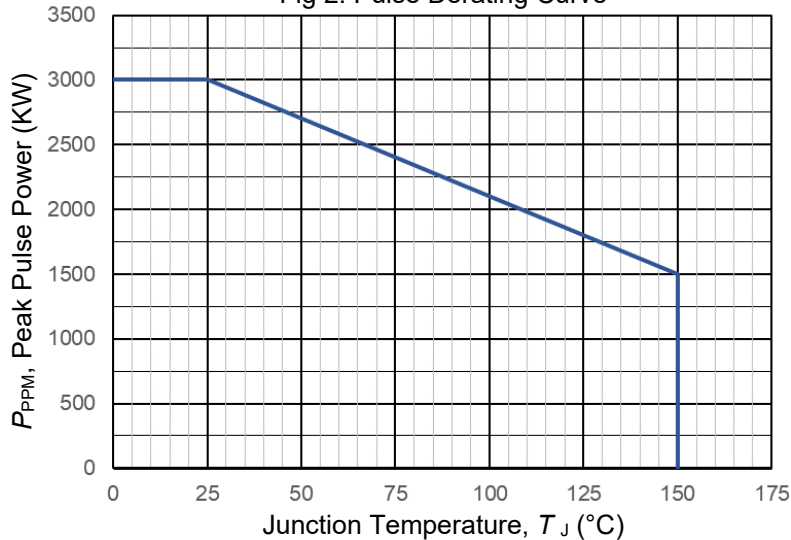


Fig 2. Pulse Derating Curve



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

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

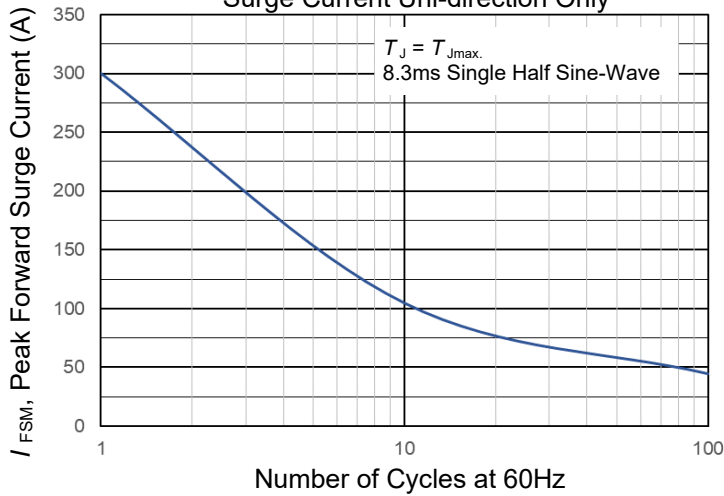


Fig 4. Typical Junction Capacitance

