Transient Voltage Suppressors (TVS) Data Sheet

Features

- For surface mounted applications in order to optimize board space
- Low profile package
- Built-in strain relief
- Glass passivated junction
- Low inductance
- Excellent clamping capability
- 600W peak pulse power capability at 10/1000μs waveform, repetition rate (duty cycle): 0.01%
- Fast response time
- Typical I_R less than 1μA above 10V
- High Temperature soldering: 260℃/10 seconds at terminals
- Plastic package has underwriters laboratory flammability 94V-0
- Meets MSL level 1, per J-STD-020
- Safety certification: UL: E244458
- IEC61000-4-2 ESD 30KV Air, 30KV contact compliance

Mechanical Data

- Case: JEDEC DO-214AA. Molded plastic over glass passivated junction
- Terminal: Tin plated, solderable per MIL-STD-750, Method 2026
- Polarity: Color band denotes cathode except bi-directional models
- Standard Packaging: 12mm tape (EIA STD RS-481)
- Weight: 0.10g

Applications

- I/O interface
- AC/DC power supply
- Low frequency signal transmission line (RS232, RS485, etc.)

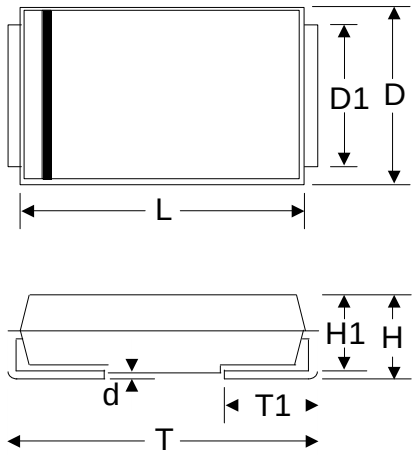
Maximum Ratings and Characteristics

Ratings at 25℃ ambient temperature unless otherwise specified.

Rating	Symbol	Value	Units
Peak pulse power dissipation at 10/1000μs waveform (Note1, Note2, Fig.1)	P_{PPM}	Minimum 600	Watts
Peak pulse current of at 10/1000μs waveform (Note 1, Fig.3)	I_{PPM}	See Table	Amps
Steady state power dissipation at T_A=50℃ (Fig.5)	$P_{M(AV)}$	5.0	Watts
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load, (JEDEC Method) (Note3, Fig.6)	I_{FSM}	100	Amps
Operating junction and Storage Temperature Range.	T_J,T_{STG}	-55 to +150	℃
Typical thermal resistance junction to lead	$R_{\theta JL}$	20	℃/W
Typical thermal resistance junction to ambient	$R_{\theta JA}$	100	℃/W

Notes: 1. Non-repetitive current pulse, per Fig.3 and derated above T_A=25℃ per Fig.2.
2. Mounted on 5.0mm×5.0mm (0.03mm thick) copper pads to each terminal.
3. 8.3ms single half sine-wave, or equivalent square wave, duty cycle=4 pulses per minutes maximum.

Dimensions (SMB/DO-214AA)



Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
L	4.06	4.57	0.160	0.180
D	3.30	3.94	0.130	0.155
D1	1.95	2.20	0.077	0.086
T	5.21	5.59	0.205	0.220
T1	0.76	1.52	0.030	0.060
d	-	0.203	-	0.008
H	2.15	2.65	0.085	0.104
H1	2.13	2.47	0.084	0.097

Electrical Characteristics (T_A=25℃)

