

Applications

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

Mechanical Data

- ◆ Package : SMA/DO-214AC
- ◆ 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 : 0.07g(approximate)

Product and Packing Information

Part Number	QTY/Reel	Reel Size
SMAJxx(C)A-AT	5,000	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.

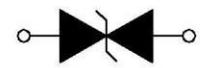
Features

- ◆ For surface mounted applications
- ◆ Excellent clamping capability
- ◆ 400 W peak pulse power capability with a 10/1000µs Waveform.
- ◆ VRWM 5.0 ~ 440V
- ◆ Low profile package and low inductance
- ◆ Typical IR less than 1uA above 12V
- ◆ Fast response time: typically less than 1.0ps from 0V to VBR min.
- ◆ AEC-Q101 Qualified

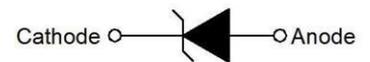
DO-214AC(SMA)



DO-214AC



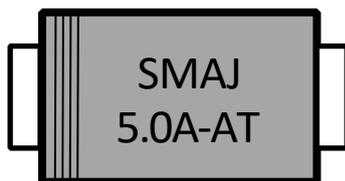
Bi-directional



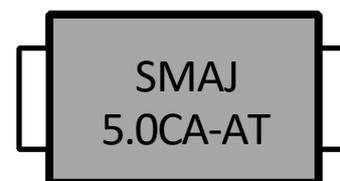
Un-directional

Marking Information

EX :
SMAJ5.0A-AT : SMAJ5.0A-AT Marking code



SMAJ5.0CA-AT : SMAJ5.0CA-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
SMAJ5.0A-AT	SMAJ5.0CA-AT	SMAJ5.0A-AT	SMAJ5.0CA-AT	5.0	800	6.40	7.00	10	9.2	43.48
SMAJ6.0A-AT	SMAJ6.0CA-AT	SMAJ6.0A-AT	SMAJ6.0CA-AT	6.0	800	6.67	7.37	10	10.3	38.84
SMAJ6.5A-AT	SMAJ6.5CA-AT	SMAJ6.5A-AT	SMAJ6.5CA-AT	6.5	500	7.22	7.98	10	11.2	35.72
SMAJ7.0A-AT	SMAJ7.0CA-AT	SMAJ7.0A-AT	SMAJ7.0CA-AT	7.0	200	7.78	8.60	10	12.0	33.34
SMAJ7.5A-AT	SMAJ7.5CA-AT	SMAJ7.5A-AT	SMAJ7.5CA-AT	7.5	100	8.33	9.21	1	12.9	31.01
SMAJ8.0A-AT	SMAJ8.0CA-AT	SMAJ8.0A-AT	SMAJ8.0CA-AT	8.0	50	8.89	9.83	1	13.6	29.42
SMAJ8.5A-AT	SMAJ8.5CA-AT	SMAJ8.5A-AT	SMAJ8.5CA-AT	8.5	20	9.44	10.40	1	14.4	27.78
SMAJ9.0A-AT	SMAJ9.0CA-AT	SMAJ9.0A-AT	SMAJ9.0CA-AT	9.0	10	10.00	11.10	1	15.4	25.98
SMAJ10A-AT	SMAJ10CA-AT	SMAJ10A-AT	SMAJ10CA-AT	10.0	5	11.10	12.30	1	17.0	23.53
SMAJ11A-AT	SMAJ11CA-AT	SMAJ11A-AT	SMAJ11CA-AT	11.0	1	12.20	13.50	1	18.2	21.98
SMAJ12A-AT	SMAJ12CA-AT	SMAJ12A-AT	SMAJ12CA-AT	12.0	1	13.30	14.70	1	19.9	20.11
