

1. Synopsis

1-1. General Description

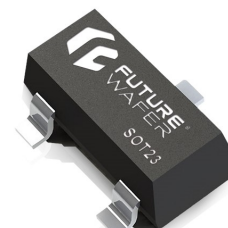
These Schottky Barrier Diodes are Designed for High Speed Switching Applications, Circuit Protection, And Voltage Clamping. Extremely Low Forward Voltage Reduces Conduction Loss. Miniature Surface Mount Package is Excellent For Hand Held And Portable Applications Where Space is Limited.

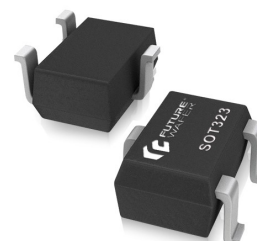
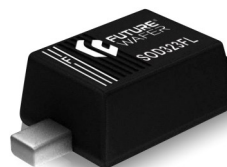
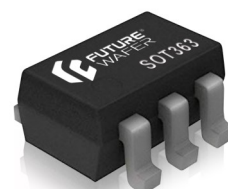
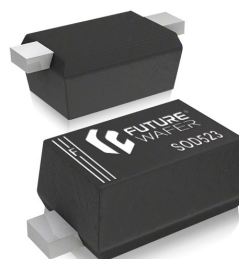
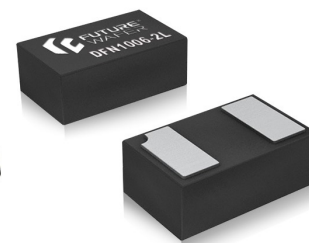
1-2. Feature List

- Low Turn-on Voltage
- Extremely Fast Switching Speed
- PN Junction Guard Ring for Transient and ESD Protection
- Totally Lead-Free & Fully RoHS Compliant
- Halogen and Antimony Free. "Green" Device

1-3. Mechanical Characteristics

- Molded JEDEC Package
 - SOT-23 / - SOT-323
 - SOT-363 / - SOD123
 - SOD323 / - SOD323-FL
 - SOD523-FL / - DFN1006-2L
- Packing: Tape and Reel
- Flammability Rating UL 94V-0
- Halogen Free
- JEDEC J-STD-20 MSL Classifications: Level 1


 BAT54T
 SOD123

 BAT54
 SOT-23

 BAT54H
 SOD323

 BAT54CW
 SOT-323

 BAT54WS
 SOD323-FL

 BAT54BRW
 SOT-363

 BAT54K
 SOD523-FL

 BAT54L
 DFN1006-2L


1-4. Device Characteristics

Maximum Ratings@25°C Unless Otherwise Specified

Parameter	Symbol	Values	Units
Peak Repetitive Reverse Voltage	V_{RRM}	30	V
Working Peak Reverse Voltage	V_{RWM}		
DC Reverse Voltage	V_R		
Average Forward Current	I_F	200	mA
Non-repetitive Peak Forward Surge Current	@ $T = 1.0s$ I_{FSM}	600	
Power Dissipation	P_D	200	mW
Operating and Storage Temperature	T_J	-65 ~ +150	°C
	T_{STG}		

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3. Electrical Property

3-1. Electrical Characteristics

Parameter	Symbol	Condition	Min.	Max.	Units
Reverse Breakdown Voltage	V_{BR}	$I_R = 100\mu A$ $T_A = 25^\circ C$	-	30	V
Forward Voltage	V_F	$I_F = 0.1mA$	-	240	mV
		$I_F = 1mA$	-	320	
		$I_F = 10mA$	-	400	
		$I_F = 30mA$	-	500	
		$I_F = 100mA$	-	800	
Reverse Recovery Time	t_{rr}	-	-	5.0	nS
Reverse Leakage Current	I_R	@ $V_R = 30V$ $T_A = 25^\circ C$	-	2.0	μA
Junction Capacitance	C_J	Pin Capacitance to GND. $V_{dc} = 0V, f = 1MHz$	-	10	pF

3-2. Thermal Characteristics

Parameter	Symbol	Package	Values	Units
Junction-Ambient	R_{thJA}	SOT23, SOD123, DFN1006-2L	500	$^\circ C/W$
		SOT323, SOT363, SOD323, SOD323FL	550	
		SOD523FL	600	

3-3. Ratings and Characteristics Curve-Fig 1~2

Fig 1. Power Derating Curve

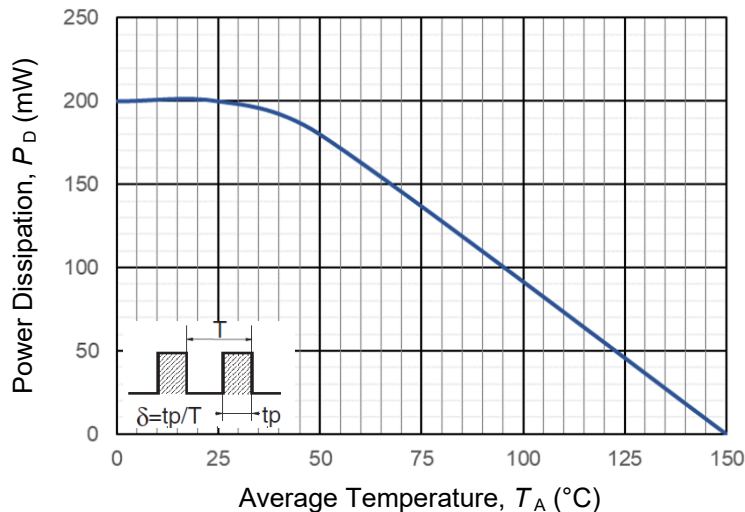
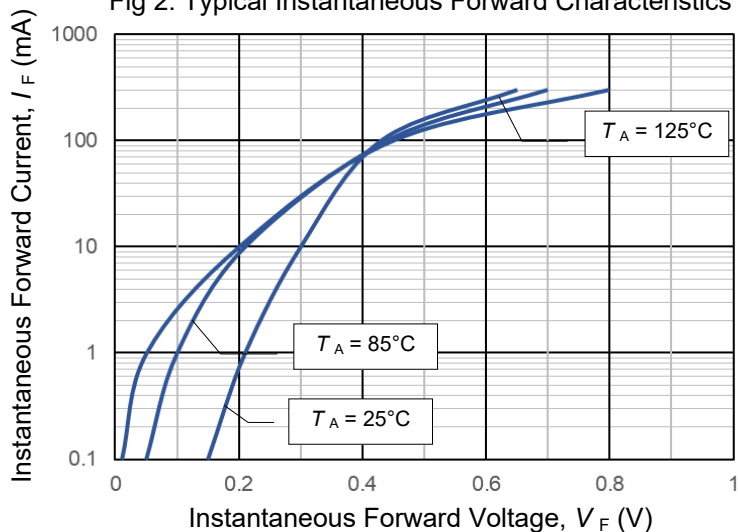


