

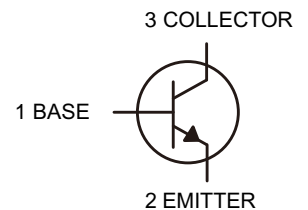
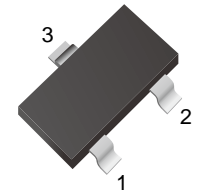
## Transistor(NPN)

### Features

- Power Dissipation of 300mW
- High Stability and High Reliability
- Lead free in comply with EU RoHS 2011/65/EU directives

### Ordering Information

Part Number	Marking	Shipping	Reel
LTW4140T-TR3	ZTW	3000PCS Tape&Reel	7 inches
LTW4140T-TR12	ZTW	12000PCS Tape&Reel	13 inches



### Maximum Ratings and Thermal Characteristics

( $T_a=25^{\circ}\text{C}$  unless otherwise noted)

Parameters	Symbol	Value	Unit
Collector-Base Voltage	$V_{CBO}$	40	V
Collector-Emitter Voltage	$V_{CEO}$	40	V
Emitter -Base Voltage	$V_{EBO}$	5	V
Collector Current-Continuous	$I_C$	1	A
Peak Collector Current	$I_{CM}$	2	A
Total Power Dissipation	$P_D$	300	mW
Junction Temperature	$T_j$	-55~+150	
Storage Temperature	$T_{stg}$	-55~+150	
Thermal resistance From junction to ambient	$R_{\theta JA}$	500	/W

