

Applications

- ◆ Computer system
- ◆ Domestic appliance
- ◆ Video input

Mechanical Data

- ◆ Package : SMB/DO-214AA
- ◆ Case Material : Molded Plastic. UL Flammability Classification Rating 94V-0. RoHS compliant
- ◆ Moisture Sensitivity : Meet MSL 1
- ◆ Terminal : Solder plated, solderable per MIL-STD-750, Method 2026
- ◆ Polarity : Color band denotes cathode except bi-directional models
- ◆ Weight : 0.10g(approximate)

Product and Packing Information

Part Number	QTY/Reel	Reel Size
SMBJxx(C)A-AT	3,000	13 inch

Description

- ◆ Transient voltage suppression diodes, also known as TVS diodes, are protective electronic parts that protect electrical equipment from voltage spikes introduced by wires.

Features

- ◆ For surface mounted applications
- ◆ Excellent clamping capability
- ◆ 600 W peak pulse power capability with a 10/1000µs Waveform.
- ◆ VRWM 3.3 ~ 440V
- ◆ Low profile package and low inductance
- ◆ Typical IR less than 1uA above 10V
- ◆ Fast response time: typically less than 1.0ps from 0V to VBR min.
- ◆ AEC-Q101 Qualified

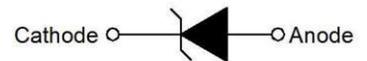
DO-214AA(SMB)



DO-214AC



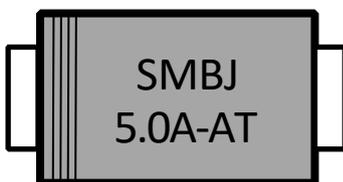
Bi-directional



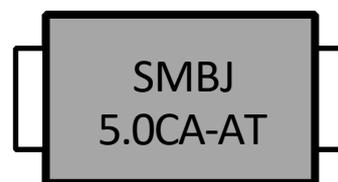
Un-directional

Marking Information

EX :
SMBJ5.0A-AT : SMBJ5.0CA-AT Marking code



SMBJ5.0CA-AT : SMBJ5.0CA-AT Marking code



Electrical Characteristics (T=25°C)