Fig 2. Typical Instantaneous Forward Characteristics



3-3. Ratings and Characteristics Curve-Fig 3~7

Fig 3. Typical Reverse Current Characteristics

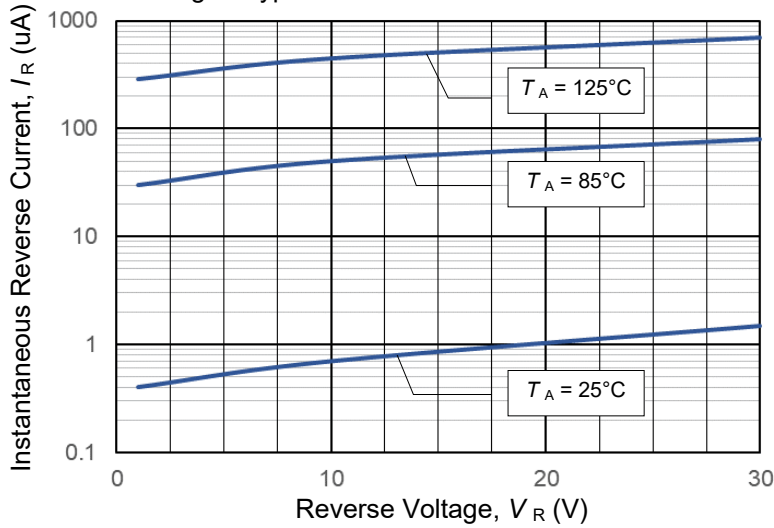


Fig 4. Total Capacitance vs. V_R

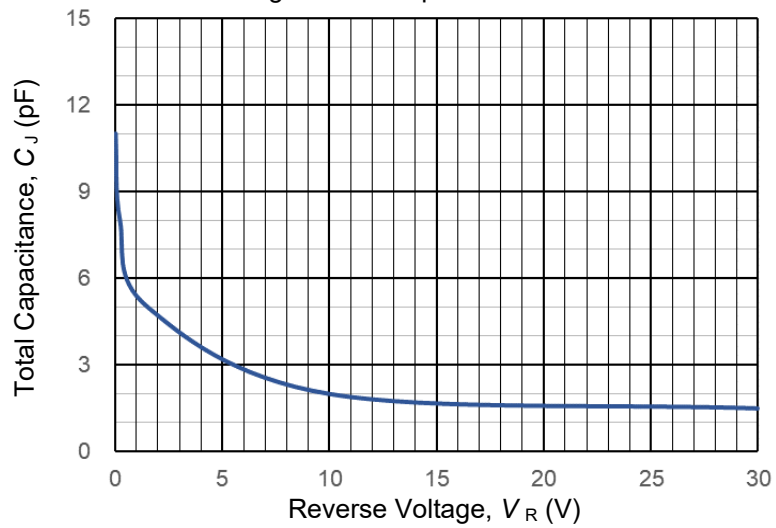


Fig 5. Average Forward Power Dissipation vs. Average Forward Current

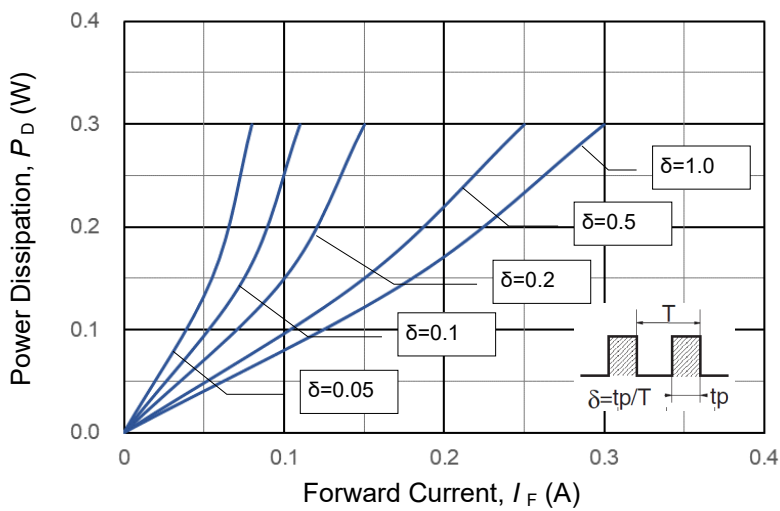


Fig 6. Reverse Leakage Current vs. Junction Temperature

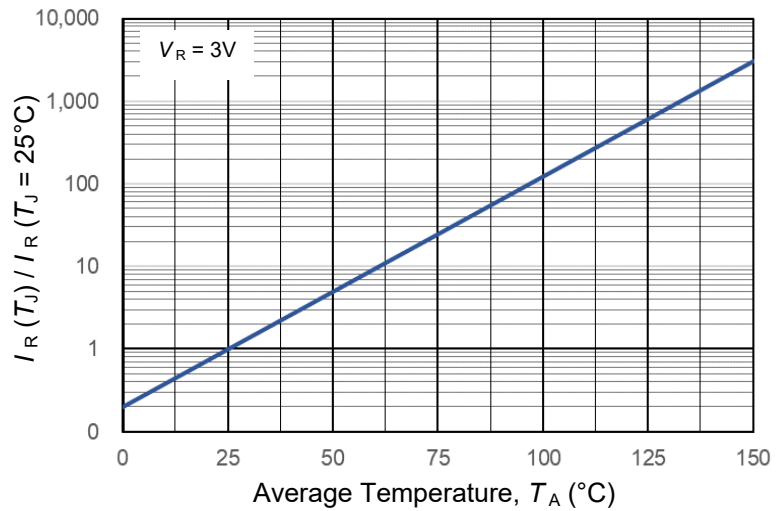
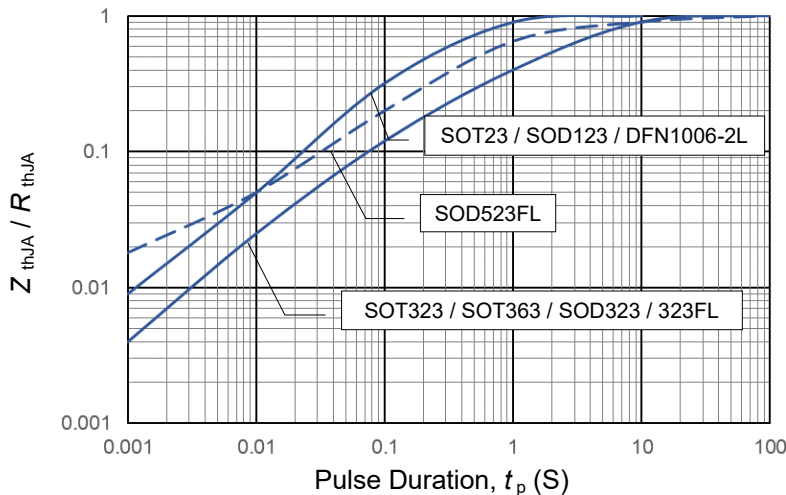
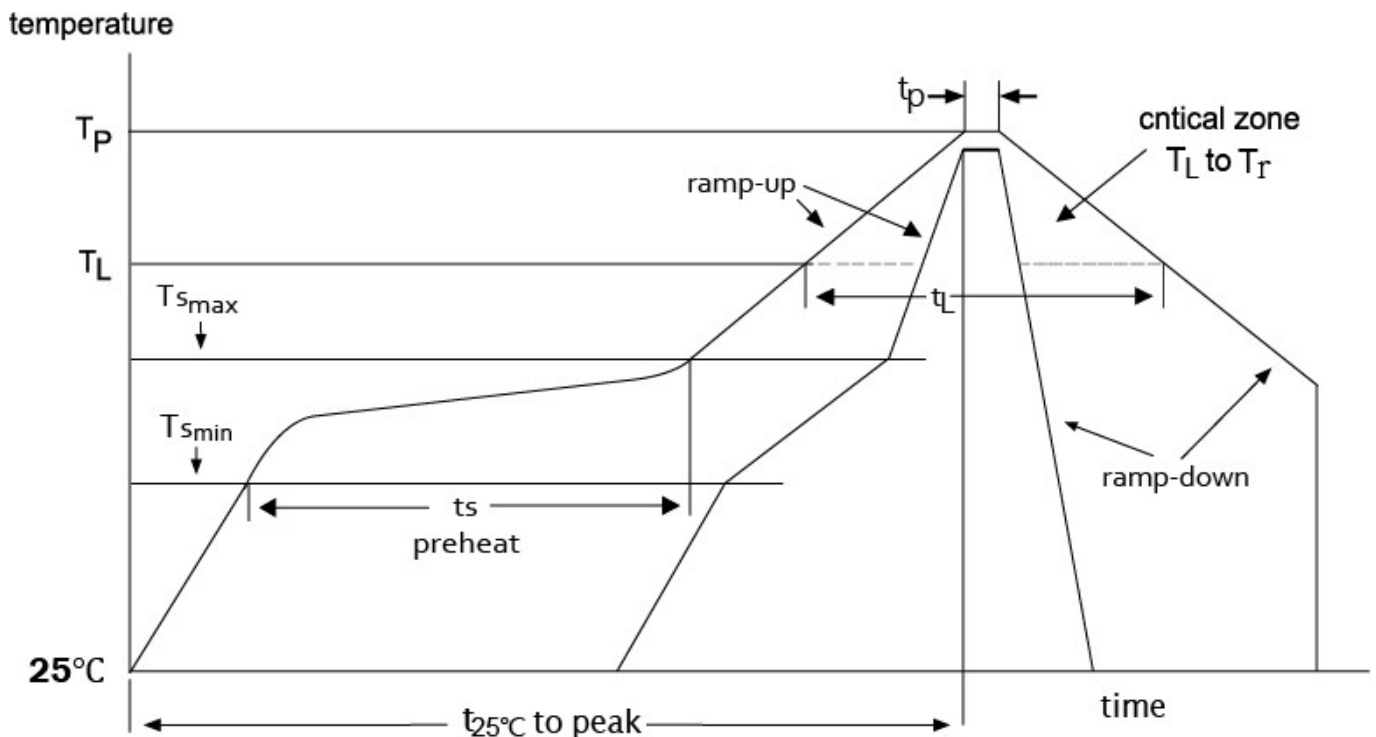


Fig 7. Relative Variation of Thermal Impedance Junction to Ambient vs. Pulse Duration