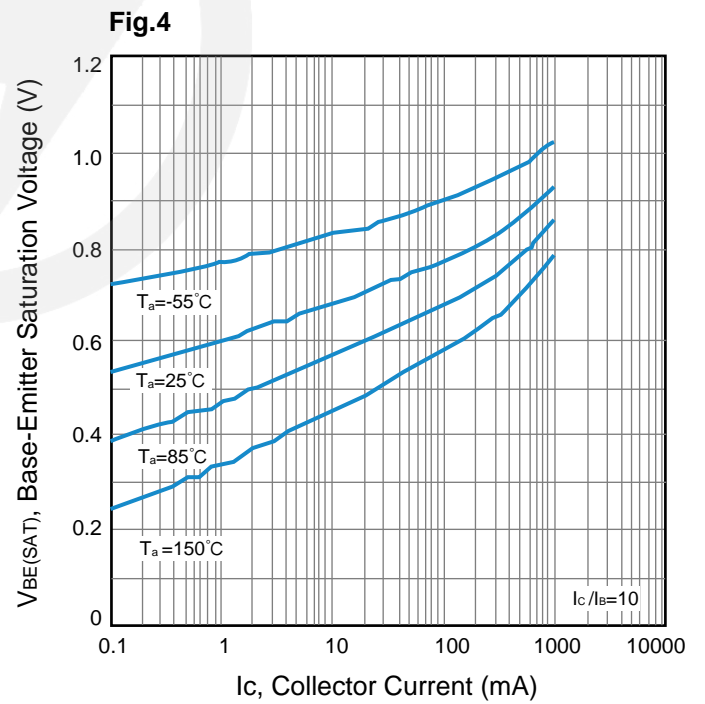
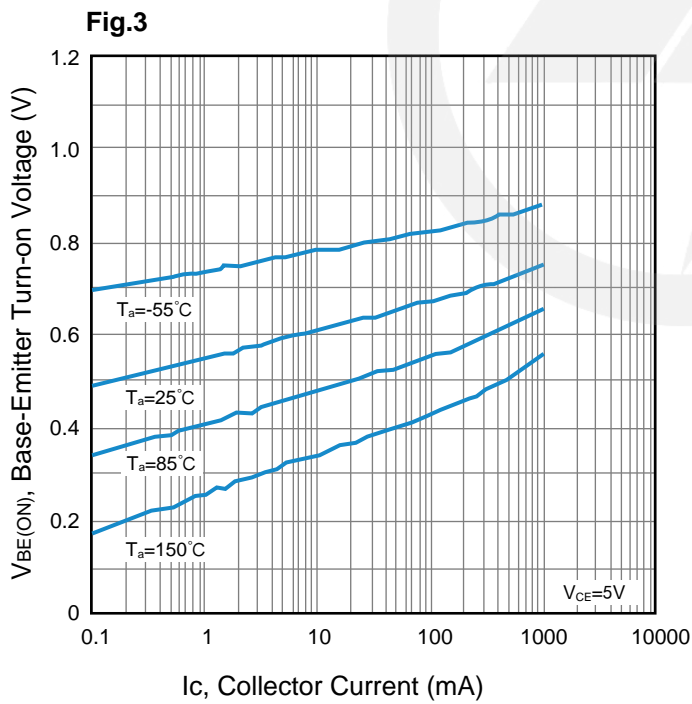
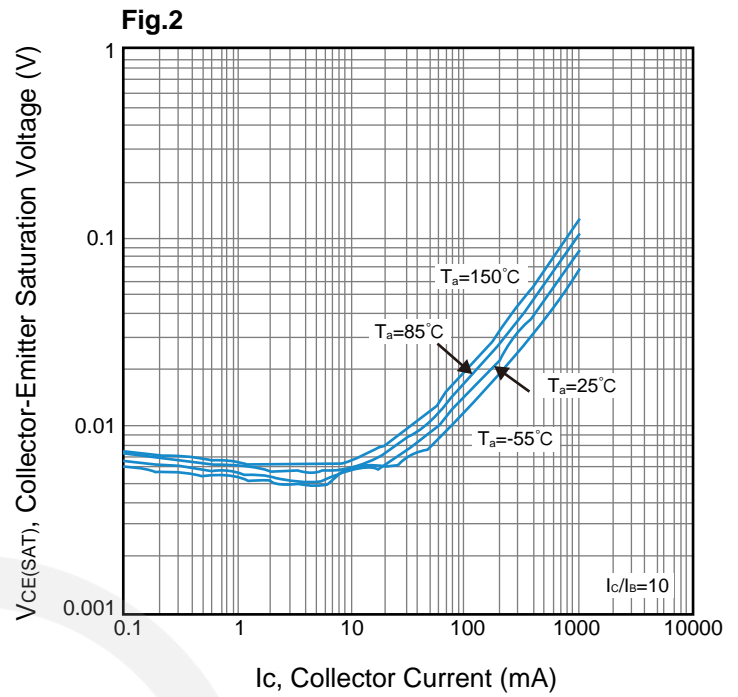
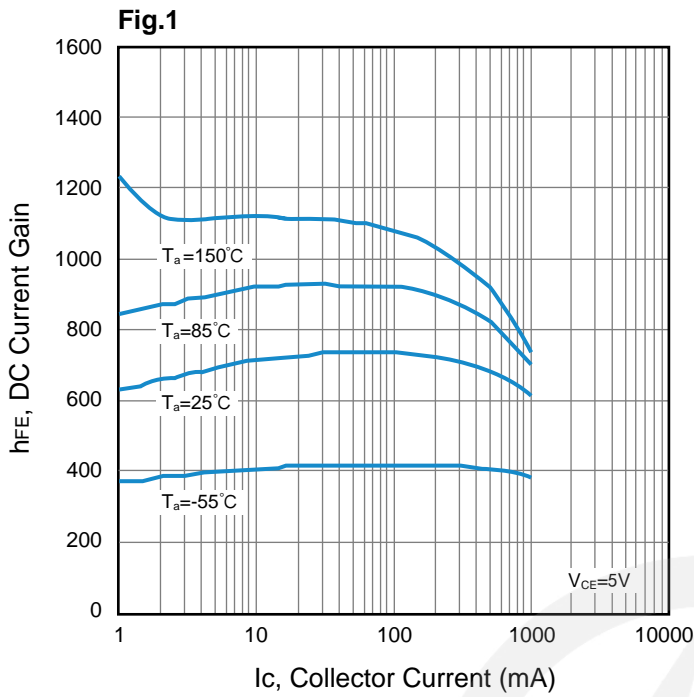
### Electrical characteristics ( $T_a=25$ unless otherwise specified )