Part Number		Marking		V _R	I _R @V _R	V _{BR} @I _T		I _T	V _C @I _{PP}	I _{PP} ①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
SMBJ3.3A	--	SMBJ3.3A	--	3.3	600	5.2	6	10	8.0	75.00
SMBJ5.0A-AT	SMBJ5.0CA-AT	SMBJ5.0A-AT	SMBJ5.0CA-AT	5.0	800	6.40	7.00	10	9.2	65.22
SMBJ6.0A-AT	SMBJ6.0CA-AT	SMBJ6.0A-AT	SMBJ6.0CA-AT	6.0	800	6.67	7.37	10	10.3	58.26
SMBJ6.5A-AT	SMBJ6.5CA-AT	SMBJ6.5A-AT	SMBJ6.5CA-AT	6.5	500	7.22	7.98	10	11.2	53.58
SMBJ7.0A-AT	SMBJ7.0CA-AT	SMBJ7.0A-AT	SMBJ7.0CA-AT	7.0	200	7.78	8.60	10	12.0	50.00
SMBJ7.5A-AT	SMBJ7.5CA-AT	SMBJ7.5A-AT	SMBJ7.5CA-AT	7.5	100	8.33	9.21	1	12.9	46.52
SMBJ8.0A-AT	SMBJ8.0CA-AT	SMBJ8.0A-AT	SMBJ8.0CA-AT	8.0	50	8.89	9.83	1	13.6	44.12
SMBJ8.5A-AT	SMBJ8.5CA-AT	SMBJ8.5A-AT	SMBJ8.5CA-AT	8.5	20	9.44	10.40	1	14.4	41.67
SMBJ9.0A-AT	SMBJ9.0CA-AT	SMBJ9.0A-AT	SMBJ9.0CA-AT	9.0	10	10.00	11.10	1	15.4	38.97
SMBJ10A-AT	SMBJ10CA-AT	SMBJ10A-AT	SMBJ10CA-AT	10.0	5	11.10	12.30	1	17.0	35.30
SMBJ11A-AT	SMBJ11CA-AT	SMBJ11A-AT	SMBJ11CA-AT	11.0	1	12.20	13.50	1	18.2	32.97
SMBJ12A-AT	SMBJ12CA-AT	SMBJ12A-AT	SMBJ12CA-AT	12.0	1	13.30	14.70	1	19.9	30.16
SMBJ13A-AT	SMBJ13CA-AT	SMBJ13A-AT	SMBJ13CA-AT	13.0	1	14.40	15.90	1	21.5	27.91
SMBJ14A-AT	SMBJ14CA-AT	SMBJ14A-AT	SMBJ14CA-AT	14.0	1	15.60	17.20	1	23.2	25.87
SMBJ15A-AT	SMBJ15CA-AT	SMBJ15A-AT	SMBJ15CA-AT	15.0	1	16.70	18.50	1	24.4	24.60
SMBJ16A-AT	SMBJ16CA-AT	SMBJ16A-AT	SMBJ16CA-AT	16.0	1	17.80	19.70	1	26.0	23.08
SMBJ17A-AT	SMBJ17CA-AT	SMBJ17A-AT	SMBJ17CA-AT	17.0	1	18.90	20.90	1	27.6	21.74
SMBJ18A-AT	SMBJ18CA-AT	SMBJ18A-AT	SMBJ18CA-AT	18.0	1	20.00	22.10	1	29.2	20.55
SMBJ20A-AT	SMBJ20CA-AT	SMBJ20A-AT	SMBJ20CA-AT	20.0	1	22.20	24.50	1	32.4	18.52
SMBJ22A-AT	SMBJ22CA-AT	SMBJ22A-AT	SMBJ22CA-AT	22.0	1	24.40	26.90	1	35.5	16.91
SMBJ24A-AT	SMBJ24CA-AT	SMBJ24A-AT	SMBJ24CA-AT	24.0	1	26.70	29.50	1	38.9	15.43
SMBJ26A-AT	SMBJ26CA-AT	SMBJ26A-AT	SMBJ26CA-AT	26.0	1	28.90	31.90	1	42.1	14.26
SMBJ28A-AT	SMBJ28CA-AT	SMBJ28A-AT	SMBJ28CA-AT	28.0	1	31.10	34.40	1	45.4	13.22
SMBJ30A-AT	SMBJ30CA-AT	SMBJ30A-AT	SMBJ30CA-AT	30.0	1	33.30	36.80	1	48.4	12.40
SMBJ33A-AT	SMBJ33CA-AT	SMBJ33A-AT	SMBJ33CA-AT	33.0	1	36.70	40.60	1	53.3	11.26
SMBJ36A-AT	SMBJ36CA-AT	SMBJ36A-AT	SMBJ36CA-AT	36.0	1	40.00	44.20	1	58.1	10.33
SMBJ40A-AT	SMBJ40CA-AT	SMBJ40A-AT	SMBJ40CA-AT	40.0	1	44.40	49.10	1	64.5	9.31
SMBJ43A-AT	SMBJ43CA-AT	SMBJ43A-AT	SMBJ43CA-AT	43.0	1	47.80	52.80	1	69.4	8.65
SMBJ45A-AT	SMBJ45CA-AT	SMBJ45A-AT	SMBJ45CA-AT	45.0	1	50.00	55.30	1	72.7	8.26
SMBJ48A-AT	SMBJ48CA-AT	SMBJ48A-AT	SMBJ48CA-AT	48.0	1	53.30	58.90	1	77.4	7.76
SMBJ51A-AT	SMBJ51CA-AT	SMBJ51A-AT	SMBJ51CA-AT	51.0	1	56.70	62.70	1	82.4	7.29
SMBJ54A-AT	SMBJ54CA-AT	SMBJ54A-AT	SMBJ54CA-AT	54.0	1	60.00	66.30	1	87.1	6.89
SMBJ58A-AT	SMBJ58CA-AT	SMBJ58A-AT	SMBJ58CA-AT	58.0	1	64.40	71.20	1	93.6	6.42
SMBJ60A-AT	SMBJ60CA-AT	SMBJ60A-AT	SMBJ60CA-AT	60.0	1	66.70	73.70	1	96.8	6.20
SMBJ64A-AT	SMBJ64CA-AT	SMBJ64A-AT	SMBJ64CA-AT	64.0	1	71.10	78.60	1	103.0	5.83