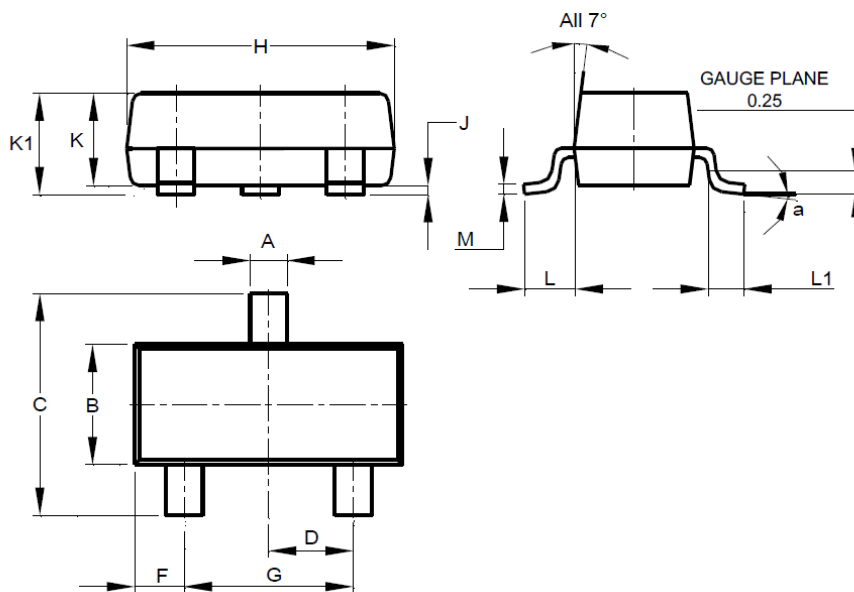
4. Soldering Parameters

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



5. Package Information

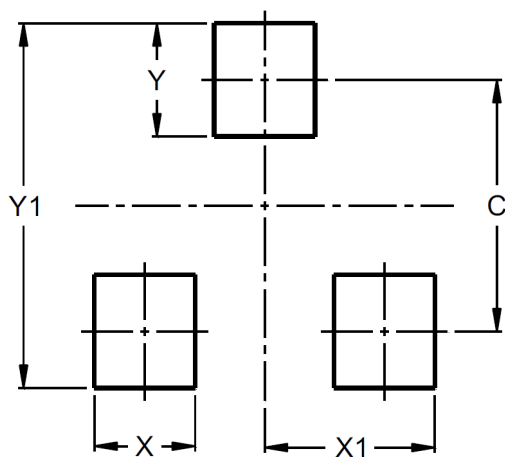
5-1. Dimension-SOT23


SOT23

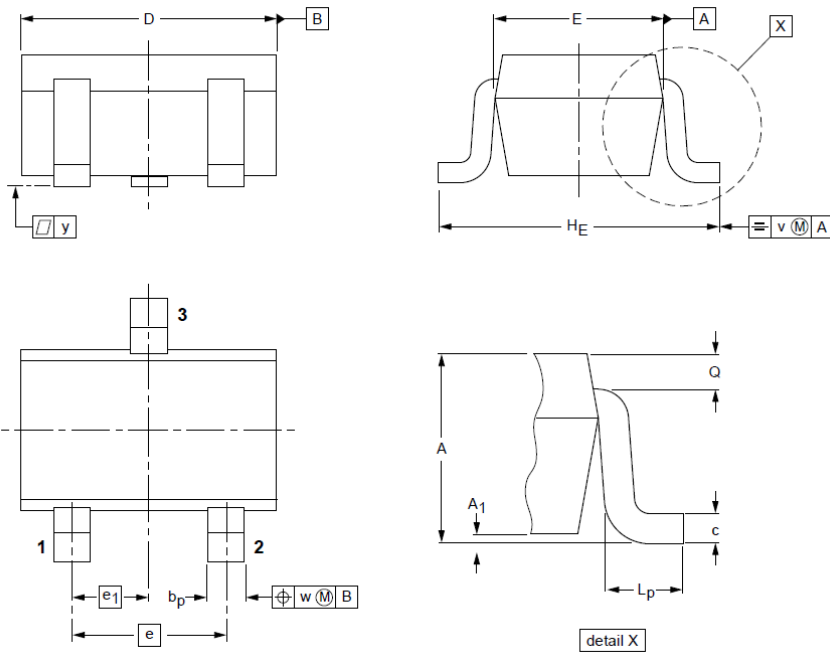
Dim	Min.	Max.	Typ.
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	8°		

Unit: mm

5-2. PCB Pad Layout Recommendation-SOT23

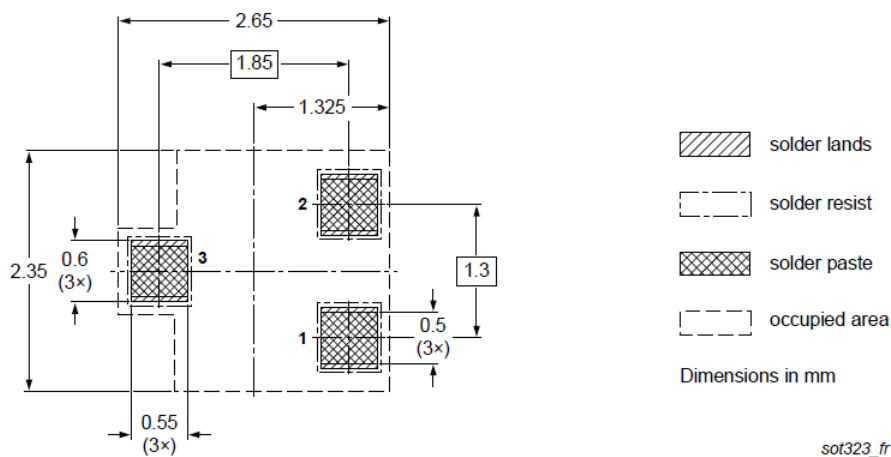


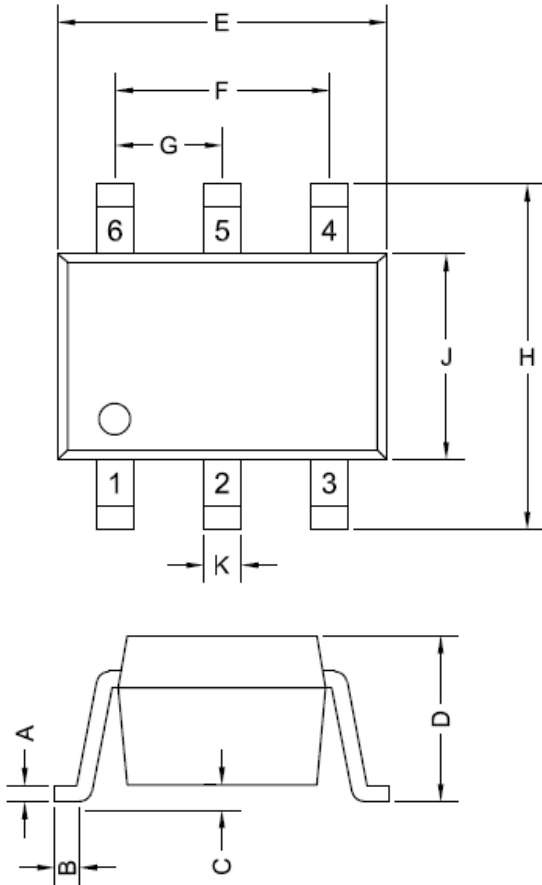
Dim	Millimeter
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

5-3. Dimension-SOT323


SOT323			
Dim	Min.	Max.	Typ.
A	0.8	1.1	-
A1	-	0.1	-
bp	0.3	0.4	-
c	0.10	0.25	-
D	1.8	2.2	-
E	1.15	1.35	-
e	-	-	1.3
e1	-	-	0.65
HE	2.0	2.2	-
Lp	0.15	0.45	-
Q	0.13	0.23	-
v	-	-	0.2
w	-	-	0.2

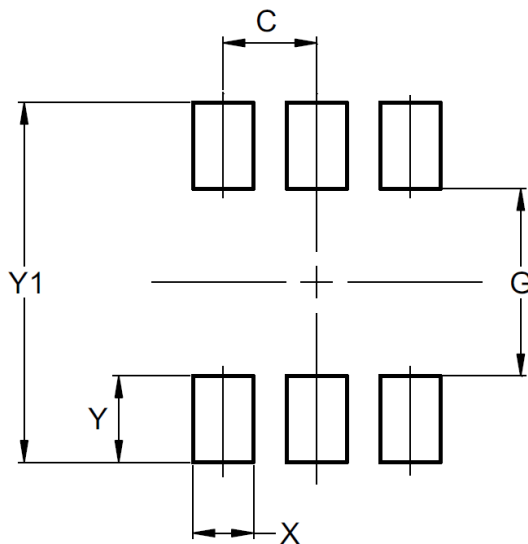
Unit:mm

5-4. PCB Pad Layout Recommendation-SOT323


5-5. Dimension-SOT363


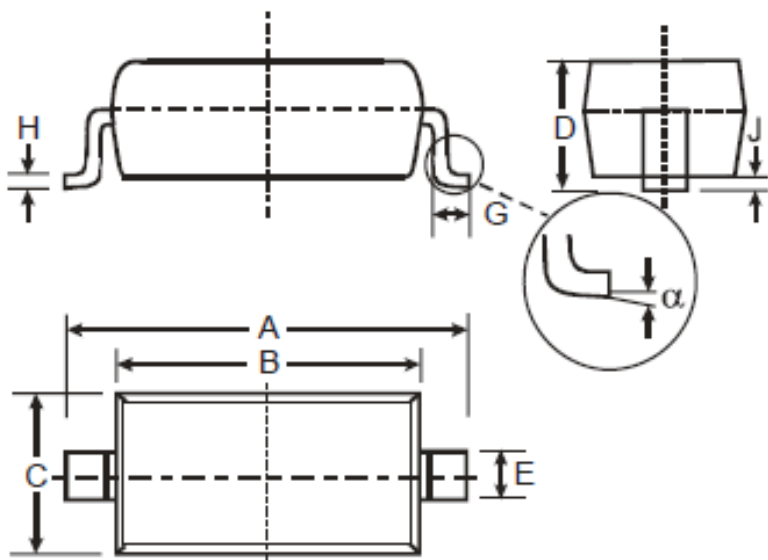
SOT363		
Symbol	Min.	Max
A	0.10	0.25
B	0.12	0.40
C	0.00	0.10
D	0.80	1.10
E	1.80	2.20
F	1.30	
G	0.65	
H	1.90	2.30
J	1.10	1.40
K	0.10	0.30