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
Unidirectional	Bidirectional	UNI	BI	V_{RWM}(V)	V_{BR}(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
SMBJ5.0A	SMBJ5.0CA	5.0A	5.0CA	5.0	6.40~7.00	10	9.2	65.3	800
SMBJ6.0A	SMBJ6.0CA	6.0A	6.0CA	6.0	6.67~7.37	10	10.3	58.3	800
SMBJ6.5A	SMBJ6.5CA	6.5A	6.5CA	6.5	7.22~7.98	10	11.2	53.6	500
SMBJ7.0A	SMBJ7.0CA	7.0A	7.0CA	7.0	7.78~8.60	10	12.0	50.0	200
SMBJ7.5A	SMBJ7.5CA	7.5A	7.5CA	7.5	8.33~9.21	1	12.9	46.6	100
SMBJ8.0A	SMBJ8.0CA	8.0A	8.0CA	8.0	8.89~9.83	1	13.6	44.2	50
SMBJ8.5A	SMBJ8.5CA	8.5A	8.5CA	8.5	9.44~10.40	1	14.4	41.7	20
SMBJ9.0A	SMBJ9.0CA	9.0A	9.0CA	9.0	10.00~11.10	1	15.4	39.0	10
SMBJ10A	SMBJ10CA	10A	10CA	10.0	11.10~12.30	1	17.0	35.3	5
SMBJ11A	SMBJ11CA	11A	11CA	11.0	12.20~13.50	1	18.2	33.0	1
SMBJ12A	SMBJ12CA	12A	12CA	12.0	13.30~14.70	1	19.9	30.2	1
SMBJ13A	SMBJ13CA	13A	13CA	13.0	14.40~15.90	1	21.5	28.0	1
SMBJ14A	SMBJ14CA	14A	14CA	14.0	15.60~17.20	1	23.2	25.9	1
SMBJ15A	SMBJ15CA	15A	15CA	15.0	16.70~18.50	1	24.4	24.6	1
SMBJ16A	SMBJ16CA	16A	16CA	16.0	17.80~19.70	1	26.0	23.1	1
SMBJ17A	SMBJ17CA	17A	17CA	17.0	18.90~20.90	1	27.6	21.8	1
SMBJ18A	SMBJ18CA	18A	18CA	18.0	20.00~22.10	1	29.2	20.6	1
SMBJ20A	SMBJ20CA	20A	20CA	20.0	22.20~24.50	1	32.4	18.6	1
SMBJ22A	SMBJ22CA	22A	22CA	22.0	24.40~26.90	1	35.5	16.9	1
SMBJ24A	SMBJ24CA	24A	24CA	24.0	26.70~29.50	1	38.9	15.5	1

Electrical Characteristics (T_A=25℃)