Parameter	Symbol	Test Condition	Limits		Unit
			Min	Max	
Collector-base breakdown voltage	$V(BR)CBO$	$I_C=100\mu\text{A}, I_E=0$	40		V
Collector-emitter breakdown voltage	$V(BR)CEO$	$I_C=10\text{mA}, I_B=0$	40		V
Emitter-base breakdown voltage	$V(BR)EBO$	$I_E=100\mu\text{A}, I_C=0$	5		V
Collector-Emitter cut-off current	$I_{CEO}$	$V_{CE}=30\text{V}, I_B=0$		500	nA
Collector-Base cut-off current	$I_{CBO}$	$V_{CB}=40\text{V}, I_E=0$		100	nA
Emitter-Base cut-off current	$I_{EBO}$	$V_{EB}=5\text{V}, I_C=0$		100	nA
DC current gain	$h_{FE(1)}^*$	$V_{CE}=5\text{V}, I_C=1\text{mA}$	300		
	$h_{FE(2)}^*$	$V_{CE}=5\text{V}, I_C=500\text{mA}$	300	900	
	$h_{FE(3)}^*$	$V_{CE}=5\text{V}, I_C=1\text{A}$	200		
Collector-emitter saturation voltage	$V_{CE(sat)1}^*$	$I_C=100\text{mA}, I_B=1\text{mA}$		0.20	V
	$V_{CE(sat)2}^*$	$I_C=500\text{mA}, I_B=50\text{mA}$		0.25	V
	$V_{CE(sat)3}^*$	$I_C=1\text{A}, I_B=100\text{mA}$		0.50	V
Base -emitter saturation voltage	$V_{BE(sat)}^*$	$I_C=1\text{A}, I_B=100\text{mA}$		1.20	V
Base-emitter turn-on voltage	$V_{BE(on)}^*$	$V_{CE}=5\text{V}, I_C=1\text{A}$		1.10	V
Transition frequency	$f_T$	$V_{CE}=10\text{V}, I_C=50\text{mA}, f=100\text{MHz}$	150		MHz
Collector capacitance	$CC$	$V_{CB}=10\text{V}, I_E=0, f=1\text{MHz}$		10	pF

\*Pulse test: pulse width  $\leq 300\mu\text{s}$ , duty cycle  $\leq 2.0\%$ .



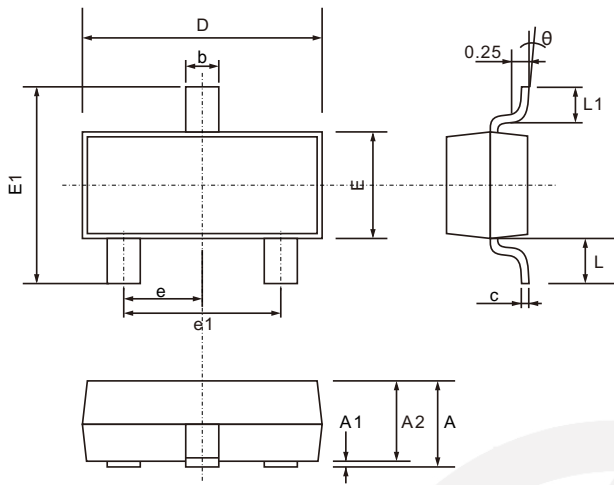
Characteristics Curves





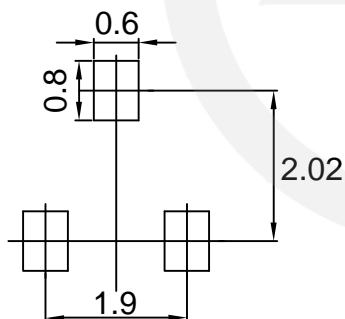
SOT-23 Package Outline

Unit: mm



SYMBOL	DIMENSIONS	
	MIN.	MAX.
A	0.900	1.200
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.200
D	2.700	3.100
E	1.200	1.400
E1	2.200	2.600
e	0.950 TYP.	
e1	1.750	2.050
L	0.550 TYP.	
L1	0.300	0.500
θ	0°	8°