SMAJ13A-AT	SMAJ13CA-AT	SMAJ13A-AT	SMAJ13CA-AT	13.0	1	14.40	15.90	1	21.5	18.61
SMAJ14A-AT	SMAJ14CA-AT	SMAJ14A-AT	SMAJ14CA-AT	14.0	1	15.60	17.20	1	23.2	17.25
SMAJ15A-AT	SMAJ15CA-AT	SMAJ15A-AT	SMAJ15CA-AT	15.0	1	16.70	18.50	1	24.4	16.40
SMAJ16A-AT	SMAJ16CA-AT	SMAJ16A-AT	SMAJ16CA-AT	16.0	1	17.80	19.70	1	26.0	15.39
SMAJ17A-AT	SMAJ17CA-AT	SMAJ17A-AT	SMAJ17CA-AT	17.0	1	18.90	20.90	1	27.6	14.50
SMAJ18A-AT	SMAJ18CA-AT	SMAJ18A-AT	SMAJ18CA-AT	18.0	1	20.00	22.10	1	29.2	13.70
SMAJ20A-AT	SMAJ20CA-AT	SMAJ20A-AT	SMAJ20CA-AT	20.0	1	22.20	24.50	1	32.4	12.35
SMAJ22A-AT	SMAJ22CA-AT	SMAJ22A-AT	SMAJ22CA-AT	22.0	1	24.40	26.90	1	35.5	11.27
SMAJ24A-AT	SMAJ24CA-AT	SMAJ24A-AT	SMAJ24CA-AT	24.0	1	26.70	29.50	1	38.9	10.29
SMAJ26A-AT	SMAJ26CA-AT	SMAJ26A-AT	SMAJ26CA-AT	26.0	1	28.90	31.90	1	42.1	9.51
SMAJ28A-AT	SMAJ28CA-AT	SMAJ28A-AT	SMAJ28CA-AT	28.0	1	31.10	34.40	1	45.4	8.82
SMAJ30A-AT	SMAJ30CA-AT	SMAJ30A-AT	SMAJ30CA-AT	30.0	1	33.30	36.80	1	48.4	8.27
SMAJ33A-AT	SMAJ33CA-AT	SMAJ33A-AT	SMAJ33CA-AT	33.0	1	36.70	40.60	1	53.3	7.51
SMAJ36A-AT	SMAJ36CA-AT	SMAJ36A-AT	SMAJ36CA-AT	36.0	1	40.00	44.20	1	58.1	6.89
SMAJ40A-AT	SMAJ40CA-AT	SMAJ40A-AT	SMAJ40CA-AT	40.0	1	44.40	49.10	1	64.5	6.21
SMAJ43A-AT	SMAJ43CA-AT	SMAJ43A-AT	SMAJ43CA-AT	43.0	1	47.80	52.80	1	69.4	5.77
SMAJ45A-AT	SMAJ45CA-AT	SMAJ45A-AT	SMAJ45CA-AT	45.0	1	50.00	55.30	1	72.7	5.51
SMAJ48A-AT	SMAJ48CA-AT	SMAJ48A-AT	SMAJ48CA-AT	48.0	1	53.30	58.90	1	77.4	5.17
SMAJ51A-AT	SMAJ51CA-AT	SMAJ51A-AT	SMAJ51CA-AT	51.0	1	56.70	62.70	1	82.4	4.86
SMAJ54A-AT	SMAJ54CA-AT	SMAJ54A-AT	SMAJ54CA-AT	54.0	1	60.00	66.30	1	87.1	4.60
SMAJ58A-AT	SMAJ58CA-AT	SMAJ58A-AT	SMAJ58CA-AT	58.0	1	64.40	71.20	1	93.6	4.28
SMAJ60A-AT	SMAJ60CA-AT	SMAJ60A-AT	SMAJ60CA-AT	60.0	1	66.70	73.70	1	96.8	4.14
SMAJ64A-AT	SMAJ64CA-AT	SMAJ64A-AT	SMAJ64CA-AT	64.0	1	71.10	78.60	1	103.0	3.89
SMAJ70A-AT	SMAJ70CA-AT	SMAJ70A-AT	SMAJ70CA-AT	70.0	1	77.80	86.00	1	113.0	3.54