Unit: mm

5-6. PCB Pad Layout Recommendation-SOT363


SOT363	
Symbol	Millimeter
C	0.65
G	1.10
X	0.42
Y	0.80
Y1	2.70

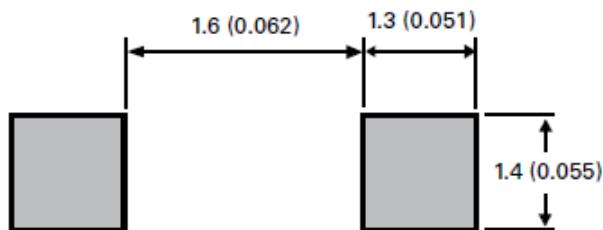
5-7. Dimension-SOD123


SOD123

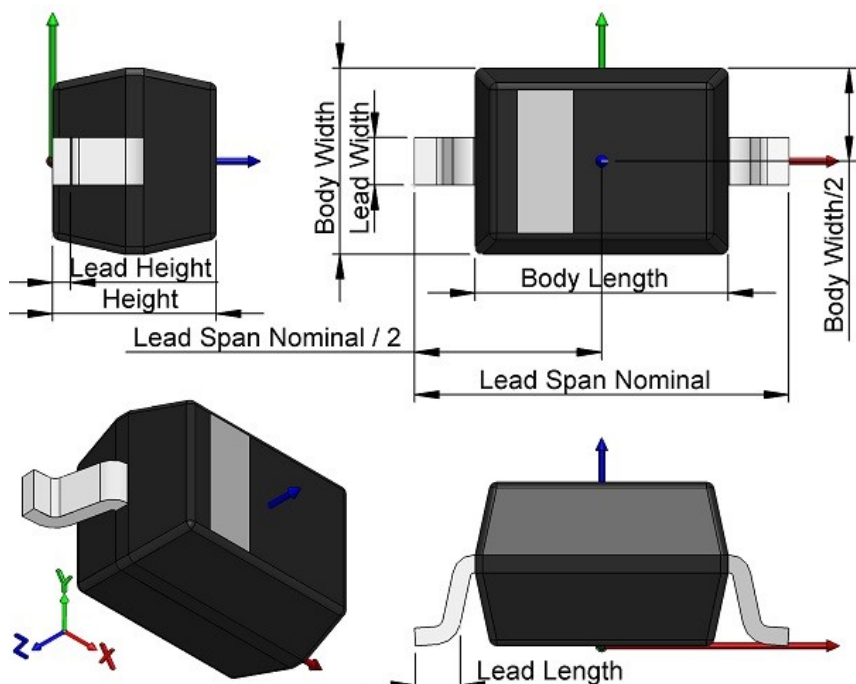
Dim	Min.	Max.
A	3.55	3.85
B	2.55	2.85
C	1.40	1.80
D	-	1.35
E	0.45	0.65
G	0.25	-
H	-	0.25
J	0.30	0.75
α	0°	8°

Unit: mm

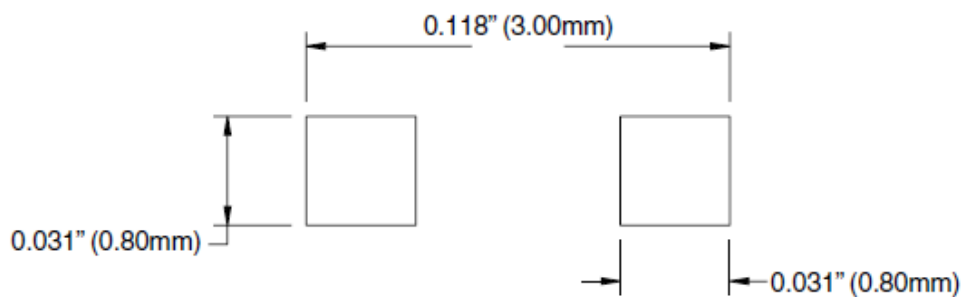
5-8. PCB Pad Layout Recommendation-SOD123

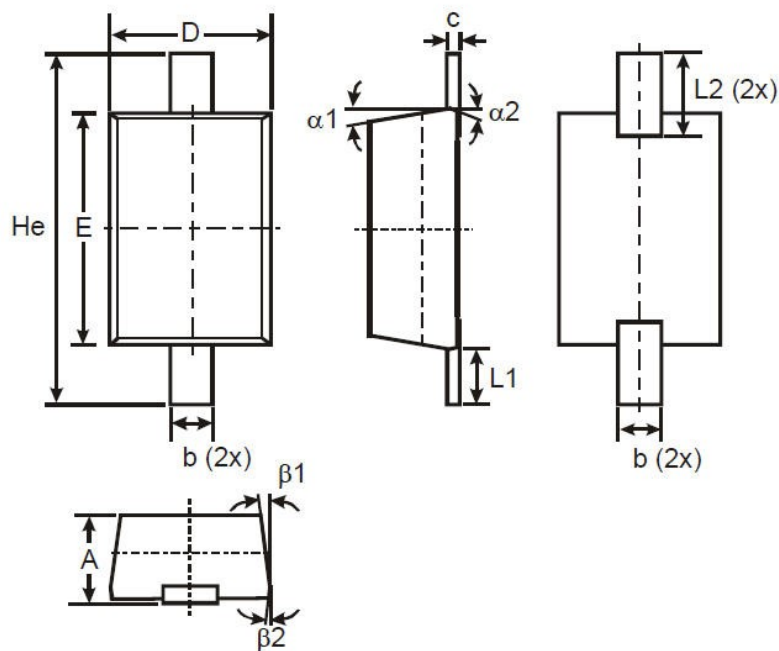


Unit: mm (inch)

5-9. Dimension-SOD323

SOD323

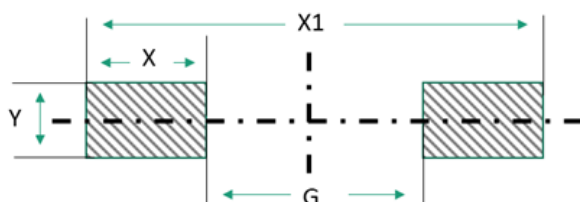
Dim	Millimeters	
	Min.	Max.
Body Length	1.60	1.90
Body Width	1.15	1.45
Lead Span Nominal	2.39	2.70
Height	0.80	1.10
Lead Width	0.25	0.40
Lead Height	0.10	0.20
Lead Length	0.20	0.40

5-10. PCB Pad Layout Recommendation-SOD323


5-11. Dimension-SOD323-FL

SOD323-FL

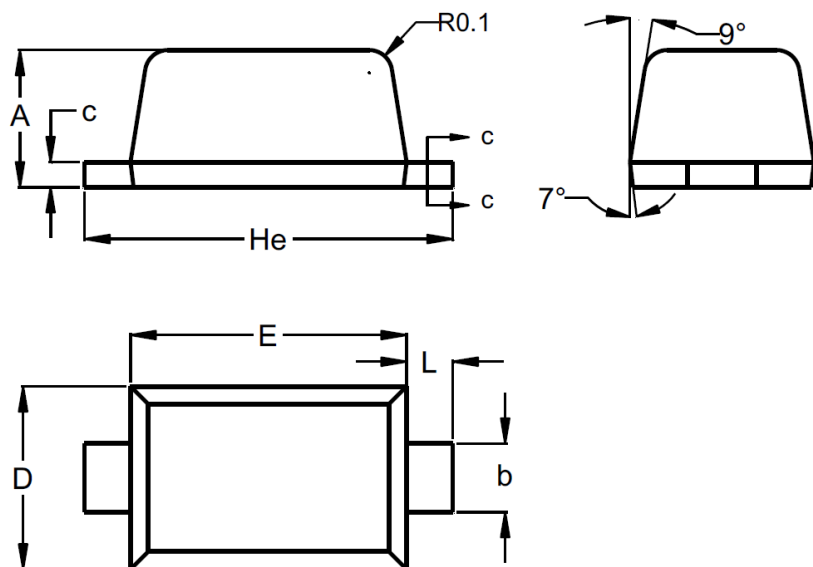
Dim.	Min.	Typ.	Max.
A	0.80	-	1.10
b	0.25	-	0.40
c	0.10	-	0.15
D	1.15	-	1.35
E	1.60	-	1.80
He	2.30	-	2.80
L1	0.7	-	1.0
L2	0.8	-	1.2
$\alpha1$	-	-	7°
$\alpha2$	-	-	3°
$\beta1$	-	-	7°
$\beta2$	-	-	3°