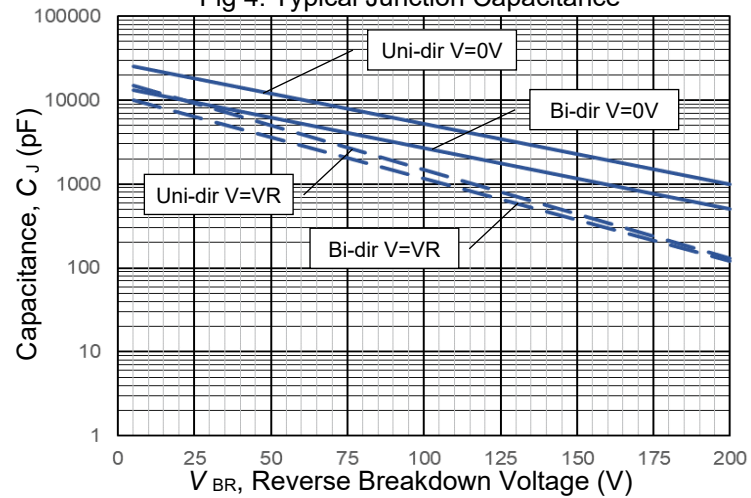


Fig 5. Maximum Forward Voltage

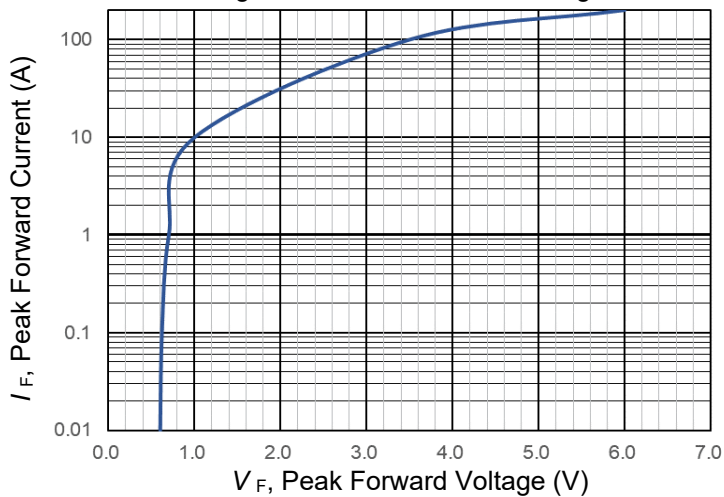


Fig 6. Typical Transient Thermal Impedance

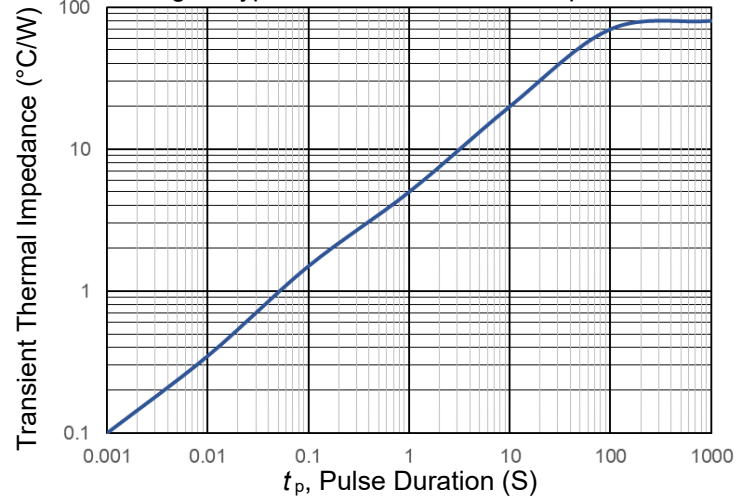
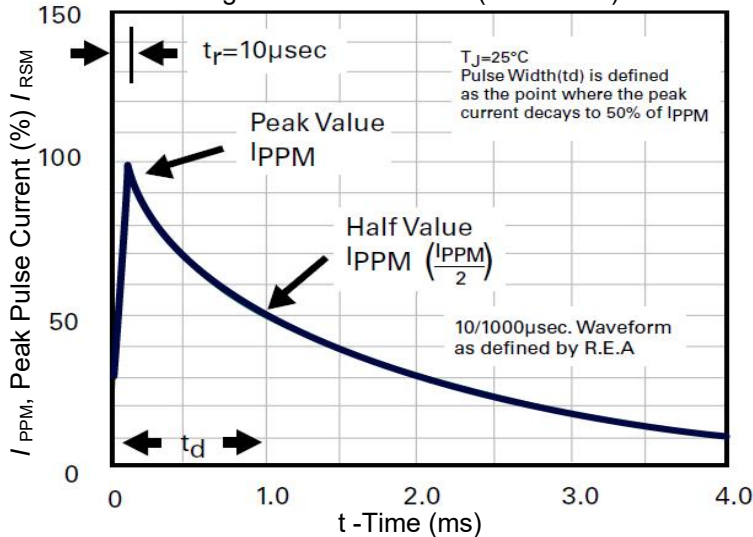