Electrical Characteristics (T=25°C)

Part Number		Marking		V _R	I _R @V _R	V _{BR} @I _T		I _T	V _C @I _{PP}	I _{PP} ①
Uni-Polar	Bi-Polar	Uni	Bi	V	μA	min(V)	max(V)	mA	max(V)	A
SMBJ70A-AT	SMBJ70CA-AT	SMBJ70A-AT	SMBJ70CA-AT	70.0	1	77.80	86.00	1	113.0	5.31
SMBJ75A-AT	SMBJ75CA-AT	SMBJ75A-AT	SMBJ75CA-AT	75.0	1	83.30	92.10	1	121.0	4.96
SMBJ78A-AT	SMBJ78CA-AT	SMBJ78A-AT	SMBJ78CA-AT	78.0	1	86.70	95.80	1	126.0	4.77
SMBJ85A-AT	SMBJ85CA-AT	SMBJ85A-AT	SMBJ85CA-AT	85.0	1	94.40	104.0	1	137.0	4.38
SMBJ90A-AT	SMBJ90CA-AT	SMBJ90A-AT	SMBJ90CA-AT	90.0	1	100.0	111.0	1	146.0	4.11
SMBJ100A-AT	SMBJ100CA-AT	SMBJ100A-AT	SMBJ100CA-AT	100.0	1	111.0	123.0	1	162.0	3.71
SMBJ110A-AT	SMBJ110CA-AT	SMBJ110A-AT	SMBJ110CA-AT	110.0	1	122.0	135.0	1	177.0	3.39
SMBJ120A-AT	SMBJ120CA-AT	SMBJ120A-AT	SMBJ120CA-AT	120.0	1	133.0	147.0	1	193.0	3.11
SMBJ130A-AT	SMBJ130CA-AT	SMBJ130A-AT	SMBJ130CA-AT	130.0	1	144.0	159.0	1	209.0	2.88
SMBJ150A-AT	SMBJ150CA-AT	SMBJ150A-AT	SMBJ150CA-AT	150.0	1	167.0	185.0	1	243.0	2.47
SMBJ160A-AT	SMBJ160CA-AT	SMBJ160A-AT	SMBJ160CA-AT	160.0	1	178.0	197.0	1	259.0	2.32
SMBJ170A-AT	SMBJ170CA-AT	SMBJ170A-AT	SMBJ170CA-AT	170.0	1	189.0	209.0	1	275.0	2.19
SMBJ180A-AT	SMBJ180CA-AT	SMBJ180A-AT	SMBJ180CA-AT	180.0	1	201.0	222.0	1	292.0	2.06
SMBJ190A-AT	SMBJ190CA-AT	SMBJ190A-AT	SMBJ190CA-AT	190.0	1	209.0	233.0	1	308.0	1.96
SMBJ200A-AT	SMBJ200CA-AT	SMBJ200A-AT	SMBJ200CA-AT	200.0	1	224.0	247.0	1	324.0	1.86
SMBJ210A-AT	SMBJ210CA-AT	SMBJ210A-AT	SMBJ210CA-AT	210.0	1	237.0	263.0	1	340.0	1.79
SMBJ220A-AT	SMBJ220CA-AT	SMBJ220A-AT	SMBJ220CA-AT	220.0	1	246.0	272.0	1	356.0	1.69
SMBJ250A-AT	SMBJ250CA-AT	SMBJ250A-AT	SMBJ250CA-AT	250.0	1	279.0	309.0	1	405.0	1.49
SMBJ300A-AT	SMBJ300CA-AT	SMBJ300A-AT	SMBJ300CA-AT	300.0	1	335.0	371.0	1	486.0	1.24
SMBJ350A-AT	SMBJ350CA-AT	SMBJ350A-AT	SMBJ350CA-AT	350.0	1	391.0	432.0	1	567.0	1.06
SMBJ400A-AT	SMBJ400CA-AT	SMBJ400A-AT	SMBJ400CA-AT	400.0	1	447.0	494.0	1	648.0	0.93
SMBJ440A-AT	SMBJ440CA-AT	SMBJ440A-AT	SMBJ440CA-AT	440.0	1	492.0	543.0	1	713.0	0.85