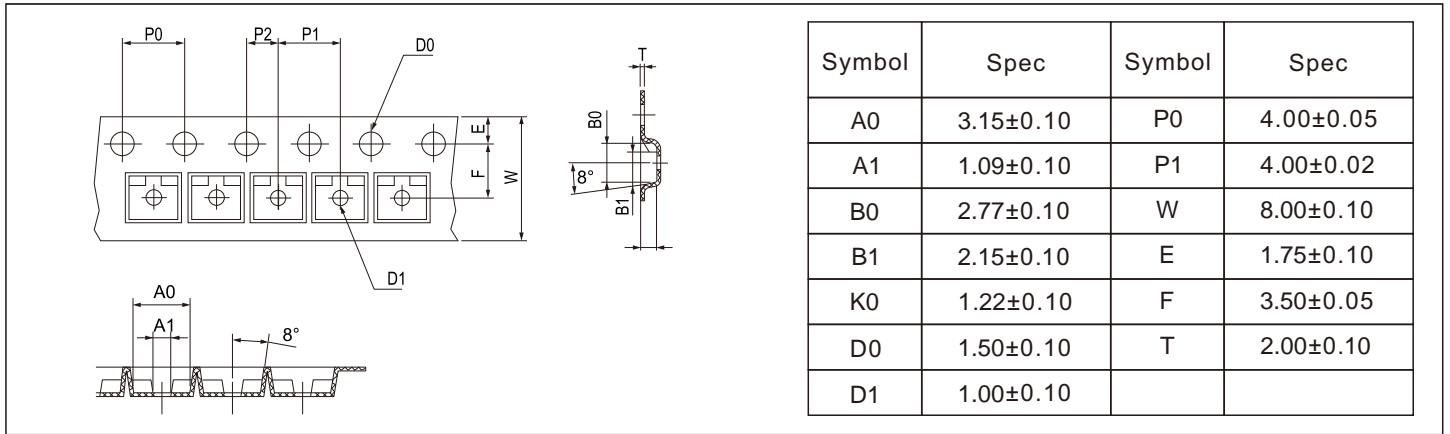
SOT-23 Suggested Pad Layout



Note:  
 1. Controlling dimension: in millimeters.  
 2. General tolerance:  $\pm 0.05\text{mm}$   
 3. The pad layout is for reference purpose only.