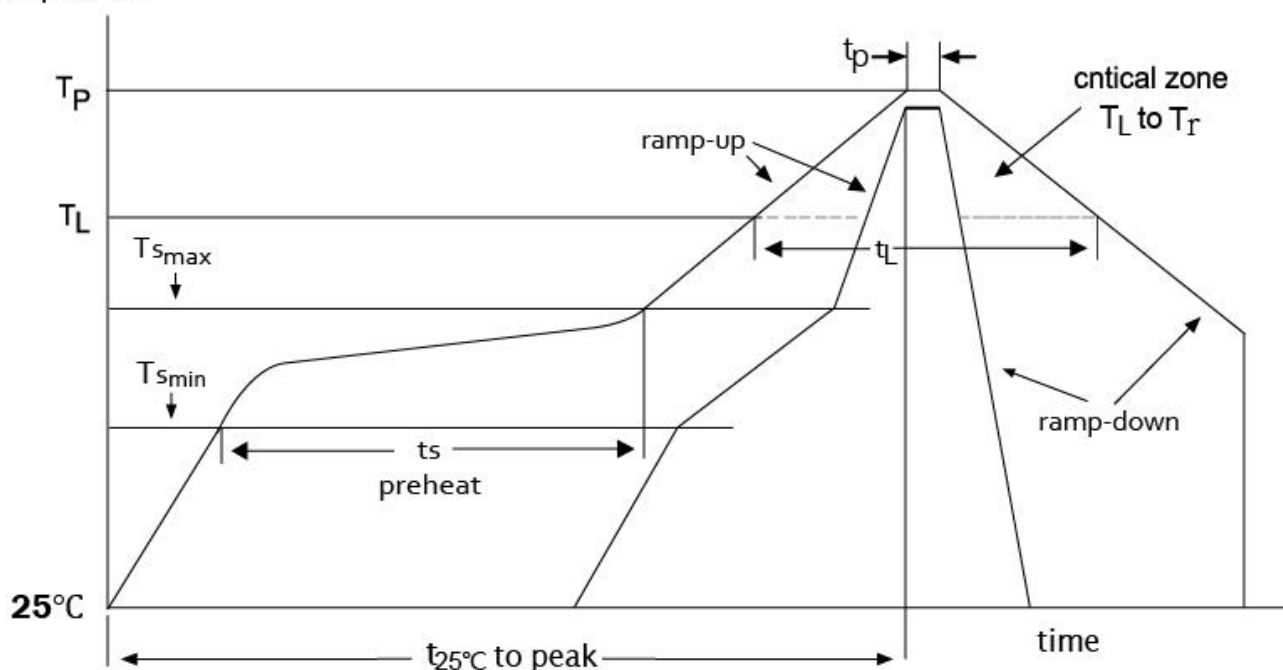
Fig 7. Pulse Waveform (10/1000us)



4. Soldering Parameters

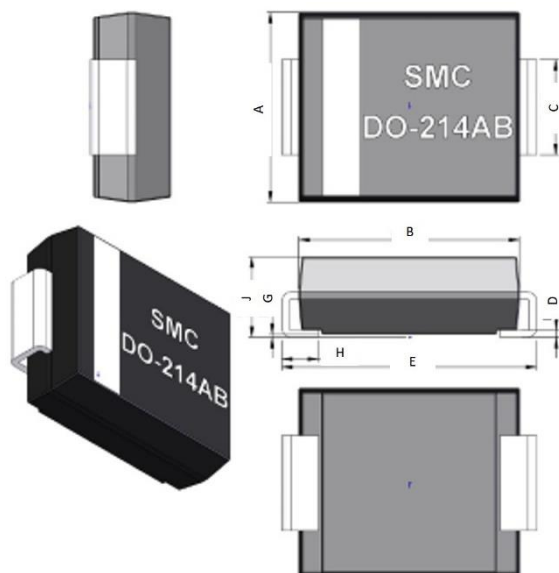
Profile Feature	SnPb eutectic assembly	Pb-free assembly
Average ramp-up rate (T _{smax} to T _p)	3 °C/s maximum	3 °C/s maximum
Preheat		
Temperature minimum (T _{smin})	100 °C	150 °C
Temperature maximum (T _{smax})	150 °C	200 °C
Time (t _{smin} to t _{smax})	60 s to 120 s	60 s to 180 s
Time maintained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