Part Number		Device Marking Code		Reverse Stand Off Voltage	Breakdown Voltage @I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
Unidirectional	Bidirectional	UNI	BI	V_{RWM}(V)	V_{BR}(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
SMBJ26A	SMBJ26CA	26A	26CA	26.0	28.90~31.90	1	42.1	14.3	1
SMBJ28A	SMBJ28CA	28A	28CA	28.0	31.10~34.40	1	45.4	13.3	1
SMBJ30A	SMBJ30CA	30A	30CA	30.0	33.30~36.80	1	48.4	12.4	1
SMBJ33A	SMBJ33CA	33A	33CA	33.0	36.70~40.60	1	53.3	11.3	1
SMBJ36A	SMBJ36CA	36A	36CA	36.0	40.00~44.20	1	58.1	10.4	1
SMBJ40A	SMBJ40CA	40A	40CA	40.0	44.40~49.10	1	64.5	9.3	1
SMBJ43A	SMBJ43CA	43A	43CA	43.0	47.80~52.80	1	69.4	8.7	1
SMBJ45A	SMBJ45CA	45A	45CA	45.0	50.00~55.30	1	72.7	8.3	1
SMBJ48A	SMBJ48CA	48A	48CA	48.0	53.30~58.90	1	77.4	7.8	1
SMBJ51A	SMBJ51CA	51A	51CA	51.0	56.70~62.70	1	82.4	7.3	1
SMBJ54A	SMBJ54CA	54A	54CA	54.0	60.00~66.30	1	87.1	6.9	1
SMBJ58A	SMBJ58CA	58A	58CA	58.0	64.40~71.20	1	93.6	6.5	1
SMBJ60A	SMBJ60CA	60A	60CA	60.0	66.70~73.70	1	96.8	6.2	1
SMBJ64A	SMBJ64CA	64A	64CA	64.0	71.10~78.60	1	103.0	5.9	1
SMBJ70A	SMBJ70CA	70A	70CA	70.0	77.80~86.00	1	113.0	5.3	1
SMBJ75A	SMBJ75CA	75A	75CA	75.0	83.30~92.10	1	121.0	5.0	1
SMBJ78A	SMBJ78CA	78A	78CA	78.0	86.70~95.80	1	126.0	4.8	1
SMBJ85A	SMBJ85CA	85A	85CA	85.0	94.40~104.00	1	137.0	4.4	1
SMBJ90A	SMBJ90CA	90A	90CA	90.0	100.00~111.00	1	146.0	4.1	1
SMBJ100A	SMBJ100CA	100A	100CA	100.0	111.00~123.00	1	162.0	3.7	1
SMBJ110A	SMBJ110CA	110A	110CA	110.0	122.00~135.00	1	177.0	3.4	1
SMBJ120A	SMBJ120CA	120A	120CA	120.0	133.00~147.00	1	193.0	3.1	1
SMBJ130A	SMBJ130CA	130A	130CA	130.0	144.00~159.00	1	209.0	2.9	1
SMBJ150A	SMBJ150CA	150A	150CA	150.0	167.00~185.00	1	243.0	2.5	1
SMBJ160A	SMBJ160CA	160A	160CA	160.0	178.00~197.00	1	259.0	2.3	1
SMBJ170A	SMBJ170CA	170A	170CA	170.0	189.00~209.00	1	275.0	2.2	1
SMBJ180A	SMBJ180CA	180A	180CA	180.0	201.00~222.00	1	292.0	2.1	1
SMBJ190A	SMBJ190CA	190A	190CA	190.0	211.00~233.00	1	308.0	2.0	1
SMBJ200A	SMBJ200CA	200A	200CA	200.0	224.00~247.00	1	324.0	1.9	1
SMBJ210A	SMBJ210CA	210A	210CA	210.0	237.00~263.00	1	340.0	1.8	1
SMBJ220A	SMBJ220CA	220A	220CA	220.0	246.00~272.00	1	356.0	1.7	1
SMBJ250A	SMBJ250CA	250A	250CA	250.0	279.00~309.00	1	405.0	1.5	1
SMBJ300A	SMBJ300CA	300A	300CA	300.0	335.00~371.00	1	486.0	1.3	1
SMBJ350A	SMBJ350CA	350A	350CA	350.0	391.00~432.00	1	567.0	1.1	1
SMBJ400A	SMBJ400CA	400A	400CA	400.0	447.00~494.00	1	648.0	0.9	1
SMBJ440A	SMBJ440CA	440A	440CA	440.0	492.00~543.00	1	713.0	0.9	1

Ratings and Characteristic Curves (T_A=25℃ unless otherwise noted)