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
SMAJ75A-AT	SMAJ75CA-AT	SMAJ75A-AT	SMAJ75CA-AT	75.0	1	83.30	92.10	1	121.0	3.31
SMAJ78A-AT	SMAJ78CA-AT	SMAJ78A-AT	SMAJ78CA-AT	78.0	1	86.70	95.80	1	126.0	3.18
SMAJ85A-AT	SMAJ85CA-AT	SMAJ85A-AT	SMAJ85CA-AT	85.0	1	94.40	104.0	1	137.0	2.92
SMAJ90A-AT	SMAJ90CA-AT	SMAJ90A-AT	SMAJ90CA-AT	90.0	1	100.0	111.0	1	146.0	2.74
SMAJ100A-AT	SMAJ100CA-AT	SMAJ100A-AT	SMAJ100CA-AT	100.0	1	111.0	123.0	1	162.0	2.47
SMAJ110A-AT	SMAJ110CA-AT	SMAJ110A-AT	SMAJ110CA-AT	110.0	1	122.0	135.0	1	177.0	2.26
SMAJ120A-AT	SMAJ120CA-AT	SMAJ120A-AT	SMAJ120CA-AT	120.0	1	133.0	147.0	1	193.0	2.08
SMAJ130A-AT	SMAJ130CA-AT	SMAJ130A-AT	SMAJ130CA-AT	130.0	1	144.0	159.0	1	209.0	1.92
SMAJ150A-AT	SMAJ150CA-AT	SMAJ150A-AT	SMAJ150CA-AT	150.0	1	167.0	185.0	1	243.0	1.65
SMAJ160A-AT	SMAJ160CA-AT	SMAJ160A-AT	SMAJ160CA-AT	160.0	1	178.0	197.0	1	259.0	1.55
SMAJ170A-AT	SMAJ170CA-AT	SMAJ170A-AT	SMAJ170CA-AT	170.0	1	189.0	209.0	1	275.0	1.46
SMAJ180A-AT	SMAJ180CA-AT	SMAJ180A-AT	SMAJ180CA-AT	180.0	1	201.0	222.0	1	292.0	1.37
SMAJ190A-AT	SMAJ190CA-AT	SMAJ190A-AT	SMAJ190CA-AT	190.0	1	209.0	233.0	1	308.0	1.30
SMAJ200A-AT	SMAJ200CA-AT	SMAJ200A-AT	SMAJ200CA-AT	200.0	1	224.0	247.0	1	324.0	1.24
SMAJ210A-AT	SMAJ210CA-AT	SMAJ210A-AT	SMAJ210CA-AT	210.0	1	237.0	263.0	1	340.0	1.18
SMAJ220A-AT	SMAJ220CA-AT	SMAJ220A-AT	SMAJ220CA-AT	220.0	1	246.0	272.0	1	356.0	1.13
SMAJ250A-AT	SMAJ250CA-AT	SMAJ250A-AT	SMAJ250CA-AT	250.0	1	279.0	309.0	1	405.0	0.99
SMAJ300A-AT	SMAJ300CA-AT	SMAJ300A-AT	SMAJ300CA-AT	300.0	1	335.0	371.0	1	486.0	0.83
SMAJ350A-AT	SMAJ350CA-AT	SMAJ350A-AT	SMAJ350CA-AT	350.0	1	391.0	432.0	1	567.0	0.71
SMAJ400A-AT	SMAJ400CA-AT	SMAJ400A-AT	SMAJ400CA-AT	400.0	1	447.0	494.0	1	648.0	0.62
SMAJ440A-AT	SMAJ440CA-AT	SMAJ440A-AT	SMAJ440CA-AT	440.0	1	492.0	543.0	1	713.0	0.57