Note: ①. Surge waveform: 10/1000μs

V_R: Stand-off voltage -- Maximum voltage that can be applied

V_{BR}: Breakdown voltage

V_C: Clamping voltage -- Peak voltage measured across the suppressor at a specified I_{PP}

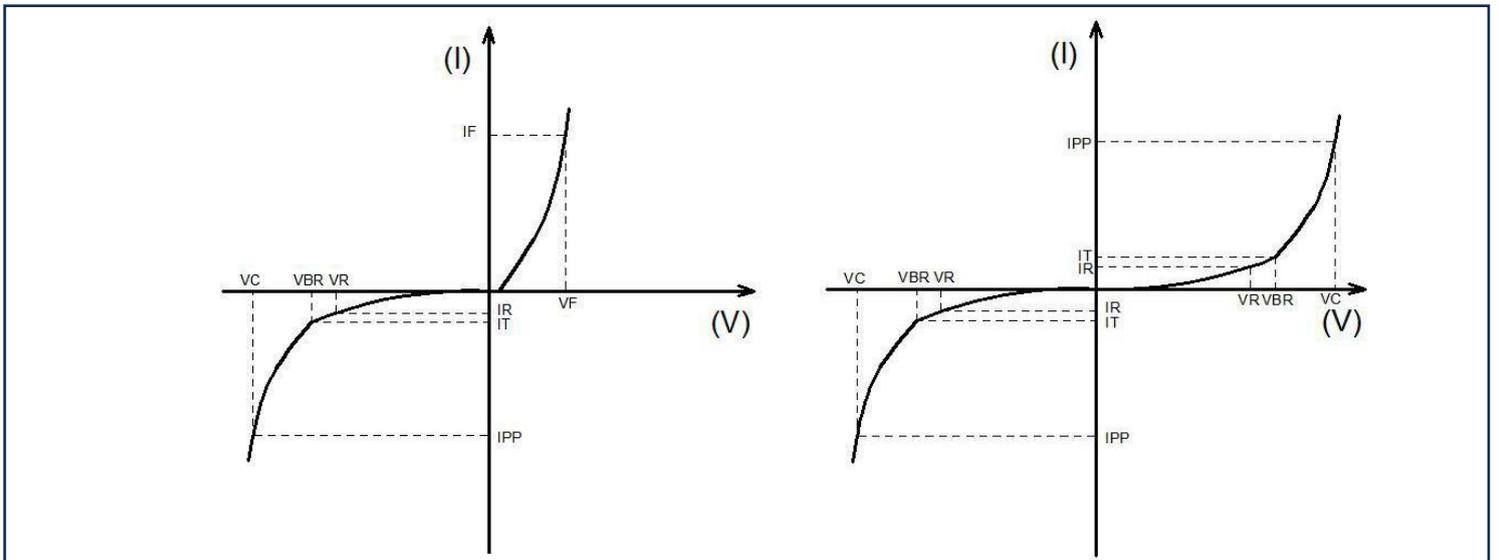
I_R: Reverse leakage current

I_T: Test current

Maximum Ratings (T=25°C, RH=45% ~ 75%, unless otherwise noted)

Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000µs waveform	P _{PP}	600	W
Steady state power dissipation at T _L =75°C	P _{M(AV)}	5.0	W
Operating junction temperature range	T _j	-55 to +175	°C
Storage temperature range	T _{stg}	-55 to +175	°C

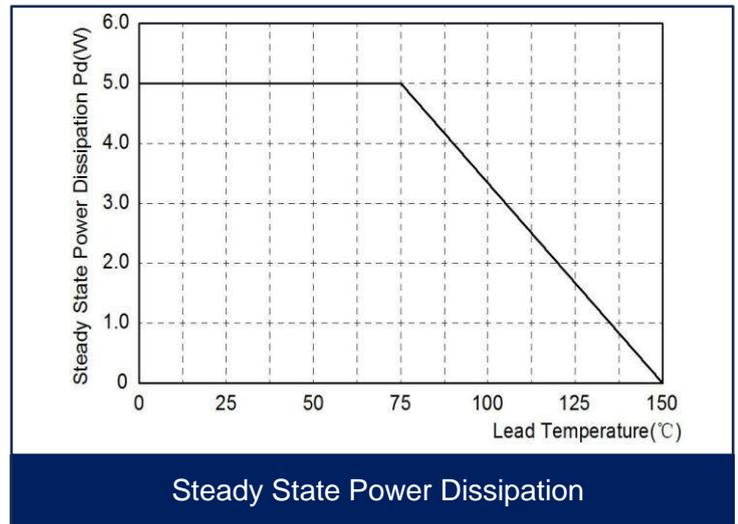
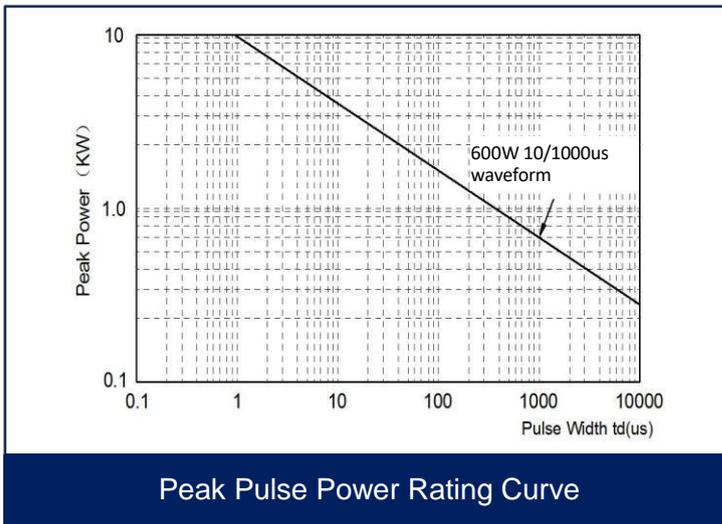
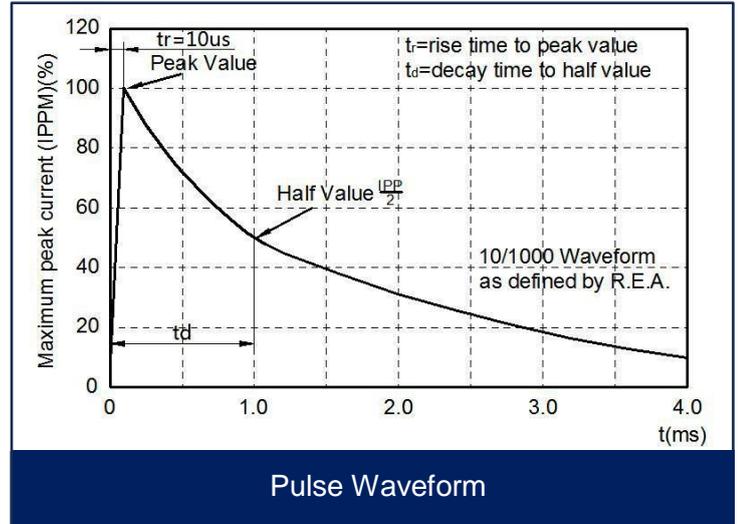
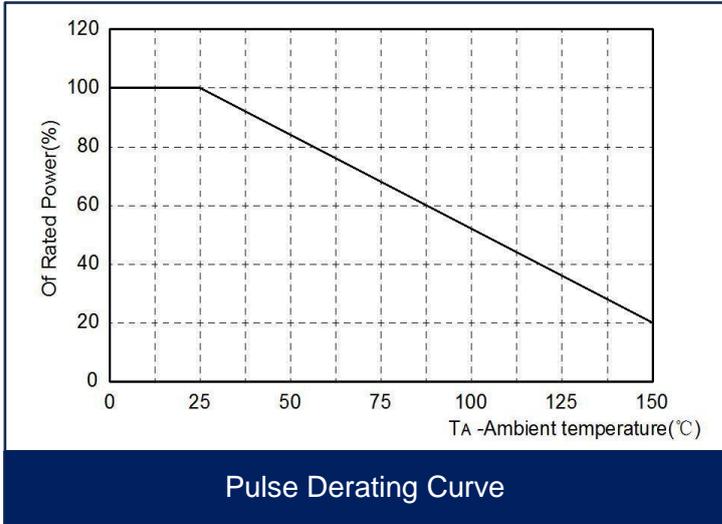
Ratings And V-I Characteristics Curves (T=25°C, unless otherwise noted)