Figure 1. Peak Pulse Power Rating Curve

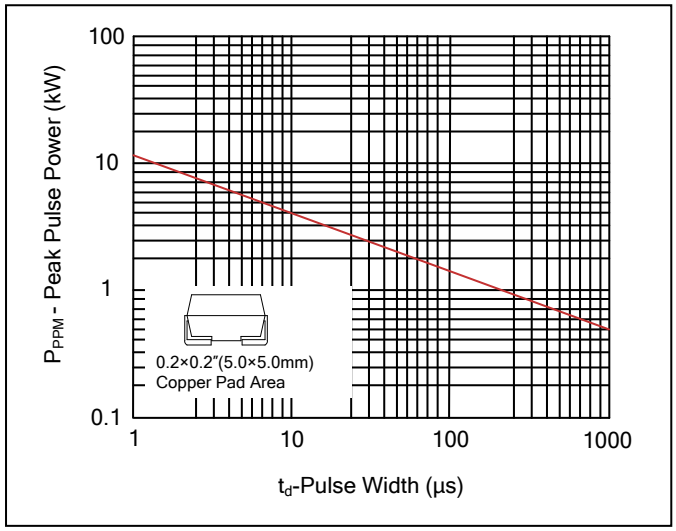


Figure 2. Pulse Derating Curve

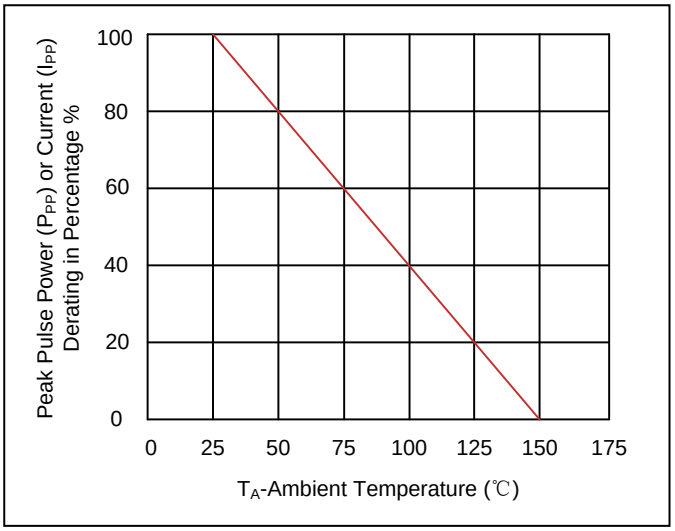


Figure 3. Pulse Waveform

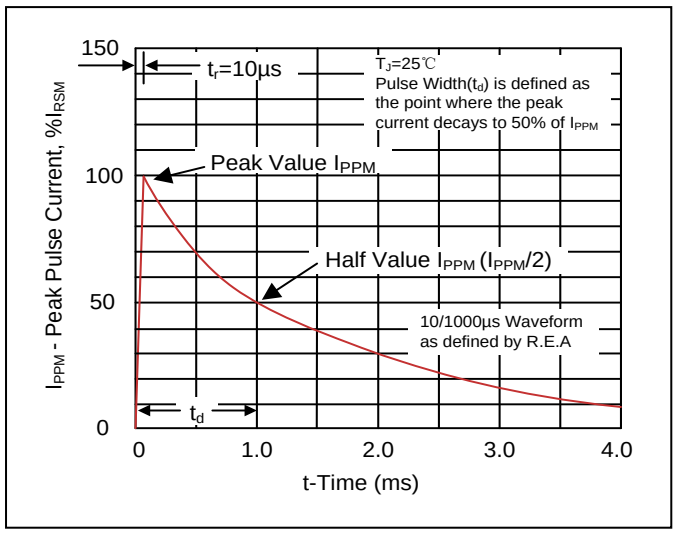