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}

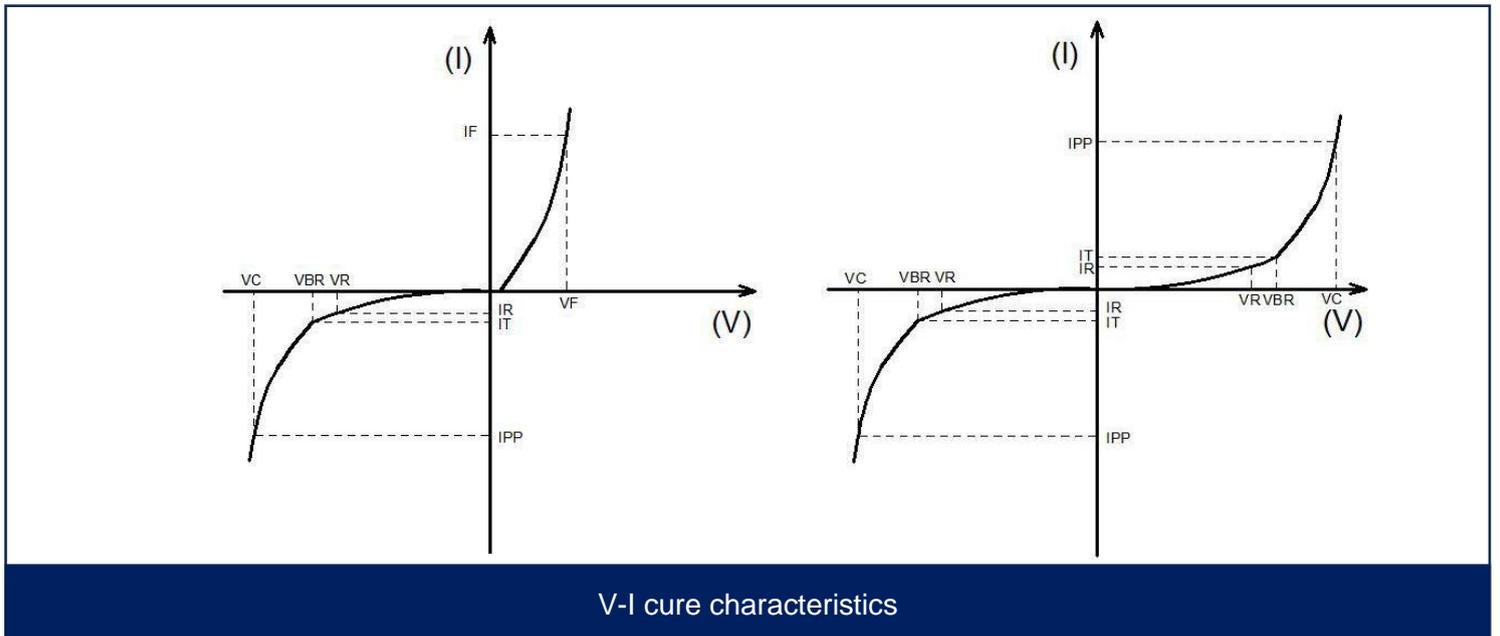
I_R: Reverse leakage current

I_T: Test current

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

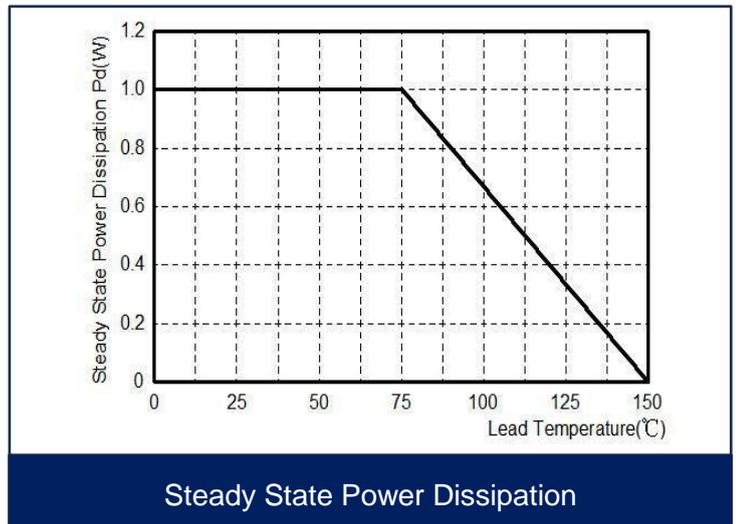
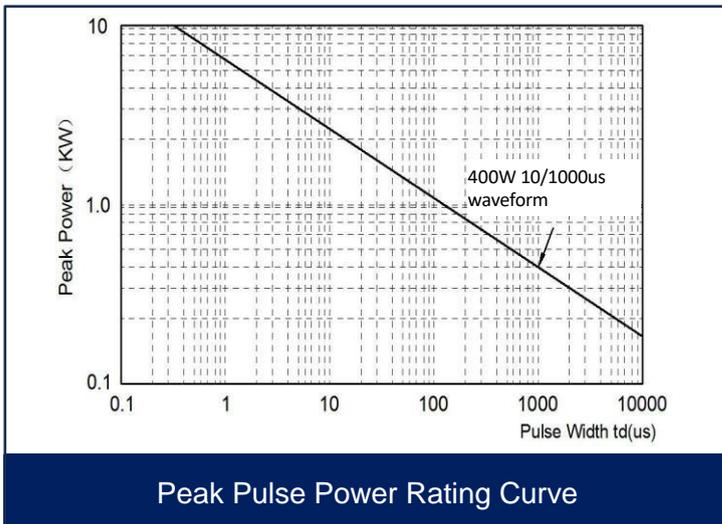
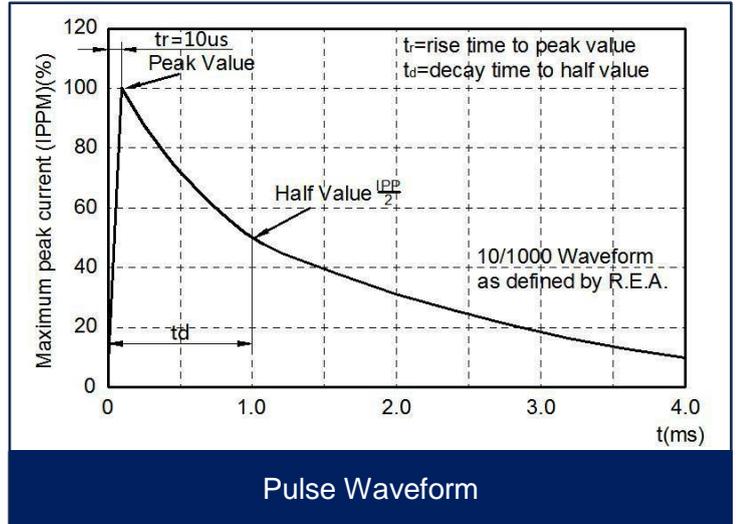
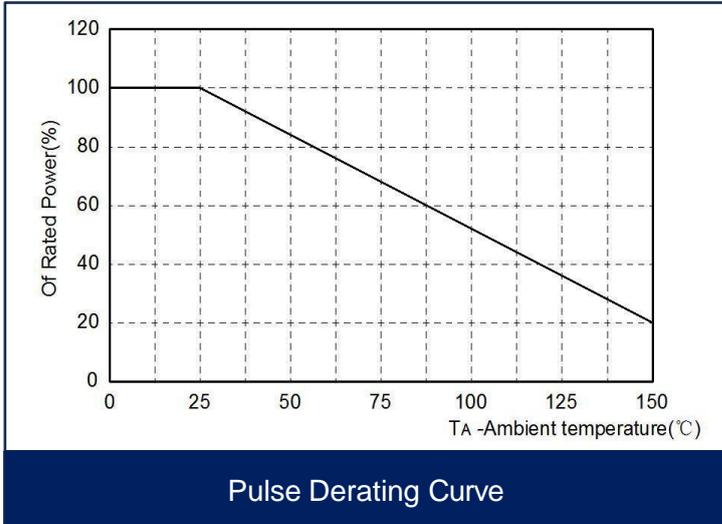
Parameter	Symbol	Value	Unit
Peak pulse power dissipation on 10/1000µs waveform	P _{PP}	400	W
Steady state power dissipation at T _L =75°C	P _{M(AV)}	1.0	W