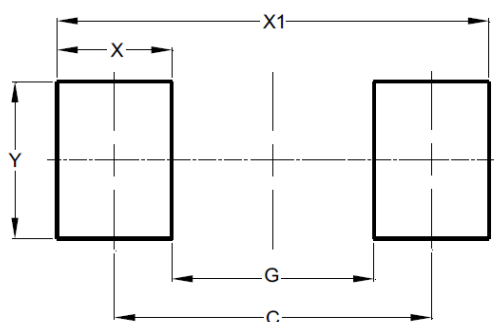
5-1. Dimension



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

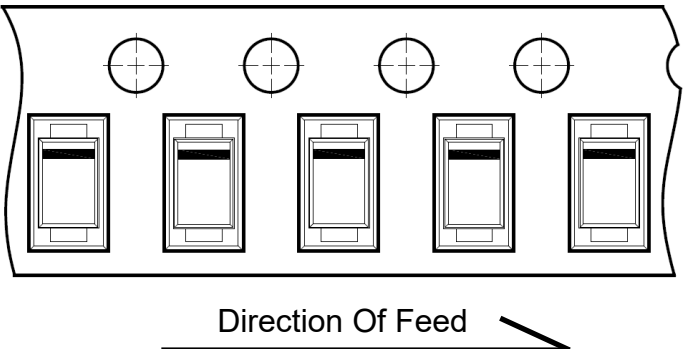


Dimensions	Value
C	6.90
G	4.40
X	2.50
X1	9.40
Y	3.30

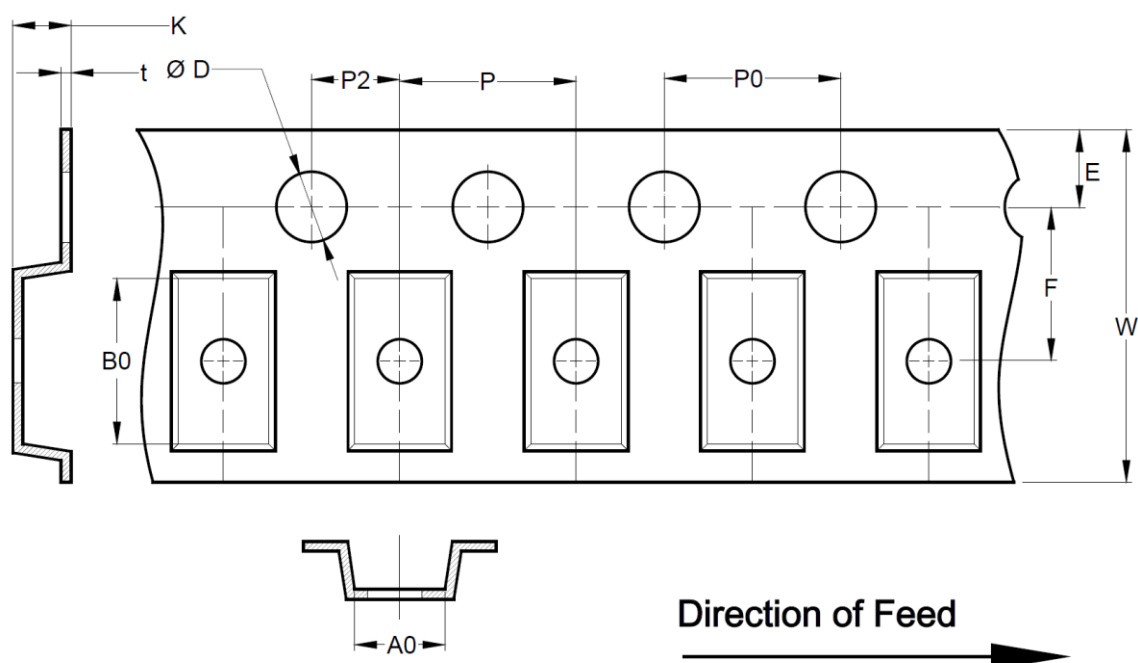
Unit:mm

6. Packing

6-1. Taping and Reel Specification

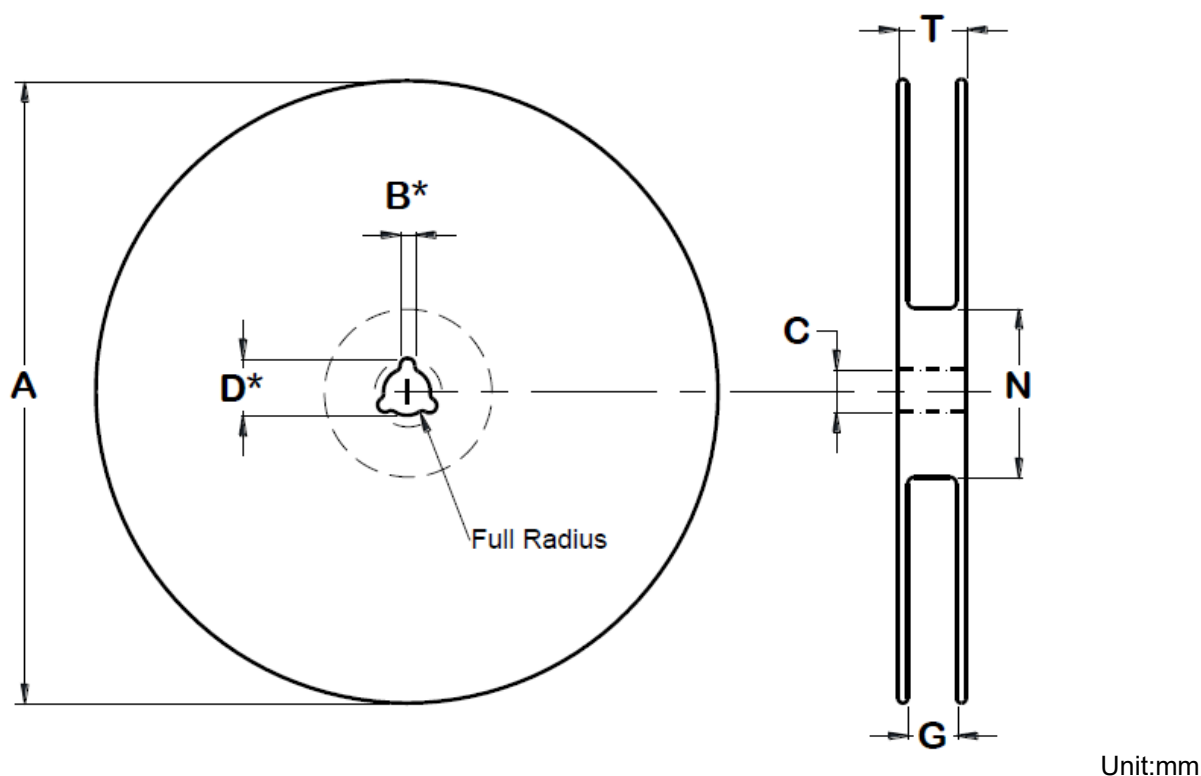
Taping Width	Tape Orientation
16mm	

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.									

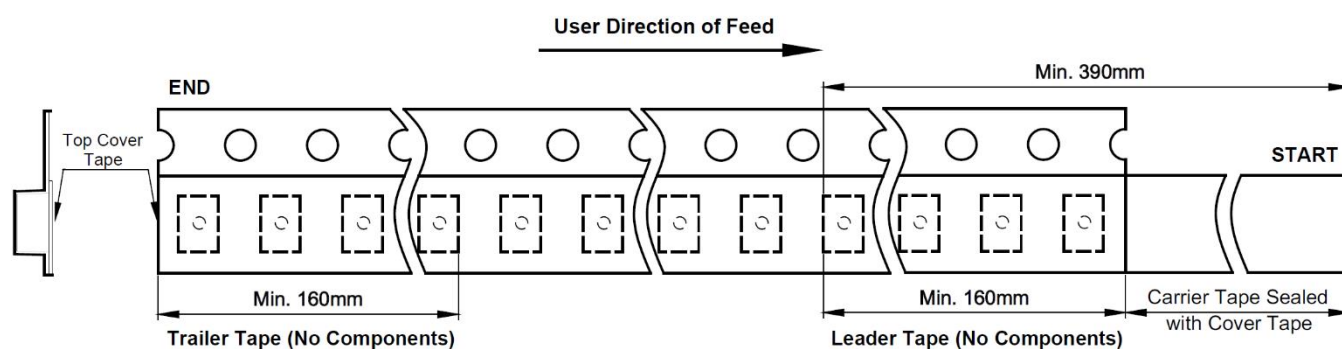
6-3. Surface Mount Reel Specification



Unit:mm

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	5.0V ~ 180V
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
3.0SMCJxxA	Series	3,000PCS	SMCJ	13"reel
3.0SMCJxxCA				

9. Version

9-1. History

Version	Date	File No.	Recording	Basis
A	01-Dec-2017	F118052	New Create	Market
B	30-Jan-2018		Outlook PCN	Engineer
C	27-Feb-2019		Update Company Info.	System
2.0	16-May-2021		Update Version	System
2.1	19-Jul-2021		Update Version	System