Figure 4. Typical Junction Capacitance

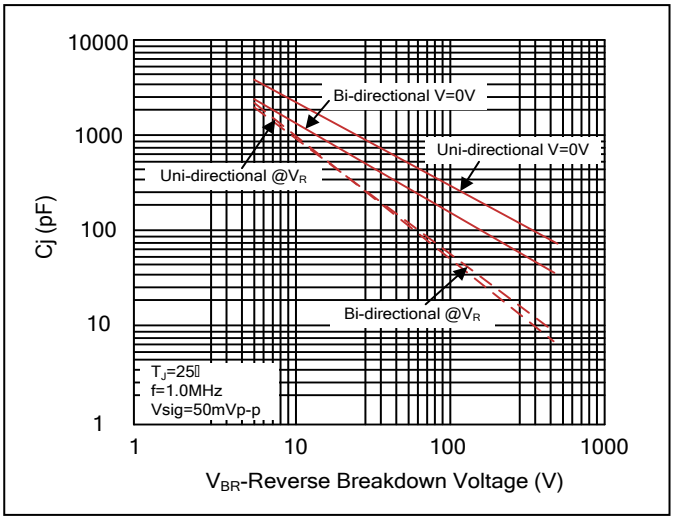


Figure 5. Steady State Power Dissipation Derating Curve

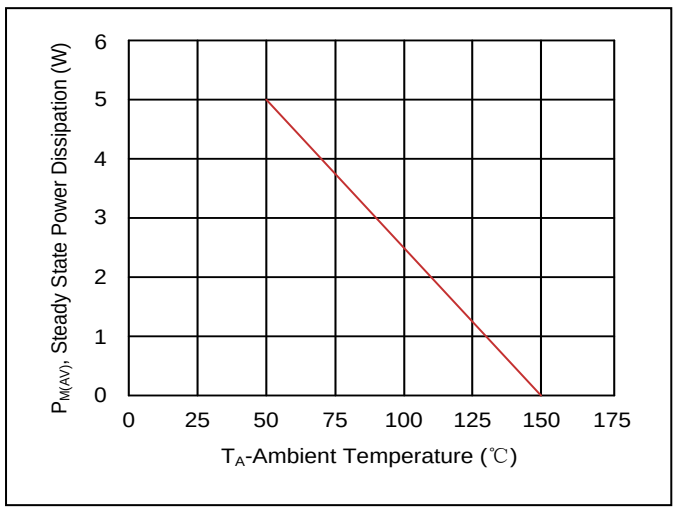
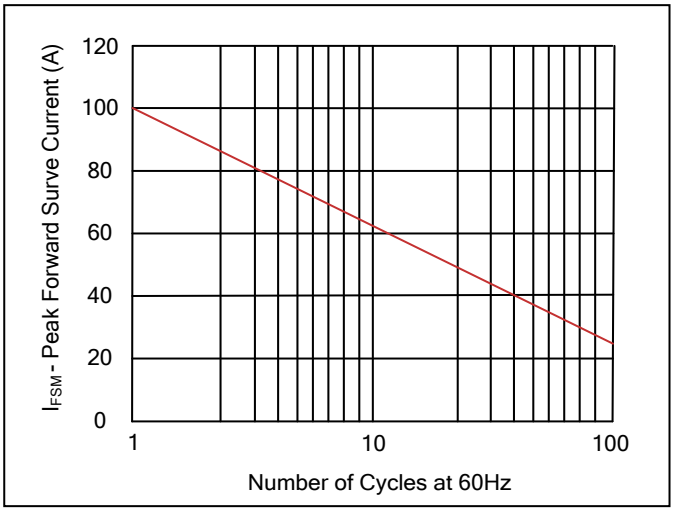
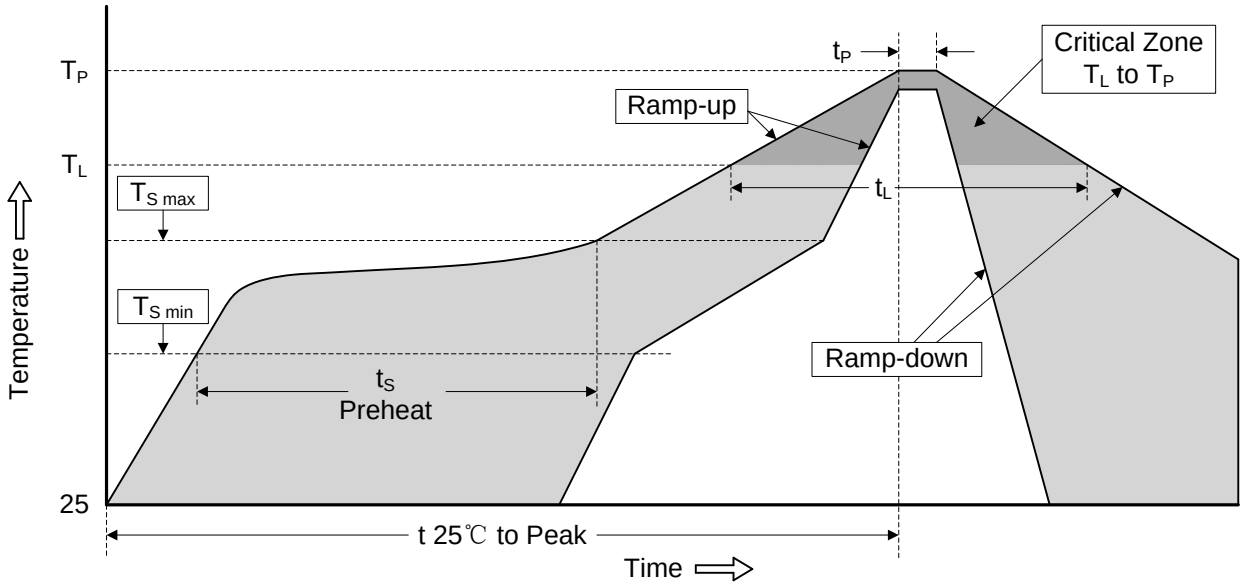