Operating junction temperature range	T _j	-55 to +175	°C
Storage temperature range	T _{stg}	-55 to +175	°C

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



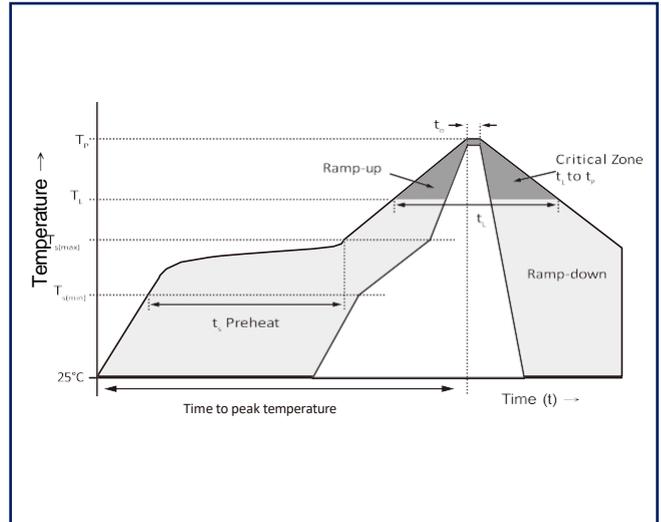
Symbol	Parameter
I _F	Mean Forward Current
V _F	Maximum Forward Voltage @ I _F
V _R	Peak Reverse Working Voltage
I _R	Reverse Leakage Current @ V _R
V _{BR}	Breakdown Voltage @ I _T
I _T	Test Current
I _{PP}	Maximum Reverse Peak Pulse Current
V _C	Clamping Voltage @ I _{PP}