Ratings And V-I Characteristics Curves (T=25°C, unless otherwise noted)

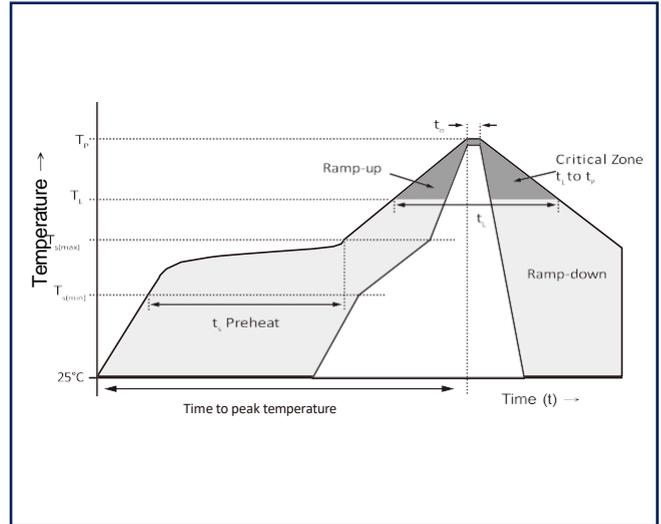
Symbol	Parameter
I _F	Mean Forward Current
V _F	Maximum Forward Voltage @ I _F
V _R	Peak Reverse Working Voltage
I _R	Reverse Leakage Current @ V _R
V _{BR}	Breakdown Voltage @ I _T
I _T	Test Current
I _{PP}	Maximum Reverse Peak Pulse Current
V _C	Clamping Voltage @ I _{PP}