Figure 6. Maximum Non-Repetitive Forward Surge Current Uni-Directional Only



Recommended Soldering Conditions

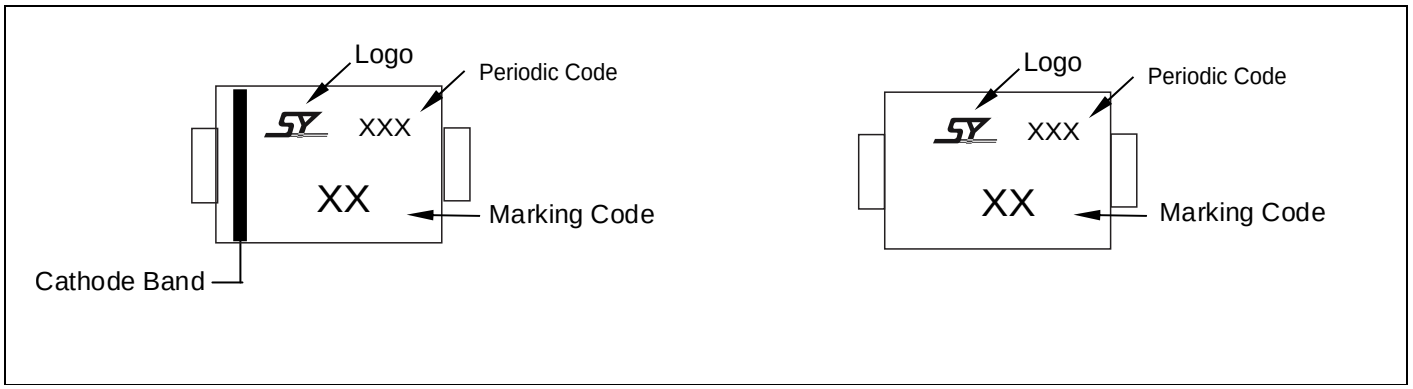
Reflow Soldering



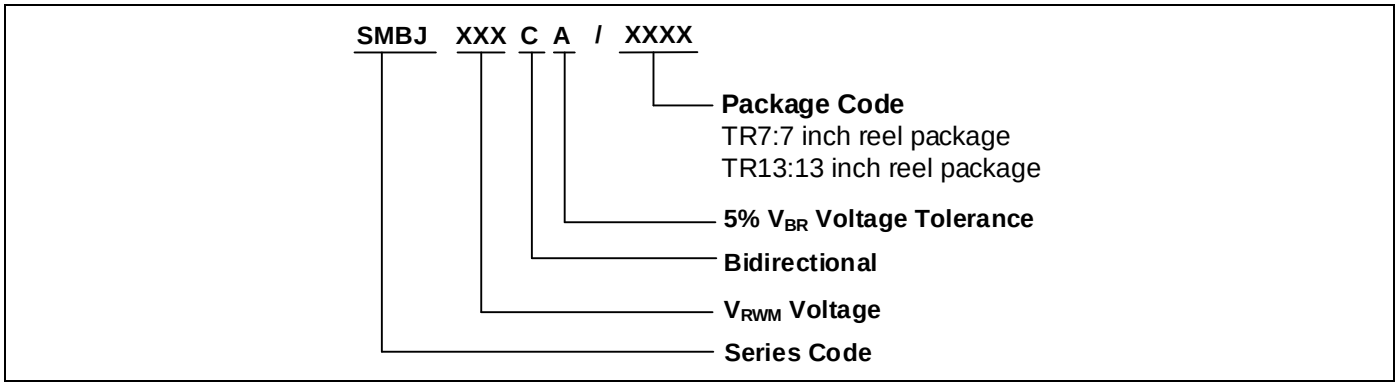
Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T_L to T_P)	3℃/second max.
Preheat -Temperature Min ($T_{S\ min}$) -Temperature Max ($T_{S\ max}$) -Time (min to max) (t_S)	 150℃ 200℃ 60-180 seconds
$T_{S\ max}$ to T_L -Ramp-up Rate	 3℃/second max.
Time maintained above: -Temperature (T_L) -Time (t_L)	 217℃ 60-150 seconds
Peak Temperature (T_P)	260℃
Time within 5℃ of actual Peak Temperature (t_P)	20-40 seconds
Ramp-down Rate	6℃/second max.
Time 25℃ to Peak Temperature	8 minutes max.