Typical Characteristics

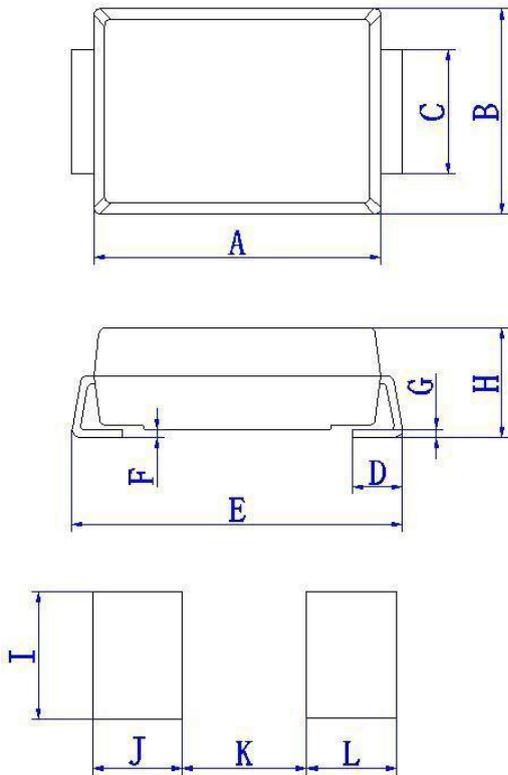


Soldering Parameters

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

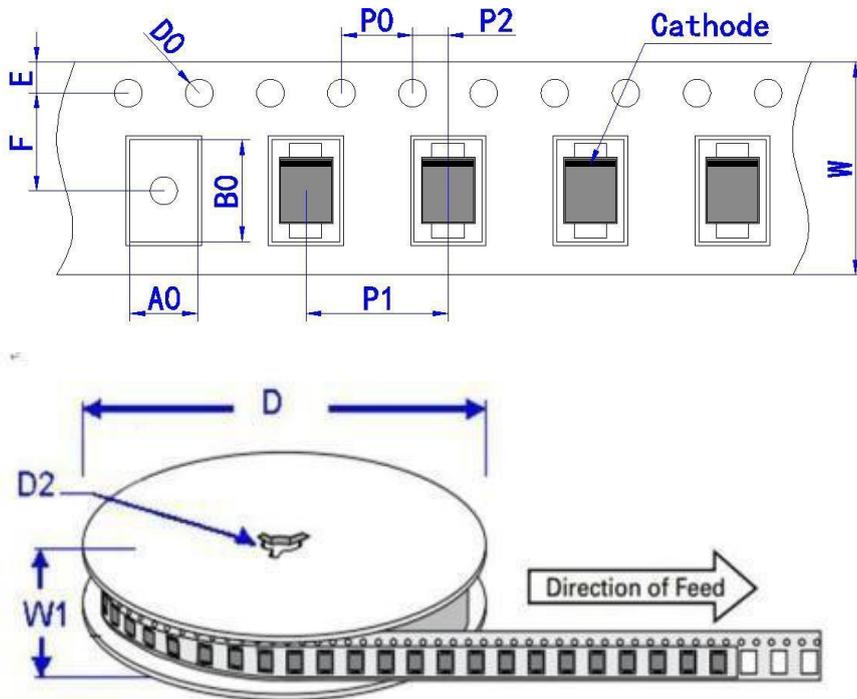


Package mechanical data & Suggested Land Pattern



Ref. (mm)	Millimeters	
	Min.	Max.
A	3.99	4.5
B	2.5	2.9
C	1.2	1.7
D	0.76	1.52
E	4.93	5.28
F	0	0.203
G	0.15	0.25
H	1.98	2.41
I	1.8	--
J	2.1	--
K	--	2.3
L	2.1	--

Tape And Reel Specification - SMA



Ref.	Millimeters
A0	2.79±0.20
B0	5.33±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	4.00±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