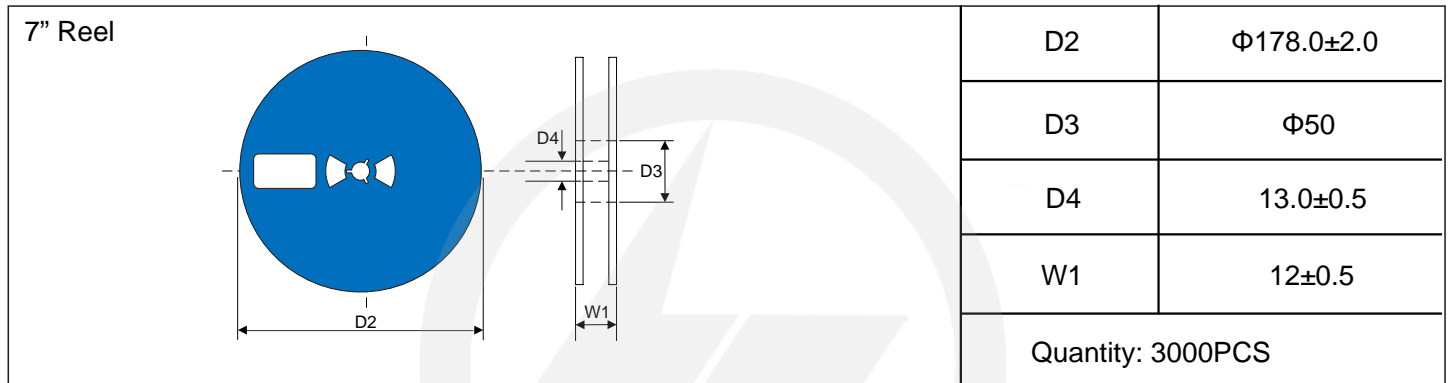
## Carrier Tape Dimensions

Unit : mm



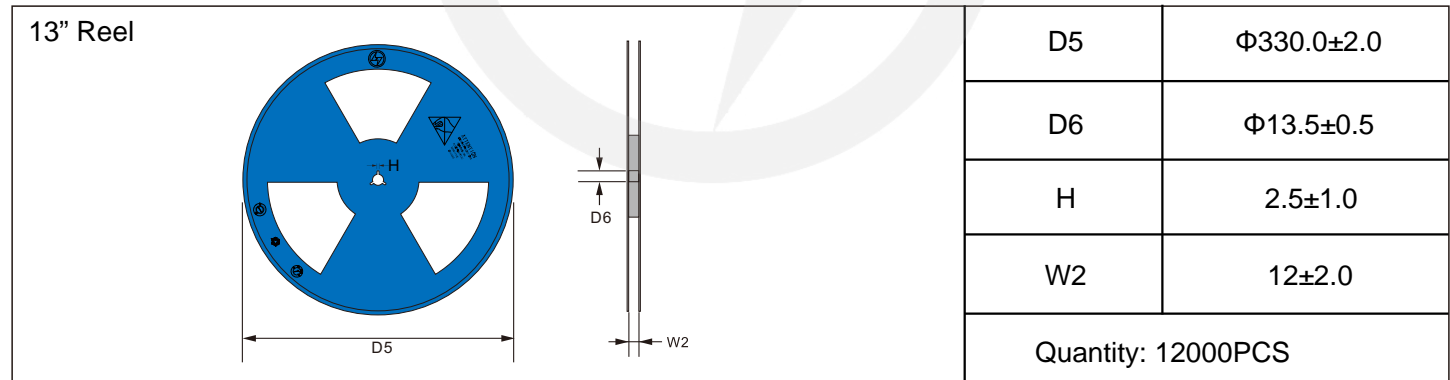
## Reel Dimensions

Unit : mm

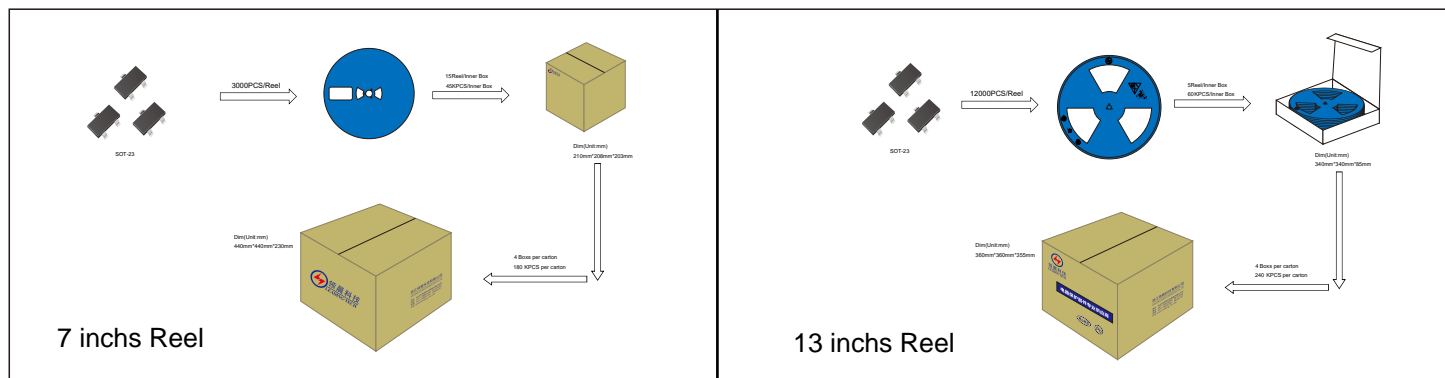


## Reel Dimensions

Unit : mm



## Packaging





Recommended Soldering Conditions



Recommended Conditions

Profile Feature	Pb-Free Assembly
Average ramp-up rate (T <sub>L</sub> to T <sub>P</sub> )	3°C/second max.
Preheat	
-Temperature Min (T <sub>S min</sub> )	150°C
-Temperature Max (T <sub>S max</sub> )	200°C
-Time (min to max) (t <sub>s</sub> )	60-180 seconds
T <sub>S max</sub> to T <sub>L</sub>	
-Ramp-up Rate	3°C/second max.
Time maintained above:	
-Temperature (T <sub>L</sub> )	217°C
-Time (t <sub>L</sub> )	60-150 seconds
Peak Temperature (T <sub>P</sub> )	260°C
Time within 5°C of actual Peak Temperature (t <sub>p</sub> )	20-40 seconds
Ramp-down Rate	6°C/second max.
Time 25°C to Peak Temperature	8 minutes max.

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## Version Update Information

Series NO.	Enactment/Revision Date	Effective Date	Version	Revision Content	Revision Reason	Revision Person	Note
01	2024.03.12	2024.03.12	3.0	New file	/	Ding	
02	2025.04.09	2024.04.09	3.1	T <sub>j</sub> : -55~+150°C	/	Ding	
03	2025.08.14	2025.08.14	3.2	Marking Modify to ZTW	/	Ding	
04	2025.10.13	2025.10.13	3.3	ICEO=500nA	/	Ding	
05	2026.03.06	2026.03.06	3.4	Package outline E1(max)=2.6mm	/	Ding	