Marking Code



Part Number Code

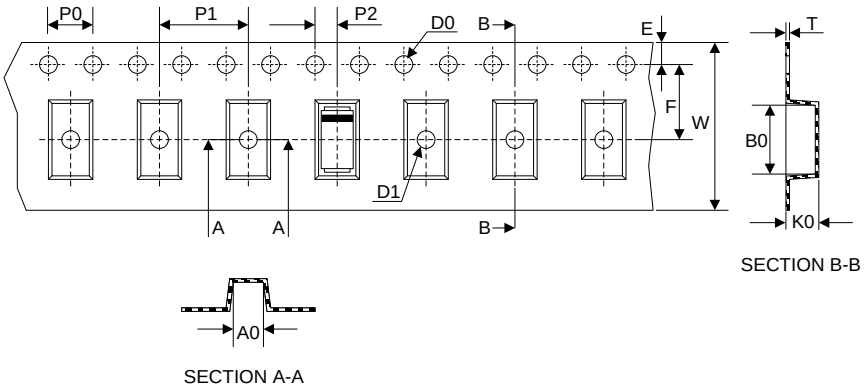


Ordering Code for Different Package

7 inch reel package: Add suffix " /TR7" at the end of the part number, such as SMBJXXXCA/TR7
13 inch reel package: Add suffix " /TR13" at the end of the part number, such as SMBJXXXCA/TR13

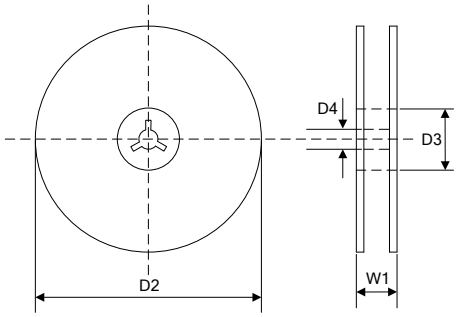
Packaging

Tape



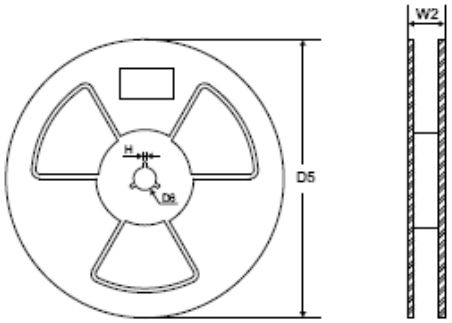
Symbol	Dimension (mm)
W	12.00±0.20
P0	4.00±0.10
P1	8.00±0.10
P2	2.00±0.10
D0	Φ1.55±0.10
D1	Φ1.5±0.10
E	1.75±0.10
F	5.50±0.10
A0	3.86±0.15
B0	5.65±0.10
K0	2.75±0.15
T	0.25±0.05

7” Reel



D2	Φ178.0±2.0
D3	Φ50.0Min.
D4	Φ13.0±0.5
W1	16.0±2.0
Quantity: 500PCS	

13” Reel



D5	Φ330.0±2.0
D6	Φ13.5±0.5
H	2.5±1.0
W2	16.0±2.0
Quantity: 3000PCS	