Unit:mm

5-12. PCB Pad Layout Recommendation-SOD323-FL


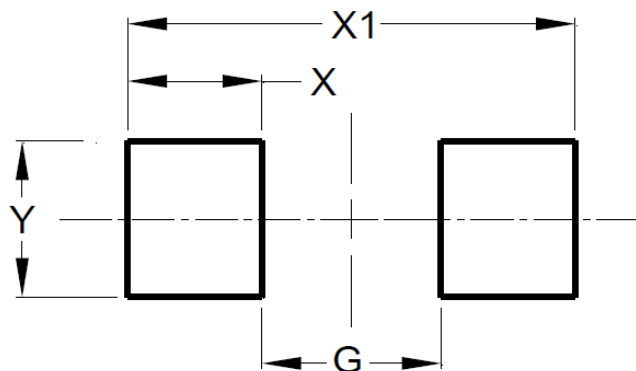
Dimension	Values
G	2.0
X	1.4
X1	3.0
Y	0.5

Unit:mm

5-13. Dimension-SOD523-FL


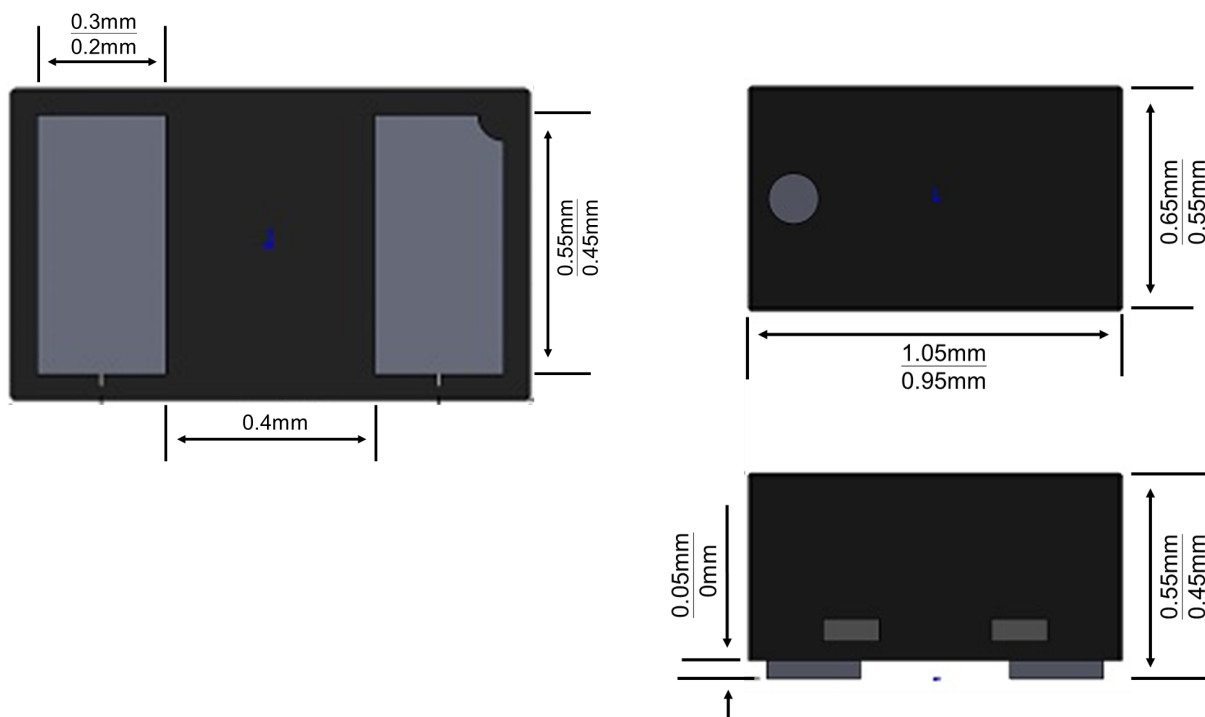
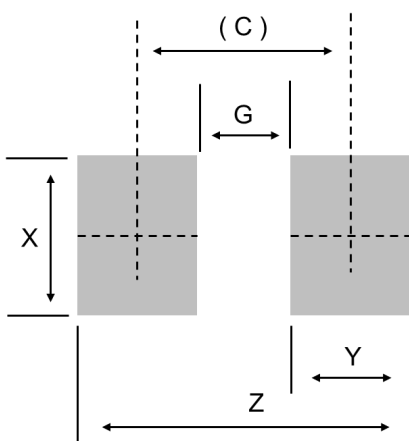
SOD523-FL		
Symbol	Min.	Max.
A	0.55	0.65
b	0.26	0.34
c	0.11	0.17
D	0.75	0.85
E	1.15	1.25
He	1.55	1.65
L	0.10	0.30

Unit: mm

5-14. PCB Pad Layout Recommendation-SOD523-FL


SOD523-FL	
Dim	Values
G	0.80
X	0.60
X1	2.00
Y	0.70

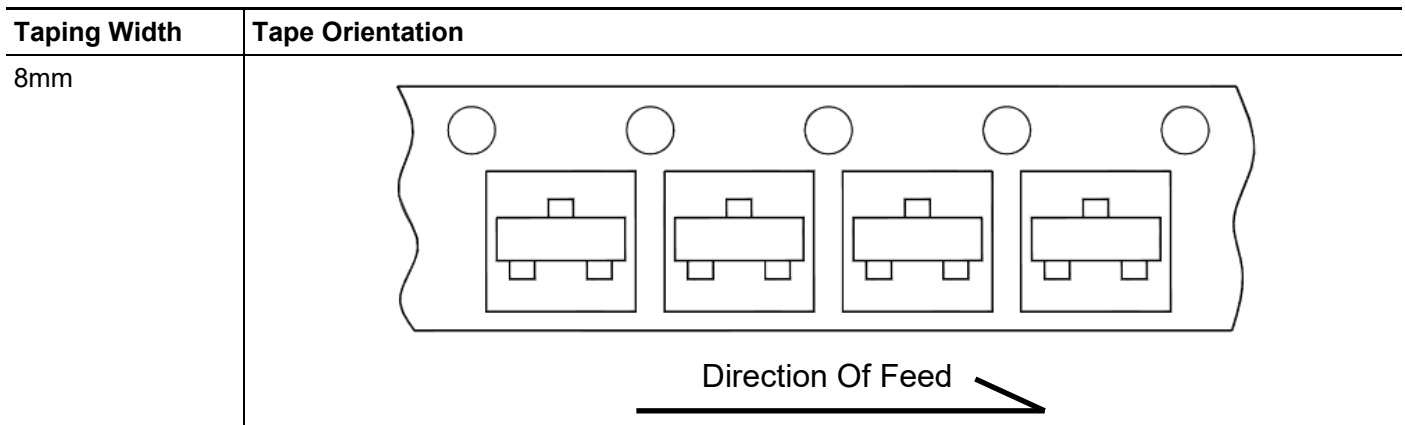
Unit: mm

5-15. Dimension-DFN1006-2L

5-16. PCB Pad Layout Recommendation-DFN1006-2L


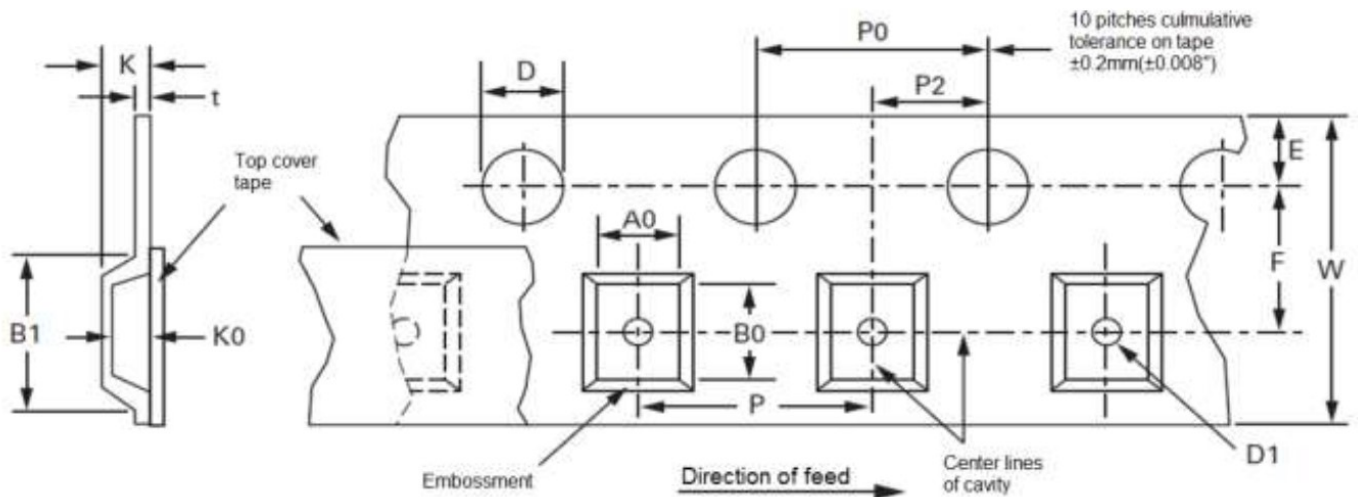
DFN1006-2L		
Dim	Inches	Millimeters
(C)	.033	0.85
G	.012	0.30
X	.024	0.60
Y	.022	0.55
Z	.055	1.40