Typical Characteristics

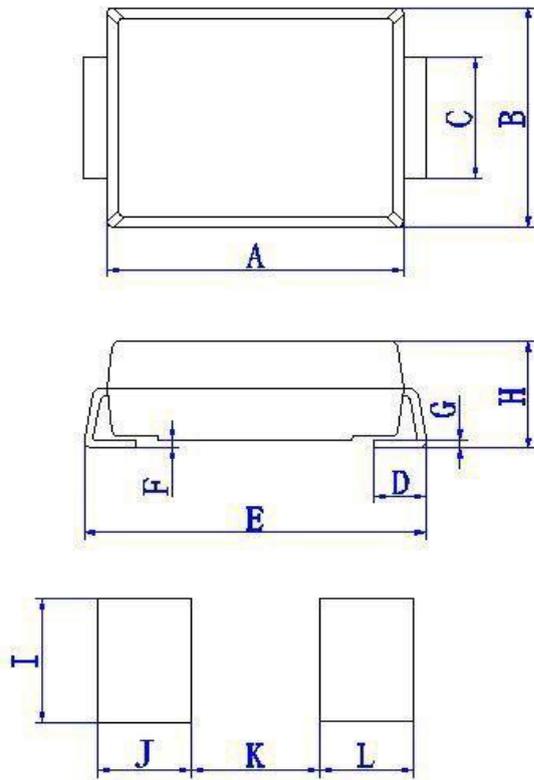


Soldering Parameters

Reflow Condition		Lead-free assembly
Pre Heat	Temperature Max ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_p)	60 – 180 secs
Average ramp up rate (Liquidus Temp (T_L) to peak)		3°C/second max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Time (min to max) (t_r)	60 – 150 seconds
Peak Temperature (T_p)		260°C (+0/-5)
Time within 5°C of actual peak Temperature (t_p)		30 seconds Max
Ramp-down Rate		6°C/second Max
Time 25°C to peak Temperature (T_p)		8 minutes Max.
Do not exceed		260°C

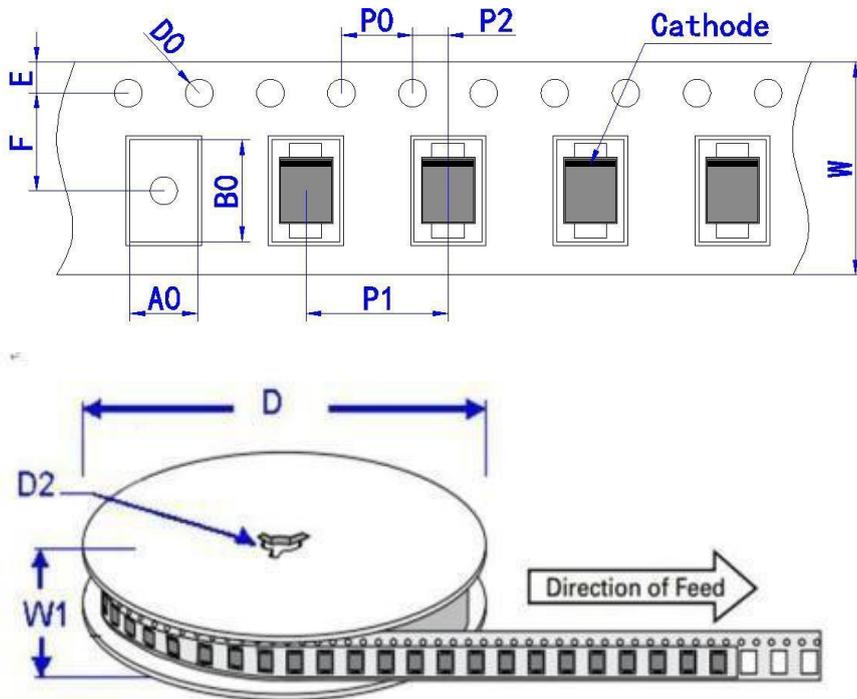


Package mechanical data & Suggested Land Pattern



Ref. (mm)	Millimeters	
	Min.	Max.
A	4.22	4.70
B	3.4	3.94
C	1.9	2.1
D	0.90	1.42
E	5.21	5.59
F	0	0.23
G	0.15	0.25
H	1.95	2.60
I	2.30	--
J	1.50	--
K	--	2.80
L	1.50	--

Tape And Reel Specification - SMB



Ref.	Millimeters
A0	3.81±0.20
B0	5.74±0.20
C	330.00
D0	1.55±0.10
E	1.75±0.20
E1	13.50±1.00
F	5.50±0.10
P0	4.00±0.20
P1	8.00±0.20
P2	2.00±0.20
W	12.00±0.30
W1	16.00±4.00
D	333±4.00
D2	13.5±0.2