6. Packing

6-1. Taping and Reel Specification-SOT23 / SOT323

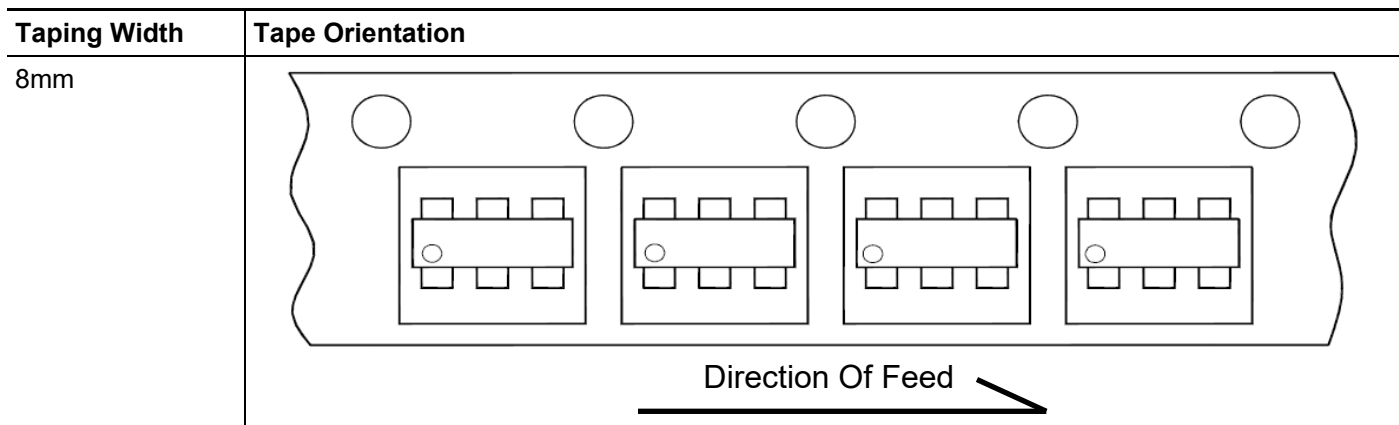
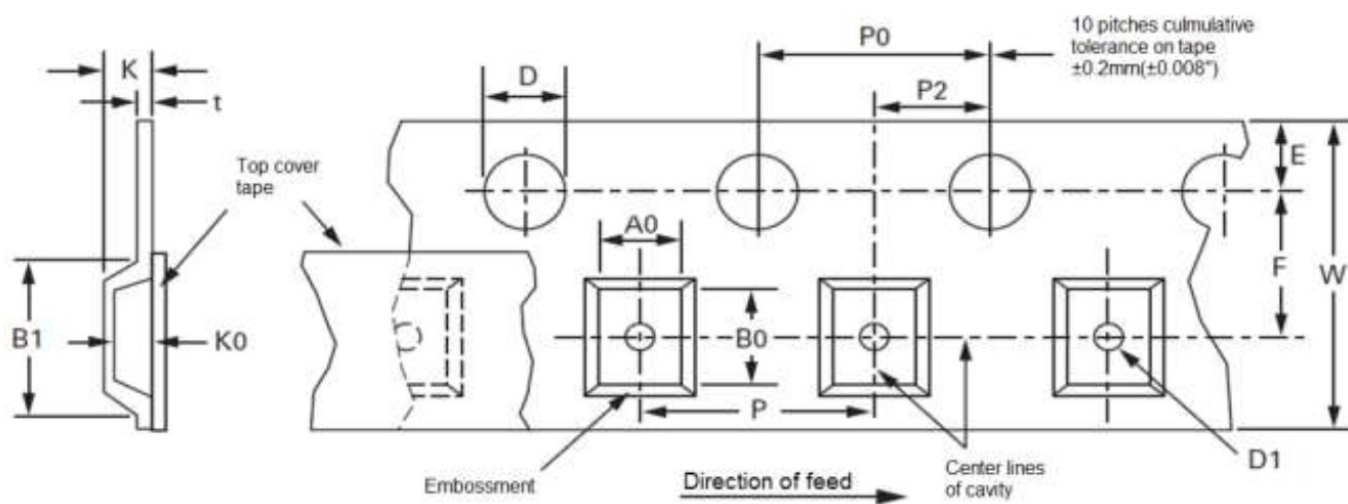


6-2. Embossed Carrier Tape Specification-SOT23 / SOT323



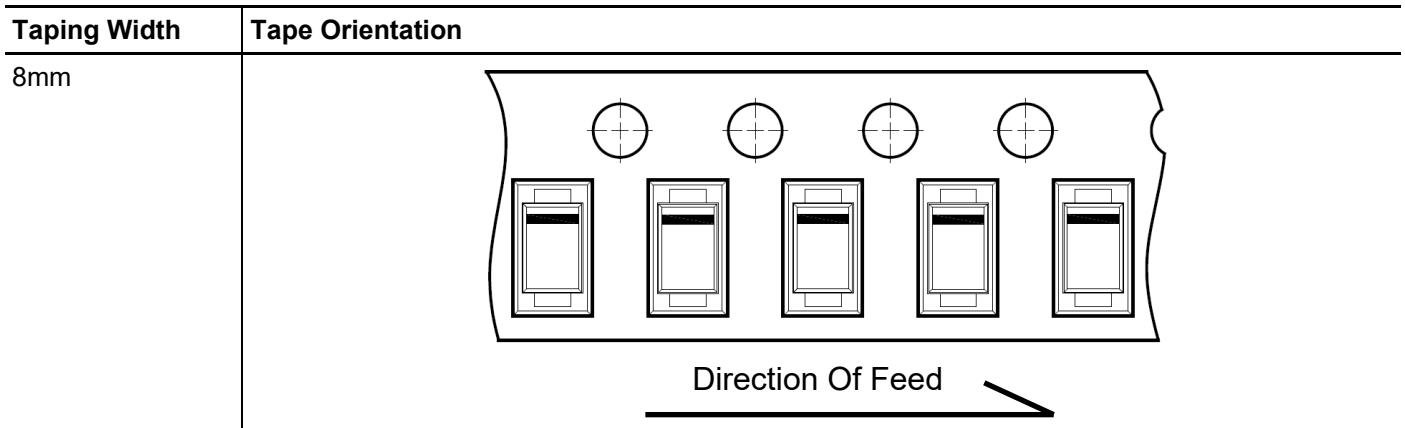
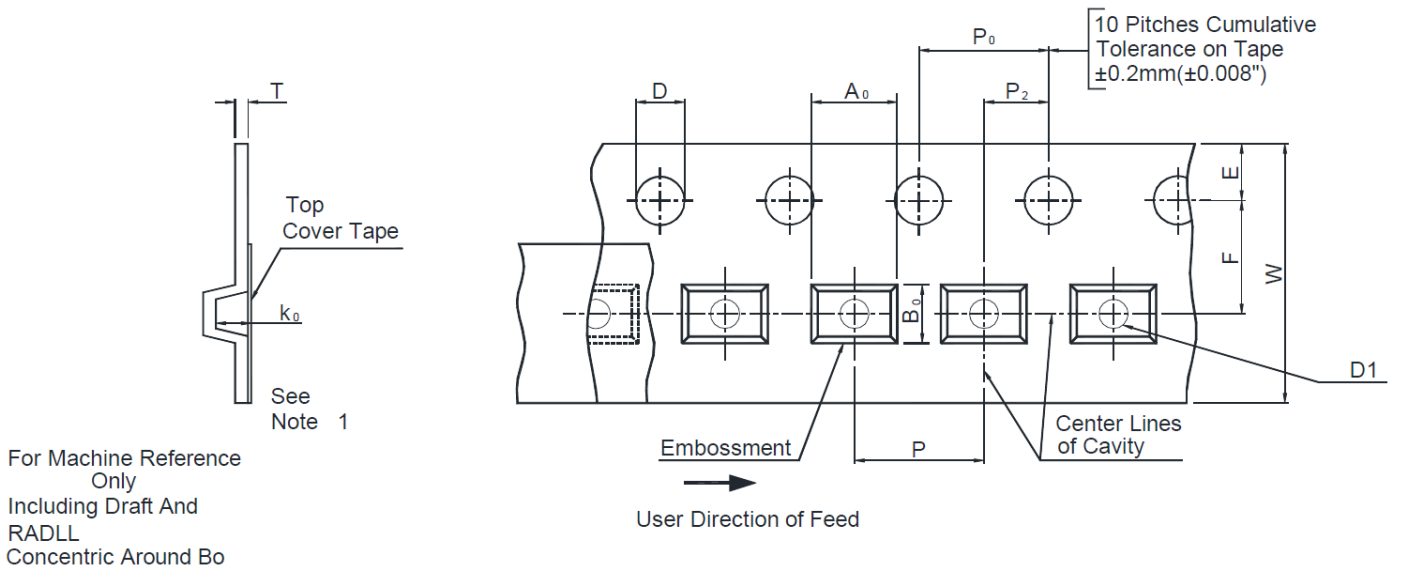
Unit: mm

Dimension	W	B1	D	D1	E	F	K	P	P0	P2	t	W
Value	8 mm	4.5 Max.	1.5 ±0.10	0.35 min.	1.75 ±0.10	3.5 ±0.05	2.4 Max.	4.0 ±0.10	4.0 ±0.10	2.0 ±0.1	0.4 Max.	8.0 ±0.3
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.											

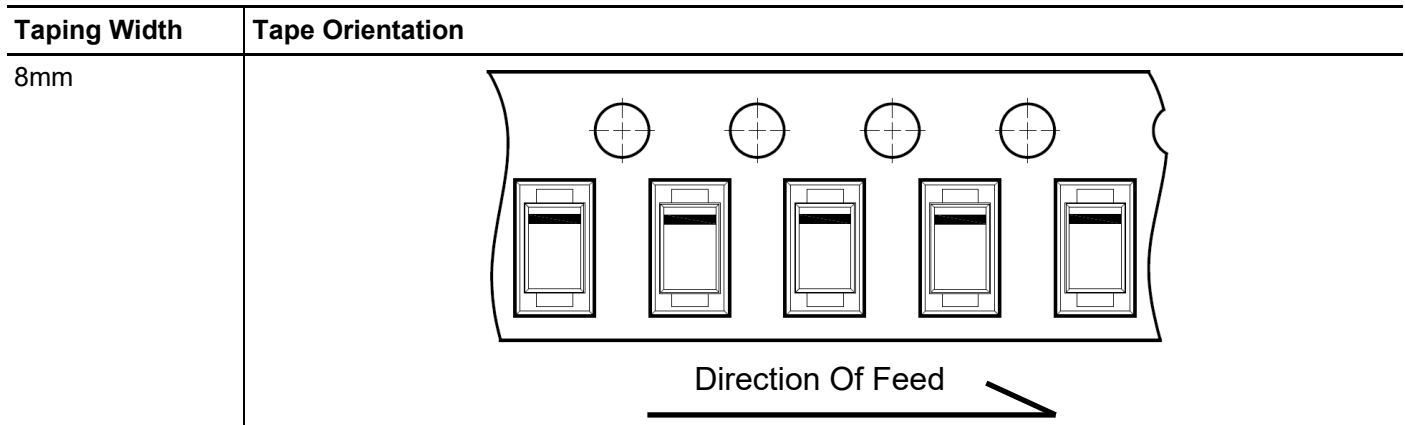
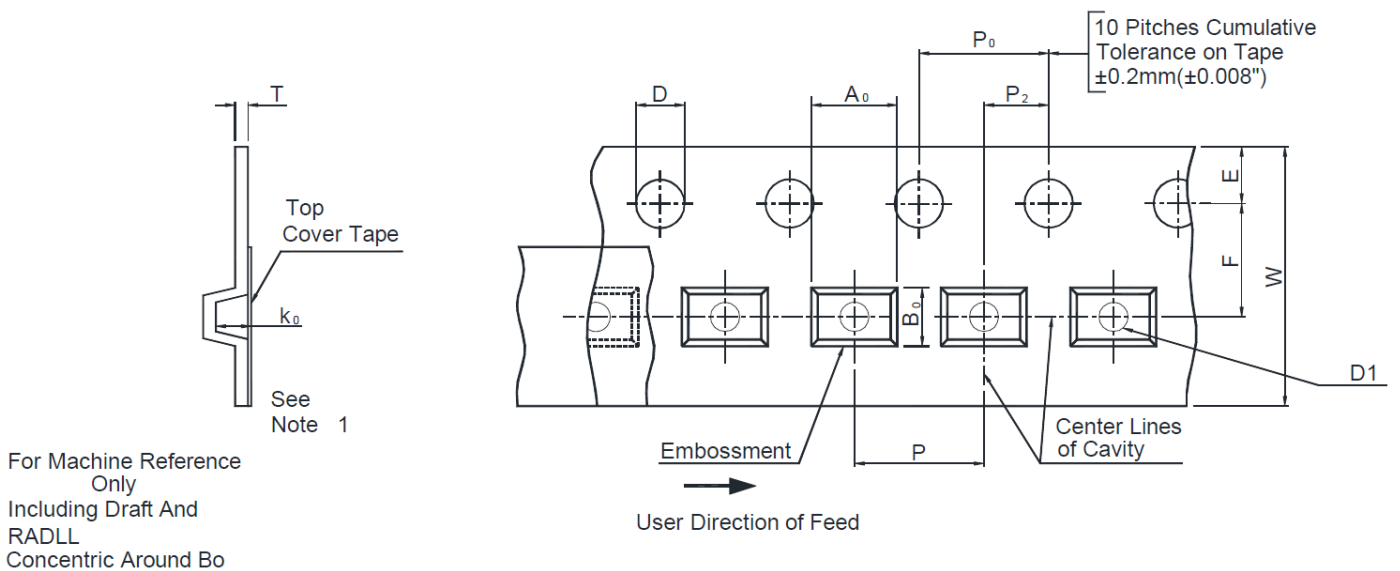
6-3. Taping and Reel Specification-SOT363

6-4. Embossed Carrier Tape Specification-SOT363


Unit: mm

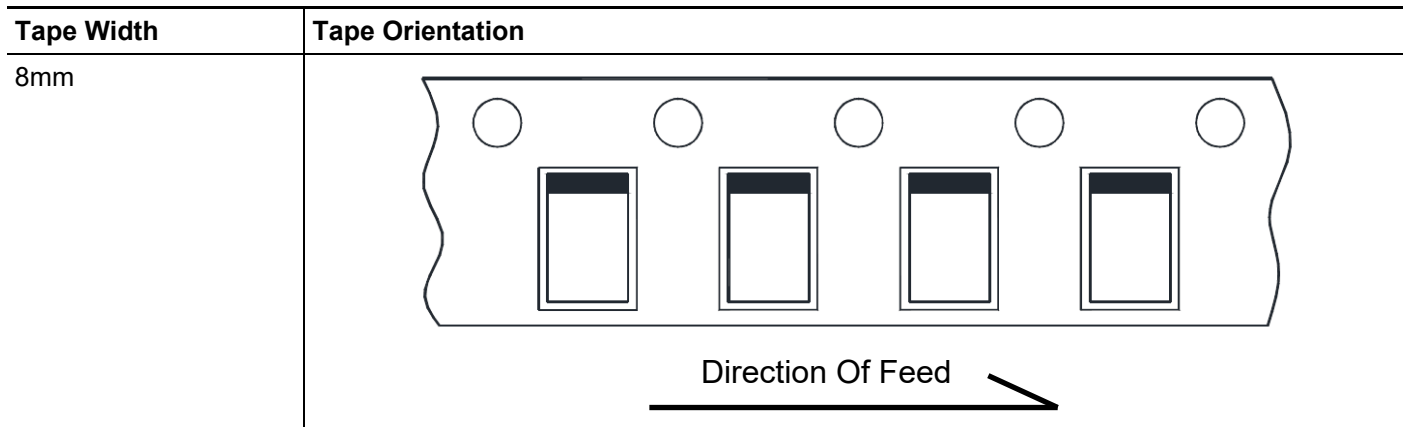
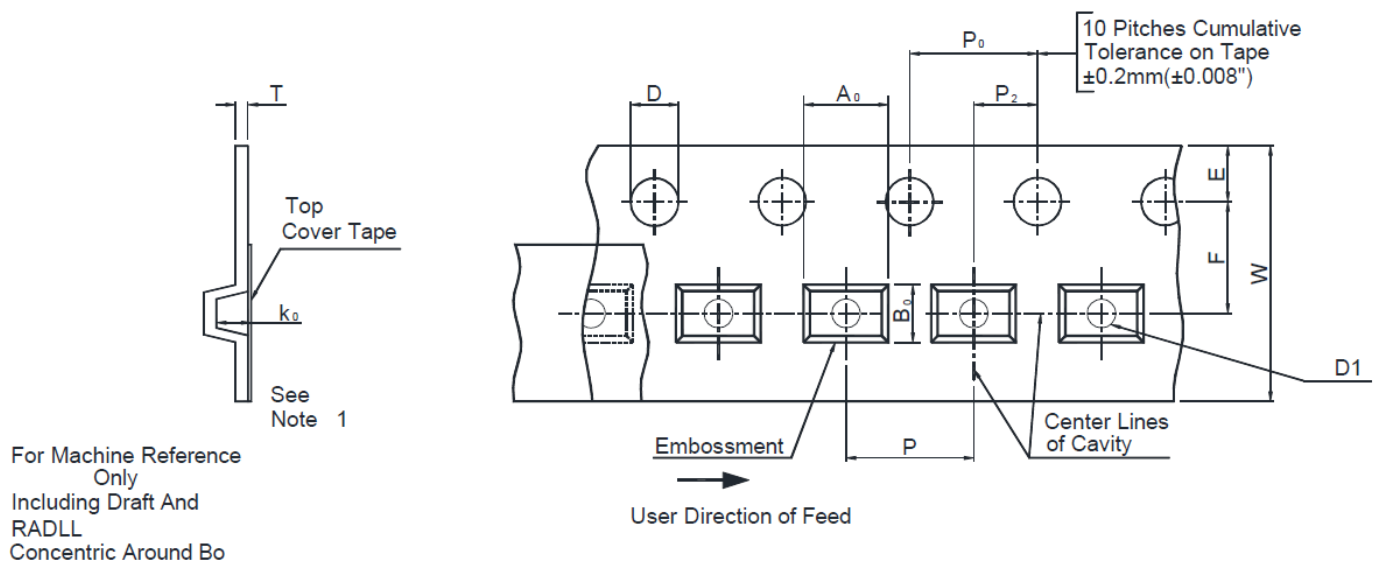
Dimension	W	B1	D	D1	E	F	K	P	P0	P2	t	W
Value	8 mm	4.5 Max.	1.5 ±0.10	0.35 min.	1.75 ±0.10	3.5 ±0.05	2.4 Max.	4.0 ±0.10	4.0 ±0.10	2.0 ±0.1	0.4 Max.	8.0 ±0.3
A0 / B0 / K0	Determined by Component Size. The Clearance Between The Component And The Cavity Must Comply to The Rotational and Lateral Movement Requirement Provided in Figures in The "Maximum Component Movement in Tape Pocket" Section.											

6-5. Taping and Reel Specification-SOD123 / SOD323 / SOD323FL

6-6. Embossed Carrier Tape Specification-SOD123 / SOD323 / SOD323FL


Dimension	W	D	D1	E	F	P	P0	P2	t	W
Values	8 mm	1.5 ±0.1	1.4 Max.	1.75 ±0.1	3.5 ±0.05	4 ±0.1	4 ±0.1	2 ±0.1	0.23 ±0.02	8 +0.3 / -0.1
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.									

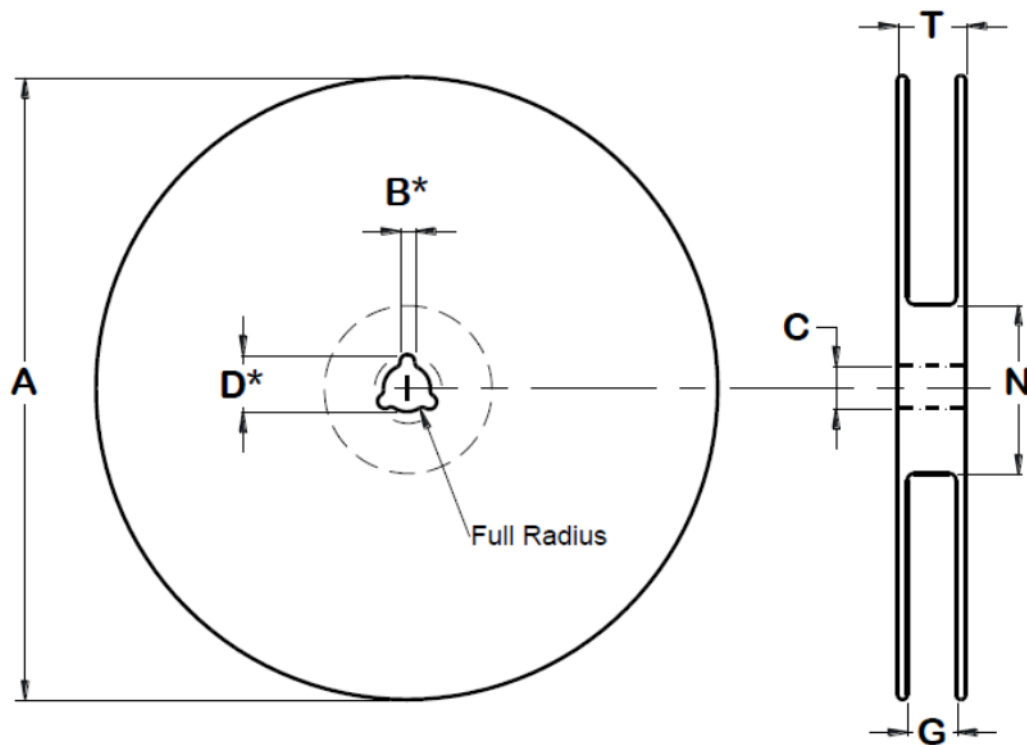
6-7. Taping and Reel Specification-SOD523FL

6-8. Embossed Carrier Tape Specification-SOD523FL


Dimension	W	D	D1	E	F	P	P0	P2	t	W
Values	8 mm	1.5 ±0.1	0.6 Max.	1.75 ±0.1	3.5 ±0.05	2 ±0.1	4 ±0.1	2 ±0.1	0.23 ±0.02	8 +0.3 / -0.1
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.									

6-9. Taping and Reel Specification-DFN1006-2L

6-10. Embossed Carrier Tape Specification-DFN1006-2L


Dim	W	D	D1	E	F	P	P0	P2	t	W
Values	8 mm	1.5 +0.1 / -0.0	0.6 Max.	1.75 ± 0.1	3.5 ± 0.05	2 ± 0.1	4 ± 0.1	2 ± 0.1	0.4 Max.	8 +0.3 / -0.1
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.									

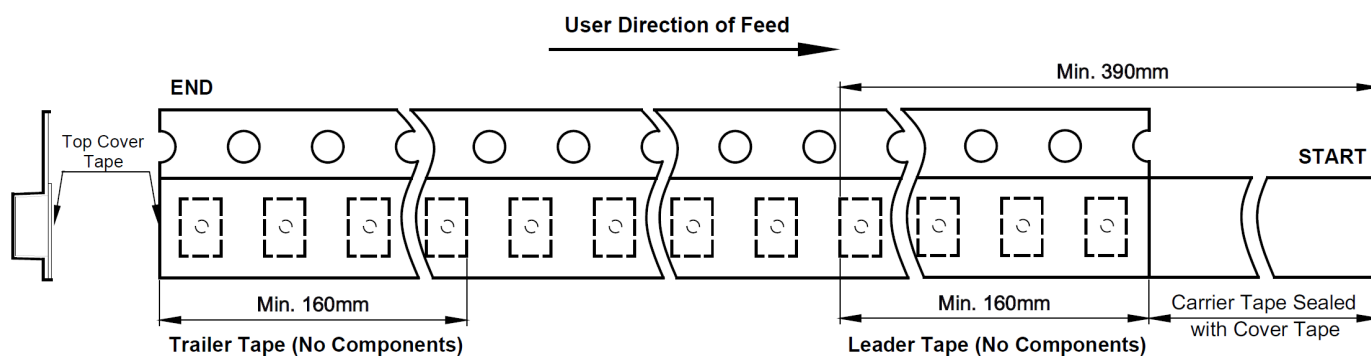
6-11. Surface Mount Reel Specification



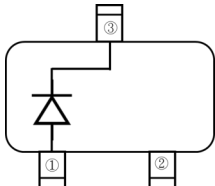
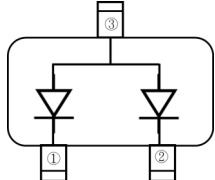
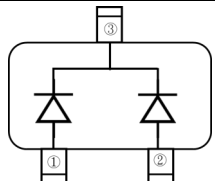
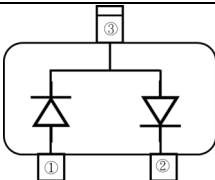
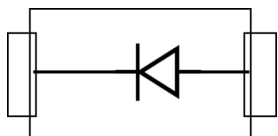
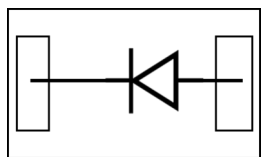
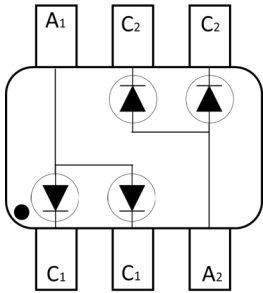
Unit: mm

Dimension	Tape Width	Reel Size	A	B	C	D	N	G	T
Values	8 mm	7"	178 ±2	2.0 +0.5/-0	13 +0.5/-0.2	20.5 ±0.2	55 ±5	8.4 +1.5/-0.0	14.4

6-12. Tape Leader and Trailer Specification



7. Ordering Information

Part Number	Schematic	Marking Code	Component Package	Quantity	Packaging Option
BAT54		L4	SOT-23	3,000 PCS	Tape & Reel - 8mm Tape & 7" Reel
BAT54W			SOT-323		
BAT54A		L42	SOT-23		
BAT54AW			SOT-323		
BAT54C		L43	SOT-23		
BAT54CW			SOT-323		
BAT54S		L44	SOT-23		
BAT54SW			SOT-323		
BAT54T		MB / L9	SOD123		
BAT54H		BS3 / S1	SOD323		
BAT54WS		S1	SOD323-FL		
BAT54K		BS3	SOD523-FL		8,000 PCS
BAT54L		BS3	DFN1006-2L	10,000 PCS	
BAT54BRW		KLB	SOT-363	3,000 PCS	

8. Version

8-1. History

Version	Date	File No.	Recording	Basis
A	07-Feb-2018	F41806F	New Create	Market
B	05-May-2019		Update Company Info.	System
2.0	10-Oct-2021		Update Version	System
2.1	07-Dec-2021		Update Version	System
2.2	07-Feb-2022		Update Marking Code	Engineer